CHAPTER 12
RECREATION

Wildlife viewing, fishing, waterfowl hunting, swimming, motor boating, rafting, sailing, and windsurfing are important water-enhanced or water-dependent recreational activities throughout California. The quality of recreation at lakes and reservoirs depends largely on surface water levels. Rafting and boating are popular activities that are often dependent on appropriate river flows and reservoir water levels for maximum enjoyment. Enjoyment of water-enhanced activities, such as picnicking and hiking, also can be related to water levels.

12.1 ENVIRONMENTAL SETTING/AFFECTED ENVIRONMENT

Potential changes in reservoir water surface elevations and river flows could affect water-enhanced and water-dependant recreational activities such as boating, swimming, and fishing. Recreational resources analyzed in the Yuba Region include water-enhanced and water-dependant recreation activities within the Yuba River Basin, including New Bullards Bar Reservoir, the North Yuba River downstream of New Bullards Bar Reservoir, Englebright Reservoir, areas along the lower Yuba River downstream of Englebright Reservoir to the confluence with the Feather River (Figure 2-1). The CVP/SWP waterways with recreational activities potentially influenced by altering facilities operation include the Sacramento River, Oroville Reservoir, the Feather River, the Delta and San Luis Reservoir. This section describes the existing recreational resources associated with surface water bodies and related facilities that provide water-related recreational opportunities within the four study area regions.

12.1.1 YUBA REGION

Yuba County offers a variety of outdoor recreational opportunities but most of the recreation is water-oriented and includes boating, swimming, and fishing. Water-related and water-enhanced recreational resources in the Yuba Region include New Bullards Bar Reservoir, the North Yuba River between New Bullards Bar Reservoir and Englebright Reservoir, Englebright Reservoir, and the lower Yuba River from below Englebright Dam to the confluence with the Feather River.

Hunting and wildlife viewing opportunities in this region are enhanced by natural or impounded shallow water areas that attract waterfowl. Ducks nesting along natural streams and other waterways is common. Large numbers of ducks and geese are observed in Yuba County during the fall and winter. Most of the organized waterfowl hunting clubs are north of Marysville in rice producing areas. Agricultural water supplies used to flood rice fields in Yuba County are administered through water contracts and conjunctive use agreements between YCWA and its Member Units (see Section 5.1.1 in Chapter 5 for a full discussion). Public lands also provide access and recreational opportunities within the region (**Figure 12-1**).

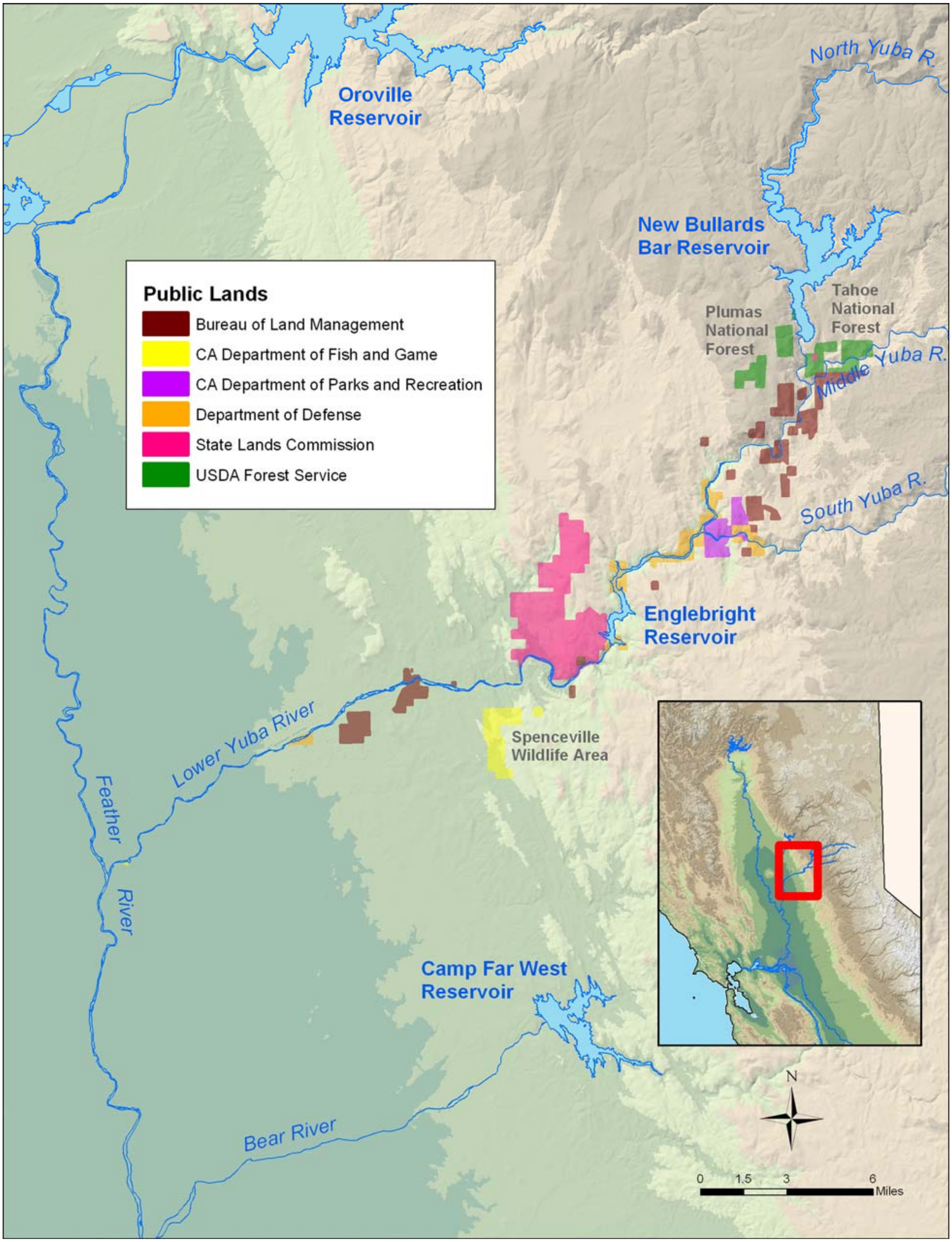

Figure 12-1. Public Lands that Provide Recreational Opportunities Within the Yuba Region

12.1.1.1 *NEW BULLARDS BAR RESERVOIR*

New Bullards Bar Reservoir is a YCWA-owned facility approximately 21 miles north of Nevada City, in historic gold country. The reservoir has a total storage volume of 960 TAF with a total surface area of 4,790 acres. Recreation on the reservoir is managed jointly between YCWA and the USDA, Tahoe National Forest. This reservoir is popular for boating, fishing, and camping from May through September. Over 20 miles of hiking and mountain biking trails exist in the area, including the Bullards Bar Trail, which runs along the perimeter of the reservoir. Several campgrounds, including Schoolhouse and Dark Day, are in the vicinity of the reservoir. Some campgrounds around the reservoir, such as Madrone Cove and Garden Point, are accessible by boat only (**Figure 12-2**). Emerald Cove Resort and Marina, located on the southern tip of New Bullards Bar Reservoir, has a general store, pumping station, launch ramp, boat rentals, moorage, and annual slips. Boat access to the reservoir is provided by the Cottage Creek boat ramp (at Emerald Cove Marina) and Dark Day boat ramp. Cottage Creek boat ramp is unusable when the reservoir level falls below 1,822 feet msl, and Dark Day boat ramp becomes inoperable when the reservoir level falls below 1,798 feet msl (Reclamation *et al.* 2003).

Fish species found in the reservoir include rainbow trout, brown trout, Kokanee, bass, bluegill, crappie, and bullhead catfish. Some boat launching occurs year round; however, the typical boating season extends from about early May through mid-October. The greatest amount of boat ramp use occurs on weekends and holidays from Memorial Day to Labor Day (USFS 1999).

12.1.1.2 *LOWER YUBA RIVER*

The 24-mile long lower Yuba River extends from Englebright Dam to the Feather River confluence. Hiking and boating opportunities in the lower Yuba River are limited by poor access. Public river access in the 24-mile long lower Yuba River is available at Parks Bar approximately five miles northeast of Smartville, Sycamore Ranch near the Dry Creek and lower Yuba River confluence, and the Hallwood Avenue Access approximately five miles northeast of Marysville. Where access is available, fishing, picnicking, rafting, kayaking, tubing, and swimming are the dominant recreational uses. The lower Yuba River offers excellent American shad, Chinook salmon, and steelhead, smallmouth bass, and striped bass fishing.

12.1.2 CVP/SWP UPSTREAM OF THE DELTA REGION

Major water-related recreation areas in the regional study area can be found at reservoirs, rivers, federal wildlife refuges, and state wildlife management areas (WMA) upstream of the Delta. Reservoirs offer recreationists many choices in destinations, settings, and activities. Oroville reservoir has boat launching facilities, day-use areas, and campgrounds. Oroville Reservoir has floating campsites, a feature unique among California state parks.

Reservoirs and rivers upstream of the Delta provide habitat for both coldwater and warmwater fish. Anglers fish for striped bass, salmon, sturgeon, steelhead, trout, kokanee, black bass, crappie, bluegill, catfish, and others. CDFG publishes a fishing regulation booklet each year that summarizes the allowable fishing season, take limit, and other guidelines for each species. Fishing is popular year-round; however, the species caught may vary during different times of the year. According to CDFG, more than 2.2 million anglers purchase some type of fishing license each year.

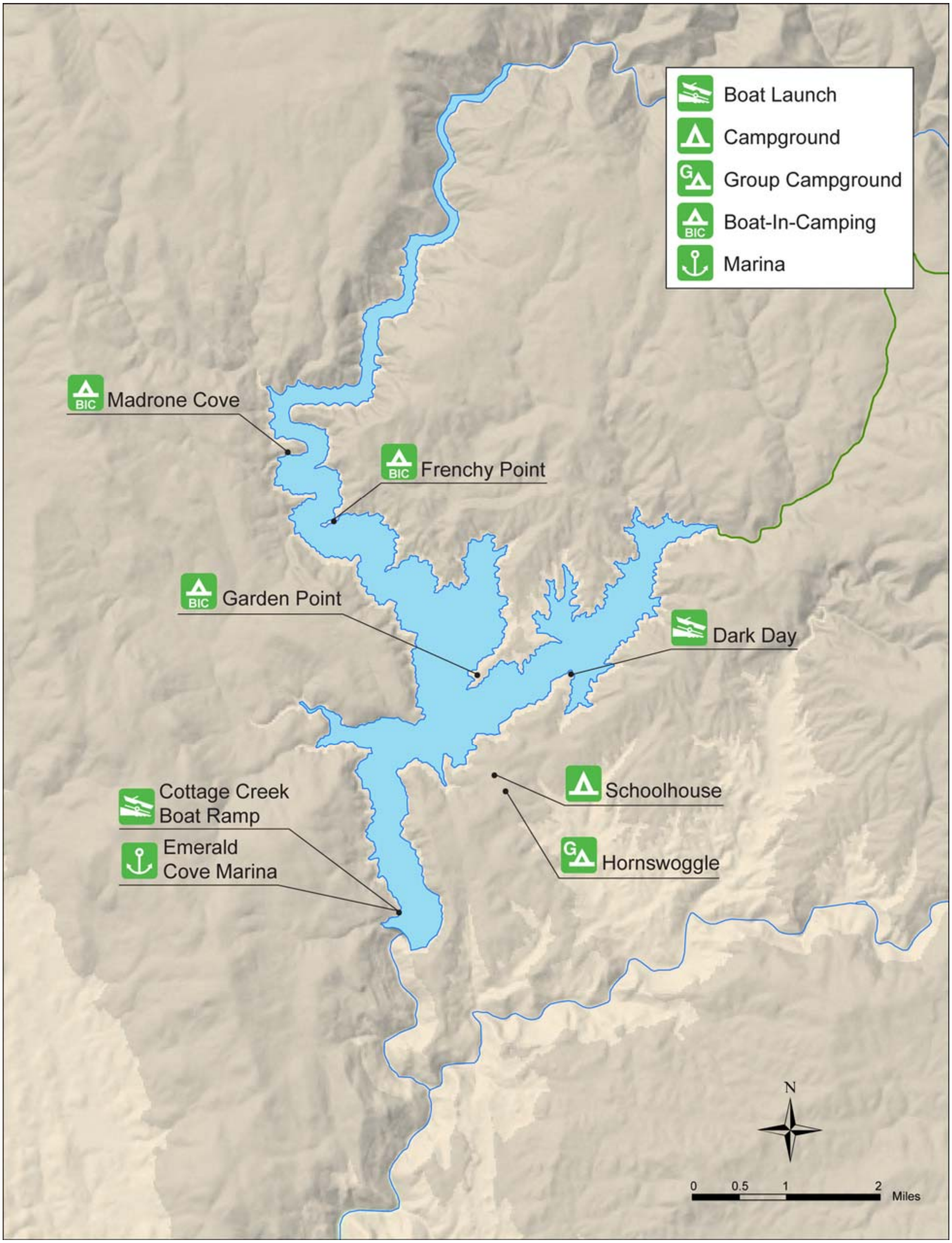

Figure 12-2. Public Access to Recreational Opportunities at New Bullards Bar Reservoir

Many waterfowl hunting clubs are established on flooded rice fields during the winter because of the large number of ducks and geese that flock to the area to forage and nest. In 2001, approximately 45,000 hunter-visits to 11 sites within the area upstream of the Delta were reported by CDFG. Approximately two waterfowl (ducks, geese, or coots) were shot per hunter. Regulations vary by bird species; however, the hunting season generally extends from late October through January.

Within the area upstream of the Delta, potential effects on recreational resources are focused on areas where the Proposed Project/Action and alternatives could alter water surface elevations within reservoirs or the timing and magnitude of reservoir releases, which could result in changes in river flows through the integrated operations of the CVP/SWP system including:

- Oroville Reservoir and the lower Feather River downstream from the Oroville Facilities to the confluence with the Sacramento River;

12.1.2.1 FEATHER RIVER BASIN

The Feather River Basin, which includes the Oroville Reservoir Complex, is an important recreational resource for Sutter, Butte and Yuba counties. These resources support a broad range of water-dependent and water-enhanced recreation opportunities, including reservoir and river facilities for boating, fishing, swimming, hunting, and camping.

OROVILLE RESERVOIR

Oroville Reservoir is the second largest reservoir in California and is a key component of the SWP. Oroville Reservoir, Thermalito Diversion Pool, Thermalito Forebay, Thermalito Afterbay, and the Oroville Wildlife Area all comprise the Oroville Reservoir Complex, which provides water, electrical power, and recreation. Oroville Reservoir has two full-service marinas and nine parks with facilities for baseball, tennis, swimming, and picnicking within the vicinity of the reservoir. The Oroville Reservoir State Recreation Area (SRA) provides camping, picnicking, boating, fishing, horseback riding, hiking, bicycling, sightseeing, and a variety of other activities. Major facilities in the Oroville SRA include Loafer Creek, Bidwell Canyon, Spillway, Lime Saddle, Oroville Reservoir Visitor Center, and North and South Thermalito Forebay (**Figure 12-3**). Only non-motorized boats are permitted on the North and South Forebays and the Diversion Pool. Additionally, the Recreation Area provides several less-developed car-top launching areas, 84 boat-in campsites, and 10 floating campsites on Oroville Reservoir. Nearby, DWR maintains three launch ramps and a day-use area at the Oroville Wildlife Area, which includes the Thermalito Afterbay. The reported optimum range of surface water elevation for Oroville Reservoir recreation activities is between 850 and 950 feet above msl (DWR 2005).

Oroville Reservoir is host to several bass fishing tournaments throughout the year and is reported to have some of the best bass fishing in California. Other fish species found in the reservoir include coho salmon, rainbow trout, sturgeon, crappie, and blue gill. The Thermalito Forebay is stocked regularly with trout and the South and North Forebay are popular with shoreline anglers.

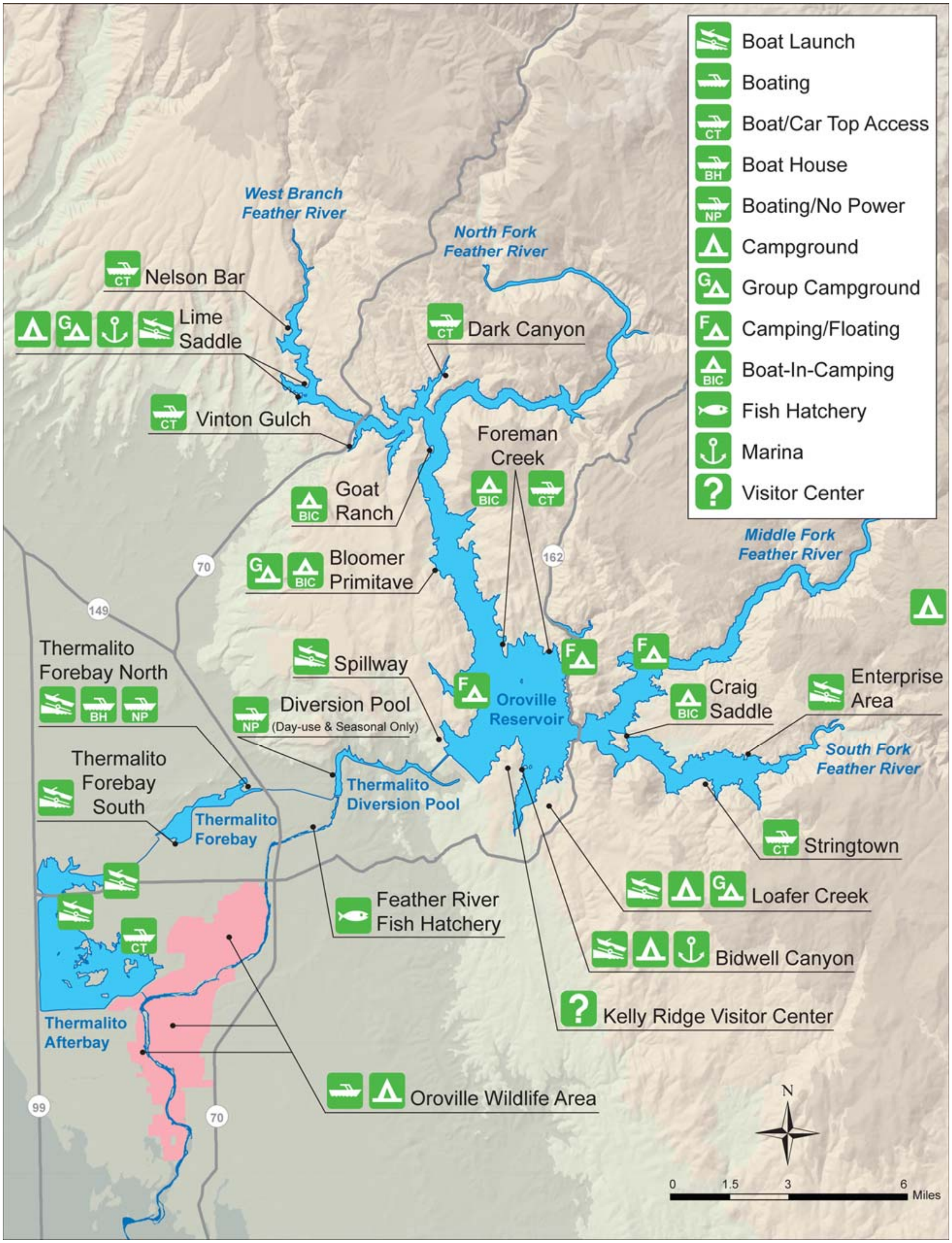

Figure 12-3. Public Access to Recreational Opportunities near the Oroville Reservoir Complex

Boat ramps on the reservoir become unusable when water surface elevations are 750 feet msl or lower. Average water surface elevation in Oroville Reservoir has historically been between 817 feet msl and 787 feet msl between July and September, respectively. Access to swimming beaches begins to decline when reservoir elevations drop below 800 feet msl (DWR 2005) due to increases in distances and slope.

LOWER FEATHER RIVER

Swimming, rafting, kayaking, fishing, camping, bird watching, picnicking, and bicycling are popular activities along the lower Feather River. The section of the Feather River between the Oroville Facilities' Thermalito Diversion Dam and Thermalito Afterbay Outlet is commonly referred to as the Low Flow Channel of the Feather River. The Low Flow Channel runs through the City of Oroville and draws anglers, wildlife and birdwatchers, sightseers, hikers, and bicyclists to trails and access points. The Brad P. Freeman Trail runs beside the Feather River from the Thermalito Diversion Dam to Highway 162. This section of the Feather River is an important recreational resource for the residents of Oroville and nearby areas.

Non-motorized boating on the lower Feather River occurs from the Low Flow Channel to the town of Gridley. The eight-mile river reach between the Fish Barrier Dam and the Thermalito Afterbay Outlet has some Class II rapids. Flows in this reach typically remain between 600 and 700 cfs. The eight-mile reach between the Thermalito Afterbay Outlet and Gridley is also the most heavily used boating and fishing reach in the lower Feather River from July to September (DWR 2004).

Based on CDFG regulations, the river is open for fishing north of the Table Mountain Bicycle Bridge. In the spring and fall, salmon are known to congregate at the Thermalito Afterbay Outlet. In recent years, the Feather River has provided habitat for a reported 40,000 Chinook salmon in the spring and fall. Most anglers are drawn to the Oroville Wildlife Area, and the Feather River Fish Hatchery, operated by CDFG located at the upper end of the Low Flow Channel immediately downstream of the Fish Barrier Dam. The hatchery has interpretive displays related to salmon and trout, and seasonally provides a unique opportunity for visitors to watch fish ascend the fish ladder to the hatchery through underwater windows. Downstream from the Thermalito Afterbay Outlet, the river continues through the Oroville Wildlife Area. The Oroville Wildlife Area provides opportunities for bird watching, in-season hunting, fishing, swimming, and camping.

Minimum flow requirements for the lower Feather River are regulated by a 1983 agreement between CDFG and DWR, which specifies that a minimum of 600 cfs is released into the river from the Thermalito Diversion Dam for fisheries purposes. Instream flow requirements below the Thermalito Afterbay are generally 1,000 cfs from April through September (based on the 1983 agreement between CDFG and DWR). However, flow requirements may be adjusted based on April through July runoff volumes. Generally flows in the reach are higher than the minimum requirements.

12.1.2.2 SACRAMENTO RIVER BASIN

The Sacramento River and major upstream reservoirs are important recreational resources in the Central Valley. These resources support a broad range of water-dependent and water-enhanced recreation opportunities, including reservoir and river facilities for boating, fishing, swimming, hunting, and camping.

SACRAMENTO RIVER

Fishing, rafting, canoeing, kayaking, swimming, and boating are popular activities along most reaches of the Sacramento River. Whitewater rafting and other boating-type recreational activities are generally seasonal and are dependent on river flows. Additional recreational activities along the Sacramento River include hiking, wildlife viewing, and camping.

Between Colusa and Sacramento, major recreational facilities exist at the Colusa-Sacramento River SRA, Colusa Weir access, Tisdale Weir access, River Bend Boating Facility, Knights Landing, Sacramento Bypass, and Elkhorn Boating Facility. The Colusa-Sacramento River SRA provides 60 acres of riverfront recreation near the City of Colusa and contains the only public boat launch and landing facility in Colusa County. The park is at the north end of town where the river makes a wide easterly bend. Its key features are boat ramps, picnic sites, nature trails, and campsites. The river's width at the park provides room for a variety of water-based activities, including fishing, boating, and waterskiing.

The dynamic nature of the river has lengthened the channel leading from the boat ramp to the river over time and in the process deposited sediment in the channel. The build-up of sediment is to the point that the boat ramp becomes unusable as seasonal decreases in river flows occur at the end of the summer season (EDAW 2003).

Wildlife refuges along the Sacramento River provide fishing, hunting, and wildlife viewing opportunities. These refuges include the Sacramento, Colusa, Sutter, and Delevan National Wildlife Refuges (NWR) and Gray Lodge WMA, which is the most popular of the five refuges in the region. Non-consumptive (photography and hiking) and consumptive (fishing and hunting) uses historically have been equally popular at the refuges, each accounting for approximately 50 percent of the total use with the exception of the Sutter and Delevan NWRs, which are used almost exclusively for hunting. Water supplies for certain wildlife refuges within the Central Valley are administered through CVPIA programs that acquire and convey water. Water for refuges is acquired through water supply contracts with "willing sellers".[1] Any water acquired under the Proposed Project/Action or an alternative for refuge-related purposes would be used to help meet Reclamation's obligations under the CVPIA to provide Incremental Level 4 refuge water supply. Water supplies to wildlife refuges along the Sacramento River corridor would not be adversely affected, and would benefit from long-term water transfers to the CVP/SWP system implemented under the Proposed Project/Action (see Chapter 5 for a detailed description of water transfer programs and operations).

As a recreational resource, the lower Sacramento River reach between the American River confluence and the Delta is closely associated with recreational use of Delta waterways due to the influence of tidal action. This lower reach of the river is a popular boating and fishing area

[1] Environmental documentation has already been prepared that addresses the overall impacts of acquiring full Level 4 supplies at the refuges, the conveyance of water to the refuges, and use of water on the refuges. The overall impacts of implementing the CVPIA, including providing Level 4 water supplies to the refuges, were addressed in a Final Programmatic EIS/EIR (Reclamation and USFWS 1999) and environmental assessments/initial studies (EA/IS). These documents addressed both the conveyance of water to the Sacramento Valley and San Joaquin Valley Wildlife Refuges (Reclamation 1997a; Reclamation 1997b; Reclamation 1997d; Reclamation 1997c; Reclamation and CDFG 2003) and the use of water on these refuges (Reclamation 1997c; Reclamation *et al.* 2001a; Reclamation *et al.* 2001b; Reclamation and USFWS 2001). Therefore, the analysis in this EIR/EIS with respect to refuge water supplies is focused solely on the potential impacts of Reclamation acquiring water to help meet Incremental Level 4 refuge needs.

with dispersed public access, several private marinas, and extensive boat traffic, particularly in the summer.

12.1.3 DELTA REGION

The Delta Region includes waterways in the Delta, including San Luis Reservoir. Because the reservoirs within the CVP/SWP system are operated in a coordinated manner to the various demands throughout California, changes in the timing and magnitude of exports from the Delta could indirectly result in changes to Delta flows and water surface elevations in San Luis Reservoir.

12.1.3.1 SACRAMENTO-SAN JOAQUIN DELTA

Hunting, fishing, wildlife viewing, and water-based recreation such as boating, swimming, sailing, windsurfing and other activities are popular recreational activities throughout the Delta. The facilities available to boaters and other recreational users include marinas, city or county public access areas, hunting clubs, and yacht or waterskiing clubs. The increasing demand for Delta recreation opportunities spurred the state to establish Brannan Island SRA in 1965 and Franks Tract SRA in 1966. Popular areas also include the Sherman Island Wildlife Area, Twitchell Island, Franks Tract SRA, and the Clifton Court Forebay.

Historically, year-round sport fishing from shore locations, piers, and boats has been a major activity in the Delta. According to the Delta Protection Commission (DPC), sportfishing tournaments are important recreational activities that contribute to the local economy. Important Delta sport fisheries include striped bass, shad, black bass, catfish, Chinook salmon, and steelhead.

Most of the navigable waterways in the Delta are public, and most of the land is private. The lack of public lands limits the use of the Delta for recreation. Public use of the Delta is concentrated in a few areas where marinas and other facilities provide recreational opportunities and access to the Delta waterways, and at roadside areas where public roads are adjacent to the waterways. There are few public parks. Some of the recreation areas in the Delta are accessible only by boat, thus limiting shoreline fishing opportunities in the Delta.

Popular access points for boating, waterskiing, and personal watercraft use include Windmill Cove near State Route (SR) 4; King Island; Paradise Point; Herman & Helen's near Eight Mile Road; Tower Park near SR 12; and Del's Boat Harbor near the City of Tracy. Houseboating also is concentrated along Eight Mile Road. Windsurfing, a popular sport in the Delta, typically occurs along SR 160 between Sherman Island and Rio Vista and at Windy Cove. Windy Cove is a new facility constructed at Brannan Island SRA and is the only formal windsurfing site in the area. Waterfowl and pheasant are hunted at WMAs including Grizzly Island, Joice Island, and Sherman Island, in addition to a variety of state cooperative hunting areas.

12.1.4 EXPORT SERVICE AREA

12.1.4.1 SAN LUIS RESERVOIR

San Luis Reservoir was constructed as a storage reservoir for the CVP/SWP for the purpose of storing water exports from the Delta that would otherwise flow into the Pacific Ocean. Water flows from the Delta through the California Aqueduct and the Delta-Mendota Canal to the O'Neill Forebay, and is then pumped into the main reservoir primarily during the winter and spring months. San Luis Reservoir is approximately nine miles long and five miles wide. San Luis Dam is located on the eastern end of the reservoir, the fourth largest embankment dam in the United States, which allows for a total water storage capacity of 2.041 MAF making it the largest off-stream reservoir in the United States. During normal operations the reservoir is drawn down by 100 feet or more during the late-summer and early-fall (California State Parks Website 2003).

San Luis Reservoir and O'Neill Forebay provide for activities such as boating, waterskiing, fishing, camping, and picnicking. San Luis Reservoir is open year-round. Boat access is available in the Basalt area located in the southeastern portion of the reservoir and at Dinosaur Point in the northwestern portion of the reservoir. The usability of the Basalt boat ramp declines below reservoir elevations of 340 feet msl; and the Dinosaur Point boat ramp becomes difficult to access when the reservoir elevation is below 360 feet msl (USDOI *et al.* 1999). There are no designated swimming areas or beaches at San Luis Reservoir, but the O'Neill Forebay provides opportunities for swimming, boating, fishing and camping.

12.1.5 REGULATORY SETTING

12.1.5.1 FEDERAL

NATIONAL WILD AND SCENIC RIVERS ACT

The National Wild and Scenic Rivers System was established in 1968 with the enactment of PL 90-542 (16 USC 1271 et seq.). Under this system, rivers possessing "outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values" may be designated as wild, scenic, or recreational. However, within the regions evaluated for this project, there are no designated rivers.

CLEAN WATER ACT

The CWA is aimed at restoring and maintaining the chemical, physical and biological integrity of the nation's waters (see Chapter 9). The act requires that due regard be given to improvements necessary to conserve waters for public water supplies, propagation of fish and aquatic life, agricultural and industrial uses and recreational purposes, including recreation in and on the water. Within the regions evaluated, recreational contact and non-contact beneficial uses are designated for the Sacramento, Feather and Yuba rivers, as well as the Delta.

RECLAMATION CVPIA LEVEL 4 WILDLIFE REFUGE WATER PURCHASE PROGRAM

Section 3406(d)(1) of the CVPIA[2], Title XXXIV of the Reclamation Projects Authorization and Adjustment Act of 1992 (PL 102-575), requires the Secretary of the Interior (Secretary), immediately upon enactment, to provide firm delivery of Level 2 and 2/3 Full Habitat Development water supplies to the various refuges' habitat areas identified in Reclamation's Refuge Water Supply Report. This report describes water needs and delivery requirements for each wetland habitat area to accomplish stated refuge management objectives. In the Refuge Water Supply Report, historical deliveries were termed Level 2, and the quantity of water

[2] The CVPIA was signed into law on October 30, 1992, as Title XXXIV of PL 10-575. The CVPIA mandated changes in CVP management, particularly to protect, restore, and enhance fish and wildlife.

needed to achieve full development was termed Level 4. Section 3406(d)(1) of the CVPIA requires the Secretary to provide firm delivery of Level 2 water supplies to each wildlife refuge in the Central Valley of California. Section 3406(d)(2) of the CVPIA further directs the Secretary to provide additional water supplies to meet Level 4 needs through the acquisition of water from willing sellers. The water to be acquired is known as Incremental Level 4 supplies. Incremental Level 4 supplies, when added to Level 2 supplies, make up full Level 4 supplies. The refuges specified in the CVPIA (see **Table 12-1**) are mainly located along the axes of the Sacramento and San Joaquin Valley.

Table 12-1 Incremental Level 4 Contract Quantities at the Refuge Boundary

Refuge	
Sacramento Valley	**100% Incremental Level 4**
Sacramento National Wildlife Reserve	3,600
Delevan National Wildlife Reserve	9,050
Sutter National Wildlife Reserve	6,500
Gray Lodge Wildlife Area	8,600
Subtotal	**27,750**
San Joaquin Valley	
San Luis National Wildlife Reserve Complex	
- West Bear Creek Unit	3,603
- East Bear Creek Unit	4,432
- Los Banos Wildlife Area	8,330
North Grasslands Wildlife Area Complex	
- China Island Unit	3,483
- Salt Slough Unit	3,340
Mendota Wildlife Area	2,056
Volta Wildlife Area	3,000
Grassland Resource Conservation District	55,000
Tulare Lake Basin	
Kern National Wildlife Reserve	15,050
Pixley National Wildlife Reserve	4,720
Subtotal	**103,014**
TOTAL	**130,764**

Recognizing the importance of recreational activities such as hunting and wildlife viewing, the CVPIA requires the Interior to acquire additional water supplies to meet optimal waterfowl habitat management needs at national wildlife refuges in California's Central Valley, certain state WMAs, and the Grassland Resource Conservation District (collectively know as refuges). The optimum water supply levels are referred to as Level 4. In recent years, acquired water to meet Level 4 needs have averaged between 70 to 80 TAF.

12.1.5.2 STATE

STATE WILD AND SCENIC RIVERS ACT

The State Wild and Scenic Rivers Act was passed by the California Legislature in 1972 (PRC Section 5093.50 et seq.). The Legislature declared that it was the state's intent that "*certain rivers which possess extraordinary scenic, recreation, fishery, or wildlife values shall be preserved in their free-*

flowing state, together with their immediate environments, for the benefit and enjoyment of the people of the state." However, within the regions evaluated for this project, there are no designated rivers.

1992 Delta Protection Act

The state's 1992 Delta Protection Act designates the Delta Primary Zone[3] as an area to be protected from intrusion of nonagricultural uses (Section 29703a), and establishes the DPC. In 1995, the DPC adopted its Regional Plan, Land Use and Resource Management Plan for the Primary Zone of the Delta. With respect to recreation, the Delta Protection Act includes the following provisions:

- The state's basic goals for the Delta include the protection, maintenance and, where possible, the enhancement and restoration of the overall quality of the Delta environment including, but not limited to, agriculture, wildlife habitat and recreational activities (Section 29702).
- Wildlife and wildlife habitats in the Delta are valuable, unique and irreplaceable resources of critical statewide significance, and it is the policy of the state that they should be preserved and protected for the enjoyment of current and future generations (Section 29705).
- Agricultural, recreational, and other uses of the Delta can best be protected by implementing projects that protect wildlife habitat before conflicts arise (Section 29710).
- The waterways and marinas in the Delta offer recreational opportunities of statewide and local significance, and are a source of economic benefit to the region, and because of increased demand and use, public safety requirements will increase (Section 29702).

12.1.5.3 LOCAL

YUBA COUNTY GENERAL PLAN

The Yuba River Restoration and Enhancement portion of the Yuba County General Plan (County of Yuba 1996) states that one of its primary goals is to "…*Restore and enhance the Yuba River corridor for recreation and wildlife….through the development of a comprehensive Recreation and Wildlife Enhancement Plan for that portion of the Yuba River situated between Park's Bar Road and the City of Marysville".*

12.2 ENVIRONMENTAL IMPACTS/ENVIRONMENTAL CONSEQUENCES

River flows and reservoir water storage levels tend to be highest in late spring and early summer and taper off toward fall, somewhat reducing the quality or availability of water-dependant recreational activities such as rafting and boating in the late summer months.

[3] "Primary Zone" is defined as "…*the delta land and water area of primary state concern and statewide significance which is situated within the boundaries of the delta, as described in Section 12220 of the Water Code, but that is not within either the urban limit line or sphere of influence line of any local government's general plan or currently existing studies, as of January 1, 1992. The precise boundary lines of the primary zone includes the land and water areas as shown on the map titled "Delta Protection Zones" on file with the State Lands Commission. Where the boundary between the primary zone and secondary zone is a river, stream, channel, or waterway, the boundary line shall be the middle of that river, stream, channel, or waterway."*(1992 Delta Protection Act Section 29728).

Water-based and water-enhanced activities are more popular during the summer months when the air temperature is warm; however, fishing and wildlife viewing are year-round activities.

Under the alternatives considered in this EIR/EIS, modifications to water release patterns could result in hydrologic changes (i.e., changes in river flow patterns and fluctuations in reservoir water surface elevations) in the Yuba River Basin and possibly other CVP/SWP rivers and reservoirs within the regions described above. Potential impacts associated with the integrated operations of the Yuba River Basin could indirectly affect both reservoir water storage levels and river flows within the CVP/SWP system if surface water released from New Bullards Bar Reservoir were to be "backed-up" in Oroville Reservoir. For analytical purposes, modeling assumptions assume that "backing-up" of surface water could occur if YCWA was not able to transfer water to the CVP/SWP system because conditions were not balanced in the Delta, or if pumping capacity at the Jones or Banks pumping plants was limited. This type of integrated operation of the CVP/SWP system is governed by a series of operating rules which ensure that flood control storage targets in the reservoirs, and flow requirements downstream of the reservoirs, are not violated. (For a more detailed discussion of these operations, see Appendix D.)

The assessment focuses on water-dependent (e.g., boating, swimming, angling) and water-enhanced (e.g., picnicking, birdwatching) recreation opportunities. Changes in reservoir storage and water surface elevations could affect recreational opportunities if boat ramps become unusable through implementation of one of the alternatives considered for the Proposed Yuba Accord, relative to the bases of comparison. Similarly, changes in river flows could affect public access and/or recreational opportunities such as angling and boating. Because of the nature of operations associated with implementing one of the alternatives (i.e., Yuba Accord Alternative, Modified Flow Alternative), there could be an increase in water transfers to the Delta through the EWA Program, which potentially could improve recreational conditions during some months and produce a beneficial effect on recreational resources in the Delta Region. For these reasons, the analysis for recreational resources relies upon both quantitative and qualitative methods to evaluate potential changes in the recreational use of regional facilities resulting from operational changes that could be expected to occur within the CVP/SWP and the Yuba River systems through implementation of the alternatives evaluated in this EIR/EIS. A description of the methodologies used to determine potential operational-related impacts to recreation resources is provided below.

12.2.1 IMPACT ASSESSMENT METHODOLOGY

Reservoir water surface elevations and river flow changes were evaluated for potentially affected water bodies in the Yuba Region, the CVP/SWP Upstream of the Delta Region, the Delta Region, and the Export Service Area. Operational changes associated with surface water deliveries from the Yuba Region to the integrated CVP/SWP system under the Proposed Project/Action and alternatives may result in increases and decreases in river flows and reservoir storage volumes.

Recreational opportunities at reservoirs are affected if reservoir levels decline so much that boat ramps become unusable. Quantitative methods include consideration of thresholds at which recreational opportunities could potentially be affected (e.g., reservoir elevations at which boat ramps become unusable). Boat ramp usability is chosen as the impact indicator because it is a quantifiable measurement, and because lower reservoir levels would generally affect boat ramps prior to affecting other recreational activities (e.g., swimming or fishing). If boat ramps remain usable, it is assumed that there are sufficient water levels in the reservoir to sustain all other recreational activities. In those cases where boat ramp usability is not a good indicator of ability to use other recreational facilities, a qualitative discussion follows.

Recreational opportunities in rivers are affected if river flow levels decline such that access to the river or whitewater rafting and other boating opportunities decline. Boating opportunities is chosen as an indicator of the ability of recreationists to utilize the river because if boating opportunities remain, then it is assumed that there are sufficient flows in the river to sustain all other recreational activities that could be limited due to limited access (i.e., swimming and fishing). In those cases where boating opportunities is not a good indicator of ability to use other recreational facilities, a qualitative discussion follows.

Water-dependent recreation use is higher in May through September than in other months of the year, coincident with the warmer summer weather. Consequently, potential hydrologic changes resulting from the Proposed Project/Action and Alternatives during this period are important for evaluating potential impacts on recreational opportunities. Potential recreation impacts to regional water bodies were analyzed based on a comparison of reservoir water surface elevations and river flows under each of the alternatives evaluated in this EIR/EIS, relative to the bases of comparison, over the 72-year simulation period. Hydrologic modeling results were used to evaluate whether changes in the monthly average reservoir water surface elevations and river flows would be of sufficient frequency and magnitude to significantly affect public access and recreational opportunities on, or around these water bodies. The simulation comparisons conducted for each alternative are described in Chapter 4, and model template output supporting the analyses is presented in Appendix F.

12.2.2 Impact Indicators and Significance Criteria for Recreation Resources

Impact indicators and significance criteria for recreational resources are presented in **Table 12-2**. The impact indicators and significance criteria used to evaluate potential impacts on recreation resources are consistent with those presented in other relevant environmental documents (e.g., Water Forum Proposal (Water Forum 1999), CALFED EIS/EIR (CALFED 2000), the Oroville Preliminary Draft Environmental Assessment (2005)), and other federal, state, and local regulations and planning documents guiding recreational activities.

Table 12-2 Impact Indicators and Significance Criteria for Recreational Resources

Impact Indicator	Significance Criteria
Yuba Region	
New Bullards Bar Reservoir	
Reservoir water surface elevations that determine boat ramp availability.	A change in reservoir water surface elevation, relative to the basis of comparison, of sufficient magnitude and frequency to substantially decrease the availability use of boat ramps over the 72-year simulation period. New Bullards Bar Reservoir: • When boat ramps are useable (1,798 feet msl or higher).
Reservoir water surface elevations that determine public access to swimming beaches.	A change in reservoir water surface elevation over the 72-year simulation period, relative to the basis of comparison, of sufficient magnitude and frequency to substantially decrease the availability or use of swimming beaches.
Consistency with applicable regulations and planning documents, guiding recreation in the study area.	A conflict or inconsistency with relevant policies, goals, or objectives (e.g., New Bullards Bar Reservoir Recreation Management Plan) guiding recreation activities in the Yuba River Basin.

Impact Indicator	Significance Criteria
Lower Yuba River	
River flows that determine boating opportunities.	A decrease in the lower Yuba River flows, relative to the basis of comparison over the 72-year simulation period, of sufficient magnitude and frequency to adversely affect boating opportunities.
Consistency with applicable regulations and planning documents, guiding recreation in the study area.	A conflict or inconsistency with relevant recreation policies and implementation strategies (e.g., Yuba County General Plan) identified for recreation activities in the Yuba River Basin.
CVP/SWP Upstream of the Delta Region	
Oroville Reservoir	
Reservoir water surface elevations that determine boat ramp availability.	A change in reservoir water surface elevation, relative to the basis of comparison, of sufficient frequency to substantially decrease the availability or optimum use of boat ramps or wet slips, for any given month of the year over the 72-year simulation period. Oroville Reservoir: • When boat ramps are useable (850 to 950 feet msl). • When boat ramps begin to become unusable (750 feet msl or lower).
Reservoir water surface elevations that determine availability and optimum use of swimming beaches.	A change in reservoir water surface elevation, relative to the basis of comparison, of sufficient magnitude and frequency to substantially decrease the availability or use of campgrounds and swimming beaches, for any given month of the year over the 72-year simulation period. Oroville Reservoir: • When recreation opportunities on the shoreline begin to decline (800 feet msl or lower).
Reservoir water surface elevations that determine recreation activity opportunities.	Changes in reservoir water surface elevation, relative to the basis of comparison, of sufficient magnitude and frequency, to substantially reduce high quality recreational opportunities, for any given month of the year over the 72-year simulation period. Oroville Reservoir: • When the reservoir elevation is within the range of high quality recreational activities (850 to 950 feet msl).
Consistency with applicable regulations and planning documents, guiding recreation in the study area.	A conflict or inconsistency with relevant policies, goals, or objectives (e.g., Recreation Management Plans) guiding recreation activities in reservoirs, relative to the basis of comparison.
Lower Feather River	
River flows affecting boating and fishing opportunities.	A decrease in lower Feather River flows over the 72-year simulation period, relative to the basis of comparison, of sufficient magnitude and frequency to adversely affect boating and fishing opportunities.
Consistency with applicable regulations and planning documents guiding recreation.	A conflict or inconsistency with relevant policies plans, goals, or objectives guiding recreation in the lower Feather River, relative to the basis of comparison.
Sacramento River	
River flows affecting boating, hunting, and fishing opportunities.	A decrease in upper or lower Sacramento River flows relative to the basis of comparison, of sufficient magnitude and frequency to adversely affect boating, hunting and fishing opportunities, over the 72-year simulation period.
Consistency with applicable regulations and planning documents, guiding recreation in the study area.	A conflict or inconsistency with relevant policies plans, goals, or objectives guiding recreation activities in the Sacramento River, relative to the basis of comparison.
Sacramento-San Joaquin Delta Region	
Sacramento-San Joaquin Delta	
River flows that determine boating or other recreational opportunities.	A substantial decrease in the contribution of lower Sacramento River flows to the Delta over the 72-year simulation period, relative to the basis of comparison, of sufficient magnitude and frequency to adversely affect recreation activities in the Delta.
Consistency with applicable regulations and planning documents, guiding recreation.	A conflict or inconsistency with relevant policies, plan goals, or objectives, relative to the basis of comparison.

Impact Indicator	Significance Criteria
Export Service Area	
San Luis Reservoir	
Reservoir water surface elevations that determine boat ramp availability.	A change in reservoir water surface elevation, relative to the basis of comparison, of sufficient frequency to substantially decrease the availability or optimum use of boat ramps, for any given month of the year over the 72-year simulation period. • When boat ramps are useable (above 340 feet msl).

As discussed in Chapter 4, CEQA and NEPA have different legal and regulatory standards that require slightly different assumptions in the modeling runs used to compare the Proposed Project/Action and alternatives to the appropriate CEQA and NEPA bases of comparison in the impact assessments. Although only one project (the Yuba Accord Alternative) and one action alternative (the Modified Flow Alternative) are evaluated in this EIR/EIS, it is necessary to use separate NEPA and CEQA modeling scenarios for the Proposed Project/Action, alternatives and bases of comparisons to make the appropriate comparisons. As a result, the scenarios compared in the impact assessments below have either a "CEQA" or a "NEPA" prefix before the name of the alternative being evaluated. A detailed discussion of the different assumptions used for the CEQA and NEPA scenarios is included in Appendix D.

As also discussed in Chapter 4, while the CEQA and NEPA analyses in this EIR/EIS refer to "potentially significant," "less than significant," "no" and "beneficial" impacts, the first two comparisons (CEQA Yuba Accord Alternative compared to the CEQA No Project Alternative and CEQA Modified Flow Alternative compared to the CEQA No Project Alternative) presented below instead refer to whether or not the proposed change would "unreasonably affect" the evaluated parameter. This is because these first two comparisons are made to determine whether the action alternative would satisfy the requirement of Water Code Section 1736 that the proposed change associated with the action alternative "would not unreasonably affect fish, wildlife, or other instream beneficial uses."

12.2.3 Environmental Impacts/Environmental Consequences of the CEQA Yuba Accord Alternative Compared to the CEQA No Project Alternative

Impact 12.2.3-1: Decreases in New Bullards Bar Reservoir monthly mean water surface elevations that could result in reduced boat ramp and swimming beaches availability

Cottage Creek boat ramp is unusable when the lake level is below 1,822 feet above msl, and Dark Day boat ramp is unusable when the lake level is below 1,798 feet above msl. Emerald Cove Marina is operable at all lake levels. During the recreation use season, long-term average monthly water surface elevations and monthly average water surface elevations by water year type at the Cottage Creek boat ramp do not decrease below 1,822 feet msl under the CEQA Yuba Accord Alternative over the 72-year simulation period, with the exception of August and September of critical water years in which average water surface elevations are 1,809 feet msl and 1,798 feet msl under the CEQA Yuba Accord Alternative, and 1,817 feet msl and 1,808 feet msl under the CEQA No Project Alternative, respectively. Long-term average monthly water surface elevations and monthly water surface elevations by water year type at the Dark Day boat ramp do not decrease below 1,798 feet msl under the CEQA Yuba Accord Alternative during the 72-year simulation period. In addition, long-term average monthly water surface elevations, and water surface elevations by water year type are essentially equivalent under the

CEQA Yuba Accord Alternative relative to the CEQA No Project Alternative (Appendix F4, 3 vs. 2, pg. 50). Lower reservoir levels would generally affect boat ramps prior to affecting other recreational activities (e.g., swimming or fishing). If boat ramps remain usable, it is assumed that there are sufficient water levels in the reservoir to sustain other recreational activities.

Therefore, because the analysis presented above indicates that New Bullards Bar Reservoir boat ramp availability would not be substantially changed, the CEQA Yuba Accord Alternative, relative to the CEQA No Project Alternative, would not unreasonably affect recreational opportunities, including boat ramp use and swimming beaches, at New Bullards Bar Reservoir.

Impact 12.2.3-2: Decreases in lower Yuba River flows that could result in reduced boating opportunities

Long-term average flows in the lower Yuba River at Smartville range from approximately 5 percent lower to approximately 25 percent higher during the recreational use season under the CEQA Yuba Accord Alternative, relative to the CEQA No Project Alternative, over the 72-year simulation period. Average flows by water year type are generally between 2 percent and 33 percent higher during both above normal and below normal years with the exception of flows occurring during May of below normal water years, during which long-term average flows are approximately 7 percent lower under the CEQA Yuba Accord Alternative, relative to the CEQA No Project Alternative (Appendix F4, 3 vs. 2, pg. 100).

Long-term average flows in the lower Yuba River at Marysville range from approximately 5 percent lower to approximately 55 percent higher under the CEQA Yuba Accord Alternative, relative to the CEQA No Project Alternative, over the 72-year simulation period. Average flows by water year type are generally between 2 percent to 83 percent higher during most months of the recreational use season with the exception of water surface elevations occurring during May in below normal water years, in which flows are approximately 11 percent lower under the CEQA Yuba Accord Alternative, relative to the CEQA No Project Alternative (Appendix F4, 3 vs. 2, pg. 272).

Long-term average monthly flow fluctuations in the lower Yuba River under the CEQA Yuba Accord Alternative during the recreational use season are generally lower in magnitude relative to the CEQA No Project Alternative (Appendix F4, 3 vs. 2, pgs. 100 and 272). Therefore, fluctuations in flows under the CEQA Yuba Accord Alternative, relative to the CEQA No Project Alternative, would not unreasonably affect recreational opportunities, including boating and angling, on the lower Yuba River. In addition, the ramping rates identified as part of the Yuba Project operations for lower Yuba River have been developed with consideration for the overall safety of anglers and other recreationists.

Overall, based on the analysis presented above, potential impacts would not unreasonably affect river recreation activities, and could potentially be beneficial. Increases in river flows under the CEQA Yuba Accord Alternative would benefit rafting and other boating opportunities.

Impact 12.2.3-3: Consistency with Yuba County General Plan recreation policies

Local plans and polices provide for the protection and enhancement of recreation opportunities within Yuba County, including the Yuba County General Plan. They establish goals and policies that address maintaining and enhancing access to the lower Yuba River, open space, and recreation facilities. The CEQA Yuba Alternative would not conflict with plans to provide enhanced access to the lower Yuba River and would not conflict with policies to provide recreation facilities or access to open space. Therefore, the CEQA Yuba Accord Alternative, relative to the CEQA No Project Alternative, would not conflict with the goals of the plans and policies to provide recreation opportunities.

Impact 12.2.3-4: Decreases in Oroville Reservoir monthly mean water surface elevations that could result in reduced boat ramp availability

All boat ramps at Oroville Reservoir are usable when the lake level ranges from 850 feet msl to 950 feet msl, and at least one boat ramp remains usable when the lake level is at 750 feet above msl or higher. During the recreation use season, long-term average monthly water surface elevations and average monthly water surface elevations by water year type are essentially equivalent, and therefore, there would be no additional months under the CEQA Yuba Accord Alternative, relative to the CEQA No Project Alternative, when long-term average monthly water surface elevations would decrease below the 750 feet msl or 850 feet msl thresholds, over the 72-year simulation period (Appendix F4, 3 vs. 2, pg. 455).

Because the analysis presented above indicates that the range of potential variation in Oroville Reservoir water surface elevations would not affect boat ramp availability, the CEQA Yuba Accord Alternative, relative to the CEQA No Project Alternative, would not unreasonably affect boat ramp availability and recreation opportunities at Oroville Reservoir.

Impact 12.2.3-5: Decreases in Oroville Reservoir monthly mean water surface elevations that could result in reduced camping and swimming beaches availability

Recreational opportunities, including use of campgrounds and swimming beaches begin to decline at Oroville Reservoir when the lake level is at 800 feet above msl or lower. During the recreation use season, there would be no additional months under the CEQA Yuba Accord Alternative, relative to the CEQA No Project Alternative, that average monthly water surface elevations would decrease below the 800 feet msl threshold over the 72-year simulation period (Appendix F4, 3 vs. 2, pg. 455). Therefore, the CEQA Yuba Accord Alternative would not result in substantial changes to the use of campground and swimming beaches at Oroville Reservoir.

Because the analysis presented above indicates that the range of potential variation in Oroville Reservoir water surface elevations would be generally equivalent, or higher, the CEQA Yuba Accord Alternative, relative to the CEQA No Project Alternative, would not unreasonably affect, and could have beneficial impacts on the use of campgrounds and swimming beaches at Oroville Reservoir.

Impact 12.2.3-6: Changes in Orville Reservoir monthly mean water surface elevations that could result in reduced recreation opportunities

High quality recreational opportunities occur at Oroville Reservoir when the lake level is between 850 and 950 feet above msl. During the recreation use season, there would be no additional months under the CEQA Yuba Accord Alternative that long-term average water surface elevations, average monthly water surface elevations by water year type would decrease below, or increase above this range, relative to the CEQA No Project Alternative over the 72-year simulation period (Appendix F4, 3 vs. 2, pg. 455). Therefore, the CEQA Yuba Accord Alternative would not result in substantial changes to recreation opportunities at Oroville Reservoir.

Because the analysis presented above indicates that the range of potential variation in Oroville Reservoir water surface elevations would be relatively minor, the CEQA Yuba Accord

Alternative, relative to the CEQA No Project Alternative, would not unreasonably affect high quality recreation opportunities at Oroville Reservoir.

Impact 12.2.3-7: Changes in Feather River flows that could result in reduced boating and fishing opportunities

Long-term average monthly flows in the Feather River below the Thermalito Afterbay Outlet to the mouth of the Sacramento River would decrease by up to 5 percent in June, to approximately 2 percent in September. Flows during all other months of the recreational use season are essentially equivalent, or up to 3 percent higher under the CEQA Yuba Accord Alternative, relative to the CEQA No Project Alternative over the 72-year simulation period (Appendix F4, 3 vs. 2, pg 603). These slight differences in flow would not preclude any recreational activity (e.g., fishing or boating) that occurred under the CEQA No Project Alternative. Therefore, the CEQA Yuba Accord Alternative, relative to the CEQA No Project Alternative, would not unreasonably affect recreation along the Feather River.

Impact 12.2.3-8: Consistency with Feather River recreation policies

The CEQA Yuba Accord Alternative would not conflict with any identified plans to provide enhanced access to the Feather River and would not conflict with policies to provide recreation facilities or access to open space. The operation of the CEQA Yuba Accord Alternative, relative to the CEQA No Project Alternative, would not conflict with the goals of the plans and policies to provide recreation opportunities.

Impact 12.2.3-9: Changes in Sacramento River flows that could result in reduced Sacramento River boating, hunting, and fishing opportunities.

Definitive optimum, maximum, and minimum river flows for recreation uses are not available for the Sacramento River, so the relative change in river flows are compared between the CEQA Yuba Accord Alternative and the CEQA No Project Alternative to assess potential recreation impacts. This is an overall standard that is not related to specific reaches of the Sacramento River, so it provides only general guidance in assessing recreation impacts. If relative flows are not substantially less for the CEQA Yuba Accord Alternative compared to the CEQA No Project Alternative, boat ramps and access points along the Sacramento River between Keswick Dam and Freeport would not be adversely affected.

Long-term average flows in the Sacramento River under the CEQA Yuba Accord Alternative are essentially equivalent and up to approximately 3 percent higher between Keswick Dam and Freeport during the recreational use season relative to the CEQA No Project Alternative over the 72-year simulation period (Appendix F4, 3 vs. 2, pgs. 1005 and 1562). These slight differences in flow are not likely to be associated with any reduction in recreational opportunities and would preclude any recreational activity (e.g., boating, hunting, or fishing) that occurred under the CEQA No Project Alternative. Therefore, the CEQA Yuba Accord Alternative, relative to the CEQA No Project Alternative, would not unreasonably affect recreation opportunities along the Sacramento River.

Impact 12.2.3-10: Consistency with Sacramento River recreation policies

The CEQA Yuba Accord Alternative would not conflict with any identified plans to provide enhanced access to the Sacramento River and would not conflict with policies to provide recreation facilities or access to open space. The operation of the CEQA Yuba Accord

Alternative, relative to the CEQA No Project Alternative, would not conflict with the goals of any existing plans and policies to provide recreation opportunities.

Impact 12.2.3-11: Changes in Delta inflows that could result in reduced recreation opportunities in the Delta

Long-term average monthly Delta inflows during the recreation use season are essentially equivalent, and up to 3 percent higher under the CEQA Yuba Accord Alternative, relative to the CEQA No Project Alternative (Appendix F4, 3 vs. 2, pg. 1103). Increases in average Delta inflows under the CEQA Yuba Accord Alternative would occur during the summer and early fall months. Increases in Delta inflows would potentially have a slightly beneficial impact on Delta recreational resources. Therefore, based on the magnitude and timing of these flow increases and decreases, the CEQA Yuba Accord Alternative, relative to the CEQA No Project Alternative, would not unreasonably affect and could have beneficial impacts to the recreation opportunities in the Delta.

Impact 12.2.3-12: Consistency with Delta recreation policies

Local plans and polices provide for the protection and enhancement of recreation opportunities in the Delta. These documents establish goals and policies that address maintaining and enhancing access to the Delta, open space, and recreation facilities. The CEQA Yuba Accord Alternative would not conflict with plans to provide enhanced access to the Delta and would not conflict with policies to provide recreation facilities or access to open space. Therefore, the CEQA Yuba Accord Alternative, relative to the CEQA No Project Alternative, would not conflict with the goals of the plans and policies to provide recreation opportunities.

Impact 12.2.3-13: Decreases in San Luis Reservoir monthly mean water surface elevations that could result in reduced boat ramp availability

All boat ramps at San Luis Reservoir are usable when the lake level is 340 feet above msl or higher. During the recreation use season there would be no additional months under the CEQA Yuba Accord Alternative that long-term average monthly water surface elevations would decrease below the 340 feet msl threshold relative to the CEQA No Project Alternative, over the 72-year simulation period (Appendix F4, 3 vs. 2, pg. 1413). Therefore, based on the analysis presented, the CEQA Yuba Accord Alternative, relative to the CEQA No Project Alternative, would not unreasonably affect boat ramp availability and recreational opportunities at San Luis Reservoir

12.2.4 ENVIRONMENTAL IMPACTS/ENVIRONMENTAL CONSEQUENCES OF THE CEQA MODIFIED FLOW ALTERNATIVE COMPARED TO THE CEQA NO PROJECT ALTERNATIVE

Impact 12.2.4-1: Decreases in New Bullards Bar Reservoir monthly mean water surface elevations that could result in reduced boat ramp and swimming beaches availability

Cottage Creek boat ramp is unusable when the lake level is below 1,822 feet above msl, and Dark Day boat ramp is unusable when the lake level is below 1,798 feet above msl. Emerald Cove Marina is operable at all lake levels. During the recreation use season, long-term average water surface elevations and monthly average water surface elevations by water year type at Cottage Creek boat ramp do not decrease below 1,822 feet msl under the CEQA Modified Flow Alternative during the 72-year simulation period. Similarly, long-term average monthly water surface elevations and monthly water surface elevations by water year type at the Dark Day boat ramp do not decrease below 1,798 feet msl under the CEQA Modified Flow Alternative during the 72-year simulation period. In addition, long-term average monthly water surface elevations, and water surface elevations by water year type, are essentially equivalent under the CEQA Modified Flow Alternative, relative to the CEQA No Project Alternative (Appendix F4, 4 vs. 2, pg. 50).

Therefore, because the analysis presented above indicates that New Bullards Bar Reservoir boat ramp availability under the CEQA Modified Flow Alternative, relative to the CEQA No Project Alternative, would not be substantially changed, the CEQA Modified Flow Alternative would not unreasonably affect recreational opportunities, including boat ramp use and swimming beaches, at New Bullards Bar Reservoir.

Impact 12.2.4-2: Decreases in lower Yuba River flows that could result in reduced boating opportunities

Long-term average flows in the lower Yuba River at Smartville range from approximately 4 percent lower to approximately 20 percent higher during the recreational use season under the CEQA Modified Flow Alternative, relative to the CEQA No Project Alternative. Average flows by water year type generally are higher during most months of the recreational use season with the exception of critical water years in which flows under the CEQA Modified Flow Alternative would be approximately 2 percent lower in July and August to approximately 30 percent lower in May, relative to the CEQA No Project Alternative, over the 72-year simulation period (Appendix F4, 4 vs. 2, pg. 100). However, over the entire cumulative flow distribution for July and August, flows are about 20 percent higher about 90 percent of the time under the CEQA Modified Flow Alternative.

Long-term average flows in the lower Yuba River at Marysville range from approximately 5 percent lower to approximately 45 percent higher during the recreational use season under the CEQA Modified Flow Alternative, relative to the CEQA No Project Alternative. Average flows by water year type generally are higher during most months of the recreational use season with the exception of critical water years, in which flows under the CEQA Modified Flow Alternative would be approximately 6 percent lower in July and August to approximately 60 percent lower in May, relative to the CEQA No Project Alternative (Appendix F4, 4 vs. 2, pg. 272). However, over the entire cumulative flow distribution for July and August, flows are about 45 percent higher about 90 percent of the time under the CEQA Modified Flow Alternative.

Long-term average monthly flow fluctuations in the lower Yuba River under the CEQA Modified Flow Alternative during the recreational use season are generally lower in magnitude relative to the CEQA No Project Alternative (Appendix F4, 4 vs. 2, pgs. 100 and 272). Therefore, potential fluctuations in flows under the CEQA Modified Flow Alternative, relative to the CEQA No Project Alternative, would not unreasonably affect recreational opportunities, including boating and angling, on the lower Yuba River. In addition, the ramping rates identified as part of the Yuba Project operations for the lower Yuba River have been developed with consideration for the overall safety of anglers and other recreationists.

Overall, based on the analysis presented above, potential impacts on river recreation activities are not likely to occur because flows would generally be higher under the CEQA Modified Flow Alternative during the peak months (i.e., July and August) of the recreational use season even during drier water years. Therefore, the CEQA Modified Flow Alternative, relative to the

CEQA No Project Alternative, would not unreasonably affect recreational opportunities in the lower Yuba River.

Impact 12.2.4-3: Consistency with Yuba County General Plan recreation policies

Local plans and polices provide for the protection and enhancement of recreation opportunities within Yuba County, including the Yuba County General Plan. They establish goals and policies that address maintaining and enhancing access to the lower Yuba River, open space, and recreation facilities. The CEQA Modified Flow Alternative would not conflict with plans to provide enhanced access to the lower Yuba River and would not conflict with policies to provide recreation facilities or access to open space. Therefore, the operation of the CEQA Modified Flow Alternative, relative to the CEQA No Project Alternative, would not conflict with the goals of the plans and policies to provide recreation opportunities.

Impact 12.2.4-4: Decreases in Oroville Reservoir monthly mean water surface elevations that could result in reduced boat ramp availability

All boat ramps at Oroville Reservoir are usable when the lake level ranges from 850 to 950 feet above msl, and at least one boat ramp remains usable when the lake level is at 750 feet above msl or higher. During the recreation use season, there would be no additional months under the CEQA Modified Flow Alternative when long-term average monthly water surface elevations and average monthly water surface elevations by water year type would decrease below the 750 feet msl or 850 feet msl thresholds, over the 72-year simulation period (Appendix F4, 4 vs. 2, pg. 455).

Because the analysis presented above indicates that the range of potential variation in Oroville Reservoir water surface elevations would not affect boat ramp availability, the CEQA Modified Flow Alternative, relative to the CEQA No Project Alternative, would not unreasonably affect boat ramp availability and recreation opportunities at Oroville Reservoir.

Impact 12.2.4-5: Decreases in Oroville Reservoir monthly mean water surface elevations that could result in reduced camping and swimming beaches availability

Recreational opportunities, including use of campgrounds and swimming beaches, begin to decline at Oroville Reservoir when the lake level is at 800 feet msl or lower. During the recreation use season, there would be no additional months under the CEQA Modified Flow Alternative that long-term average monthly water surface elevations or average monthly water surface elevations by water year type would decrease below the 800 feet msl threshold over the 72-year simulation period (Appendix F4, 4 vs. 2, pg. 455). Therefore, the CEQA Modified Flow Alternative, relative to the CEQA No Project Alternative, would not result in substantial changes to the use of campgrounds and swimming beaches at Oroville Reservoir.

Because the analysis presented above indicates that the range of potential variation in Oroville Reservoir water surface elevations would be generally equivalent, the CEQA Modified Flow Alternative, relative to the CEQA No Project Alternative, would not unreasonably affect the use of campgrounds and swimming beaches at Oroville Reservoir.

Impact 12.2.4-6: Changes in Orville Reservoir monthly mean water surface elevations that could result in reduced recreation opportunities

High quality recreational opportunities occur at Oroville Reservoir when the lake level is between 850 and 950 feet above msl. During the recreation use season there are no additional months under the CEQA Modified Flow Alternative that long-term monthly average water surface elevations, or average monthly water surface elevation by water year type decrease below, or increase above this range over the 72-year simulation period (Appendix F4, 4 vs. 2, pg. 455). Therefore, the CEQA Modified Flow Alternative would not result in substantial changes to recreation opportunities at Oroville Reservoir.

Because the analysis presented above indicates that the range of potential variation in Oroville Reservoir water surface elevations under the CEQA Modified Flow Alternative, relative to the CEQA No Project Alternative, would be relatively minor, the CEQA Modified Flow Alternative would not unreasonably affect recreation opportunities at Oroville Reservoir.

Impact 12.2.4-7: Changes in Feather River flows that could result in reduced boating and fishing opportunities

Differences in long-term average monthly flows in the Feather River flows from the Thermalito Afterbay Outlet to the Sacramento River do not exceed approximately 2 percent during the recreational use season under the CEQA Modified Flow Alternative, relative to the CEQA No Project Alternative, over the 72-year simulation period (Appendix F4, 4 vs. 2, pg. 603). These slight differences in flow would not preclude any recreational activity (e.g., fishing or boating) that occurred under the CEQA No Project Alternative. These differences in flow would therefore not unreasonably affect recreation along the Feather River. In conclusion, the CEQA Modified Flow Alternative, relative to the CEQA No Project Alternative, would not unreasonably affect recreation along the Feather River.

Impact 12.2.4-8: Consistency with Feather River recreation policies

The CEQA Modified Flow Alternative would not conflict with any identified plans to provide enhanced access to the Feather River and would not conflict with policies to provide recreation facilities or access to open space. The operation of the CEQA Modified Flow Alternative, relative to the CEQA No Project Alternative, would not conflict with the goals of the plans and policies to provide recreation opportunities.

Impact 12.2.4-9: Changes in Sacramento River flows that could result in reduced boating, hunting, and fishing opportunities

Definitive optimum, maximum, and minimum river flows for recreation uses are not available for the Sacramento River, so the relative change in river flows are compared between the CEQA Modified Flow Alternative and the CEQA No Project Alternative to assess potential recreation impacts. This is an overall standard that is not related to specific reaches of the Sacramento River, so it provides only general guidance in assessing recreation impacts. If relative flows are not substantially less for the CEQA Modified Flow Alternative, compared to the CEQA No Project Alternative, boat ramps and access points along the Sacramento River between Keswick Dam and Freeport would not be adversely affected.

Long-term average monthly flows in the Sacramento River between Keswick Dam and Freeport under the CEQA Modified Flow Alternative are generally essentially equivalent to the CEQA No Project Alternative during the recreation use season over the 72-year simulation period (Appendix F4, 4 vs. 2, pgs. 1005 and 1562).

Based on the analyses presented above, Sacramento River flows under the CEQA Modified Flow Alternative, relative to the CEQA No Project Alternative, are not likely to be associated with any reduction in recreational opportunities. These changes in monthly average flows would not preclude any recreational activity (e.g., boating, hunting, or fishing) that occurred under the CEQA No Project Alternative. Therefore, the CEQA Modified Flow Alternative, relative to the CEQA No Project Alternative, would not unreasonably affect recreation opportunities along the Sacramento River.

Impact 12.2.4-10: Consistency with Sacramento River recreation policies

The CEQA Modified Flow Alternative would not conflict with any identified plans to provide enhanced access to the Sacramento River and would not conflict with policies to provide recreation facilities or access to open space. The operation of the CEQA Modified Flow Alternative, relative to the CEQA No Project Alternative, would not conflict with the goals of any existing plans and policies to provide recreation opportunities.

Impact 12.2.4-11: Changes in Delta inflows that could result in reduced recreation opportunities in the Delta

Long-term average monthly Delta inflows during the recreation use season from the Sacramento River are essentially equivalent, and up to approximately 2 percent higher during July and August under the CEQA Modified Flow Alternative, relative to the CEQA No Project Alternative, over the 72-year simulation period (Appendix F4, 4 vs. 2, pg. 1103). Increases in Delta inflows would potentially have a slightly beneficial impact on Delta recreational resources. Therefore, based on the magnitude and timing of these flow increases, the CEQA Modified Flow Alternative, relative to the CEQA No Project Alternative, would not unreasonably affect and could have beneficial impacts to recreation opportunities in the Delta.

Impact 12.2.4-12: Consistency with Delta recreation policies

Local plans and polices provide for the protection and enhancement of recreation opportunities in the Delta. These documents establish goals and policies that address maintaining and enhancing access to the Delta, open space, and recreation facilities. The CEQA Modified Flow Alternative would not conflict with plans to provide enhanced access to the Delta and would not conflict with policies to provide recreation facilities or access to open space. The CEQA Modified Flow Alternative, relative to the CEQA No Project Alternative, would not conflict with the goals of the plans and policies to provide recreation opportunities.

Impact 12.2.4-13: Decreases in San Luis Reservoir monthly mean water surface elevations that could result in reduced boat ramp availability

All boat ramps at San Luis Reservoir are usable when the lake level is 340 feet above msl or higher. During the recreation use season there would be no additional months under the CEQA Modified Flow Alternative that long-term average monthly water surface elevations would decrease below the 340 feet msl threshold relative to the CEQA No Project Alternative, over the 72-year simulation period (Appendix F4, 4 vs. 2, pg. 1413). Therefore, based on the analysis presented, the CEQA Modified Flow Alternative, relative to the CEQA No Project Alternative, would not unreasonably affect boat ramp availability and recreation opportunities at San Luis Reservoir.

12.2.5 ENVIRONMENTAL IMPACTS/ENVIRONMENTAL CONSEQUENCES OF THE CEQA YUBA ACCORD ALTERNATIVE COMPARED TO THE CEQA EXISTING CONDITION

Impact 12.2.5-1: Decreases in New Bullards Bar Reservoir monthly mean water surface elevations that could result in reduced boat ramp and swimming beaches availability

Cottage Creek boat ramp is unusable when the lake level is below 1,822 feet msl and Dark Day boat ramp is unusable when the lake level is below 1,798 feet msl. Emerald Cove Marina is operable at all lake levels. During the recreation use season, long-term average monthly water surface elevations under the CEQA Yuba Accord Alternative do not decrease below 1,822 feet msl under the CEQA Yuba Accord Alternative during the 72-year simulation period. Monthly average water surface elevations by water year type also would not decrease below 1,822 feet, with the exception of August and September in critical water years in which average water surface elevation would be 1,808 feet msl and 1,798 feet msl, respectively, under the CEQA Yuba Accord Alternative, relative to the CEQA Existing Condition. Similarly, long-term average monthly water surface elevations and monthly water surface elevations by water year type at the Dark Day boat ramp do not decrease below 1,798 feet msl under the CEQA Yuba Accord Alternative during the 72-year simulation period (Appendix F4, 3 vs. 1, pg. 50).

Therefore, because the analysis presented above indicates that New Bullards Bar Reservoir boat ramp availability would not be substantially changed, the CEQA Yuba Accord Alternative, relative to the CEQA Existing Condition, would result in a less than significant impact on recreational opportunities, including boat ramp use and swimming beaches, at New Bullards Bar Reservoir.

Impact 12.2.5-2: Decreases in lower Yuba River flows that could result in reduced boating opportunities

Long-term average flows in the lower Yuba River at Smartville range from approximately 8 percent lower to approximately 5 percent higher during the recreational use season under CEQA Yuba Accord Alternative, relative to the CEQA Existing Condition over the 72-year simulation period. Average flows by water year type generally are higher during most months of the recreational use season with the exception of wet, above normal, and below normal water years in which flows under the CEQA Yuba Accord Alternative are up to approximately 17 percent lower relative to the CEQA Existing Condition (Appendix F4, 3 vs. 1, pg.100). However, flows during these times range between about 2,000 cfs and 6,000 cfs.

Long-term average flows in the lower Yuba River at Marysville range from approximately 20 percent lower to approximately 2 percent higher during the recreational use season under the CEQA Yuba Accord Alternative, relative to the CEQA Existing Condition. Average flows by water year type generally are lower (up to 30 percent) during most months of the recreational use season but remain between 800 cfs and 1,000 cfs. During dry and critical water years, flows under the CEQA Yuba Accord Alternative are up to approximately 80 percent higher relative to the CEQA Existing Condition (Appendix F4, 3 vs. 1, pg. 272). In addition, during the typically low flow conditions in the lower Yuba River (i.e., lowest 25 percent of the cumulative flow distribution), flows under the CEQA Yuba Accord Alternative during the recreational use season range between 60 percent and 100 percent higher 60 percent to 100 percent of the time.

Long-term average monthly flow fluctuations in the lower Yuba River under the CEQA Yuba Accord Alternative during the recreational use season are generally lower in magnitude relative to the CEQA Existing Condition (Appendix F4, 3 vs. 1, pgs. 100 and 272). Therefore, potential fluctuations in flows under the CEQA Yuba Accord Alternative, relative to the CEQA Existing Condition, would not result in substantial impacts to recreational opportunities, including boating and angling, on the lower Yuba River. In addition, the ramping rates identified as part of the Yuba Project operations for lower Yuba River have been developed with consideration for the overall safety of anglers and other recreationists.

Overall, based on the analysis presented above, potential impacts on river recreation activities are not likely to occur because changes in the frequency and magnitude of flows under the CEQA Yuba Accord Alternative, relative to the CEQA Existing Condition, would result in a less than significant impact on recreation on the lower Yuba River.

Impact 12.2.5-3: Consistency with Yuba County General Plan recreation policies

Local plans and polices provide for the protection and enhancement of recreation opportunities within Yuba County, including the Yuba County General Plan. They establish goals and policies that address maintaining and enhancing access to the lower Yuba River, open space, and recreation facilities. The CEQA Yuba Accord Alternative would not conflict with plans to provide enhanced access to the lower Yuba River and would not conflict with policies to provide recreation facilities or access to open space. The operation of the CEQA Yuba Accord Alternative, relative to the CEQA Existing Condition, would not conflict with the goals of the plans and policies to provide recreation opportunities.

Impact 12.2.5-4: Decreases in Oroville Reservoir monthly mean water surface elevations that could result in reduced boat ramp availability

All boat ramps at Oroville Reservoir are usable when the lake level ranges from 850 feet msl to 950 feet msl, and at least one boat ramp remains usable when the lake level is at 750 feet msl or higher. During the recreation use season long-term average monthly water surface elevations and average monthly water surface elevations by water year type are essentially equivalent, and therefore, there would be no additional months under the CEQA Yuba Accord Alternative, relative to the CEQA Existing Condition, when long-term average monthly water surface elevations would decrease below the 750 feet msl of 850 feet msl thresholds, over the 72-year simulation period (Appendix F4, 3 vs. 1, pg. 455).

Because the analysis presented above indicates that the range of potential variation in Oroville Reservoir water surface elevations would not affect boat ramp availability, the CEQA Yuba Accord Alternative, relative to the CEQA Existing Condition, would result in a less than significant impact on recreation opportunities at Oroville Reservoir.

Impact 12.2.5-5: Decreases in Oroville Reservoir monthly mean water surface elevations that could result in reduced camping and swimming beaches availability

Recreational opportunities, including use of campgrounds and swimming beaches begin to decline at Oroville Reservoir when the lake level is at 800 feet msl or lower. During the recreation use season there would be no additional months under the CEQA Yuba Accord Alternative that long-term average monthly water surface elevations or average monthly water surface elevations by water year type, relative to the CEQA Existing Condition, would decrease below the 800 feet msl threshold over the 72-year simulation period (Appendix F4, 3 vs. 1, pg. 455). Therefore, the CEQA Yuba Accord Alternative would not result in substantial changes to the use of campground and swimming beaches at Oroville Reservoir.

Because the analysis presented above indicates that the range of potential variation in Oroville Reservoir water surface elevations would be generally equivalent, the CEQA Yuba Accord Alternative, relative to the CEQA Existing Condition, would result in a less than significant impact on the use of campgrounds and swimming beaches at Oroville Reservoir.

Impact 12.2.5-6: Changes in Orville Reservoir monthly mean water surface elevations that could result in reduced recreation opportunities

High quality recreational opportunities occur at Oroville Reservoir when the lake level is between 850 feet msl and 950 feet msl. During the recreation use season there are no additional months under the CEQA Yuba Accord Alternative, relative to the CEQA Existing Condition, that long-term average monthly water surface elevations, or average monthly water surface elevations by water year type decrease below, or increase above this range over the 72-year simulation period (Appendix F4, 3 vs. 1, pg. 455). Therefore, the CEQA Yuba Accord Alternative would not result in substantial changes to recreation opportunities at Oroville Reservoir.

Because the analysis presented above indicates that the range of potential variation in Oroville Reservoir water surface elevations would be essentially equivalent, the CEQA Yuba Accord Alternative, relative to the CEQA Existing Condition, would result in a less than significant impact on recreation opportunities at Oroville Reservoir.

Impact 12.2.5-7: Changes in Feather River flows that could result in reduced boating and fishing opportunities

Differences in long-term average monthly flows in the Feather River flows from the Thermalito Afterbay Outlet to the Sacramento River do not exceed approximately 3 percent during the recreational use season under the CEQA Yuba Accord Alternative, relative to the CEQA Existing Condition, over the 72-year simulation period (Appendix F4, 3 vs. 1, pg. 603). These slight differences in flow would not preclude any recreational activity (e.g., fishing or boating) that occurred under the CEQA Existing Condition. Therefore, the CEQA Yuba Accord Alternative, relative to the CEQA Existing Condition, would have a less than significant impact on recreation along the Feather River.

Impact 12.2.5-8: Consistency with Feather River recreation policies

The CEQA Yuba Accord Alternative would not conflict with any identified plans to provide enhanced access to the Feather River and would not conflict with policies to provide recreation facilities or access to open space. The operation of the CEQA Yuba Accord Alternative, relative to the CEQA Existing Condition, would not conflict with the goals of the plans and policies to provide recreation opportunities.

Impact 12.2.5-9: Changes in Sacramento River flows that could result in reduced boating, hunting, and fishing opportunities

Definitive optimum, maximum, and minimum river flows for recreation uses are not available for the Sacramento River, so the relative change in river flows are compared between the CEQA Yuba Accord Alternative and the CEQA Existing Condition to assess potential recreation impacts. This is an overall standard that is not related to specific reaches of the Sacramento River, so it provides only general guidance in assessing recreation impacts. If relative flows are not substantially less for the CEQA Yuba Accord Alternative compared to the CEQA Existing

Condition, boat ramps and access points along the Sacramento River between Keswick Dam and Freeport would not be adversely affected.

Simulated average monthly flows in the Sacramento River from Keswick Dam to Freeport are essentially equivalent under the CEQA Yuba Accord Alternative, relative to the CEQA Existing Condition, during the recreational use season over the 72-year simulation period (Appendix F4, 3 vs. 1, pgs. 1005 and 1562). Therefore, the CEQA Yuba Accord Alternative, relative to the CEQA Existing Condition, would have a less than significant impact on recreation opportunities along the Sacramento River.

Impact 12.2.5-10: Consistency with Sacramento River recreation policies

The CEQA Yuba Accord Alternative would not conflict with any identified plans to provide enhanced access to the Sacramento River and would not conflict with policies to provide recreation facilities or access to open space. The CEQA Yuba Accord Alternative, relative to the CEQA Existing Condition, would not conflict with the goals of any existing plans and policies to provide recreation opportunities.

Impact 12.2.5-11: Changes in Delta inflows that could result in reduced recreation opportunities in the Delta

Long-term average monthly increases in Delta inflows during the recreation use season from the Sacramento River are essentially equivalent under the CEQA Yuba Accord Alternative, relative to the CEQA Existing Condition, over the 72-year simulation period (Appendix F4, 3 vs. 1, pg. 1103). Therefore, the CEQA Yuba Accord Alternative, relative to the CEQA Existing Condition, would result in a less than significant impact to recreation opportunities in the Delta.

Impact 12.2.5-12: Consistency with Delta recreation policies

Local plans and polices provide for the protection and enhancement of recreation opportunities in the Delta. These documents establish goals and policies that address maintaining and enhancing access to the Delta, open space, and recreation facilities. The CEQA Yuba Accord Alternative would not conflict with plans to provide enhanced access to the Delta and would not conflict with policies to provide recreation facilities or access to open space. Therefore, the CEQA Yuba Accord Alternative, relative to the CEQA Existing Condition, would not conflict with the goals of the plans and policies to provide recreation opportunities.

Impact 12.2.5-13: Changes in San Luis Reservoir monthly mean water surface elevations that could result in reduced boat ramp availability

All boat ramps at San Luis Reservoir are usable when the lake level is 340 feet above msl or higher. During the recreation use season there would be no additional months under the CEQA Yuba Accord Alternative that long-term average water surface elevations would decrease below the 340 feet msl threshold relative to the CEQA Existing Condition, over the 72-year simulation period (Appendix F4, 3 vs. 1, pg. 1413). Based on the analysis, the CEQA Yuba Accord Alternative, relative to the CEQA Existing Condition, would not result in a significant impact on boat ramp availability and recreation opportunities at San Luis Reservoir.

12.2.6 ENVIRONMENTAL IMPACTS/ENVIRONMENTAL CONSEQUENCES OF THE CEQA MODIFIED FLOW ALTERNATIVE COMPARED TO THE CEQA EXISTING CONDITION

Impact 12.2.6-1: Decreases in New Bullards Bar Reservoir monthly mean water surface elevations that could result in reduced boat ramp and swimming beaches availability

Cottage Creek boat ramp is unusable when the lake level is below 1,822 feet msl, and Dark Day boat ramp is unusable when the lake level is below 1,798 feet msl. Emerald Cove Marina is operable at all lake levels. During the recreation use season long-term average monthly water surface elevations and monthly average water surface elevations by water year type at the Cottage Creek boat ramp do not decrease below 1,822 feet msl under the CEQA Modified Flow Alternative during the 72-year simulation period. Similarly, long-term average monthly water surface elevations and monthly water surface elevations by water year type at the Dark Day boat ramp do not decrease below 1,798 feet msl under the CEQA Modified Flow Alternative during the 72-year simulation period. In addition, long-term average monthly water surface elevations, and water surface elevations by water year type are essentially equivalent under the CEQA Modified Flow Alternative, relative to the CEQA Existing Condition (Appendix F4, 4 vs. 1, pg. 50).

Therefore, because the analysis presented above indicates that New Bullards Bar Reservoir boat ramp availability would not be substantially changed, the CEQA Modified Flow Alternative, relative to the CEQA Existing Condition, would result in less than significant impact on recreational opportunities, including boat ramp use and swimming beaches, at New Bullards Bar Reservoir.

Impact 12.2.6-2: Decreases in lower Yuba River flows that could result in reduced boating opportunities

Long-term average flows in the lower Yuba River at Smartville are essentially equivalent to approximately 2 percent lower during the May through September recreational use season under CEQA Modified Flow Alternative, relative to the CEQA Existing Condition over the 72-year simulation period. Average flows by water year type are up to approximately 10 percent lower under the CEQA Modified Flow Alternative, relative to the CEQA Existing Condition, during some months of the recreational use season over the 72-year simulation period (Appendix F4, 4 vs. 1, pg. 100).

Long-term average flows in the lower Yuba River at Marysville are up to approximately 15 percent lower during the May through September recreational use season under the CEQA Modified Flow Alternative, relative to the CEQA Existing Condition. Average flows by water year type are generally lower (up to approximately 20 percent) during most months of the recreational use season (Appendix F4, 4 vs. 1, pg. 272). During low flow conditions in the lower Yuba River (i.e., lowest 25 percent of the cumulative flow distribution), flows under the CEQA Modified Flow Alternative during the May and June are essentially equivalent or higher over 90 percent of the time. However, flows during July and August are about 15 percent lower about 70 percent of the time, and essentially equivalent up to 100 percent higher 30 percent of the time.

Long-term average monthly flow fluctuations in the lower Yuba River under the CEQA Modified Flow Alternative during the recreational use season are generally lower in magnitude relative to the CEQA Existing Condition (Appendix F4, 4 vs. 1, pgs. 100 and 272). Therefore, potential fluctuations in flows under the CEQA Modified Flow Alternative, relative to the CEQA Existing Condition, would not result in substantial impacts to recreational opportunities, including boating and angling, on the lower Yuba River. In addition, the ramping rates identified as part of the Yuba Project operations for lower Yuba River have been developed with consideration for the overall safety of anglers and other recreationists.

Decreases in flows under the CEQA Modified Flow Alternative, relative to the CEQA Existing Condition occur due to differences in the two alternatives regarding the nature and timing of potential water transfers in the hydrologic modeling assumptions. Under the Existing Condition, water transfers from YCWA to EWA and the CVP/SWP would occur at historical volumes during the historical water transfer period (i.e., May through August). These historical transfer volumes result in higher flows in the lower Yuba River under the CEQA Existing Condition, compared to the CEQA Modified Flow Alternative because under the CEQA Modified Flow Alternative, water transfers to EWA and CVP /SWP would occur less frequently and generally during drier years. As a result, under the CEQA Modified Flow Alternative increases in flow, relative to the CEQA Existing Condition would occur during lowest five percent of flows in July and August when water transfers from YCWA to the EWA Dry Year Water Purchase Program would be possible.

Overall, flows during the recreational use season in the lower Yuba River under the CEQA Modified Flow Alternative would be lower, relative to the CEQA Existing Condition. However, there has been no optimal recreational flow ranges developed for the lower Yuba River. The lower Yuba River below Englebright Dam to the confluence with the Feather River has a relatively low gradient that does not offer high quality (i.e., Class III-V) flow dependant rapids. Therefore, it is assumed that boating opportunities would decline only if passage along the river were restricted due to shallow water depths. The range of flows occurring under both the CEQA Modified Flow Alternative and the CEQA Existing Condition would be within the range of lower Yuba River flows that would generally occur during the recreational use season and therefore, would not be expected substantially reduce recreational boating opportunities. Therefore, the CEQA Modified Flow Alternative, relative to the CEQA Existing Condition, would have a less than significant impact on boating opportunities in the lower Yuba River.

Impact 12.2.6-3: Consistency with Yuba County General Plan recreation policies

Local plans and polices provide for the protection and enhancement of recreation opportunities within Yuba County, including the Yuba County General Plan. They establish goals and policies that address maintaining and enhancing access to the lower Yuba River, open space, and recreation facilities. The CEQA Modified Flow Alternative would not conflict with plans to provide enhanced access to the lower Yuba River and would not conflict with policies to provide recreation facilities or access to open space. Therefore, the operation of the CEQA Modified Flow Alternative, relative to the CEQA Existing Condition, would not conflict with the goals of the plans and policies to provide recreation opportunities.

Impact 12.2.6-4: Decreases in Oroville Reservoir monthly mean water surface elevations that could result in reduced boat ramp availability

All boat ramps at Oroville Reservoir are usable when the lake level ranges from 850 feet msl to 950 feet msl, and at least one boat ramp remains usable when the lake level is at 750 feet msl or higher. During the recreation use season long-term average monthly water surface elevations and average monthly water surface elevations by water year type are essentially equivalent, and therefore, there would be no additional months under the CEQA Modified Flow

Alternative, relative to the CEQA Existing Condition, when long-term average monthly water surface elevations would decrease below the 750 feet msl of 850 feet msl thresholds, over the 72-year simulation period (Appendix F4, 4 vs. 1, pg. 455).

Because the analysis presented above indicates that the range of potential variation in Oroville Reservoir water surface elevations under the CEQA Modified Flow Alternative, relative to the CEQA Existing Condition, would not affect boat ramp availability. The Yuba Accord Alternative would result in a less than significant impact on boat ramp availability and recreation opportunities at Oroville Reservoir.

Impact 12.2.6-5: Decreases in Oroville Reservoir monthly mean water surface elevations that could result in reduced camping and swimming beaches availability

Recreational opportunities, including use of campgrounds and swimming beaches begin to decline at Oroville Reservoir when the lake level is at 800 feet msl or lower. During the recreation use season there would be no additional months under the CEQA Modified Flow Alternative that long-term average monthly water surface elevations or average monthly water surface elevations by water year type, relative to the CEQA Existing Condition, would decrease below the 800 feet msl threshold over the 72-year simulation period (Appendix F4, 4 vs. 1, pg. 455). Therefore, the CEQA Modified Flow Alternative would not result in substantial changes to the use of campground and swimming beaches at Oroville Reservoir.

Because the analysis presented above indicates that the range of potential variation in Oroville Reservoir water surface elevations would be generally equivalent, the CEQA Modified Flow Alternative, relative to the CEQA Existing Condition, would result in less than significant impacts on the use of campgrounds and swimming beaches at Oroville Reservoir.

Impact 12.2.6-6: Changes in Orville Reservoir monthly mean water surface elevations that cold result in reduced recreation opportunities

High quality recreational opportunities occur at Oroville Reservoir when the lake level is between 850 and 950 feet msl. During the recreation use season there are no additional months under the CEQA Modified Flow Alternative, relative to the CEQA Existing Condition that long-term average monthly water surface elevations, or average monthly water surface elevations by water year type decrease below, or increase above this range over the 72-year simulation period (Appendix F4, 4 vs. 1, pg. 455). Therefore, the CEQA Modified Flow Alternative would not result in substantial changes to high quality recreation opportunities at Oroville Reservoir.

Because the analysis presented above indicates that the range of potential variation in Oroville Reservoir water surface elevations under the CEQA Modified Flow Alternative, relative to the CEQA Existing Condition, would be essentially equivalent, the CEQA Modified Flow Alternative would result in a less than significant impact on high quality recreation opportunities at Oroville Reservoir.

Impact 12.2.6-7: Changes in Feather River flows that could result in reduced boating and fishing opportunities

Differences in long-term average monthly flows in the Feather River flows from the Thermalito Afterbay Outlet to the Sacramento River do not exceed approximately 3 percent during the recreational use season under the CEQA Modified Flow Alternative, relative to the CEQA Existing Condition, over the 72-year simulation period (Appendix F4, 4 vs. 1, pg. 603). These slight differences in flow would not preclude any recreational activity (e.g., fishing or boating) that occurred under the CEQA Existing Condition. Therefore, the CEQA Modified Flow Alternative, relative to the CEQA Existing Condition, would have a less than significant impact on recreation along the Feather River.

Impact 12.2.6-8: Consistency with Feather River recreation policies

The CEQA Modified Flow Alternative would not conflict with any identified plans to provide enhanced access to the Feather River and would not conflict with policies to provide recreation facilities or access to open space. Therefore, the CEQA Modified Flow Alternative, relative to the CEQA Existing Condition, would not conflict with the goals of the plans and policies to provide recreation opportunities.

Impact 12.2.6-9: Changes in Sacramento River flows that could result in reduced boating, hunting, and fishing opportunities

Definitive optimum, maximum, and minimum river flows for recreation uses are not available for the Sacramento River, so the relative change in river flows are compared between the CEQA Modified Flow Alternative and the CEQA Existing Condition to assess potential recreation impacts. This is an overall standard that is not related to specific reaches of the Sacramento River, so it provides only general guidance in assessing recreation impacts. If relative flows are not substantially less for the CEQA Modified Flow Alternative compared to the CEQA Existing Condition, boat ramps and access points along the Sacramento River between Keswick Dam and Freeport would not be adversely affected.

Simulated average monthly flows in the Sacramento River between Keswick Dam to Freeport are generally essentially equivalent under the CEQA Modified Flow Alternative, relative to the CEQA Existing Condition, during the recreation use season over the 72-year simulation period (Appendix F4, 4 vs. 1, pgs. 1005 and 1562). Therefore, the CEQA Modified Flow Alternative, relative to the CEQA Existing Condition, would have a less than significant impact on recreation opportunities along the Sacramento River.

Impact 12.2.6-10: Consistency with Sacramento River recreation policies

The CEQA Modified Flow Alternative would not conflict with any identified plans to provide enhanced access to the Sacramento River and would not conflict with policies to provide recreation facilities or access to open space. Therefore, the CEQA Modified Flow Alternative, relative to the CEQA Existing Condition, would not conflict with the goals of any existing plans and policies to provide recreation opportunities.

Impact 12.2.6-11: Changes in Delta inflows that could result in reduced recreation opportunities in the Delta

Long-term average monthly Delta inflows during the recreation use season from the Sacramento River are essentially equivalent under the CEQA Modified Flow Alternative, relative to the CEQA Existing Condition over the 72-year simulation period (Appendix F4, 4 vs. 1, pg. 1103). Therefore, the CEQA Modified Flow Alternative, relative to the CEQA Existing Condition, would result in a less than significant impact to recreation opportunities in the Delta.

Impact 12.2.6-12: Consistency with Delta recreation policies

Local plans and polices provide for the protection and enhancement of recreation opportunities in the Delta. These documents establish goals and policies that address maintaining and enhancing access to the Delta, open space, and recreation facilities. The CEQA Modified Flow

Alternative would not conflict with plans to provide enhanced access to the Delta and would not conflict with policies to provide recreation facilities or access to open space. Therefore, the operation of CEQA Modified Flow Alternative, relative to the CEQA Existing Condition, would not conflict with the goals of the plans and policies to provide recreation opportunities.

Impact 12.2.6-13: Decreases in San Luis Reservoir monthly mean water surface elevations that could result in reduced boat ramp availability

All boat ramps at San Luis Reservoir are usable when the lake level is 340 feet above msl or higher. During the recreation use season there would be no additional months under the CEQA Modified Flow Alternative that long-term average water surface elevations would decrease below the 340 feet msl threshold relative to the CEQA Existing Condition, over the 72-year simulation period (Appendix F4, 4 vs. 1, pg. 1413). Based on the analysis, the CEQA Modified Flow Alternative, relative to the CEQA Existing Condition, would not result in a significant impact on boat ramp availability and recreation opportunities at San Luis Reservoir.

12.2.7 ENVIRONMENTAL IMPACTS/ENVIRONMENTAL CONSEQUENCES OF THE CEQA NO PROJECT/NEPA NO ACTION ALTERNATIVE COMPARED TO THE CEQA EXISTING CONDITION/NEPA AFFECTED ENVIRONMENT

As discussed in Chapter 3, the key elements and activities (e.g., implementation of the RD-1644 Long-term instream flow requirements) for the CEQA No Project Alternative would be the same for the NEPA No Action Alternative. The primary differences between the CEQA No Project and NEPA No Action alternatives are various hydrologic and other modeling assumptions (see Section 4.5 and Appendix D). Because of these differences between the No Project and No Action alternatives, these alternatives are distinguished as separate alternatives for CEQA and NEPA evaluation purposes.

Based on current plans and consistent with available infrastructure and community services, the CEQA No Project Alternative in this EIR/EIS is based on current environmental conditions (e.g., project operations, water demands, and level of land development) plus potential future operational and environmental conditions (e.g., implementation of the RD-1644 Long-term instream flow requirements in the lower Yuba River) that probably would occur in the foreseeable future in the absence of the Proposed Project/Action or another action alternative. The NEPA No Action Alternative also is based on conditions without the proposed project, but uses a longer-term future timeframe that is not restricted by existing infrastructure or physical and regulatory environmental conditions. The differences between these modeling characterizations and assumptions for the CEQA No Project and the NEPA No Action alternatives, including the rationale for developing these two different scenarios for this EIR/EIS, are explained in Chapter 4[4].

Although implementation of the RD-1644 Long-term instream flow requirements would occur under both the CEQA No Project and the NEPA No Action alternatives, the resultant model outputs for both scenarios are different because of variations in the way near-term and long-term future operations are characterized for other parameters in the CEQA and NEPA

[4] For modeling purposes related to CEQA analytical requirements, OCAP Study 3 (2001 level of development) is used as the foundational study upon which the modeling scenarios for the CEQA No Project Alternative and the CEQA Existing Condition were developed. For modeling purposes related to NEPA analytical requirements, OCAP Study 5 (2020 level of development) is used as the foundational study upon which the modeling scenarios for the NEPA No Action Alternative was developed.

assumptions. As discussed in Chapter 4, the principal difference between the CEQA No Project Alternative and the NEPA No Action Alternative is that the NEPA No Action Alternative includes several potential future water projects in the Sacramento and San Joaquin valleys (e.g., CVP/SWP Intertie, FRWP, SDIP and a long-term EWA Program or a program equivalent to the EWA), while the CEQA No Project Alternative does not. Because many of the other assumed conditions for these two scenarios are similar, the longer-term analysis of the NEPA No Action Alternative compared to the NEPA Affected Environment builds upon the nearer-term analysis of the CEQA No Project Alternative compared to the CEQA Existing Condition.

Because the same foundational modeling base (OCAP Study 3) was used to characterize near-term conditions (2001 level of development) both the CEQA No Project Alternative and the CEQA Existing Condition, it was possible to conduct a detailed analysis to quantitatively evaluate the hydrologic changes in the Yuba Region and the CVP/SWP system that would be expected to occur under these conditions. Building on this CEQA analysis, the analysis of the NEPA No Action Alternative compared to the NEPA Affected Environment consists of two components: (1) an analysis of near-term future without project conditions quantified through the CEQA No Project Alternative, relative to the CEQA Existing Condition; and (2) a qualitative analysis of longer-term future without project conditions (the NEPA No Action Alternative)[5].

12.2.7.1 CEQA No Project Alternative Compared to the CEQA Existing Condition

Impact 12.2.7.1-1: Decreases in New Bullards Bar Reservoir monthly mean water surface elevations that could result in reduced boat ramp and swimming beaches availability

Cottage Creek boat ramp is unusable when the lake level is below 1,822 feet msl, and Dark Day boat ramp is unusable when the lake level is below 1,798 feet msl. Emerald Cove Marina is operable at all lake levels. During the recreation use season, long-term average monthly water surface elevations and monthly average water surface elevations by water year type at Cottage Creek boat ramp do not decrease below 1,822 feet msl under the CEQA No Project Alternative during the 72-year simulation period with the exception of August and September of critical water years in which average water surface elevations are 1,817 feet msl and 1,808 feet msl, respectively. Long-term average monthly water surface elevations and monthly water surface elevations by water year type at the Dark Day boat ramp do not decrease below 1,798 feet msl under the CEQA No Project Alternative during the 72-year simulation period. In addition, long-term average monthly water surface elevations, and water surface elevations by water year type are essentially equivalent under the CEQA No Project Alternative, relative to the CEQA Existing Condition (Appendix F4, 2 vs. 1, pg. 50).

Therefore, because the analysis presented above indicates that New Bullards Bar Reservoir boat ramp availability would not be substantially changed, the CEQA No Project Alternative, relative to the CEQA Existing Condition, would result in less than significant impact on recreational opportunities, including boat ramp use and swimming beaches, at New Bullards Bar Reservoir.

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[5] The second analytical component cannot be evaluated quantitatively due to the differences in the underlying baseline assumptions for OCAP Study 3 and OCAP Study 5.

Impact 12.2.7.1-2: Decreases in lower Yuba River flows that could result in reduced boating opportunities

Over the entire 72-year period of simulated, long-term average flows in the lower Yuba River at Smartville range from approximately 20 percent lower to approximately 5 percent higher during the May through September recreational use season under CEQA No Project Alternative, relative to the CEQA Existing Condition. Average flows by water year type generally are lower during most months of the recreational use season with the exception of critical water years in which flows under the CEQA No Project Alternative are up to approximately 50 percent higher relative to the CEQA Existing Condition (Appendix F4, 2 vs. 1, pg. 100).

Long-term average flows in the lower Yuba River at Marysville range from approximately 40 percent lower to approximately 4 percent higher during the May through September recreational use season under the CEQA No Project Alternative, relative to the CEQA Existing Condition. Average flows by water year type generally are lower (up to approximately 50 percent) during most months of the recreational use season with the exception of May and June of critical water years in which flows under the CEQA No Project Alternative are up to approximately 140 percent higher over the 72-year simulation period relative to the CEQA Existing Condition (Appendix F4, 2 vs. 1, pg. 272).

Lower Yuba River flows measured at Marysville under the CEQA No Project Alternative, relative to the CEQA Existing Condition are similar most of the time during May and June. However, flows from July through August are 20 percent to 40 percent lower about 70 percent to 90 percent of the time (Appendix F4, 2 vs. 1, pg. 371 through 382). However, during the lowest five percent of flow conditions, flows under the CEQA No Project Alternative are over 100 percent higher.

Long-term average monthly flow fluctuations in the lower Yuba River under the CEQA No Project Alternative during the recreational use season are generally lower in magnitude from August to September and higher from May to June relative to the CEQA Existing Condition (Appendix F4, 2 vs. 1, pgs. 100 and 272). Therefore, potential fluctuations in flows under the CEQA No Project Alternative, relative to the CEQA Existing Condition, would not result in substantial impacts to recreational opportunities, including boating and angling, on the lower Yuba River. In addition, the ramping rates identified as part of the Yuba Project operations for lower Yuba River have been developed with consideration for the overall safety of anglers and other recreationists.

Overall, flows in the lower Yuba River under the CEQA No Project Alternative Condition during the recreational use season would be similar compared to the CEQA Existing during most months of the recreational use season. Flow decreases during July and August result from differences in assumptions between the alternatives regarding potential stored water transfers from New Bullards Bar Reservoir during the primary water transfer period in July and August. Under the CEQA No Project Alternative, no stored water transfers would occur during the summer water transfer period, however under the CEQA Existing Condition water transfers would occur at historical volumes. Therefore, flows would be substantially reduced under the CEQA No Project Alternative, during the primary water transfer period in July and August. However, there has been no optimal recreational flow ranges developed for the lower Yuba River. The lower Yuba River below Englebright Dam to the confluence with the Feather River has a relatively low gradient that does not offer high quality (i.e., Class III-V) flow dependant rapids. Therefore, it is assumed that boating opportunities would decline only if passage along the river were restricted due to shallow water depths. The range of flows occurring under both the CEQA No Project Alternative and the CEQA Existing Condition would be within the range of lower Yuba River flows that would generally occur during the recreational use season and therefore, would not be expected substantially reduce recreational boating opportunities. Therefore, the CEQA No Project Alternative, relative to the CEQA Existing Condition, would have a less than significant impact on boating opportunities in the lower Yuba River.

Impact 12.2.7.1-3: Consistency with Yuba County General Plan recreation policies

Local plans and polices provide for the protection and enhancement of recreation opportunities within Yuba County, including the Yuba County General Plan. They establish goals and policies that address maintaining and enhancing access to the lower Yuba River, open space, and recreation facilities. The CEQA No Project Alternative would not conflict with plans to provide enhanced access to the lower Yuba River and would not conflict with policies to provide recreation facilities or access to open space. Therefore, the CEQA No Project Alternative, relative to the CEQA Existing Condition, would not conflict with the goals of the plans and policies to provide recreation opportunities.

Impact 12.2.7.1-4: Decreases in Oroville Reservoir monthly mean water surface elevations that could result in reduced boat ramp availability

All boat ramps at Oroville Reservoir are usable when the lake level ranges from 850 feet msl to 950 feet msl, and at least one boat ramp remains usable when the lake level is at 750 feet msl or higher. During the recreation use season long-term average monthly water surface elevations and average monthly water surface elevations by water year type are essentially equivalent, and therefore, there would be no additional months under the CEQA No Project Alternative, relative to the CEQA Existing Condition, when long-term average monthly water surface elevations would decrease below the 750 feet msl of 850 feet msl thresholds, over the 72-year simulation period (Appendix F4, 2 vs. 1, pg. 455).

Because the analysis presented above indicates that the range of potential variation in Oroville Reservoir water surface elevations would be essentially equivalent under the CEQA No Project Alternative, relative to the CEQA Existing Condition, there would be a less than significant impact on boat ramp availability and recreation opportunities at Oroville Reservoir.

Impact 12.2.7.1-5: Decreases in Oroville Reservoir monthly mean water surface elevations that could result in reduced camping and swimming beaches availability

Recreational opportunities, including use of campgrounds and swimming beaches begin to decline at Oroville Reservoir when the lake level is at 800 feet msl or lower. During the recreation use season there would be no additional months under the CEQA No Project Alternative that long-term average monthly water surface elevations or average monthly water surface elevations by water year type, relative to the CEQA Existing Condition, would decrease below the 800 feet msl threshold over the 72-year simulation period (Appendix F4, 2 vs. 1, pg. 455). Therefore, the CEQA No Project Alternative would not result in substantial changes to the use of campground and swimming beaches at Oroville Reservoir.

Because the analysis presented above indicates that the range of potential variation in Oroville Reservoir water surface elevations would be generally equivalent, the CEQA No Project Alternative, relative to the CEQA Existing Condition, would result in less than significant impacts on the use of campgrounds and swimming beaches at Oroville Reservoir.

Impact 12.2.7.1-6: Decreases in Oroville Reservoir monthly mean water surface elevations that could result in reduced recreation opportunities

High quality recreational opportunities occur at Oroville Reservoir when the lake level is between 850 feet msl and 950 feet msl. During the recreation use season there are no additional months under the CEQA No Project Alternative, relative to the CEQA Existing Condition that long-term average monthly water surface elevations, or average monthly water surface elevations by water year type would, decrease below, or increase above this range over the 72-year simulation period (Appendix F4, 2 vs. 1, pg. 455). Therefore, the CEQA No Project Alternative would not result in substantial changes to high quality recreation opportunities at Oroville Reservoir.

Because the analysis presented above indicates that the range of potential variation in Oroville Reservoir water surface elevations would be relatively minor, the CEQA No Project Alternative, relative to the CEQA Existing Condition, would result in a less than significant impact on high quality recreation opportunities at Oroville Reservoir.

Impact 12.2.7.1-7: Changes in Feather River flows that could result in reduced boating and fishing opportunities

Long-term average monthly flows in the Feather River would decrease by up to approximately 8 percent in August at the Sacramento River confluence under the CEQA No Project Alternative, relative to the CEQA Existing Condition, over the 72-year simulation period (Appendix F4, 2 vs. 1, pg. 603). This slight decrease would not preclude any recreational activity (e.g., fishing or boating) that occurred under the CEQA Existing Condition. The CEQA No Project Alternative, relative to the CEQA Existing Condition, would therefore have a less than significant impact on recreation along the Feather River.

Impact 12.2.7.1-8: Consistency with Feather River recreation policies

The CEQA No Project Alternative would not conflict with any identified plans to provide enhanced access to the Feather River and would not conflict with policies to provide recreation facilities or access to open space. The CEQA No Project Alternative, relative to the CEQA Existing Condition, would not conflict with the goals of the plans and policies to provide recreation opportunities.

Impact 12.2.7.1-9: Changes in Sacramento River flows that could result in reduced boating, hunting, and fishing opportunities

Definitive optimum, maximum, and minimum river flows for recreation uses are not available for the Sacramento River. Therefore, the relative change in river flows between the CEQA No Project Alternative and the CEQA Existing Condition is compared to assess potential recreation impacts. This is an overall standard that is not related to specific reaches of the Sacramento River, so it provides only general guidance in assessing recreation impacts. If relative flows are not substantially reduced under the CEQA No Project Alternative compared to the CEQA Existing Condition, boat ramps and access points along the Sacramento River would not be adversely affected.

Long-term average flows in the Sacramento River from Keswick Dam to Freeport under the CEQA No Project Alternative are essentially equivalent during some months, and up to 3 percent lower relative to the CEQA Existing Condition over the 72-year simulation period (Appendix F4, 2 vs. 1, pgs. 1005 and 1562). These slight decreases in monthly average flows are not likely to be associated with any reduction on recreational opportunities (e.g., boating, hunting, or fishing). The CEQA No Project Alternative, relative to the CEQA Existing Condition, would have a less than significant impact on recreation opportunities along the Sacramento River.

Impact 12.2.7.1-10: Consistency with Sacramento River recreation policies

The CEQA No Project Alternative would not conflict with any identified plans to provide enhanced access to the Sacramento River and would not conflict with policies to provide recreation facilities or access to open space. The operation of the CEQA No Project Alternative, relative to the CEQA Existing Condition, would not conflict with the goals of any existing plans and policies to provide recreation opportunities.

Impact 12.2.7.1-11: Changes in Delta inflows that could result in reduced recreation opportunities in the Delta

Long-term average monthly Delta inflows from the Sacramento River are essentially equivalent during all months of the recreational use season except July and August, during which flows are approximately 3 percent lower under the CEQA No Project Alternative, relative to the CEQA Existing Condition over the 72-year simulation period (Appendix F4, 2 vs. 1, pg. 1103). These slight decreases are not likely to substantially impact recreation opportunities in the Delta. Therefore, the CEQA No Project Alternative, relative to the CEQA Existing Condition, would result in less than significant impacts to recreation opportunities in the Delta.

Impact 12.2.7.1-12: Consistency with Delta recreation policies

Local plans and polices provide for the protection and enhancement of recreation opportunities in the Delta. These documents establish goals and policies that address maintaining and enhancing access to the Delta, open space, and recreation facilities. The CEQA No Project Alternative would not conflict with plans to provide enhanced access to the Delta and would not conflict with policies to provide recreation facilities or access to open space. The CEQA No Project Alternative, relative to the CEQA Existing Condition, would not conflict with the goals of the plans and policies to provide recreation opportunities.

Impact 12.2.7.1-13: Decreases in San Luis Reservoir monthly mean water surface elevations that could result in reduced boat ramp availability

All boat ramps at San Luis Reservoir are usable when the lake level is 340 feet above msl or higher. During the recreation use season there would be no additional months under the CEQA No Project Alternative that long-term average water surface elevations would decrease below the 340 feet msl threshold relative to the CEQA Existing Condition, over the 72-year simulation period (Appendix F4, 2 vs. 1, pg. 1413). Therefore, based on the analysis presented, the CEQA No Project Alternative, relative to the CEQA Existing Condition, would not result in a significant impact on boat ramp availability and recreation opportunities at San Luis Reservoir.

12.2.7.2 NEPA No Action Alternative Compared to the NEPA Affected Environment

In the Yuba Region, the primary differences between the NEPA No Action Alternative and the NEPA Affected Environment would be the changes in lower Yuba River flows associated with the implementation of the RD-1644 Long-term instream flow requirements, to replace the RD-1644 Interim instream flow requirements, and the increased local surface water demands for the Wheatland Water District. These also are the primary differences that would occur in the Yuba

Region between the CEQA No Project Alternative and the CEQA Existing Condition. The potential effects to recreational resources that were evaluated in the quantitative analyses that is presented in Section 12.2.7.1 above for the CEQA No Project Alternative relative to the CEQA Existing Condition (see also Appendix F4, 2 vs. 1) therefore also are used for comparison of the NEPA No Action Alternative relative to the NEPA Affected Environment, and are not repeated here.

As discussed above, the analysis of the NEPA No Action Alternative includes several additional proposed projects in the project study area that are not included in the CEQA analysis. However, these other proposed projects would not significant affect hydrologic conditions needed for recreational resources in the Yuba Region and, thus, are only discussed in the context of CVP/SWP operations upstream of and within the Delta.

Under the NEPA No Action Alternative, future levels of demand for water in California would be addressed through the implementation of numerous projects, including water storage and conveyance projects (e.g., SDIP[6]), water transfers and acquisition programs (e.g., a long-term EWA Program or a program equivalent to the EWA), and other projects related to CVP/SWP system operations (e.g., CVP/SWP Intertie and FRWP).

To meet increased future demands, several other projects would increase water diversions from the Sacramento and Feather rivers under the NEPA No Action Alternative, relative to the NEPA Affected Environment. Particularly in drier years, these increased diversions could result in reduced river flows during the summer when the rivers upstream of the Delta are used for recreational activities (e.g., swimming, boating and fishing). Changes in CVP/SWP reservoir levels in response to the increased future demands of downstream water users may reduce access to recreation facilities (e.g., boat ramps) and reduce recreational opportunities. Similarly, future water transfer and acquisition programs (e.g., a long-term EWA Program or a program equivalent to the EWA) could purchase water from the same agency or reservoir, and, thus, could collectively draw down reservoirs further than under the NEPA Affected Environment. The additional water sold for other programs could reduce reservoir water levels in the CVP/SWP reservoirs, which also could cause a loss of boat ramp access and, thus, reduce recreational opportunities.

For the reasons discussed above, new water conveyance projects, new water transfer and acquisition programs and other projects related to CVP/SWP operations discussed above could potentially affect recreation in the CVP/SWP system.

12.2.8 ENVIRONMENTAL IMPACTS/ENVIRONMENTAL CONSEQUENCES OF THE NEPA YUBA ACCORD ALTERNATIVE COMPARED TO THE NEPA NO ACTION ALTERNATIVE

Impact 12.2.8-1: Decreases in New Bullards Bar Reservoir monthly mean water surface elevations that could result in reduced boat ramp and swimming beaches availability

Cottage Creek boat ramp is unusable when the lake level is below 1,822 feet above msl, and Dark Day boat ramp is unusable when the lake level is below 1,798 feet above msl. Emerald Cove Marina is operable at all lake levels. During the recreation use season, long-term average monthly water surface elevations and monthly average water surface elevations by water year

[6] The SDIP includes a maximum pumping rate of 8,500 cfs at the Banks Pumping Plant.

type at the Cottage Creek boat ramp do not drop below 1,822 feet msl under the NEPA Yuba Accord Alternative over the 72-year simulation period, with the exception of August and September of critical water years in which average water surface elevations are 1,809 feet msl and 1,798 feet msl under the NEPA Yuba Accord Alternative, and 1,817 feet msl and 1,808 feet msl under the NEPA No Project respectively. Long-term average monthly water surface elevations and monthly average water surface elevations by water year type at the Dark Day boat ramp do not decrease below 1,798 feet msl under the NEPA Yuba Accord Alternative during the 72-year simulation period (Appendix F4, 6 vs. 5, pg. 50). In addition, average monthly long-term average water surface elevations and water surface elevations by water year type in New Bullards Bar Reservoir are essentially equivalent under the NEPA Yuba Accord Alternative relative to the NEPA No Action Alternative.

Therefore, because the analysis presented above indicates that New Bullards Bar Reservoir boat ramp availability would not be substantially changed, the NEPA Yuba Accord Alternative, relative to the NEPA No Action Alternative, would result in a less than significant impact on recreational opportunities, including boat ramp use and swimming beaches, at New Bullards Bar Reservoir.

Impact 12.2.8-2: Changes in lower Yuba River flows that could result in reduced boating opportunities

Long-term average flows in the lower Yuba River at Smartville range from approximately 5 percent lower in May and up to approximately 25 percent higher from June to September during the recreational use season under the NEPA Yuba Accord Alternative, relative to the NEPA No Action Alternative over the 72-year simulation period. Average flows by water year type are generally higher during most months of the recreational use season with the exception of May and June of dry and critical water years when flows are up to 20 percent lower under the NEPA Yuba Accord Alternative, relative to the NEPA No Action Alternative (Appendix F4, 6 vs. 5, pg. 100).

Long-term average flows in the lower Yuba River at Marysville range from approximately 5 percent lower to approximately 60 percent higher during the recreational use season under the NEPA Yuba Accord Alternative, relative to the NEPA No Action Alternative. Average flows by water year type are between approximately 2 percent and approximately 80 percent higher for all water years with the exception of flows occurring during May and June of dry and critical water years when flows are up to 30 percent lower under the NEPA Yuba Accord Alternative, relative to the NEPA No Action Alternative (Appendix F4, 6 vs. 5, pg. 272). However, during the peak of the recreational use season (i.e., July and August), flows under the NEPA Yuba Accord Alternative are on average about 50 percent to 60 percent higher 95 percent to 100 percent of the time over the cumulative flow distribution.

Long-term average monthly flow fluctuations in the lower Yuba River under the NEPA Yuba Accord Alternative during the recreational use season are generally lower in magnitude relative to the NEPA No Action Alternative (Appendix F4, 6 vs. 5, pgs. 100 and 272). Therefore, fluctuations in flows under the NEPA Yuba Accord Alternative, relative to the NEPA No Action Alternative, would result in a less than significant impact to recreational opportunities, including boating and angling, on the lower Yuba River. In addition, the ramping rates identified as part of the Yuba Project operations for lower Yuba River have been developed with consideration for the overall safety of anglers and other recreationists.

Overall, flows in the lower Yuba River under the NEPA Yuba Accord Alternative would be lower during May and June of the recreational use season however, flows during this time would be relatively high (i.e., 1,000 cfs and 5,000 cfs) during most water years therefore, it is unlikely that boating opportunities would be reduced under the NEPA Yuba Accord Alternative. During the peak recreational use season in July and August when seasonal flow generally would be decreasing, flows under the NEPA Yuba Accord Alternative would be substantially higher compared to the NEPA No Action Alternative and could have a potentially beneficial impact on boating opportunities in the lower Yuba River. Therefore, the NEPA Yuba Accord Alternative, relative to the NEPA No Action Alternative, would have a less than significant impact on boating opportunities in the lower Yuba River.

Impact 12.2.8-3: Consistency with Yuba County General Plan recreation policies

Local plans and polices provide for the protection and enhancement of recreation opportunities within Yuba County, including the Yuba County General Plan. They establish goals and policies that address maintaining and enhancing access to the lower Yuba River, open space, and recreation facilities. The NEPA Yuba Accord Alternative would not conflict with plans to provide enhanced access to the lower Yuba River and would not conflict with policies to provide recreation facilities or access to open space. The operation of the NEPA Yuba Accord Alternative, relative to the NEPA No Action Alternative, would not conflict with the goals of the plans and policies to provide recreation opportunities.

Impact 12.2.8-4: Decreases in Oroville Reservoir monthly mean water surface elevations that could result in reduced boat ramp availability

All boat ramps at Oroville Reservoir are usable when the lake level ranges from 850 feet msl to 950 feet msl, and at least one boat ramp remains usable when the lake level is at 750 feet msl or higher. During the recreation use season under the NEPA Yuba Accord Alternative, relative to the NEPA No Action Alternative there would be one month during June of below normal years when average monthly reservoir surface elevations are 849 feet msl; and one month during May of critical years when the reservoir elevations are 749 feet msl. However, over the cumulative reservoir elevation distribution reservoir elevations during May would remain above 850 feet msl 70 percent of the time compared to 71 percent of the time under the NEPA No Action Alternative. In addition, reservoir elevations would remain above 750 feet msl over 90 percent of the time under both the NEPA Yuba Accord Alternative and the NEPA No Action Alternative. Similarly, in June under the NEPA Yuba Accord Alternative there is only a 1 percent additional probability that reservoir elevations would drop below 850 feet msl over the cumulative reservoir storage distribution.

Overall, reservoir elevations in Oroville Reservoir under the NEPA Yuba Accord Alternative would not be reduced with a sufficient frequency and magnitude compared to the NEPA No Action Alternative to substantially affect boat ramp availability. Therefore the NEPA Yuba Accord Alternative, relative to the NEPA No Action Alternative, would have a less than significant impact on boat ramp availability and recreation opportunities in Oroville Reservoir.

Impact 12.2.8-5: Decreases in Oroville Reservoir monthly mean water surface elevations that could result in reduced camping and swimming beaches availability

Recreational opportunities, including use of campgrounds and swimming beaches begin to decline at Oroville Reservoir when the lake level is at 800 feet above msl or lower. During the recreation use season there would be no additional months under the NEPA Yuba Accord

Alternative, relative to the NEPA No Action Alternative that long-term average monthly water surface elevations or average monthly water surface elevations by water year type would decrease below the 800 feet msl threshold over the 72-year simulation period (Appendix F4, 6 vs. 5, pg. 455). Therefore, the NEPA Yuba Accord Alternative would not result in substantial changes to the use of campground and swimming beaches at Oroville Reservoir.

Because the analysis presented above indicates that the range of potential variation in Oroville Reservoir water surface elevations would be generally equivalent, therefore the NEPA Yuba Accord Alternative, relative to the NEPA No Action Alternative, would result in less than significant impacts on the use of campgrounds and swimming beaches at Oroville Reservoir.

Impact 12.2.8-6: Decreases in Orville Reservoir monthly mean water surface elevations that could result in reduced recreation opportunities

High quality recreational opportunities occur at Oroville Reservoir when the lake level is between 850 and 950 feet above msl. During the recreation use season long-term average monthly water surface elevations do not drop below 850 foot msl or rise above 950 foot msl over the 72-year simulation period under the NEPA Yuba Accord Alternative, relative to the NEPA No Action Alternative. In addition average monthly water surface elevations by water year type do not drop below 850 foot msl or increase above 950 feet msl over the 72-year simulation period except during of May of below Normal water years when they are 1 foot lower under the NEPA Yuba Accord Alternative (i.e., less than 1 percent difference compared to the NEPA No Action Alternative) over the 72-year simulation period. (Appendix F4, 6 vs. 5, pg. 455). However, this decrease in reservoir elevation would not occur with sufficient frequency and magnitude to result in any substantial changes to high quality recreation opportunities at Oroville Reservoir.

Because the analysis presented above indicates that the range of potential variation in Oroville Reservoir water surface elevations would be relatively minor, the NEPA Yuba Accord Alternative, relative to the NEPA No Action Alternative, would result in a less than significant impact on recreation opportunities at Oroville Reservoir.

Impact 12.2.8-7: Changes in Feather River flows that could result in reduced boating and fishing opportunities

Long-term average monthly flows during the recreational use season in the Feather River from the Thermalito Afterbay to the confluence of the Sacramento River under the NEPA Yuba Accord Alternative are generally essentially equivalent and decreases that occur do not exceed 3 percent, relative to the NEPA No Action Alternative over the 72-year simulation period (Appendix F4, 6 vs. 5, pg. 603). These differences in flow would not preclude any recreational activity (e.g., fishing or boating) that occurred under the NEPA No Action Alternative due to their frequency, magnitude, and duration. Therefore, differences in flow under the NEPA Yuba Accord Alternative, relative to the NEPA No Action Alternative, would therefore have a less than significant impact on recreation along the Feather River.

Impact 12.2.8-8: Consistency with Feather River recreation policies

The NEPA Yuba Accord Alternative would not conflict with any identified plans to provide enhanced access to the Feather River and would not conflict with policies to provide recreation facilities or access to open space. The operation of the NEPA Yuba Accord Alternative, relative to the NEPA No Action Alternative, would not conflict with the goals of the plans and policies to provide recreation opportunities.

Impact 12.2.8-9: Changes in Sacramento River flows that could result in reduced boating, hunting, and fishing opportunities

Definitive optimum, maximum, and minimum river flows for recreation uses are not available for the Sacramento River, so the relative change in river flows are compared between the NEPA Yuba Accord Alternative and the NEPA No Action Alternative to assess potential recreational impacts. This is an overall standard that is not related to specific reaches of the Sacramento River, so it provides only general guidance in assessing recreation impacts. If relative flows are not substantially less for the NEPA Yuba Accord Alternative compared to the NEPA No Action Alternative, boat ramps and access points along the Sacramento River between Keswick Dam and Freeport would not be adversely affected.

Differences in long-term average flows in the Sacramento River between the confluence of the lower Feather River and Freeport under the NEPA Yuba Accord Alternative, relative to the NEPA No Action Alternative, do not exceed approximately 3 percent during most months of the recreational use season (Appendix F4, 6 vs. 5, pgs. 882 and 1005). These slight differences in Sacramento River flows are not likely to be associated with any reduction in recreational opportunities (e.g., boating, hunting, or fishing) relative to the NEPA No Action Alternative. Therefore, the NEPA Yuba Accord Alternative would have a less than significant impact on recreation opportunities along the Sacramento River.

Impact 12.2.8-10: Consistency with Sacramento River recreation policies

The NEPA Yuba Accord Alternative would not conflict with any identified plans to provide enhanced access to the Sacramento River and would not conflict with policies to provide recreation facilities or access to open space. The operation of the NEPA Yuba Accord Alternative, relative to the NEPA No Action Alternative, would not conflict with the goals of any existing plans and policies to provide recreation opportunities.

Impact 12.2.8-11: Changes in Delta inflows that could result in reduced recreation opportunities in the Delta

Long-term average monthly Delta inflows from the Sacramento River are essentially equivalent or higher during most months of the recreational use season under the NEPA Yuba Accord Alternative, relative to the NEPA No Action Alternative, over the 72-year simulation period (Appendix F4, 6 vs. 5, pg. 1103). Increases up to 3 percent in Delta inflows under the NEPA Yuba Accord Alternatives would occur in July and August. These increases would potentially have a slightly beneficial impact on Delta recreational resources. Therefore, based on the magnitude and timing of these flow differences, the NEPA Yuba Accord Alternative, relative to the NEPA No Action Alternative, would result in less than significant or beneficial impacts to recreation opportunities in the Delta.

Impact 12.2.8-12: Consistency with Delta recreation policies

Local plans and polices provide for the protection and enhancement of recreation opportunities in the Delta. These documents establish goals and policies that address maintaining and enhancing access to the Delta, open space, and recreation facilities. The NEPA Yuba Accord Alternative would not conflict with plans to provide enhanced access to the Delta and would not conflict with policies to provide recreation facilities or access to open space. The operation of NEPA Yuba Accord Alternative, relative to the NEPA No Action Alternative, would not conflict with the goals of the plans and policies to provide recreation opportunities.

Impact 12.2.8-13: Decreases in San Luis Reservoir monthly mean water surface elevations that could result in reduced boat ramp availability

All boat ramps at San Luis Reservoir are usable when the lake level is 340 feet above msl or higher. During the recreation use season there would be no additional months under the NEPA Yuba Accord Alternative that long-term average monthly water surface elevations would decrease below the 340 feet msl threshold relative to the NEPA No Action Alternative, over the 72-year simulation period (Appendix F4, 6 vs. 5, pg. 1413). Based on the analysis, the NEPA Yuba Accord Alternative, relative to the NEPA No Action Alternative, would not result in a significant impact on boat ramp availability and recreation opportunities at San Luis Reservoir.

12.2.9 ENVIRONMENTAL IMPACTS/ENVIRONMENTAL CONSEQUENCES OF THE NEPA MODIFIED FLOW ALTERNATIVE COMPARED TO THE NEPA NO ACTION ALTERNATIVE

Impact 12.2.9-1: Decreases in New Bullards Bar Reservoir monthly mean water surface elevations that could result in reduced boat ramp and swimming beaches availability

Cottage Creek boat ramp is unusable when the lake level is below 1,822 feet above msl, and Dark Day boat ramp is unusable when the lake level is below 1,798 feet above msl. Emerald Cove Marina is operable at all lake levels. During the recreation season, long-term average monthly water surface elevations and monthly average water surface elevations by water year type at the Cottage Creek boat ramp would not fall below 1,822 feet msl under the NEPA Modified Flow Alternative over the 72-year simulation period. However, under the NEPA No Action Alternative, average water surface elevations would decrease (1,817 feet msl and 1808 feet msl) during August and September of critical years when the are. Long-term average monthly water surface elevations and monthly average water surface elevations by water year type at the Dark Day boat ramp do not decrease below 1,798 feet msl under the NEPA Modified Flow Alternative during the 72-year simulation period (Appendix F4, 7 vs. 5, pg. 50). Differences in average monthly long-term average water surface elevations and water surface elevations by water year type in New Bullards Bar Reservoir under the Modified Flow and No Action alternatives do not differ by more than 1 percent over the 72-year simulation period.

Therefore, because the analysis presented above indicates that New Bullards Bar Reservoir boat ramp availability under the NEPA Modified Flow Alternative, relative to the NEPA No Action Alternative, would not be substantially changed, the NEPA Modified Flow Alternative would result in less than significant impact and may be beneficial to recreational opportunities, including boat ramp use and swimming beaches, at New Bullards Bar Reservoir.

Impact 12.2.9-2: Decreases in lower Yuba River flows that could result in reduced boating opportunities

Over the 72-year simulation period, long-term average flows in the lower Yuba River at Smartville range from up to approximately 4 percent lower in May and June to approximately 20 percent higher from July through September during the recreational use season under the NEPA Modified Flow Alternative, relative to the NEPA No Action Alternative. Average flows by water year type are generally higher during most months of the recreational use season however, they are up to 30 percent lower during May and June of some water years (Appendix F4, 7 vs. 5, pg. 100). However, over the entire cumulative flow distribution for July and August, flows are about 20 percent higher about 90 percent of the time under the NEPA Modified Flow Alternative.

Long-term average flows in the lower Yuba River at Marysville range from approximately 6 percent lower in May and June and up to approximately 30 percent higher from July through September under the NEPA Modified Flow Alternative, relative to the NEPA No Action Alternative. Average monthly flows by water year type are between approximately 14 percent to approximately 60 percent higher however, they also are up to 30 percent lower during May and June of some water years (Appendix F4, 7 vs. 5, pg. 272). However, over the entire cumulative flow distribution for July and August, flows are about 45 percent higher at least 80 percent of the time under the NEPA Modified Flow Alternative.

Long-term average monthly flow fluctuations in the lower Yuba River under the NEPA Modified Flow Alternative during the recreational use season are generally lower in magnitude relative to the NEPA No Action Alternative (Appendix F4, 7 vs. 5, pgs. 100 and 272). Therefore, fluctuations in flows under the NEPA Modified Flow Alternative, relative to the NEPA No Action Alternative, would result in a less than significant impact to recreational opportunities, including boating and angling, on the lower Yuba River. In addition, the ramping rates identified as part of the Yuba Project operations for lower Yuba River have been developed with consideration for the overall safety of anglers and other recreationists.

Overall, based on the analysis presented above, potential impacts on river recreation activities are not likely to occur because flows would generally be higher under the NEPA Modified Flow Alternative during the peak months (i.e., July and August) of the recreational use season even during drier water years. Therefore, the NEPA Modified Flow Alternative, relative to the NEPA No Action Alternative, would not unreasonably affect recreational opportunities in the lower Yuba River.

Impact 12.2.9-3: Consistency with Yuba County General Plan recreation policies

Local plans and polices provide for the protection and enhancement of recreation opportunities within Yuba County, including the Yuba County General Plan. They establish goals and policies that address maintaining and enhancing access to the lower Yuba River, open space, and recreation facilities. The NEPA Modified Flow Alternative would not conflict with plans to provide enhanced access to the lower Yuba River and would not conflict with policies to provide recreation facilities or access to open space. The operation of the NEPA Modified Flow Alternative, relative to the NEPA No Action Alternative, would not conflict with the goals of the plans and policies to provide recreation opportunities.

Impact 12.2.9-4: Decreases in Oroville Reservoir monthly mean water surface elevations that could result in reduced boat ramp availability

All boat ramps at Oroville Reservoir are usable when the lake level ranges from 850 feet msl to 950 feet msl, and at least one boat ramp remains usable when the lake level is at 750 feet above msl or higher. During the recreation use season there would be no additional months under the NEPA Modified Flow Alternative, relative to the NEPA No Action Alternative when long-term average monthly water surface elevations or average monthly water surface elevations by water year type would decrease below the 750 feet msl or 850 feet msl thresholds, over the 72-year simulation period (Appendix F4, 7 vs. 5, pg. 455). There would be one month during June of below normal years when average monthly reservoir surface elevations are 849 feet msl; and one month during May of critical years when the reservoir elevations are 747 feet msl. However, over the cumulative reservoir elevation distribution reservoir elevations during May would remain above 850 feet msl 70 percent of the time compared to 71 percent of the time under the NEPA No Action Alternative. In addition, reservoir elevations would remain above

750 feet msl over 90 percent of the time under both the NEPA Modified Flow Alternative and the NEPA No Action Alternative. Similarly, in June under the NEPA Modified Flow Alternative there is only an additional 2 percent probability that reservoir elevations would drop below 850 feet msl over the cumulative reservoir storage distribution.

Overall, reservoir elevations in Oroville Reservoir under the NEPA Modified Flow Alternative would not be reduced with a sufficient frequency and magnitude compared to the NEPA No Action Alternative to substantially affect boat ramp availability, therefore the NEPA Modified Flow Alternative, relative to the NEPA No Action Alternative, would have a less than significant impact on boat ramp availability and recreation opportunities in Oroville Reservoir.

Impact 12.2.9-5: Decreases in Oroville Reservoir monthly mean water surface elevations that could result in reduced camping and swimming beaches availability

Recreational opportunities, including use of campgrounds and swimming beaches begin to decline at Oroville Reservoir when the lake level is at 800 feet above msl or lower. During the recreation use season there would be no additional months under the NEPA Modified Flow Alternative, relative to the NEPA No Action Alternative that average monthly water surface elevations would decrease below the 800 feet msl threshold over the 72-year simulation period (Appendix F4, 7 vs. 5, pg. 455). Therefore, the NEPA Modified Flow Alternative, relative to the NEPA No Action Alternative, would not result in substantial changes to the use of campground and swimming beaches at Oroville Reservoir.

Because the analysis presented above indicates that the range of potential variation in Oroville Reservoir water surface elevations under the NEPA Modified Flow Alternative, relative to the NEPA No Action Alternative, would be generally equivalent, or higher, the NEPA Modified Flow Alternative would result in less than significant, or beneficial impacts on the use of campgrounds and swimming beaches at Oroville Reservoir.

Impact 12.2.9-6: Changes in Orville Reservoir monthly mean water surface elevations that could result in reduced recreation opportunities

High quality recreational opportunities occur at Oroville Reservoir when the lake level is between 850 and 950 feet above msl. During the recreation use season there would be no additional months under the NEPA Modified Flow Alternative, relative to the NEPA No Action Alternative that long-term average monthly water surface elevations would decrease below, or increase above this range over the 72-year simulation period (Appendix F4, 7 vs. 5, pg. 455). Average reservoir elevations by water year type under the NEPA Modified Flow Alternative during June of below normal years are 849 feet msl compared to 850 feet msl under the NEPA No Action Alternative. However, this decrease in reservoir elevation would not occur with sufficient frequency or magnitude to substantially reduce recreation opportunities in Oroville Reservoir.

Because the analysis presented above indicates that the range of potential variation in Oroville Reservoir water surface elevations under the NEPA Modified Flow Alternative, relative to the NEPA No Action Alternative, would be relatively minor, the NEPA Modified Flow Alternative would result in a less than significant impact on high quality recreation opportunities at Oroville Reservoir.

Impact 12.2.9-7: Changes in Feather River flows that could result in reduced boating and fishing opportunities

Long-term average monthly flows during the recreational use season in the Feather River from the Thermalito Afterbay to the confluence of the Sacramento River under the NEPA Modified Flow Alternative are generally essentially equivalent or higher relative to the NEPA No Action Alternative over the 72-year simulation period. Decreases in flow under the NEPA Modified Flow Alternative, relative to the NEPA No Action Alternative do not exceed approximately 2 percent. Average monthly flows by water year type under the NEPA Modified Flow Alternative decrease by up to approximately 15 percent during May and/or June of drier water years relative to the NEPA No Action Alternative (Appendix F4, 7 vs. 5, pg. 603). These slight decreases in flow would not preclude any recreational activity (e.g., fishing or boating) that occurred under the NEPA No Action Alternative due to their frequency, magnitude, and duration. Therefore, potential flow decreases under the NEPA Modified Flow Alternative, relative to the NEPA No Action Alternative, would have a less than significant impact on recreation along the Feather River.

Impact 12.2.9-8: Consistency with Feather River recreation policies

The NEPA Modified Flow Alternative would not conflict with any identified plans to provide enhanced access to the Feather River and would not conflict with policies to provide recreation facilities or access to open space. The operation of the NEPA Modified Flow Alternative, relative to the NEPA No Action Alternative, would not conflict with the goals of the plans and policies to provide recreation opportunities.

Impact 12.2.9-9: Changes in Sacramento River flows that could result in reduced boating, hunting, and fishing opportunities

Definitive optimum, maximum, and minimum river flows for recreation uses are not available for the Sacramento River, so the relative change in river flows are compared between the Yuba Accord Alternative and the NEPA No Action Alternative to assess potential recreational impacts. This is an overall standard that is not related to specific reaches of the Sacramento River, so it provides only general guidance in assessing recreation impacts. If relative flows are not substantially less for the Yuba Accord Alternative compared to the NEPA No Action Alternative, boat ramps and access points along the Sacramento River between Keswick Dam and Freeport would not be adversely affected.

Long-term average monthly flows in the Sacramento River are essentially equivalent and up to approximately 3 percent higher between the Feather River confluence and Freeport during the recreational use season over the 72-year simulation period (Appendix F4, 7 vs. 5, pgs. 1005 and 1562). These slight increases in Sacramento River flows are not likely to be associated with any reduction in recreational opportunities (e.g., boating, hunting, or fishing). Therefore, the NEPA Modified Flow Alternative, relative to the NEPA No Action Alternative, would have a less than significant impact on recreation opportunities along the Sacramento River.

Impact 12.2.9-10: Consistency with Sacramento River recreation policies

The NEPA Modified Flow Alternative would not conflict with any identified plans to provide enhanced access to the Sacramento River and would not conflict with policies to provide recreation facilities or access to open space. The operation of the NEPA Modified Flow Alternative, relative to the NEPA No Action Alternative, would not conflict with the goals of any existing plans and policies to provide recreation opportunities.

Impact 12.2.9-11: Changes in Delta inflows that could result in reduced recreation opportunities in the Delta

Differences in long-term average monthly Delta inflows from the Sacramento River do not exceed 2 percent during the recreational use season under the NEPA Modified Flow Alternative, relative to the NEPA No Action Alternative, over the 72-year simulation period (Appendix F4, 7 vs. 5, pg. 1103). Therefore changes in Delta inflows are not likely to substantially impact recreational resources in the Delta. Therefore, based on the magnitude and timing of Delta inflows, the NEPA Modified Flow Alternative, relative to the NEPA No Action Alternative, would result in less than significant impacts to recreation opportunities in the Delta.

Impact 12.2.9-12: Consistency with Delta recreation policies

Local plans and polices provide for the protection and enhancement of recreation opportunities in the Delta. These documents establish goals and policies that address maintaining and enhancing access to the Delta, open space, and recreation facilities. The NEPA Modified Flow Alternative would not conflict with plans to provide enhanced access to the Delta and would not conflict with policies to provide recreation facilities or access to open space. The operation of NEPA Modified Flow Alternative, relative to the NEPA No Action Alternative, would not conflict with the goals of the plans and policies to provide recreation opportunities.

Impact 12.2.9-13: Decreases in San Luis Reservoir monthly mean water surface elevations that could result in reduced boat ramp availability

All boat ramps at San Luis Reservoir are usable when the lake level is 340 feet above msl or higher. During the recreation use season there would be no additional months under the NEPA Modified Flow Alternative that long-term average monthly water surface elevations would decrease below the 340 feet msl threshold, relative to the NEPA No Action Alternative, over the 72-year simulation period (Appendix F4, 7 vs. 5, pg. 1413). Therefore, based on the analysis presented, the NEPA Modified Flow Alternative, relative to the NEPA No Action Alternative, would not result in a significant impact on boat ramp availability and recreation opportunities at San Luis Reservoir.

12.3 CUMULATIVE IMPACTS

Hydrologic modeling was used to evaluate the cumulative effects of the Yuba Accord Alternative and other likely changes in CVP/SWP operations on hydrology and water supply. The proposed projects that have been adequately defined (e.g., in recent project-level environmental documents or CALSIM II modeling) and that have the potential to contribute to cumulative impacts are included in the quantitative assessment of the Yuba Accord's impacts. For analytical purposes of this EIR/EIS, the projects that are considered well defined and "reasonably foreseeable" are described in Chapter 21. Additionally, the assumptions used to categorize future hydrologic cumulative conditions that are quantitatively simulated using CALSIM II and the post-processing tools are presented in Appendix D. To the extent feasible, potential cumulative impacts on resources dependent on hydrology or water supply (e.g., reservoir surface elevation) are analyzed quantitatively. Because several projects cannot be accurately characterized for hydrologic modeling purposes at this time, either due to the nature of the particular project or because specific operations details are only in the preliminary phases of development, these projects are evaluated qualitatively.

Only those projects that could affect recreational resources are included in the qualitative evaluation that is presented in subsequent sections of this chapter. Although most of the proposed projects described in Chapter 21 could have project-specific impacts that will be addressed in future project-specific environmental documentation, future implementation of these projects is not expected to result in cumulative impacts to regional water supply operations, or water-related and water dependent resources that also could be affected by the Proposed Project/Action or alternatives (see Chapter 21). For this reason, only the limited numbers of projects with the potential to cumulatively impact recreation resources in the project study area are specifically considered qualitatively in the cumulative impacts analysis for recreation resources:

- Water Storage and Conveyance Projects
  - Shasta Lake Water Resources Investigation (Shasta Reservoir Enlargement)
  - Upstream of Delta Off-Stream Storage (Sites Reservoir)
  - In-Delta Storage Program (Delta Wetlands Project)
  - Upper San Joaquin River Basin Storage Investigation
  - Los Vaqueros Reservoir Expansion Project
  - Folsom Dam Raise Project
- Projects Related to Changes in CVP/SWP System Operations
  - Long-Term CVP and SWP Operations Criteria and Plan
  - Isolated Delta Facility
  - Central Valley Project Long-term Contract Renewals
  - Sacramento River Water Reliability Study
  - City of Stockton Delta Water Supply Project
- Water Transfer and Acquisition Programs
  - Dry Year Water Purchase Program
  - Sacramento Valley Water Management Program
  - Delta Improvements Package
  - Oroville Facilities FERC Relicensing
- Flood Control, Ecosystem Restoration and Fisheries Improvement Projects
  - North Delta Flood Control and Ecosystem Restoration Project
  - CALFED Ecosystem Restoration Program
  - San Joaquin River Restoration Settlement Act (Friant Settlement Legislation)
- Local Projects in the Yuba Region
  - Yuba River Development Project FERC Relicensing

These projects are described in Chapter 21 and qualitatively addressed below.

12.3.1 ENVIRONMENTAL IMPACTS/ENVIRONMENTAL CONSEQUENCES OF THE YUBA ACCORD ALTERNATIVE CUMULATIVE CONDITION COMPARED TO THE EXISTING CONDITION

For CEQA, the purpose of the cumulative analysis is to determine whether the incremental effects of the Proposed Project (Yuba Accord Alternative) would be expected to be "cumulatively considerable" when viewed in connection with the effects of past projects, other current projects, and probable future projects (Public Resources Code Section 21083, subdivision (b)(2)).[7]

For NEPA, the scope of an EIS must include "Cumulative actions, which when viewed with other proposed actions have cumulatively significant impacts and should therefore be discussed in the same impact statement (40 CFR §1508.25(a)(2)).

Because the CEQ regulations implementing NEPA and the CEQA guidelines contain very similar requirements for analyzing, and definitions of, cumulative impacts, the discussions of cumulative impacts of the Yuba Accord Alternative Cumulative Condition relative to the Existing Condition will be the basis for evaluation of cumulative impacts for both CEQA and NEPA. In addition, an analysis of the Modified Flow Alternative Cumulative Condition relative to the Existing Condition is provided to fulfill NEPA requirements.

The following sections describe this analysis for the projects discussed in Section 12.3 above.

12.3.1.1 Water Storage and Conveyance Projects

Construction of new water storage facilities could provide additional public access and increased opportunities for contact (e.g., swimming and fishing) and non-contact (e.g., boating, hunting, sunbathing, sightseeing) water-related recreational activities. Expansion of existing dam and reservoir facilities would involve having to relocate, modify or protect existing structures such as marinas, campgrounds, roads, bridges, hiking trails and other structures surrounding existing reservoirs. There also would be a potential loss of terrestrial and on-stream recreation activities as a result of these types of water storage projects. Depending on the timing and construction duration associated with each project, concurrent implementation of multiple projects may limit recreational use opportunities within the project study area for several years or cause people (e.g., boaters) to more heavily utilize other available recreation areas (e.g., Oroville Reservoir, the Delta) during peak periods of use (i.e., summer). Thus, some areas may receive more use than anticipated, which could continue for several years until construction of the new water storage project (including construction of new boat ramps, trails, campgrounds necessary to replace those that were lost as a result of expansion) is completed.

12.3.1.2 Projects Related to CVP/SWP System Operations

Changes in CVP/SWP reservoir levels in response to the increased future demands of downstream water users may reduce access to recreation facilities and decrease recreation opportunities. Wildlife refuges in the project study area provide fishing, hunting, and wildlife viewing opportunities. With increased future demands, there may be a reduced amount of surplus water available for the CVP/SWP to provide to these areas, particularly during drier years. As described in Chapter 3, portions of the water obtained by the CVP and SWP under the Water Purchase Agreement may be used for fish and wildlife purposes including refuge water supply needs. By maintaining water supplies to refuge areas, this may help to offset reduced recreation opportunities such as boating and wildlife viewing that may be expected to

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[7] The "*Guide to the California Environmental Quality Act*" (Remy *et. al.* 1999) states that "*…although a project may cause an "individually limited" or "individually minor" incremental impact that, by itself, is not significant, the increment may be "cumulatively considerable", and thus significant, when viewed against the backdrop of past, present, and probable future projects." (CEQA Guidelines, § 15064, subd. (i)(l), 15065, subd. (c), 15355, subd. (b)).*"

occur in these areas as water supplies are shifted to other projects in response to increased future water demands and conveyance requirements.

12.3.1.3 *Water Transfer and Acquisition Programs*

Other water transfer and acquisition programs (e.g. SVWMP, EWA) could purchase water from the same agency or reservoir, and, thus, could draw down reservoirs further than under the Existing Condition. Collectively, the additional water sold for other programs could reduce reservoir water levels in the CVP/SWP reservoirs and, thus, contribute to greater reductions in boat ramp access under cumulative conditions. This could result in potentially significant cumulative impacts if recreational opportunities were reduced because of a loss of boat ramp access. The Yuba Accord Alternative would not contribute to a cumulative effect (e.g., a greater reduction in reservoir elevation) on reservoir recreation because water available for transfer would be released from New Bullards Bar Reservoir, which is not a reservoir operated by the CVP or the SWP.

Groundwater substitution and water transfers from other acquisition programs in the CVP/SWP Upstream of the Delta Region would affect river hydrology (e.g., changing the timing and quantity of water released from reservoirs, and thus altering river flows) in the same rivers (e.g., lower Feather and lower Sacramento) as those that would be affected by the Yuba Accord Alternative. Water transfers from other agencies along the same rivers as in the Yuba Accord Alternative could cause a cumulative effect on the change in river flow. However, the cumulative effect is not anticipated to cause a significant impact on recreation because recreational uses of the rivers, including fishing, swimming, and rafting, are possible within large fluctuations in flow. It is not anticipated that the river flow would change to such a level as to cause a cumulatively significant effect on recreation.

12.3.1.4 *Flood Control, Ecosystem Restoration and Fisheries Improvement Projects*

Flood control, ecosystem restoration and fisheries improvement projects would be targeted to improve aquatic habitat conditions within the project study area. Implementation of other projects, in addition to the Yuba Accord Alternative, could improve instream flow and water temperature conditions, physical habitat availability and ecosystem functions. Improvement of levee systems, channel capacities, and fish and wildlife habitat could enhance recreation opportunities by providing increased public access to scenic areas, via bicycling, foot traffic, or boating.

12.3.1.5 *Local Projects in the Yuba Region*

Proposed license terms and conditions, and PM&Es will be considered during development of the regulatory and environmental documentation associated with the FERC relicensing process. It is anticipated that FERC would make recommendations to improve or enhance recreational opportunities and activities associated with New Bullards Bar Reservoir and the lower Yuba River, which would be used to develop terms and conditions for operating the hydropower project. However, it is not anticipated that regulatory requirements resulting from the FERC relicensing process would contribute to potentially significant cumulative adverse impacts on recreation.

12.3.1.6 *OTHER CUMULATIVE RECREATION IMPACT CONSIDERATIONS*

The quantitative operations-related impact considerations for the CEQA Yuba Accord Alternative, relative to the Existing Condition, are discussed in Section 12.2.5. Potential impacts identified in Section 12.2.5 are summarized below and provide an indication of the potential incremental contributions of the Yuba Accord Alternative to cumulative impacts. These potential impacts are summarized here:

- Impact 12.2.5-1: Decreases in New Bullards Bar Reservoir monthly mean water surface elevations that could result in reduced boat ramp and swimming beaches availability – Less than Significant
- Impact 12.2.5-2: Decreases in lower Yuba River flows that could result in reduced boating opportunities – Less than Significant
- Impact 12.2.5-3: Consistency with Yuba County General Plan recreation policies – Less than Significant
- Impact 12.2.5-4: Decreases Oroville Reservoir monthly mean water surface elevations that could result in reduced boat ramp availability – Less than Significant
- Impact 12.2.5-5: Decreases in Oroville Reservoir monthly mean water surface elevations that could result in reduced camping and swimming beaches availability – Less than Significant
- Impact 12.2.5-6: Changes in Orville Reservoir monthly mean water surface elevations that could result in reduced recreation opportunities – Less than Significant
- Impact 12.2.5-7: Changes in Feather River flows that could result in reduced boating and fishing opportunities – Less than Significant
- Impact 12.2.5-8: Consistency with Feather River recreation policies – Less than Significant
- Impact 12.2.5-9: Changes in Sacramento River flows that could result in reduced boating, hunting, and fishing opportunities – Less than Significant
- Impact 12.2.5-10: Consistency with Sacramento River recreation policies – Less than Significant
- Impact 12.2.5-11: Changes in Delta inflows that could result in reduced recreation opportunities in the Delta – Less than Significant
- Impact 12.2.5-12: Consistency with Delta recreation policies – Less than Significant
- Impact 12.2.5-13: Changes in San Luis Reservoir monthly mean water surface elevations that could result in reduced boat ramp availability – Less than Significant

Although these impacts would be less than significant, the potential exists for cumulative impacts nevertheless. Cumulative impact determinations are presented below, and are based upon consideration of the quantified Yuba Accord Alternative impacts relative to the Existing Condition, in combination with other reasonably foreseeable projects. These cumulative impact determinations are summarized by region.

12.3.1.7 POTENTIAL FOR CUMULATIVE RECREATION IMPACTS WITHIN THE PROJECT STUDY AREA

Results from the quantitative analysis generally indicate that direct project-related recreation impacts would be less than significant. Nevertheless, the Yuba Accord Alternative still could incrementally contribute to cumulative recreation impacts within the project study area. The frequency and magnitude of the quantitative hydrologic changes associated with the Yuba Accord Alternative and the other qualitative analytical considerations discussed above were considered during the development of the overall cumulative impact conclusions discussed below for the Yuba Accord Alternative Cumulative Condition, relative to the Existing Condition.

Impact 12.3.1.7-1: Potential for significant cumulative recreation impacts within the Yuba Region

Of the projects discussed above, only the Yuba Project FERC Relicensing has the potential to affect future recreation conditions in the Yuba Region. While, as part of the relicensing, FERC may impose new regulatory constraints on the Yuba Project, which could affect New Bullards Bar Reservoir operations and YCWA's ability to manage releases into the lower Yuba River, it is not anticipated that FERC's new conditions would significantly affect recreation. The overall effects on recreation in the Yuba Region therefore would be minor, or possibly beneficial, and the impacts on recreation within the Yuba Region of the Yuba Accord Alternative Cumulative Condition, compared to the Existing Condition, would be less than significant.

Impact 12.3.1.7-2: Potential for significant cumulative recreation impacts within the CVP/SWP Upstream of the Delta Region

For the reasons discussed above, it is anticipated that the new water storage and conveyance projects, new water transfer and acquisition programs and new flood control, ecosystem restoration and fisheries improvement projects discussed above could result in potential cumulative impacts on recreation in the CVP/SWP Upstream of the Delta Region. Thus, compared to the Existing Condition, the overall effects of the Yuba Accord Alternative Cumulative Condition on recreation in the CVP/SWP Upstream of Delta Region could be potentially significant. While some projects would provide additional recreation opportunities through the creation of new reservoirs, they also could result in adverse impacts to existing structures and facilities, which could cause greater recreational use of other areas within the project study area. Because implementation of other water supply projects would be complex, construction activities would require multiple years of work and, thus, would extend over a long duration. Adverse impacts most likely would be caused by the removal of existing recreation features and facilities during construction of these water supply projects, rather than from changing flows in the Feather and Sacramento rivers. Boaters may seek other waterways to use, or shift their use patterns if certain facilities were no longer available.

However, potential cumulative impacts on recreation resulting from the Yuba Accord Alternative would be limited to river reaches in the lower Feather and lower Sacramento rivers. The Yuba Accord Alternative would be expected to increase river flows in the Feather and Sacramento rivers during part of the peak recreation use season (July through September). When combined with the potential effects of other projects, the effects from the Yuba Accord Alternative could be positive or neutral, depending on the overall timing and operation of other reasonably foreseeable projects (most of which are still in planning stages) that would occur in combination with the Yuba Accord Alternative. However, in the absence of more definitive or quantitative information, a conservative analytical interpretation is made that concludes that the incremental contribution of the Yuba Accord Alternative, when combined with the potential effects of other projects, may result in a potentially significant and unavoidable cumulative impact on recreation in the CVP/SWP Upstream of the Delta Region.

Impact 12.3.1.7-3: Potential for significant cumulative recreation impacts within the Delta Region

For the reasons discussed above, it is anticipated that the new water storage and conveyance projects, new water transfer and acquisition programs and new flood control ecosystem restoration and fisheries improvement projects discussed above could result in potential cumulative impacts on recreation in the Delta Region. Potential cumulative effects on recreation could be either positive or negative, depending on the overall timing and operation of other reasonably foreseeable projects (most of which are still in planning stages) that would occur in combination with the Yuba Accord Alternative. However, because there is a potential for the Yuba Accord Alternative to result in minor changes to Delta inflows, a conservative analytical interpretation is made, which concludes that the incremental contribution of the Yuba Accord Alternative, when combined with the potential effects of other projects, may result in a potentially significant and unavoidable cumulative impact on recreation in the CVP/SWP Upstream of the Delta Region.

Impact 12.3.1.7-4: Potential for significant cumulative recreation impacts within the Export Service Area

For the reasons discussed above, it is anticipated that the new water storage projects, new water transfer and acquisition programs and new flood control ecosystem restoration and fisheries improvement projects discussed above would not adversely impact recreation, and therefore would not have any cumulative impacts in the Export Service Area (i.e., San Luis Reservoir). Future San Luis Reservoir operations would be expected to cause fluctuations (increases and decreases) in water surface elevations that would be within the range of historical variation currently observed and, thus, these changes would remain within the range of seasonal drawdown levels observed under the Existing Condition. Because reservoir drawdown would not increase beyond the range of current reservoir operations, it is anticipated that boat ramp access would be reduced and the overall effects of the new projects discussed above would not adversely impact recreation at San Luis Reservoir. Therefore, the overall effects on recreation associated with San Luis Reservoir would be minor, and the potential cumulative impacts of the Yuba Accord Alternative Cumulative Condition, relative to the Existing Condition, would be less than significant.

12.3.2 ENVIRONMENTAL IMPACTS/ENVIRONMENTAL CONSEQUENCES OF THE MODIFIED FLOW ALTERNATIVE CUMULATIVE CONDITION COMPARED TO THE EXISTING CONDITION

It is anticipated that the Modified Flow Alternative Cumulative Condition would have the same potential for cumulative impacts as the Yuba Accord Cumulative Condition. Therefore, the description of the potential impacts in Section 12.3.1 also serves as the description of cumulative impacts associated with the Modified Flow Alternative. Thus, the Modified Flow Alternative Cumulative Condition would result in the following potential cumulative impacts:

- Yuba Region - Potential cumulative impacts on recreation resources in the Yuba Region would be less than significant.

- CVP/SWP Upstream of the Delta Region - Potential cumulative impacts on recreation resources in the CVP/SWP Upstream of the Delta Region would be potentially significant and unavoidable.
- Delta Region - Potential cumulative impacts on recreation resources in the Delta Region would be potentially significant and unavoidable.
- Export Service Area - Potential cumulative impacts on recreation resources in the Export Service Area (San Luis Reservoir) would be less than significant.

12.4 POTENTIAL CONDITIONS TO SUPPORT APPROVAL OF YCWA'S WATER RIGHTS PETITION

No unreasonable adverse effects to recreation would occur under the Proposed Project/Action or an action alternative and, thus, no impact avoidance measures or other protective conditions are identified for the SWRCB's consideration in determining whether or not to approve YCWA's petitions to implement the Yuba Accord.

12.5 MITIGATION MEASURES/ENVIRONMENTAL COMMITMENTS

No adverse effects would occur to recreation under the Proposed Project/Action or an action alternative and, thus, no mitigation measures are required.

12.6 POTENTIALLY SIGNIFICANT UNAVOIDABLE IMPACTS

There are no potentially significant unavoidable impacts to recreation associated with the implementation of the Proposed Project/Action or an action alternative. However, although minor, the Yuba Accord Alternative, in combination with other future projects, may result in a potentially significant unavoidable cumulative impact on recreation in the CVP/SWP Upstream of the Delta Region due to the combined effects of multiple projects on river flow in the lower Feather and Sacramento rivers, and in the Delta Region due to the combined effects of multiple projects on Delta inflow. Similarly, the Modified Flow Alternative, in combination with other reasonably foreseeable future projects, could result in potentially significant unavoidable cumulative impacts on recreation in the CVP/SWP Upstream of the Delta Region and the Delta Region.

CHAPTER 13
VISUAL RESOURCES

Both natural and artificial landscape features contribute to perceived visual images and the aesthetic value of a view. The value is determined by contrasts, forms and textures exhibited by geology, hydrology, vegetation, wildlife, and man-made features. Individuals respond differently to changes in the physical environment, depending on prior experiences and expectations and proximity and duration of views. Therefore, visual effects analyses tend to be highly subjective in nature. The following sections describe the existing visual resource conditions and evaluate the areas that could be visually affected by actions associated with the alternatives evaluated in this EIR/EIS.

Reservoirs in the area of analysis have higher levels of scenic attractiveness at their maximum operating levels. Reservoirs are generally Class A or B visual resources when their water surface elevations are near to or at their maximum levels. As reservoir drawdown occurs, typically during the summer and fall, an area of shoreline mostly devoid of vegetation and commonly referred to as a "bathtub ring" is exposed within the fluctuation zone between maximum reservoir storage level and the lowered water surface. The exposed rock and soil of this drawdown zone contrasts with the vegetated areas above the high water level and with the reservoir surface. As a consequence of reservoir operations, scenic attractiveness tends to decline in late summer with increasing reservoir drawdown.

Seasonal variations in flow levels of the rivers within this region provide for a wide range of aesthetic opportunities. Most of the rivers in this region have minimum flow requirements in place. Flow requirements for the various rivers and streams are specified in SWRCB water right permits and licenses, FERC hydropower licenses, and interagency agreements. Because there are minimum flow requirements and the flows are managed, riparian vegetation along the rivers reflects the results of current management practices. These practices include construction and maintenance of levees for flood control, managed floodplains and overflow bypasses, and controlled releases from reservoirs, and result in a narrow riparian vegetation corridor. Nevertheless, riparian vegetation remains an important visual aspect to all streams and river corridors. Water, shade, and dense cover distinguish the riparian areas from the surrounding land. In addition, riparian areas are popular wildlife habitats because they offer food, water, and protection from both the sun and from large-scale human disturbances.

13.1 ENVIRONMENTAL SETTING/AFFECTED ENVIRONMENT

The areas where visual resources potentially could be affected include the Yuba Region, the CVP/SWP Upstream of the Delta Region, the Delta Region and the Export Service Area.

Scenic attractiveness classifications are a key component of the Scenery Management System (SMS) developed by the USFS. The SMS is used to classify visual features into the following categories (USDA 1995).

- ***Class A - "Distinctive":*** Areas where landform, vegetation patterns, water characteristics, and cultural features combine to provide unusual, unique, or outstanding scenic quality. These landscapes have strong positive attributes of variety, unity, vividness, mystery, intactness, order, harmony, uniqueness, pattern, and balance.
- ***Class B - "Typical":*** Areas where landform, vegetation pattern, water characteristics, and cultural features combine to provide ordinary or common scenic quality. These

landscapes generally have positive, yet common, attributes of variety, unity, vividness, mystery, intactness, order, harmony, uniqueness, pattern, and balance.

- *Class C – "Indistinctive":* Areas where landform, vegetation patterns, water characteristics, and cultural land use have low scenic quality. Often water and rock form of any consequence are missing in Class C landscapes. These landscapes have weak to missing attributes of variety, unity, vividness, mystery, intactness, order, harmony, uniqueness, pattern, and balance.

13.1.1 YUBA REGION

Visual resources in the Yuba Region include New Bullards Bar Reservoir, the North Yuba River between New Bullards Bar Reservoir and Englebright Reservoir, and the lower Yuba River downstream of Englebright Dam to the confluence with the Feather River. The Yuba Region also includes the viewsheds of groundwater wells located within Yuba County that may undergo short-term visual impacts associated with the conversion of diesel motors to electric motors. However, the short-term nature of these activities combined with the visual character assigned to agricultural lands (Class C) precludes them from further consideration.

13.1.1.1 NEW BULLARDS BAR RESERVOIR

New Bullards Bar Reservoir is located on the North Yuba River, approximately 21 miles north of Nevada City. Conifers and mixed hardwoods surround the reservoir. Cliffs of red, clay-like soil are found in areas around the reservoir. These variations offer visitors a variety of landscape views. A marina, trail, and campgrounds provide public access and viewing opportunities. Adjacent county roads also provide viewing opportunities of New Bullards Bar Dam and Reservoir. During the summer months, largely undeveloped areas of the New Bullards Bar Reservoir shoreline become visible as summer drawdown exposes the reservoir fluctuation zones. However, reservoir drawdown is a result of normal reservoir operations. The magnitude of seasonal drawdowns is generally a product of both local hydrologic conditions and reservoir management operations. The visible fluctuation zone or bathtub ring resulting from seasonal drawdowns represents a visual feature that affects the overall visual quality of the area. In general, however, the reservoir has both Class A and B visual resources.

13.1.1.2 LOWER YUBA RIVER

The North Yuba, Middle Yuba, and South Yuba rivers originate in the Sierra Nevada. The North Yuba and Middle Yuba rivers converge downstream of New Bullards Bar Reservoir, and the South Yuba River joins just upstream of Englebright Reservoir. The confluence of the Yuba and Feather rivers is located near Marysville. The vegetation along the North Yuba and South Yuba rivers consists of large areas of conifer trees intermixed with small pockets of hardwood and barren land (Class A or B visual resources). The Middle Yuba River has very similar vegetation features, but small pockets of annual grassland are intermixed within the terrain. Grassland, agricultural fields, as well as some areas of barren land (Class C visual resources) surround the lower Yuba River as it flows toward the Feather River near Marysville. A few rural residences and small communities also are located throughout this area.

13.1.2 CVP/SWP Upstream of the Delta Region

Within the CVP/SWP Upstream of the Delta Region, the visual resources analysis is focused on those areas where actions associated with the Proposed Project/Action and alternatives could change or impair visual resources. The entire CVP/SWP Upstream of the Delta Region is bordered on the east by the Sierra Nevada, on the northwest by the Coast Ranges, and on the south by the northern extent of the San Joaquin River watershed. Agriculture in the Central Valley, forests in the upper watersheds, and grasslands and woodlands in the foothills characterize the region visually. Much of the upper watershed on the east side of the Central Valley is forested, which limits views for motorists traveling through the area.

Historical changes from grasslands, floodplains, and extensive riparian areas to cropland, rice fields, and orchards have altered the visual variety in the Central Valley of California. The valley floor is primarily irrigated agriculture classified as Variety Class C – the least visually distinctive category (see Section 13.2.1 for a description of the variety classes).

The only upland elevations in the northern Central Valley upstream from the Delta are 32,000 acres in the Sutter Buttes. Rising from the valley floor, the Sutter Buttes, generally a Class A visual resource, provide visual drama from a wide viewing area.

Highways with high viewer sensitivity in the regional study area include Interstate 5, Highway 99, and SR 70 and SR 20. Agricultural areas along these highways and other roads in the Central Valley are generally Class C.

13.1.2.1 Feather River Basin

The Feather River Basin originates in Plumas and Lassen counties. The upper, middle, and lower forks of the Feather River flow south/southwest into Oroville Reservoir. Surface water released from Oroville Dam flows into the lower Feather River and continues south to the river's confluence with the Sacramento River. Areas within the Feather River Basin that are addressed in this analysis include Oroville Reservoir and associated facilities and the lower Feather River downstream from the Oroville Facilities to the confluence with the Sacramento River.

Oroville Reservoir

Oroville Reservoir, Thermalito Diversion Pool, Thermalito Forebay, Thermalito Afterbay, and the Oroville Wildlife Area together comprise the Oroville Reservoir Complex, which provides water, electrical power, and recreation. These dams, reservoirs, and related facilities are among the most visually important elements within the area. Although the scenery in the foothill region around the facilities is attractive, it is generally of local and regional importance, not state or national importance. The SRA at Oroville Reservoir has Class A and B visual resources.

The Lake Oroville Visitor Center, on the crest of Kelly Ridge, includes a 47-foot high observation tower designed to provide panoramic views of the dam and reservoir. Many of the most immediate views of the reservoir are from marinas, boat launch areas, campgrounds, picnic areas, and other developed recreation areas surrounding the reservoir. During the summer months, largely undeveloped areas of the Oroville Reservoir shoreline become visible as summer drawdown exposes the reservoir fluctuation zones. As previously described, the visible fluctuation zone or bathtub ring represents a negative visual feature that affects the overall visual quality of the area. However, reservoir drawdown is a result of normal reservoir operations. The magnitude of seasonal drawdown is generally a product of both local hydrologic conditions and reservoir management operations. However, the visible fluctuation zone or bathtub ring resulting from seasonal drawdown represents a visual feature that affects the overall visual quality of the area. In general, however, the reservoir has both Class A and B visual resources.

LOWER FEATHER RIVER

The lower Feather River extends from the Oroville Dam to its confluence with the Sacramento River. Agricultural lands (Class C) are predominant in the vicinity of the lower Feather River. The lower Feather River terrain is generally flat. Riparian vegetation lines the river, with grassland and croplands in the adjacent agricultural areas. Along the southern portion of the Feather River, near Marysville, large areas of rice fields, as well as other field crops are located.

13.1.2.2 SACRAMENTO RIVER BASIN

The Sacramento River originates above Shasta Reservoir in the north and flows through the Central Valley into the Delta. Agriculture, a Class C visual resource, dominates the land use near the river along the valley floor, while the upper watershed has retained its oak woodland, grasslands, forests, and rural character. Rice is one if the dominant crops grown in the Central Valley and is visibly noticeable along the Interstate 5 corridor. The Central Valley also has many acres of other field crops and orchards.

Important visual resources on the valley floor include the Sacramento National Wildlife Refuge Complex, which contains the Sacramento NWR, Colusa NWR, Delevan NWR, Sacramento River NWR, Sutter NWR, Butte Sink NWR, and the Sutter Buttes.

Areas within the Sacramento River Basin that are addressed in this analysis include the Sacramento River downstream from the confluence of the Feather Reservoir to the Delta.

SACRAMENTO RIVER

The lands bordering the Sacramento River in the Central Valley are primarily flat and the land use is largely agricultural with scattered areas of development ranging in intensity from scattered rural residential, to suburban, to urban. The visual environment of the Sacramento River area is dominated and largely influenced by human development activities and generally has a rural character. While agriculture, a Class C visual resource, dominates the land use near the Sacramento River along the valley floor, the upper watershed has retained its oak woodland, grasslands, forests, and largely rural character. Rice is one of the prominent crops grown in the Sacramento Valley, and is visibly noticeable along the Interstate 5 corridor; however the Sacramento Valley also has many acres of irrigated row crops and orchards in the flatter areas and grazing in the foothills.

13.1.3 DELTA REGION

The Delta Region includes waterways in the Sacramento-San Joaquin Delta. Because the reservoirs within the CVP/SWP system are operated in a coordinated manner to the various demands throughout California, changes in the timing and magnitude of exports from the Delta could indirectly result in changes to Delta flows.

13.1.3.1 *SACRAMENTO-SAN JOAQUIN DELTA*

A large portion of the Delta is devoted to farming. The region is interlaced with a network of waterways and levees designed to protect the Delta's islands and tracts. Major visual resources in the Delta Region include the state recreation areas of Franks Tract, Brannan Island, and Windy Cove; Stone Lakes NWR; the Cosumnes-Mokelumne River confluence wildlife preserve; and several private marinas, camping, and fishing sites. State Route 160 is a state-designated scenic highway from Antioch to Freeport. Representative Scenic Classes A and B resources viewed from the Delta include Mount Diablo in Contra Costa County and the Vaca Range in Napa and Solano counties.

The main roads from which travelers can view the Delta are State routes 160, 4, and 12. In many sections of these highways it is impossible to view the Delta waterways, although elevated features such as Mount Diablo can be viewed. Delta waterways, including rivers, creeks, and sloughs, are visible primarily from boats which use the Delta for commerce and recreation.

13.1.4 EXPORT SERVICE AREA

Because the reservoirs within the CVP/SWP system are operated in a coordinated manner to the various demands throughout California, changes in the timing and magnitude of exports from the Delta could indirectly result in changes to water surface elevations in San Luis Reservoir.

13.1.4.1 *SAN LUIS RESERVOIR*

San Luis Reservoir is located in the grassy hills of the western San Joaquin Valley near historic Pacheco Pass. The reservoir's 23,551-acre recreation area provides opportunities for boating, fishing, and picnicking. In the spring the golden-brown hills surrounding the reservoir offer views of ephemeral green grasses and wildflowers. The visitor center at the Romero Overlook offers information on the reservoir and provides telescopes for viewing the reservoir and surrounding landscape. The groundwater recharge basins nearby, such as the San Luis Rey Basin, provide opportunities for viewing wildlife and vegetation.

13.1.5 REGULATORY SETTING

13.1.5.1 *FEDERAL*

No federal regulations applicable to visual resources found within the evaluated regions have been identified.

13.1.5.2 *STATE*

The California State Legislature created California's Scenic Highway Program in 1963. Its purpose is to preserve and protect scenic highway corridors from change that would diminish the aesthetic value of lands adjacent to highways. A highway may be designated scenic depending upon how much of the natural landscape can be seen by travelers, the scenic quality of the landscape, and the extent to which development intrudes on the traveler's enjoyment of the view. The State Scenic Highway System includes a list of highways that are either eligible for designation as scenic highways or have been so designated. The status of state scenic highway changes from eligible to official designation when local jurisdiction adopts a scenic corridor protection program, applies to the California Department of Transportation (Caltrans) for scenic highway approval, and receives notification from Caltrans that the highway has been designated as a Scenic Highway (California Department of Transportation Website 2007). Although there are eligible state scenic highways in Yuba County, there are none officially designated at this time (California Department of Transportation Website 2007). State Highway 160 south and southwest of Interstate 5 in southwest Sacramento County in the Delta region is an officially designated Scenic Highway and the middle portion of this highway is officially designated as a County Scenic Highway (California Department of Transportation Website 2007).

13.1.5.3 LOCAL

The Open Space and Conservation Element of the Yuba County General Plan (County of Yuba 1996) identifies a general goal to "*…maintain and enhance the natural resources, open space land uses and scenic beauty of Yuba County in order to protect the quality of the environment, the County's economy, and health and well-being of present and future residents.*" Supporting this goal is a policy to "*encourage the preservation and enhancement of the natural features of the County, including rivers and streams and their banks, mountain peaks, bluffs, areas of scenic beauty, and native vegetation.*"

13.2 ENVIRONMENTAL IMPACTS/ENVIRONMENTAL CONSEQUENCES

Modifications to water release patterns and CVP/SWP operations associated the Proposed Project/Action and alternatives could result in hydrologic changes (i.e., river flow patterns and fluctuations in reservoir water surface elevations) in the Yuba River and possibly other CVP/SWP river systems within the regions described above. Changes in the integrated operations of the Yuba River Basin could indirectly affect both reservoir water storage levels and river flows within the CVP/SWP system if surface water released from New Bullards Bar Reservoir were to be "backed-up" in Oroville Reservoir. The "backing-up" of surface water would occur if YCWA were not able to make a water transfer to the CVP/SWP system because conditions were not balanced in the Delta, or pumping capacity at the Jones and Banks pumping plants was limited. This type of integrated operation of the CVP/SWP system is governed by a series of operating rules which ensures that flood control storage targets in the reservoirs, and flow requirements downstream of the reservoirs are not violated (for a more detailed discussion of these operations, see Appendix D).

13.2.1 IMPACT ASSESSMENT METHODOLOGY

The assessment of the scenic value of a landscape is very subjective, therefore visual resources analysis are generally restricted to qualitative significance criteria. In this analysis, the assessment methods are guided by the SMS developed by the USFS (USDA 1995) and outlined in "*Landscape Aesthetics: A Handbook for Scenery Management, Agriculture Handbook Number 701*". The SMS is an evolved and updated version of the Visual Management System. While the essence of the system remains unchanged, the SMS allows for improved integration of aesthetics with other biological, physical, and social/cultural resources in the planning process. This analysis methodology describes the effects of the surface water diversion related changes to instream flow regimens, and discusses project components associated with surface water reservoirs, instream flows, and groundwater substitution that could affect the quality of visual resources within the regions described above. Potential effects were evaluated based upon the significance criteria described in Section 13.2.2. The SMS was applied to the Proposed Project/Action and alternatives utilizing the following steps:

- **Identify visually sensitive areas.** Sensitivity is considered highest for views seen by people driving to or from recreational activities, or along routes designated as scenic corridors. Views from relatively moderate to high-use recreation areas are also considered sensitive.
- **Define the landscape character.** Landscape character gives an area its visual and cultural image, and consists of the combination of physical, biological, and cultural attributes that make each landscape identifiable or unique. Landscape character refers to the images of the landscape that can be defined with a list of scenic attributes. A description of landscape character is provided in Section 13.1 for each of the visually sensitive areas defined.
- **Classify scenic attractiveness.** Scenic attractiveness classifications are a key component of the SMS and are used to classify visual features into the Class A, B and C categories (USDA 1995) previously discussed in Section 13.1.

Class A and B resources typically include state or federal park, recreation, or wilderness areas. Rivers and reservoirs are typically considered Class A or B visual resources. Class C resources generally include areas that have low scenic quality and contain more common landscapes, such as agricultural lands.

Changes in SWP/ CVP and Yuba River system operations associated with the Proposed Project/Action and alternatives could result in changes to river flow patterns and reservoir water surface elevations within the project area. Significant reductions in river flows would result in a reduced river expanse, which could contribute to a thinning of the riparian corridor, loss of valuable border zone vegetation, and subsequently reduce wildlife habitat. Such a reduction in available wildlife habitat could lead to a reduction in wildlife viewing opportunities. Fluctuations in the water surface elevations of reservoirs are considered acceptable if they are within normal operating procedures. However, large decreases in water surface elevations could result in significant increases in the amount of shoreline exposed. Because drawdown zones are typically unvegetated, reductions in reservoir water surface elevations greater than 10 feet typically expose areas that lack terrestrial vegetation, and could be considered visually significant.

To evaluate diversion-related effects on regional waterbodies and known visual resources and landscapes within the Yuba, CVP/SWP Upstream of the Delta, and Delta regions, visual impacts were analyzed based upon a comparison of reservoir water surface elevations and river flows under existing and future scenarios with and without the various alternatives. Hydrologic modeling results were reviewed to evaluate whether reductions in the monthly mean reservoir water surface elevations and river flows could result in significant alterations to the visual character of waterbodies within the regional project study areas. The simulation comparisons conducted for each alternative are described in Chapter 4, and model template output supporting the analyses is presented in Appendix F4.

13.2.2 IMPACT INDICATORS AND SIGNIFICANCE CRITERIA FOR VISUAL RESOURCES

Significance criteria were developed based on local general plan objectives and policies, the California Department of Parks and Recreation (CDPR) resource management plan guidelines and the CEQA Guidelines Environmental Checklist (CELSOC 2005). Impact indicators were developed using visual component characteristics. The impact indicators and significance criteria utilized to evaluate the Proposed Project/Action and alternatives are presented in **Table 13-1**.

Table 13-1. Impact Indicators and Significance Criteria for Visual Resources

Impact Indicator	Significance Criteria
Monthly mean water surface elevation of New Bullards Bar, Oroville, and San Luis reservoirs.	A change in the monthly mean water surface elevation of more than 10 feet, relative to the basis of comparison, contributing to reduction in shoreline vegetation or increase of bathtub ring of sufficient frequency to adversely affect the visual character for any given month of the year over the 72-year simulation period.
Monthly mean flows (cfs) of the lower Yuba, lower Feather, and Sacramento rivers and Delta	Changes in flow, relative to the basis of comparison, of sufficient frequency and magnitude to adversely affect the visual character for any given month of the year over the 72-year simulation period.
The visibility of scenic landscape from sensitive viewpoints within the study area.	Result in long-term (i.e., persisting for five years or more) adverse visual changes or contrast to the existing landscape as viewed from areas with high visual sensitivity within three miles, relative to the basis of comparison, to adversely affect the visual character for any given month of the year.
Landscape character and scenic attractiveness of Class A and B visual resources within the study area.	Affect landscape character and scenic attractiveness of Class A and B visual resources, relative to the basis of comparison, of sufficient frequency and magnitude to adversely affect the character of visual resources.

As discussed in Chapter 4, CEQA and NEPA have different legal and regulatory standards that require slightly different assumptions in the modeling runs used to compare the Proposed Project/Action and alternatives to the appropriate CEQA and NEPA bases of comparison in the impact assessments. Although only one project (the Yuba Accord Alternative) and one action alternative (the Modified Flow Alternative) are evaluated in this EIR/EIS, it is necessary to use separate NEPA and CEQA modeling scenarios for the Proposed Project/Action, alternatives and bases of comparisons to make the appropriate comparisons. As a result, the scenarios compared in the impact assessments below have either a "CEQA" or a "NEPA" prefix before the name of the alternative being evaluated. A detailed discussion of the different assumptions used for the CEQA and NEPA scenarios is included in Appendix D.

As also discussed in Chapter 4, while the CEQA and NEPA analyses in this EIR/EIS refer to "potentially significant," "less than significant," "no" and "beneficial" impacts, the first two comparisons (CEQA Yuba Accord Alternative compared to the CEQA No Project Alternative and CEQA Modified Flow Alternative compared to the CEQA No Project Alternative) presented below instead refer to whether or not the proposed change would "unreasonably affect" the evaluated parameter. This is because these first two comparisons are made to determine whether the action alternative would satisfy the requirement of Water Code Section 1736 that the proposed change associated with the action alternative "would not unreasonably affect fish, wildlife, or other instream beneficial uses."

The Proposed Project/Action and alternatives do not involve construction, introduction of new scenic features, or activities that would visually change the landscape for more than one season. Therefore, there would not be any visual effects over the long-term (i.e., persisting for five years or more), relative to the bases of comparison, to adversely affect the visual character for any given month of the year. However, the Proposed Project/Action and alternatives could result in temporary changes or seasonal changes in the landscape. Therefore, potential effects could occur relating to the changes in reservoir levels and river flows and associated scenic landscape. The analysis describes these potential effects to the scenic landscape.

13.2.3 ENVIRONMENTAL IMPACTS/ENVIRONMENTAL CONSEQUENCES OF THE CEQA YUBA ACCORD ALTERNATIVE COMPARED TO THE CEQA NO PROJECT ALTERNATIVE

Impact 13.2.3-1: Changes in New Bullards Bar Reservoir monthly mean water surface elevations that could result in adverse impacts to the visual character of the landscape

Implementation of the CEQA Yuba Accord Alternative would alter the hydrologic pattern of reservoir releases, relative to the CEQA No Project Alternative; however, water surface elevations at New Bullards Bar Reservoir would remain within the range of historical operating parameters. Over the 72-year simulation period, decreases in long-term average monthly water surface elevations greater than 10 feet would occur in August (12 feet), September (13 feet), October (14 feet), and November (14 feet) under the CEQA Yuba Accord Alternative, relative to the CEQA No Project Alternative. The lowest long-term average monthly water surface elevation under the CEQA Yuba Accord Alternative would be 1,851 feet msl and would occur in November, compared to 1,865 feet msl under the CEQA No Project Alternative also occurring in November (Appendix F4, 3 vs. 2, pg. 50).

Visual impacts associated with decreases in reservoir water surface elevations would be most likely to occur as a result of additional reservoir drawdown that could contribute to the existing bathtub rings that are observed when a reservoir reaches its maximum seasonal drawdown levels from September through November. Depending on water year type, reservoir elevations during months of maximum reservoir drawdown (i.e., September, October, and November) under the CEQA Yuba Accord Alternative would be from 9 feet msl to 19 feet msl lower compared to the CEQA No Project Alternative. The lowest reservoir elevation under the CEQA Yuba Accord Alternative and the CEQA No Project Alternative would occur in September of critical years, and would be 10 feet msl lower under the CEQA Yuba Accord Alternative. As a result of this reduction, some areas of the shoreline may be exposed up to an additional 10 feet msl compared to the CEQA No Project Alternative. However, it is unlikely that this reduction would occur uniformly along the entire shoreline of the reservoir due to the irregular nature of its morphology. In addition, this 10 feet msl reduction in minimum reservoir elevation under the CEQA Yuba Accord Alternative, relative to the CEQA No Project Alternative, would not occur with sufficient frequency and magnitude (i.e., only occurring in September of critical water years and not greater than 10 feet msl) to reduce the visual character of New Bullards Bar Reservoir.

Decreases in month-to-month reservoir water surface elevations greater than 10 feet msl under both the CEQA Yuba Accord Alternative and the CEQA No Project Alternative generally occur from June through September as a part of normal reservoir drawdown operations. During any given water year there would be only one additional occurrence under the CEQA Yuba Accord Alternative when reservoir water surface elevations would decrease by more than 10 feet msl from month-to-month. This decrease would potentially only result in an additional 5 feet msl of shoreline exposure, compared to the CEQA No Project Alternative. In addition, this reduction would occur in an above normal water year when reservoir elevations would be relatively high, therefore, it is unlikely that this reduction would contribute to a substantial reduction in shoreline vegetation or substantially expose the existing bathtub rings.

Based on this analysis, reservoir water surface elevations under the CEQA Yuba Accord Alternative generally would remain within normal (i.e., historical) reservoir operational levels, and any anticipated reductions would not occur with sufficient frequency and magnitude to cause a reduction in shoreline vegetation or increase bathtub ring exposure in New Bullards Bar

Reservoir. Therefore, the CEQA Yuba Accord Alternative, relative to the CEQA No Project Alternative, would not unreasonably affect the visual character of New Bullards Bar Reservoir.

Impact 13.2.3-2: Changes in lower Yuba River monthly mean flows that could result in adverse impacts to the visual character of the landscape

Long-term average flows in the lower Yuba River at both the Smartville and Marysville gages under the CEQA Yuba Accord Alternative, relative to the CEQA No Project Alternative, are up to approximately 9 percent to 1 percent lower some months during the winter and early spring and up to approximately 56 percent higher from July through October over the 72-year simulation period (Appendix F4, 3 vs. 2, pgs. 100 and 272). Decreases in monthly average flows under the CEQA Yuba Accord Alternative, relative to the CEQA No Project Alternative, occur during months when river flows are generally at their seasonal peak, and also are within the range of flows occurring under the CEQA No Project Alternative.

Based on this analysis, changes in the magnitude, timing, and duration of lower Yuba River flows under the CEQA Yuba Accord Alternative, relative to the CEQA No Project Alternative, would not substantially change the visual character of the landscape along the lower Yuba River and, thus, would not unreasonably affect the visual character of the lower Yuba River.

Impact 13.2.3-3: Changes in Oroville Reservoir monthly mean water surface elevations that could result in adverse impacts to the visual character of the landscape

Long-term average monthly water surface elevations under the CEQA Yuba Accord Alternative are essentially equivalent relative to the CEQA No Project Alternative over the 72-year simulation period (Appendix F4, 3 vs. 2, pg. 455). Therefore, there would be no change in the existing bathtub ring from the implementation of the CEQA Yuba Accord Alternative compared to the CEQA No Project Alternative.

Based on the analysis presented above, the range of water surface elevations expected to occur under the CEQA Yuba Accord Alternative, relative to the CEQA No Project Alternative, would not unreasonably affect the visual character of Oroville Reservoir.

Impact 13.2.3-4: Changes in Feather River flows that could result in adverse impacts to the visual character of the landscape

Differences in long-term average monthly flows in the Feather River below the Thermalito Afterbay Outlet to the mouth of the Sacramento River do not exceed approximately 8 percent over the entire 72-year simulation period under the CEQA Yuba Accord Alternative relative to the CEQA No Project Alternative. Decreases in average monthly flows under the CEQA Yuba Accord Alternative during all water year types do not exceed approximately 5 percent except during May and June of dry and critical water years during which flows are up to approximately 10 percent to 17 percent lower, respectively (Appendix F4, 3 vs. 2, pg. 603). However, these slight differences in Feather River flows under the CEQA Yuba Accord Alternative, relative to the CEQA No Project Alternative, are not likely to result in changes to the visual character of the Feather River.

Therefore, because the analysis presented above indicates that the range of potential variation in Feather River flow changes expected to occur under the CEQA Yuba Accord Alternative would be relatively minor compared to the CEQA No Project Alternative, the CEQA Yuba Accord Alternative would not unreasonably affect the visual character of the Feather River.

Impact 13.2.3-5: Changes in Sacramento River monthly mean flows that could result in adverse impacts to the visual character of the landscape

Long-term average flows in the Sacramento River under the CEQA Yuba Accord Alternative are essentially equivalent relative to the CEQA No Project Alternative over the 72-year simulation period. Flows in the Sacramento River under the CEQA Yuba Accord Alternative below the Feather River confluence are up to approximately 1 percent lower and up to approximately 3 percent higher during some months (Appendix F4, 3 vs. 2, pg. 882). However, in consideration of both the magnitude and duration of these slight differences in flow, the CEQA Yuba Accord Alternative, relative to the CEQA No Project Alternative, would not result in changes to the visual character of the Sacramento River. Therefore, based on the analysis presented, the range of potential changes in Sacramento River flows expected to occur under the CEQA Yuba Accord Alternative, relative to the CEQA No Project Alternative, would not unreasonably affect the visual character of the Sacramento River.

Impact 13.2.3-6: Changes in monthly mean Delta inflows that could result in adverse impacts to the visual character of the landscape

Long-term average monthly Delta inflows under the CEQA Yuba Accord Alternative, relative to the CEQA No Project Alternative, are essentially equivalent or up to approximately 3 percent higher over the 72-year simulation period. Differences in average monthly Delta inflows during all water year types do not exceed approximately 5 percent (Appendix F4, 3 vs. 2, pg. 1103). These slight differences in Delta inflows under the CEQA Yuba Accord Alternative, relative to the CEQA No Project Alternative, would not unreasonably affect the visual character of the Delta.

Impact 13.2.3-7: Changes in San Luis Reservoir monthly mean water surface elevations that could result in adverse impacts to the visual character of the landscape

Implementation of the CEQA Yuba Accord Alternative would not alter the hydrologic pattern of San Luis Reservoir relative to the CEQA No Project Alternative. Water surface elevations in San Luis Reservoir would remain within normal operational parameters. During all months, long-term average monthly water surface elevations would be essentially equivalent under the CEQA Yuba Accord Alternative, relative to the CEQA No Project Alternative, over the 72-year simulation period (Appendix F4, 3 vs. 2, pg. 1413). Therefore, there would be no change in the existing bathtub ring, under the CEQA Yuba Accord Alternative relative to the CEQA No Project Alternative.

Based on the analysis presented above, the range of potential variation in water surface elevations expected to occur under the CEQA Yuba Accord Alternative would remain within recent historic drawdown levels. Therefore the CEQA Yuba Accord Alternative, relative to the CEQA No Project Alternative, would not unreasonably affect the visual character of San Luis Reservoir.

Impact 13.2.3-8: Change in surface water conditions that could result in adverse impacts to the landscape character and the attractiveness of Class A and B resources

Changes in local study area reservoir water surface elevations and river flows are anticipated to occur under the CEQA Yuba Accord Alternative; however, these changes would not be of sufficient frequency and magnitude to change the character of the landscape and would not detract from the scenic attractiveness. The visual impact would cause minimal effects to Class A or B scenic features of New Bullards Bar Reservoir. The visual character of riparian vegetation along the lower Yuba River corridor would not be affected, and decreases in flows would cause little affect to Class A or B visual resources.

Within the regional study area, changes in water surface elevations under the CEQA Yuba Accord Alternative, relative to the CEQA No Project Alternative, would not change the character of the landscape or scenic attractiveness (Class A or B) of Oroville or San Luis reservoirs. The Sacramento River is generally considered a Class B visual resource. Slight differences in flows would not be sufficient to reduce the character of the riparian corridor along the river. Therefore, because these potential changes in flow are minimal and temporary in nature, they would not change the character of the landscape or detract from the overall scenic attractiveness of the Sacramento River. Therefore, the CEQA Yuba Accord Alternative, relative to the CEQA No Project Alternative, would not unreasonably affect the landscape character and the attractiveness of Class A or B resources.

13.2.4 ENVIRONMENTAL IMPACTS/ENVIRONMENTAL CONSEQUENCES OF THE CEQA MODIFIED FLOW ALTERNATIVE COMPARED TO THE CEQA NO PROJECT ALTERNATIVE

Impact 13.2.4-1: Changes in New Bullards Bar Reservoir monthly mean water surface elevations that could result in adverse impacts to the visual character of the landscape

Implementation of the CEQA Modified Flow Alternative would alter the hydrologic pattern relative to the CEQA No Project Alternative. Long-term average monthly water surface elevations at New Bullards Bar Reservoir under the CEQA Modified Flow Alternative are essentially equivalent to the CEQA No Project Alternative. Decreases in average monthly water surface elevations during wet, above normal, and below normal water years under the CEQA Modified Flow Alternative greater than 10 feet, relative to the CEQA No Project Alternative, occur during August and September over the 72-year simulation period. The lowest monthly mean water surface elevations under the Yuba Accord Alternative and CEQA No Project Alternative occur during September of critical water years and are 1,829 feet msl and 1,808 feet msl, respectively (Appendix F4, 4 vs. 2, pg. 50).

Because the lowest water surface elevation under the CEQA Modified Flow Alternative (1,829 feet msl) would not decline below the lowest water surface elevation under the CEQA No Project Alternative (1,808 feet msl), there would be no substantial visible effects due to the existing bathtub ring under the CEQA No Project Alternative. Reduction of water surface elevations also would have minimal effect on the visual features of riparian vegetation along the reservoir shoreline.

Therefore, because the analysis presented above indicates that the range of potential variation in water surface elevations expected to occur would remain within recent historic drawdown levels, the CEQA Modified Flow Alternative, relative to the CEQA No Project Alternative, would not unreasonably affect the visual character of New Bullards Bar Reservoir.

Impact 13.2.4-2: Changes in lower Yuba River monthly mean flows that could result in adverse impacts to the visual character of the landscape

Long-term average monthly flows in the lower Yuba River at both the Smartville and Marysville gages under the CEQA Modified Flow Alternative, relative to the CEQA No Project Alternative, are up to approximately 10 percent lower during the fall and winter months, and up to approximately 45 percent higher from July through September over the 72-year simulation period (Appendix F4, 4 vs. 2, pgs. 100 and 272). Decreases in average monthly flows under the Yuba Accord Alternative, relative to the CEQA No Project Alternative, occur during months when river flows are at their seasonal peak, and are within the range of flows occurring under the CEQA No Project Alternative and, therefore, would not result in substantial impacts to visual resources along the lower Yuba River.

Based on this analysis, reductions in lower Yuba River flows under the CEQA Modified Flow Alternative would not substantially change the visual character of the lower Yuba River, relative to the CEQA No Project Alternative, due to their magnitude, timing, and duration, and therefore, would not unreasonably affect the visual character of the lower Yuba River.

Impact 13.2.4-3: Changes in Oroville Reservoir monthly mean water surface elevations that could result in adverse impacts to the visual character of the landscape

Long-term average monthly water surface elevations under the CEQA Modified Flow Alternative are essentially equivalent to the CEQA No Project Alternative over the 72-year simulation period (Appendix F4, 4 vs. 2, pg. 455). Therefore, there would be no change in the existing bathtub ring from the implementation of the CEQA Modified Flow Alternative compared to the CEQA No Project Alternative.

Based on the analysis presented above, the range of water surface elevations expected to occur under the CEQA Modified Flow Alternative, relative to the CEQA No Project Alternative, would not unreasonably affect the visual character of Oroville Reservoir.

Impact 13.2.4-4: Changes in Feather River monthly mean flows that could result in adverse impacts to the visual character of the landscape

Differences in long-term average monthly flows under the CEQA Modified Flow Alternative relative to the CEQA No Project Alternative do not exceed approximately 5 percent over the entire 72-year simulation period. Decreases in monthly average flows under the CEQA Modified Flow Alternative during all water year types do not exceed approximately 6 percent except during May and June of dry and critical water years, during which flows are approximately 7 percent to approximately 17 percent lower, respectively (Appendix F4, 4 vs. 2, pg. 603). However, these slight decreases in Feather River flows under the CEQA Modified Flow Alternative, relative to the CEQA No Project Alternative, are not expected to result in changes to the visual character of the Feather River due to their timing, magnitude, and duration.

Therefore, because the analysis presented above indicates that the range of potential variation in Feather River flow changes expected to occur under the CEQA Modified Flow Alternative would be relatively minor compared to the CEQA No Project Alternative, the CEQA Modified Flow Alternative would not unreasonably affect the visual character of the Feather River.

Impact 13.2.4-5: Changes in Sacramento River monthly mean flows that could result in adverse impacts to the visual character of the landscape

Long-term average monthly flows in the Sacramento River under the CEQA Modified Flow Alternative are essentially equivalent or higher during most months, relative to the CEQA No Project Alternative, over the 72-year simulation period (Appendix F4, 4 vs. 2, pg. 882). Therefore, potential changes in Sacramento River flows expected to occur under the CEQA Modified Flow Alternative, relative to the CEQA No Project Alternative, would be relatively minor, and would not unreasonably affect the visual character of the Sacramento River.

Impact 13.2.4-6: Changes in monthly mean Delta inflows that could result in adverse impacts to the visual character of the landscape

Long-term average monthly Delta inflows under the CEQA Modified Flow Alternative, relative to the CEQA No Project Alternative, are essentially equivalent, or up to approximately 2 percent higher over the 72-year simulation period. Differences in average monthly Delta inflows under the CEQA Modified Flow Alternative, relative to the CEQA No Project Alternative, during all water year types do not exceed approximately 5 percent (Appendix F4, 4 vs. 2, pg. 1103). These slight differences in Delta inflows under the CEQA Modified Flow Alternative, relative to the CEQA No Project Alternative, would not unreasonably affect the visual character of the Delta.

Impact 13.2.4-7: Changes in San Luis Reservoir monthly mean water surface elevations that could result in adverse impacts to the visual character of the landscape

Changes in long-term average water surface elevations at San Luis Reservoir under the CEQA Modified Flow Alternative would remain within normal operational parameters. During all months, long-term average water surface elevations would be essentially equivalent under the CEQA Modified Flow Alternative and the CEQA No Project Alternative over the 72-year simulation period (Appendix F4, 4 vs. 2, pg. 1413). Therefore, there would be no change in the existing bathtub ring under the CEQA Modified Flow Alternative, relative to the CEQA No Project Alternative.

Based on the analysis presented above, the range of potential variation in water surface elevations expected to occur under the CEQA Modified Flow Alternative would remain within historic drawdown levels, therefore the CEQA Modified Flow Alternative, relative to the CEQA No Project Alternative, would not unreasonably affect the visual character of San Luis Reservoir.

Impact 13.2.4-8: Changes in surface water conditions that could result in adverse impacts to the landscape character and the attractiveness of Class A and B resources

Changes in local study area reservoir water surface elevations and river flows are anticipated to occur under the CEQA Modified Flow Alternative; these changes would not be of sufficient frequency and magnitude to change the character of the landscape and would not detract from their scenic attractiveness. The visual impact would cause minimal effects to Class A or B scenic features of New Bullards Bar Reservoir. The visual character of riparian vegetation along the lower Yuba River corridor would not be affected, and a decrease in flows would cause little effect to Class A or B visual resources.

Within the regional study area, changes in water surface elevations under the CEQA Modified Flow Alternative, relative to the CEQA No Project Alternative, would not change the character of the landscape or scenic attractiveness (Class A or B) of Oroville or San Luis reservoirs. The Sacramento River is generally considered a Class B visual resource. Slight differences in flows would not be sufficient to reduce the character of the riparian corridor along the river. Therefore, because these potential changes in flow are minimal and temporary in nature under the CEQA Modified Flow Alternative, relative to the CEQA No Project Alternative, they would not change the character of the landscape or detract from the overall scenic attractiveness of the Sacramento River, and would not unreasonably affect the landscape character and the scenic attractiveness of Class A or B resources.

13.2.5 ENVIRONMENTAL IMPACTS/ENVIRONMENTAL CONSEQUENCES OF THE CEQA YUBA ACCORD ALTERNATIVE COMPARED TO THE CEQA EXISTING CONDITION

Impact 13.2.5-1: Changes in New Bullards Bar Reservoir monthly mean water surface elevations that could result in adverse impacts to the visual character of the landscape

Implementation of the CEQA Yuba Accord Alternative would alter the hydrologic pattern relative to the CEQA Existing Condition; however, water surface elevations at New Bullards Bar Reservoir would remain within normal operational parameters. Decreases in long-term average monthly water surface elevations under the CEQA Yuba Accord Alternative greater than 10 feet, relative to the CEQA Existing Condition, occur only during critical water years and range from 11 feet msl to 30 feet msl lower from December through September (Appendix F4, 3 vs. 1, pg. 50). However, since critical water years have an approximately 1 percent probability of occurrence, it is unlikely that these water surface elevations would occur with sufficient frequency to substantially impact the long-term visual character of New Bullards Bar Reservoir relative to the CEQA Existing Condition. In addition, these reductions in water surface elevations are within the range of recent historical drawdown levels occurring in New Bullards Bar Reservoir under the CEQA Existing Condition.

Therefore, because the analysis presented above indicates that the range of potential variation in water surface elevations expected to occur under the CEQA Yuba Accord Alternative, relative to the CEQA Existing Condition, would remain within recent historic drawdown levels, the CEQA Yuba Accord Alternative would result in a less than significant impact on the visual character of New Bullards Bar Reservoir.

Impact 13.2.5-2: Changes in lower Yuba River monthly mean flows that could result in adverse impacts to the visual character of the landscape

Long-term average flows under the CEQA Yuba Accord Alternative, relative to the CEQA Existing Condition, are up to approximately 20 percent to 2 percent lower some months during the summer and early spring, and either essentially equivalent or higher during all other months (Appendix F4, 3 vs. 1, pgs. 100 and 272). Decreases in monthly average flows under the CEQA Yuba Accord Alternative, relative to the CEQA Existing Condition, are within the range of flows occurring under the CEQA Existing Condition, and, therefore, would not result in substantial impacts to the visual character of the lower Yuba River.

Based on this analysis, reductions in lower Yuba River flows under the CEQA Yuba Accord Alternative would not substantially change the visual character of the lower Yuba River, relative to the CEQA Existing Condition, due to their magnitude, timing, and duration, and therefore, would result in a less than significant impact to the visual character of the lower Yuba River.

Impact 13.2.5-3: Changes in Oroville Reservoir monthly mean water surface elevations that could result in adverse impacts to the visual character of the landscape

Long-term average monthly water surface elevations under the CEQA Yuba Accord Alternative are essentially equivalent to the CEQA Existing Condition over the 72-year simulation period (Appendix F4, 3 vs. 1, pg. 455). Therefore, there would be no change in the existing bathtub ring from the implementation of the CEQA Yuba Accord Alternative compared to the CEQA Existing Condition.

Based on the analysis presented above, the range of water surface elevations expected to occur under the CEQA Yuba Accord Alternative, relative to the CEQA Existing Condition, would be expected to result in a less than significant impact on the visual character of Oroville Reservoir.

Impact 13.2.5.-4: Changes in Feather River monthly mean flows that could result in adverse impacts to the visual character of the landscape

Differences in long-term average monthly flows under the CEQA Yuba Accord Alternative, relative to the CEQA Existing Condition, do not exceed approximately 3 percent over the entire 72-year simulation period. Decreases in average monthly flows under the CEQA Yuba Accord Alternative during all water year types do not exceed approximately 5 percent except during May and June of dry and critical water years, during which flows are up to approximately 10 percent lower (Appendix F4, 3 vs. 1, pg. 603). However, these slight differences in Feather River flows under the CEQA Yuba Accord Alternative, relative to the CEQA Existing Condition, are not expected to result in substantial changes to the visual character of the Feather River due to their timing, magnitude, and duration.

Therefore, because the analysis presented above indicates that the range of potential variation in Feather River flows expected to occur under the CEQA Yuba Accord Alternative would be relatively minor compared to the CEQA Existing Condition, the CEQA Yuba Accord Alternative would be expected to result in a less than significant impact on the visual character of the Feather River.

Impact 13.2.5-5: Changes in monthly mean Sacramento River flows that could result in adverse impacts to the visual character of the landscape

Long-term average monthly flows in the Sacramento River under the CEQA Yuba Accord Alternative are essentially equivalent, relative to the CEQA Existing Condition over the 72-year simulation period. Average monthly flows by water year type under the CEQA Yuba Accord Alternative, relative to the CEQA Existing Condition, do not differ by more than 5 percent (Appendix F4, 3 vs. 1, pg. 882). These slight differences in the magnitude and duration of Sacramento River flows under the CEQA Yuba Accord Alternative are not likely to result in changes to the visual character of the Sacramento River.

Based on the analysis presented, the range of potential changes in Sacramento River flows expected to occur under the CEQA Yuba Accord Alternative, relative to the CEQA Existing Condition, would be relatively minor, and would result in a less than significant impact on the visual character of the Sacramento River.

Impact 13.2.5-6: Changes in monthly mean Delta inflows that could result in adverse impacts to the visual character of the landscape

Long-term average monthly Delta inflows under the CEQA Yuba Accord Alternative relative to the CEQA Existing Condition are essentially equivalent over the 72-year simulation period. Differences in average Delta inflows during all water year types do not exceed approximately 5 percent (Appendix F4, 3 vs. 1, pg. 1103). These slight differences in Delta flows under the CEQA Yuba Accord Alternative, relative to the CEQA Existing Condition, are expected to result in a less than significant impact to the visual character of the Delta.

Impact 13.2.5-7: Changes in San Luis Reservoir monthly mean water surface elevations that could result in adverse impacts to the visual character of the landscape

Long-term average water surface elevations would be essentially equivalent under the CEQA Yuba Accord Alternative, relative to the CEQA Existing Condition, over the 72-year simulation period (Appendix F4, 3 vs. 1, pg. 1413). Therefore, there would be no change in the existing bathtub ring, under the CEQA Yuba Accord Alternative relative to the CEQA Existing Condition.

Based on the analysis presented above, the range of potential variation in water surface elevations expected to occur under the CEQA Yuba Accord Alternative, relative to the CEQA Existing Condition, would remain within historic drawdown levels. Therefore the CEQA Yuba Accord Alternative would be expected to result in a less than significant impact to the visual character of San Luis Reservoir.

Impact 13.2.3-8: Changes in surface water conditions that could result in adverse impacts to the landscape character and the attractiveness of Class A and B resources

Changes in local study area reservoir water surface elevations and river flows are anticipated to occur under the CEQA Yuba Accord Alternative; these changes would not be of sufficient frequency and magnitude to change the character of the landscape and would not detract from the scenic attractiveness. The visual impact would cause minimal effects to Class A or B scenic features of New Bullards Bar Reservoir. The visual character of riparian vegetation along the lower Yuba River corridor would not be affected, and a decrease in flows would cause little effect to Class A or B visual resources.

Within the regional study area, changes in water surface elevations under the CEQA Yuba Accord Alternative, relative to the CEQA Existing Condition, would not change the character of the landscape or scenic attractiveness (Class A or B) of Oroville or San Luis reservoirs. The Sacramento River is generally considered a Class B visual resource. Slight differences in flows would not be sufficient to reduce the character of the riparian corridor along the river. Therefore, because potential flow changes would be minimal and temporary in nature under the CEQA Yuba Accord Alternative, relative to the CEQA Existing Condition, they would result in a less than significant impact to the character of the landscape and the overall scenic attractiveness of the Sacramento River.

13.2.6 ENVIRONMENTAL IMPACTS/ENVIRONMENTAL CONSEQUENCES OF THE CEQA MODIFIED FLOW ALTERNATIVE COMPARED TO THE CEQA EXISTING CONDITION

Impact 13.2.6-1: Changes in New Bullards Bar Reservoir monthly mean water surface elevations that could result in adverse impacts to the visual character of the landscape

Implementation of the CEQA Modified Flow Alternative would alter the hydrologic pattern relative to the CEQA Existing Condition; however, water surface elevations at New Bullards Bar Reservoir would remain within normal operational parameters. Decreases in long-term average monthly water surface elevations under the CEQA Modified Flow Alternative greater than 10 feet, relative to the CEQA Existing Condition, do not occur over the 72-year simulation period. Long-term average monthly water surface elevations and average monthly water surface elevations by water year type are essentially equivalent under the CEQA Modified Flow Alternative, relative to the CEQA Existing Condition (Appendix F4, 4 vs. 1, pg. 50)

Therefore, because the analysis presented above indicates that the range of potential variation in water surface elevations expected to occur under the CEQA Modified Flow Alternative, relative to the CEQA Existing Condition, would remain within recent historic drawdown levels, the CEQA Modified Flow Alternative would result in a less than significant impact on the visual character of New Bullards Bar Reservoir.

Impact 13.2.6-2: Changes in monthly mean lower Yuba River flows that could result in adverse impacts to the visual character of the landscape

Long-term average monthly flows under the CEQA Modified Flow Alternative, relative to the CEQA Existing Condition, are up to approximately 15 percent to approximately 3 percent lower some months, and either essentially equivalent or higher during all other months over the 72-year simulation period (Appendix F4, 4 vs. 1, pgs. 100 and 272). Decreases in monthly average flows under the CEQA Modified Flow Alternative, relative to the CEQA Existing Condition, are within the range of flows occurring under the CEQA Existing Condition, and, therefore, would not result in substantial impacts to visual resources along the lower Yuba River.

Based on this analysis, reductions in lower Yuba River flows under the CEQA Modified Flow Alternative, relative to the CEQA Existing Condition, would not substantially change the visual character of the lower Yuba River and, thus, would result in a less than significant impact to the visual character of the lower Yuba River.

Impact 13.2.6-3: Changes in Oroville Reservoir monthly mean water surface elevations that could result in adverse impacts to the visual character of the landscape

Long-term average monthly water surface elevations under the CEQA Modified Flow Alternative are essentially equivalent to the CEQA Existing Condition over the 72-year simulation period (Appendix F4, 4 vs. 1, pg. 455). Therefore, there would be no change in the existing bathtub ring from the implementation of the Yuba Accord Alternative compared to the CEQA Existing Condition.

Based on the analysis presented above, the range of water surface elevations expected to occur under the CEQA Modified Flow Alternative, relative to the CEQA Existing Condition, would be expected to result in a less than significant impact on the visual character of Oroville Reservoir.

Impact 13.2.6.-4: Changes in Feather River monthly mean flows that could result in adverse impacts to the visual character of the landscape

Differences in long-term average monthly flows under the CEQA Modified Flow Alternative, relative to the CEQA Existing Condition, do not exceed approximately 3 percent over the entire 72-year simulation period. Decreases in average monthly flows under the CEQA Modified Flow Alternative during all water year types do not exceed approximately 5 percent (Appendix F4, 4 vs. 1, pg. 603). The slight differences in the magnitude and duration of Feather River flows under the CEQA Modified Flow Alternative, relative to the CEQA Existing Condition, are not expected to result in changes to the visual character of the Feather River.

Therefore, because the analysis presented above indicates that the range of potential variation in Feather River flows expected to occur under the CEQA Modified Flow Alternative would be relatively minor compared to the CEQA Existing Condition, the CEQA Modified Flow Alternative would be expected to result in a less than significant impact on the visual character of the Feather River.

Impact 13.2.6-5: Changes in Sacramento River monthly mean flows that could result in adverse impacts to the visual character of the landscape

Long-term average flows in the Sacramento River under the CEQA Modified Flow Alternative are essentially equivalent relative to the CEQA Existing Condition over the 72-year simulation period. Average monthly flows by water year type under the CEQA Modified Flow Alternative, relative to the CEQA Existing Condition, do not differ by more than 2 percent (Appendix F4, 4 vs. 1, pg.882). These slight differences in Sacramento River flows under the CEQA Modified Flow Alternative, relative to the CEQA Existing Condition, are not expected to result in changes to the visual character of the Sacramento River.

Based on the analysis presented, the range of potential changes in Sacramento River flows expected to occur under the CEQA Modified Flow Alternative, relative to the CEQA Existing Condition, would be relatively minor, and would result in less than significant impacts on the visual character of the Sacramento River.

Impact 13.2.6-6: Changes in monthly mean Delta inflows that could result in adverse impacts to the visual character of the landscape

Long-term average monthly Delta inflows are essentially equivalent under the CEQA Modified Flow Alternative, relative to the CEQA Existing Condition t over the 72-year simulation period (Appendix F4, 4 vs. 1, pg. 1103).

Therefore, because the analysis presented above indicates that the range of potential variation in Delta inflows expected to occur under the CEQA Modified Flow Alternative would be relatively minor compared to the CEQA Existing Condition, the CEQA Modified Flow Alternative is expected to result in a less than significant impact on the visual character of the Delta.

Impact 13.2.6-7: Changes in San Luis Reservoir monthly mean water surface elevations that could result in adverse impacts to the visual character of the landscape

During all months, long-term average monthly water surface elevations would be essentially equivalent under the CEQA Modified Flow Alternative and the CEQA Existing Condition over the 72-year simulation period (Appendix F4, 4 vs. 1, pg. 1413). Therefore, there would be no change in the existing bathtub ring, under the CEQA Modified Flow Alternative, relative to the CEQA Existing Condition.

Based on the analysis presented above, the range of potential variation in water surface elevations expected to occur under the CEQA Modified Flow Alternative, relative to the CEQA Existing Condition, would remain within recent historic drawdown levels, therefore the CEQA Modified Flow Alternative would be expected to result in a less than significant impact to visual character of San Luis Reservoir.

Impact 13.2.6-8: Changes in surface water conditions that could result in adverse impacts to the landscape character and the attractiveness of Class A and B resources

Changes in local study area reservoir water surface elevations and river flows are anticipated to occur under the CEQA Modified Flow Alternative; these changes would not be of sufficient frequency and magnitude to change the character of the landscape and would not detract from the scenic attractiveness. The visual impact would cause minimal effects to Class A or B scenic features of New Bullards Bar Reservoir. The visual character of riparian vegetation along the lower Yuba River corridor would not be affected, and a decrease in flows would cause little affect to Class A or B visual resources.

Within the regional study area, changes in water surface elevations relative to the CEQA Existing Condition would not change the character of the landscape or scenic attractiveness (Class A or B) of Oroville or San Luis reservoirs. The Sacramento River is generally considered a Class B visual resource. Slight differences in flows would not be sufficient to reduce the character of the riparian corridor along the river. Therefore, because these potential changes in flow are minimal and temporary in nature under the CEQA Modified Flow Alternative, relative to the CEQA Existing Condition, they would result in a less than significant impact to the character of the landscape and the overall scenic attractiveness of the Sacramento River.

13.2.7 ENVIRONMENTAL IMPACTS/ENVIRONMENTAL CONSEQUENCES OF THE CEQA NO PROJECT/NEPA NO ACTION ALTERNATIVE COMPARED TO THE CEQA EXISTING CONDITION/NEPA AFFECTED ENVIRONMENT

As discussed in Chapter 3, the key elements and activities (e.g., implementation of the RD-1644 Long-term instream flow requirements) for the CEQA No Project Alternative would be the same for the NEPA No Action Alternative. The primary differences between the CEQA No Project and NEPA No Action alternatives are various hydrologic and other modeling assumptions (see Section 4.5 and Appendix D). Because of these differences between the No Project and No Action alternatives, these alternatives are distinguished as separate alternatives for CEQA and NEPA evaluation purposes.

Based on current plans and consistent with available infrastructure and community services, the CEQA No Project Alternative in this EIR/EIS is based on current environmental conditions (e.g., project operations, water demands, and level of land development) plus potential future operational and environmental conditions (e.g., implementation of the RD-1644 Long-term instream flow requirements in the lower Yuba River) that probably would occur in the foreseeable future in the absence of the Proposed Project/Action or another action alternative. The NEPA No Action Alternative also is based on conditions without the proposed project, but uses a longer-term future timeframe that is not restricted by existing infrastructure or physical and regulatory environmental conditions. The differences between these modeling characterizations and assumptions for the CEQA No Project and the NEPA No Action alternatives, including the rationale for developing these two different scenarios for this EIR/EIS, are explained in Chapter 4[1].

Although implementation of the RD-1644 Long-term instream flow requirements would occur under both the CEQA No Project and the NEPA No Action alternatives, the resultant model outputs for both scenarios are different because of variations in the way near-term and long-term future operations are characterized for other parameters in the CEQA and NEPA assumptions. As discussed in Chapter 4, the principal difference between the CEQA No Project Alternative and the NEPA No Action Alternative is that the NEPA No Action Alternative includes several potential future water projects in the Sacramento and San Joaquin valleys (e.g., CVP/SWP Intertie, FRWP, SDIP and a long-term EWA Program or a program equivalent to the EWA), while the CEQA No Project Alternative does not. Because many of the other assumed conditions for these two scenarios are similar, the longer-term analysis of the NEPA No Action

[1] For modeling purposes related to CEQA analytical requirements, OCAP Study 3 (2001 level of development) is used as the foundational study upon which the modeling scenarios for the CEQA No Project Alternative and the CEQA Existing Condition were developed. For modeling purposes related to NEPA analytical requirements, OCAP Study 5 (2020 level of development) is used as the foundational study upon which the modeling scenarios for the NEPA No Action Alternative was developed.

Alternative compared to the NEPA Affected Environment builds upon the nearer-term analysis of the CEQA No Project Alternative compared to the CEQA Existing Condition.

Because the same foundational modeling base (OCAP Study 3) was used to characterize near-term conditions (2001 level of development) both the CEQA No Project Alternative and the CEQA Existing Condition, it was possible to conduct a detailed analysis to quantitatively evaluate the hydrologic changes in the Yuba Region and the CVP/SWP system that would be expected to occur under these conditions. Based on this CEQA analysis, the analysis of the NEPA No Action Alternative compared to the NEPA Affected Environment consists of two components: (1) an analysis of near-term future without project conditions quantified through the CEQA No Project Alternative, relative to the CEQA Existing Condition; and (2) a qualitative analysis of longer-term future without project conditions (the NEPA No Action Alternative)[2].

13.2.7.1 CEQA No Project Alternative Compared to the CEQA Existing Condition

Impact 13.2.7.1-1: Changes in New Bullards Bar Reservoir monthly mean water surface elevations that could result in adverse impacts to the visual character of the landscape

Implementation of the CEQA No Project Alternative would alter the hydrologic pattern relative to the CEQA Existing Condition; however, water surface elevations at New Bullards Bar Reservoir would remain within normal operational parameters. Decreases in long-term average monthly water surface elevations under the CEQA No Project Alternative greater than 10 feet msl relative to the CEQA Existing Condition occur only during critical water years and range from 15 feet msl to 20 feet msl lower from June through September over the 72-year simulation period (Appendix F4, 2 vs. 1, pg. 50). However, since critical water years have an approximately 1 percent probability of occurrence it is unlikely that the CEQA No Project Alternative would substantially impact the long-term visual character of New Bullards Bar Reservoir relative to the CEQA Existing Condition. In addition, these reductions in water surface elevations are within the range of recent historical drawdown levels occurring in New Bullards Bar Reservoir.

Therefore, because the analysis presented above indicates that the range of potential variation in water surface elevations expected to occur under the CEQA No Project Alternative, relative to the CEQA Existing Condition, would remain within recent historic drawdown levels. Therefore, the CEQA No Project Alternative would result in a less than significant impact on the visual character of New Bullards Bar Reservoir.

Impact 13.2.7.1-2: Changes in lower Yuba River monthly mean flows that could result in adverse impacts to the visual character of the landscape

Long-term average monthly flows under the CEQA No Project Alternative relative to the CEQA Existing Condition are up to approximately 40 percent to approximately 5 percent lower during the summer months over the 72-year simulation period (Appendix F4, 2 vs. 1, pgs. 100 and 272). Decreases in average monthly flows under the CEQA No Project Alternative, relative to the CEQA Existing Condition, are within the range of flows occurring under the CEQA Existing

[2] The second analytical component cannot be evaluated quantitatively due to the differences in the underlying baseline assumptions for OCAP Study 3 and OCAP Study 5.

Condition and therefore would not result in substantial impacts to visual resources along the lower Yuba River.

Based on this analysis, changes in lower Yuba River flows under the CEQA No Project Alternative, relative to the CEQA Existing Condition, would not substantially alter the visual character of the lower Yuba River and, thus, would result in a less than significant impact to the visual character of the lower Yuba River.

Impact 13.2.7.1-3: Changes in Oroville Reservoir monthly mean water surface elevations that could result in adverse impacts to the visual character of the landscape

Long-term average monthly water surface elevations under the CEQA No Project Alternative are essentially equivalent to the CEQA Existing Condition over the 72-year simulation period (Appendix F4, 2 vs. 1, pg 455). Therefore, there would be no change in the existing bathtub ring from the implementation of the CEQA No Project Alternative compared to the CEQA Existing Condition.

Based on the analysis presented above, the range of water surface elevations expected to occur under the CEQA No Project Alternative, relative to the CEQA Existing Condition, would be expected to result in a less than significant impact on the visual character of Oroville Reservoir.

Impact 13.2.7.1-4: Changes in Feather River monthly mean flows that could result in adverse impacts to the visual character of the landscape

Differences in long-term average monthly flows under the CEQA No Project Alternative relative to the CEQA Existing Condition do not exceed approximately 8 percent over the entire 72-year simulation period. Decreases in average monthly flows under the CEQA No Project Alternative during all water year types do not exceed approximately 14 percent except during May and June of dry and critical water years during which flows are up to approximately 20 percent higher under the CEQA No Project Alternative (Appendix F4, 2 vs. 1, pg. 603). However, these slight differences in Feather River flows under the CEQA No Project Alternative relative to the CEQA Existing Condition are not likely to result in changes to the visual character of the Feather River relative to the CEQA Existing Condition due to their magnitude, and duration. In addition, these flows are within the normal range of flows occurring in the lower Feather River.

Therefore, because the analysis presented above indicates that the range of potential variation in Feather River flow changes expected to occur under the CEQA No Project Alternative would be relatively minor compared to the CEQA Existing Condition, the CEQA No Project Alternative is expected to result in a less than significant impact on the visual character of the Feather River.

Impact 13.2.7.1-5: Changes in Sacramento River monthly mean flows that could result in adverse impacts to the visual character of the landscape

Long-term average flows in the Sacramento River under the CEQA No Project Alternative are essentially equivalent during most months relative to the CEQA Existing Condition over the 72-year simulation period. Average monthly flows by water year type under the CEQA No Project Alternative, relative to the CEQA Existing Condition, do not differ by more than approximately 5 percent (Appendix F4, 2 vs. 1, pg. 882). These slight differences in Sacramento River flows under the CEQA No Project Alternative are not expected to result in substantial changes to the visual character of the Sacramento River relative to the CEQA Existing Condition due their magnitude, and duration.

Based on the analysis presented, the range of potential changes in Sacramento River flows expected to occur under the CEQA No Project Alternative, relative to the CEQA Existing Condition, would be relatively minor, and would result in a less than significant impact on the visual character of the Sacramento River.

Impact 13.2.7.1-6: Changes in monthly mean Delta inflows that could result in adverse impacts to the visual character of the landscape

Long-term average monthly Delta inflows under the CEQA No Project Alternative relative to the CEQA Existing Condition are essentially equivalent during most months over the 72-year simulation period. Differences in average Delta inflows during all water year types do not exceed approximately 5 percent (Appendix F4, 2 vs. 1, pg. 1103). These slight differences in Delta inflows under the CEQA No Project Alternative, relative to the CEQA Existing Condition, would be expected to result in a less than significant impact to the visual character of the Delta.

Impact 13.2.7.1-7: Changes in San Luis Reservoir monthly mean water surface elevations that could result in adverse impacts to the visual character of the landscape

Implementation of the CEQA No Project Alternative would not alter the hydrologic pattern relative to the CEQA Existing Condition. Water surface elevations at San Luis Reservoir would remain within normal operational parameters. During all months, long-term average water surface elevations would be essentially equivalent under the CEQA No Project Alternative and the CEQA Existing Condition over the 72-year simulation period (Appendix F4, 2 vs. 1, pg. 1413). Therefore, there would be no change in the existing bathtub ring, under the CEQA No Project Alternative relative to the CEQA Existing Condition.

Based on the analysis presented above, the range of potential variation in water surface elevations expected to occur under the CEQA No Project Alternative would remain within recent historic drawdown levels, therefore the CEQA No Project Alternative, relative to the CEQA Existing Condition, would be expected to result in a less than significant impact to the visual character of San Luis Reservoir.

Impact 13.2.7.1-8: Changes in surface water conditions that could result in adverse impacts to the landscape character and the attractiveness of Class A and B resources

Changes in local study area reservoir water surface elevations and river flows are anticipated to occur under the CEQA No Project Alternative; these changes would not be of sufficient frequency and magnitude to change the character of the landscape and would not detract from the scenic attractiveness. The visual impact would cause minimal effects to Class A or B scenic features of New Bullards Bar Reservoir. The visual character of riparian vegetation along the lower Yuba River corridor would not be affected, and a decrease in flows would cause little affect to Class A or B visual resources.

Within the regional study area, changes in water surface elevations relative to the CEQA Existing Condition would not change the character of the landscape or scenic attractiveness (Class A or B) of Oroville or San Luis reservoirs. The Sacramento River is generally considered a Class B visual resource. As shown by the model output, slight differences in flows would not be sufficient to reduce the character of the riparian corridor along the Sacramento River. Therefore, because these potential changes in flow are minimal and temporary in nature under the CEQA No Project Alternative, relative to the CEQA Existing Condition, they would result in a less than significant impact to the character of the landscape and the overall scenic attractiveness of the Sacramento River.

13.2.7.2 NEPA NO ACTION ALTERNATIVE COMPARED TO THE NEPA AFFECTED ENVIRONMENT

In the Yuba Region, the primary differences between the NEPA No Action Alternative and the NEPA Affected Environment would be the changes in lower Yuba River flows associated with the implementation of the RD-1644 Long-term instream flow requirements, to replace the RD-1644 Interim instream flow requirements, and the increased local surface water demands for the Wheatland Water District These also are the only differences that would occur in the Yuba Region between the CEQA No Project Alternative and the CEQA Existing Condition. The potential effects to visual resources that were evaluated in the quantitative analyses that is presented in Section 13.2.7.1 above for the CEQA No Project Alternative relative to the CEQA Existing Condition (see also Appendix F4, 2 vs. 1) therefore also are used for comparison of the NEPA No Action Alternative relative to the NEPA Affected Environment, and are not repeated here.

As discussed above, the analysis of the NEPA No Action Alternative includes several additional proposed projects in the project study area that are not included in the CEQA analysis. However, these other proposed projects would not significantly affect hydrologic conditions or visual resources in the Yuba Region and, thus, are only discussed in the context of CVP/SWP operations upstream of and within the Delta.

Under the NEPA No Action Alternative, future levels of demand for water in California would be addressed through the implementation of numerous projects, including water storage and conveyance projects (e.g., SDIP[3]), water transfers and acquisition programs (e.g., a long-term EWA Program or a program equivalent to the EWA), and other projects related to CVP/SWP system operations (e.g., CVP/SWP Intertie and FRWP).

Other proposed projects under the NEPA No Action Alternative could reduce the aesthetic quality of visual resources by affecting water surface elevations in CVP/SWP reservoirs, river flows in the Feather and Sacramento rivers and Delta inflows. To meet increased future demands, several other projects would increase water diversions from the Sacramento and Feather rivers under the NEPA No Action Alternative, relative to the NEPA Affected Environment. Changes in CVP/SWP reservoir levels in response to the increased future demands of downstream water users also may reduce scenic attractiveness (e.g., increase of exposed rock and soil) and reduce visual opportunities. Water transfer and acquisition programs (e.g., a long-term EWA Program or a program equivalent to the EWA) under the NEPA No Action Alternative could purchase water from the same agency or reservoir, and, thus, could collectively draw down reservoirs further than under the NEPA Affected Environment. The additional water sold for other programs could reduce water surface elevations in CVP/SWP reservoirs, which could magnify the effects of multiple projects. Depending on the timing and operations of other projects, water transfers from other agencies could increase river flows during transfer periods, which could be a positive effect on the scenic value of these waterbodies. Conversely, increased diversions could reduce river flows during the summer (particularly in drier years), which could alter the visual quality from water level and land-based viewpoints along the Feather and Sacramento rivers. However, due to the volume of water flowing through the lower reaches of the Feather and Sacramento rivers, it is not anticipated that these changes (i.e., increases or decreases) in river flows under either of

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[3] The SDIP includes a maximum pumping rate of 8,500 cfs at the Banks Pumping Plant.

these scenarios would affect the rivers to such an extent to cause a significant effect on the visual character of the landscape.

Overall, changes in hydrologic conditions associated with water conveyance projects, water transfer and acquisition programs and other projects related to CVP/SWP operations under the NEPA No Action Alternative could result in potential effects to the visual character of the landscape in the CVP/SWP system. However, potential effects to visual resources could be either positive or negative, depending on the overall timing and operation of other projects that would occur under the NEPA No Action Alternative, relative to the NEPA Affected Environment.

13.2.8 ENVIRONMENTAL IMPACTS/ENVIRONMENTAL CONSEQUENCES OF THE NEPA YUBA ACCORD ALTERNATIVE COMPARED TO THE NEPA NO ACTION ALTERNATIVE

Impact 13.2.8-1: Changes in New Bullards Bar Reservoir monthly mean water surface elevations that could result in adverse impacts to the visual character of the landscape

Implementation of the NEPA Yuba Accord Alternative would alter the hydrologic pattern relative to the NEPA No Action Alternative; however, water surface elevations at New Bullards Bar Reservoir would remain within normal operational parameters. Over the 72-year simulation period, decreases in long-term average monthly water surface elevations and average water surface elevations by water year type under the NEPA Yuba Accord Alternative greater than 10 feet relative to the NEPA No Action Alternative occur in August (11 feet msl), September (13 feet msl), October (15 feet msl), November (up to 15 feet msl) and December (11 feet msl). The lowest monthly mean water surface elevation under the NEPA Yuba Accord Alternative would be 1,798 feet msl occurring in September of critical water years, compared to 1,808 feet msl also occurring in September of critical water years under the NEPA No Action Alternative (Appendix F4, 6 vs. 5, pg. 50). However, given that the frequency of critical water years is approximately 1 percent, and the magnitude of this decrease is not substantially below the lowest water surface elevation under the NEPA No Action Alternative, there is not likely to be any substantial visible effects due to the existing bathtub ring, under the NEPA No Action Alternative. Reduction of water surface elevations also would have minimal effect on the visual features of riparian vegetation along the banks (See Impact 13.2.3-1 for a full discussion).

Therefore, because the analysis presented above indicates that the range of potential variation in water surface elevations expected to occur under the NEPA Yuba Accord Alternative, relative to the NEPA No Action Alternative, would remain within recent historic drawdown levels, the NEPA Yuba Accord Alternative would result in a less than significant impact on the visual character of New Bullards Bar Reservoir.

Impact 13.2.8-2: Changes in lower Yuba River monthly mean flows that could result in adverse impacts to the visual character of the landscape

Long-term average monthly flows in the lower Yuba River at the Smartville and Marysville gages under the NEPA Yuba Accord Alternative, relative to the NEPA No Action Alternative are up to approximately 9 percent lower during the winter and early spring and up to approximately 60 percent higher from July through October over the 72-year simulation period (Appendix F4, 6 vs. 5, pgs 100 and 272). Decreases in monthly average flows under the NEPA Yuba Accord Alternative, relative to the NEPA No Action Alternative, occur during months when river flows are generally at their seasonal peak, and also are within the range of flows occurring under the NEPA No Action Alternative.

Based on this analysis, changes in lower Yuba River flows under the NEPA Yuba Accord Alternative, relative to the NEPA No Action Alternative, would not substantially change the visual character of the lower Yuba River and, thus, would result in a less than significant impact to the visual character of the lower Yuba River.

Impact 13.2.8-3: Changes in Oroville Reservoir monthly mean water surface elevations that could result in adverse impacts to the visual character of the landscape

Long-term average monthly water surface elevations under the NEPA Yuba Accord Alternative are essentially equivalent relative to the NEPA No Action Alternative over the 72-year simulation period (Appendix F4, 2 vs. 1, pg. 455). Therefore, there would be no change in the existing bathtub ring from the implementation of the NEPA Yuba Accord Alternative compared to the NEPA No Action Alternative.

Based on the analysis presented above, the range of water surface elevations expected to occur under the NEPA Yuba Accord Alternative, relative to the NEPA No Action Alternative, would be expected to result in a less than significant impact on the visual character of Oroville Reservoir.

Impact 13.2.8-4: Changes in Feather River monthly mean flows that could result in adverse impacts to the visual character of the landscape

Long-term average monthly flows in the Feather River under the NEPA Yuba Accord Alternative relative to the NEPA No Action Alternative are up to approximately 3 percent lower during the winter and spring months, and approximately 7 percent higher during the summer and fall months over the 72-year simulation period. Decreases in average monthly flows under the NEPA Yuba Accord Alternative during all water year types are greatest during the early spring, however they do not exceed approximately 10 percent relative to the NEPA No Action Alternative (Appendix F4, 6 vs. 5, pg. 603). These slight differences in Feather River flows under the NEPA Yuba Accord Alternative relative to the NEPA No Action Alternative are not likely to result in changes to the visual character of the Feather River relative to the NEPA No Action Alternative due to their frequency, magnitude, and duration.

Therefore, because the analysis presented above indicates that the range of potential variation in Feather River flow changes expected to occur under the NEPA Yuba Accord Alternative would be relatively minor compared to the NEPA No Action Alternative, the NEPA Yuba Accord Alternative is expected to result in a less-than-significant impact on the visual character of the Feather River.

Impact 13.2.8-5: Changes in Sacramento River monthly mean flows that could result in adverse impacts to the visual character of the landscape

Long-term average monthly flows in the Sacramento River under the NEPA Yuba Accord Alternative are generally essentially equivalent or higher relative to the NEPA No Action Alternative over the 72-year simulation period. Differences in average monthly flows by water year type generally under the NEPA Yuba Accord Alternative and do not exceed approximately 5 percent, relative to the NEPA No Action Alternative (Appendix F4, 6 vs. 5, pg. 882). These differences in Sacramento River flows under the NEPA Yuba Accord Alternative, relative to the NEPA No Action Alternative are not likely to result in changes to the visual character of the

Sacramento River relative to the NEPA No Action Alternative due to their magnitude, and duration.

Based on the analysis presented, the range of potential changes in Sacramento River flows expected to occur under the NEPA Yuba Accord Alternative, relative to the NEPA No Action Alternative, would be relatively minor, and would result in a less than significant impact on the visual resources of the Sacramento River.

Impact 13.2.8-6: Changes in monthly mean Delta inflows that could result in adverse impacts to the visual character of the landscape

Long-term average monthly Delta inflows under the NEPA Yuba Accord Alternative relative to the NEPA No Action Alternative are essentially equivalent during most months, and up to approximately 5 percent higher during August over the 72-year simulation period. Differences in Delta inflows during all water year types do not exceed approximately 3 percent (Appendix F4, 6 vs. 5, 1103). These slight differences in Delta inflows under the NEPA Yuba Accord Alternative, relative to the NEPA No Action Alternative, are not expected to change the visual character of the Delta.

Impact 13.2.8-7: Changes in San Luis Reservoir monthly mean water surface elevations that could result in adverse impacts to the visual character of the landscape

Implementation of the NEPA Yuba Accord Alternative would not substantially alter the hydrologic pattern of San Luis Reservoir relative to the NEPA No Action Alternative. During all months, long-term average monthly water surface elevations would be essentially equivalent under the NEPA Yuba Accord Alternative relative to the NEPA No Action Alternative over the 72-year simulation period (Appendix F4, 6 vs. 5, pg. 1413). Therefore, there would be no change in the existing bathtub ring, under the NEPA Yuba Accord Alternative relative to the NEPA No Action Alternative.

Based on the analysis presented above, the range of potential variation in water surface elevations expected to occur under the NEPA Yuba Accord Alternative would remain within historic drawdown levels, therefore the NEPA Yuba Accord Alternative, relative to the NEPA No Action Alternative, would be expected to result in a less than significant impact to the visual character of San Luis Reservoir.

Impact 13.2.8-8: Changes in surface water conditions that could result in adverse impacts to the landscape character and the attractiveness of Class A and B resources

Changes in local study area reservoir water surface elevations and river flows are anticipated to occur under the NEPA Yuba Accord Alternative; these changes would not be of sufficient frequency and magnitude to change the character of the landscape and would not detract from the scenic attractiveness. The visual impact would cause minimal effects to Class A or B scenic features of New Bullards Bar Reservoir. The visual character of riparian vegetation along the lower Yuba River corridor would not be affected, and a decrease in flows would cause little affect to Class A or B visual resources.

Within the regional study area, changes in water surface elevations relative to the NEPA No Action Alternative would not change the character of the landscape or scenic attractiveness (Class A or B) of Oroville or San Luis reservoirs. The Sacramento River is generally considered a Class B visual resource. Slight differences in flows that would not be sufficient to reduce the character of the riparian corridor along the river. Therefore, because these potential changes in flow are minimal and temporary in nature under the NEPA Yuba Accord Alternative, relative to the NEPA No Action Alternative, they would not change the character of the landscape or detract from the overall scenic attractiveness of the Sacramento River.

13.2.9 ENVIRONMENTAL IMPACTS/ENVIRONMENTAL CONSEQUENCES OF THE NEPA MODIFIED FLOW ALTERNATIVE COMPARED TO THE NEPA NO ACTION ALTERNATIVE

Impact 13.2.9-1: Changes in New Bullards Bar Reservoir monthly mean water surface elevations that could result in adverse impacts to the visual character of the landscape

Implementation of the NEPA Modified Flow Alternative would alter the hydrologic pattern relative to the NEPA No Action Alternative; however, water surface elevations at New Bullards Bar Reservoir would remain within normal operational parameters. Decreases in long-term average monthly water surface elevations under the NEPA Modified Flow Alternative greater than 10 feet, relative to the NEPA No Action Alternative do not occur over the 72-year simulation period. However, average monthly water surface elevations by water year type are up to 17 feet msl lower during all water year types under the NEPA Modified Flow Alternative, with the exception of critical water years in which water surface elevations are up to approximately 20 feet- msl higher relative to the NEPA No Action Alternative. The lowest monthly mean water surface elevation under the NEPA Modified Flow Alternative would be 1,830 feet msl occurring in September of critical water years, compared to 1,808 feet msl under the NEPA No Action Alternative, also occurring in September of critical water years (Appendix F4, 7 vs. 5, pg. 50). Because the lowest water surface elevation occurring under the NEPA No Action Alternative is approximately 22 feet msl lower relative to the NEPA Modified Flow Alternative, it is not likely that any substantial visible effects would occur due to the existing bathtub ring, under the NEPA No Action Alternative. Reduction of water surface elevations also would have minimal effect on the visual features of riparian vegetation along the banks.

Therefore, because the analysis presented above indicates that the range of potential variation in average monthly water surface elevations expected to occur under the NEPA Modified Flow Alternative, relative to the NEPA No Action Alternative, would remain within recent historic drawdown levels, the NEPA Modified Flow Alternative would result in a less-than-significant impact on the visual character of New Bullards Bar Reservoir.

Impact 13.2.9-2: Changes in lower Yuba River monthly mean flows that could result in adverse impacts to the visual character of the landscape

Long-term average flows in the lower Yuba River at both the Smartville and Marysville gages under the NEPA Modified Flow Alternative, relative to the NEPA No Action Alternative are up to approximately 7 percent lower during the winter and early spring and up to approximately 20 percent higher from July through October over the 72-year simulation period (Appendix F4, 7 vs. 5, pgs. 100 and 272). Decreases in monthly average flows under the NEPA Modified Flow Alternative, relative to the NEPA No Action Alternative, occur during months when river flows are generally at their seasonal peak, and also are within the range of flows occurring under the No Project Alternative.

Based on this analysis changes in lower Yuba River flows under the NEPA Modified Flow Alternative, relative to the NEPA No Action Alternative, would not substantially change the visual character of the lower Yuba River and, thus, would result in a less than significant impact to the visual character of the lower Yuba River.

Impact 13.2.9-3: Changes in Oroville Reservoir monthly mean water surface elevations that could result in adverse impacts to the visual character of the landscape

Long-term average monthly water surface elevations under the NEPA Modified Flow Alternative are essentially equivalent relative to the NEPA No Action Alternative over the 72-year simulation period (Appendix F4, 7 vs. 5, pg. 455). Therefore, there would be no change in the existing bathtub ring from the implementation of the NEPA Modified Flow Alternative compared to the NEPA No Action Alternative.

Based on the analysis presented above, the range of water surface elevations expected to occur under the NEPA Modified Flow Alternative, relative to the NEPA No Action Alternative, would be expected to result a less than significant impact on the visual character of Oroville Reservoir.

Impact 13.2.9-4: Changes in Feather River monthly mean flows that could result in adverse impacts to the visual character of the landscape

Long-term average monthly flows under the NEPA Modified Flow Alternative relative to the NEPA No Action Alternative are up to approximately 2 percent lower during some winter months and up to approximately 6 percent higher during the summer months over the 72-year simulation period (Appendix F4, 7 vs. 5, pg. 603). Decreases in average monthly flows by water year type under the NEPA Modified Flow Alternative are greatest during the late- spring when flows are generally at their seasonal peak. However these decreases in flow do not exceed approximately 12 percent relative to the NEPA No Action Alternative. These differences in Feather River flows under the NEPA Modified Flow Alternative, relative to the NEPA No Action Alternative are not likely to result in changes to the visual character of the Feather River relative to the NEPA No Action Alternative due to their frequency, magnitude, and duration.

Therefore, because the analysis presented above indicates that the range of potential variation in Feather River flow changes expected to occur under the NEPA Modified Flow Alternative, relative to the NEPA No Action Alternative, would be relatively minor, the NEPA Modified Flow Alternative would result in a less than significant impact on the visual character of the Feather River.

Impact 13.2.9-5: Changes in Sacramento River monthly mean flows that could result in adverse impacts to the visual character of the landscape

Long-term average monthly flows in the Sacramento River under the NEPA Modified Flow Alternative are generally essentially equivalent or higher relative to the NEPA No Action Alternative over the 72-year simulation period. Average monthly flows by water year type are generally higher under the NEPA Modified Flow Alternative and differences do not exceed approximately 5 percent, relative to the NEPA No Action Alternative (Appendix F4, 7 vs. 5, pg. 882). These slight differences in Sacramento River flows under the NEPA Modified Flow Alternative, relative to the NEPA No Action Alternative are not likely to result in changes to the visual character of the Sacramento River relative to the NEPA No Action Alternative due to their frequency, magnitude, and duration.

Based on the analysis presented, the range of potential changes in Sacramento River flows expected to occur under the NEPA Modified Flow Alternative, relative to the NEPA No Action Alternative, would be relatively minor, and would result in a less than significant impact on the visual character of the Sacramento River.

Impact 13.2.9-6: Changes in monthly mean Delta inflows that could result in adverse impacts to the visual character of the landscape

Long-term average monthly Delta inflows under the NEPA Modified Flow Alternative relative to the NEPA No Action Alternative are essentially equivalent during most months, and up to approximately 2 percent higher during August over the 72-year simulation period. Differences in Delta inflows during all water year types do not exceed approximately 5 percent (Appendix F4, 7 vs. 5, pg. 1103). These slight differences in Delta inflows under the NEPA Modified Flow Alternative, relative to the NEPA No Action Alternative, are not sufficient in magnitude to result in changes to the visual character of the Delta.

Impact 13.2.9-7: Change in San Luis Reservoir monthly mean water surface elevations that could result in adverse impacts to the visual character of the landscape

Implementation of the NEPA Modified Flow Alternative would not substantially alter the hydrologic pattern of San Luis Reservoir relative to the NEPA No Action Alternative. During all months, long-term average monthly water surface elevations are essentially equivalent under the NEPA Modified Flow Alternative, relative to the NEPA No Action Alternative over the 72-year simulation period (Appendix F4, 7 vs. 5, pg. 1413). Therefore, there would be no change in the existing bathtub ring, under the NEPA Modified Flow Alternative relative to the NEPA No Action Alternative.

Based on the analysis presented above, the range of potential variation in water surface elevations expected to occur under the NEPA Modified Flow Alternative would remain within recent historic drawdown levels, therefore the NEPA Modified Flow Alternative, relative to the NEPA No Action Alternative, would be expected to result in a less than significant impact to the visual character of San Luis Reservoir.

Impact 13.2.9-8: Changes in surface water conditions that could result in adverse impacts to the landscape character and the attractiveness of Class A and B resources

Changes in local study area reservoir water surface elevations and river flows are anticipated to occur with the NEPA Modified Flow Alternative; these changes would not be of sufficient frequency and magnitude to change the character of the landscape and would not detract from the scenic attractiveness. The visual impact would cause minimal effects to Class A or B scenic features of New Bullards Bar Reservoir. The visual character of riparian vegetation along the lower Yuba River corridor would not be affected, and a decrease in flows would cause little affect to Class A or B visual resources.

Within the regional study area, changes in water surface elevations under the NEPA Modified Flow Alternative, relative to the NEPA No Action Alternative, would not change the character of the landscape or scenic attractiveness (Class A or B) of Oroville or San Luis reservoirs. The Sacramento River is generally considered a Class B visual resource. Slight differences in flows would not be sufficient to reduce the character of the riparian corridor along the river. Therefore, because these potential changes in flow are minimal and temporary in nature under the NEPA Modified Flow Alternative, relative to the NEPA No Action Alternative, they would not change the character of the landscape or detract from the overall scenic attractiveness of the Sacramento River.

13.3 CUMULATIVE IMPACTS

Hydrologic modeling was used to evaluate the cumulative effects of the Yuba Accord Alternative and other likely changes in CVP/SWP operations on hydrology and water supply. The proposed projects that have been adequately defined (e.g., in recent project-level environmental documents or CALSIM II modeling) and that have the potential to contribute to cumulative impacts are included in the quantitative assessment of the Yuba Accord's impacts. For analytical purposes of this EIR/EIS, the projects that are considered well defined and "reasonably foreseeable" are described in Chapter 21, Cumulative Impacts. Additionally, the assumptions used to categorize future hydrologic cumulative conditions that are quantitatively simulated using CALSIM II and the post-processing tools are presented in Appendix D. To the extent feasible, potential cumulative impacts on resources dependent on hydrology or water supply (e.g., reservoir surface elevation) are analyzed quantitatively. Because several projects cannot be accurately characterized for hydrologic modeling purposes at this time, either due to the nature of the particular project or because specific operations details are only in the preliminary phases of development, these projects are evaluated qualitatively.

Only those projects that could affect visual resources are included in the qualitative evaluation that is presented in subsequent sections of this chapter. Although most of the proposed projects described in Chapter 21 could have project-specific impacts that will be addressed in future project-specific environmental documentation, future implementation of these projects is not expected to result in cumulative impacts to regional water supply operations, or water-related and water dependent resources that also could be affected by the Proposed Project/Action or an action alternative (see Chapter 21). For this reason, only the limited numbers of projects with the potential to cumulatively impact visual resources in the project study area are specifically considered qualitatively in the cumulative impacts analysis for visual resources. These projects are:

- Water Storage and Conveyance Projects
  - Shasta Lake Water Resources Investigation (Shasta Reservoir Enlargement)
  - Upstream of Delta Off-Stream Storage (Sites Reservoir)
  - In-Delta Storage Program (Delta Wetlands Project)
  - Upper San Joaquin River Basin Storage Investigation
  - Los Vaqueros Reservoir Expansion Project
  - Folsom Dam Raise Project
- Projects Related to Changes in CVP/SWP System Operations
  - Long-Term CVP and SWP Operations Criteria and Plan
  - Delta-Mendota Canal/California Aqueduct Intertie
  - Clifton Court Forebay Intertie
  - Isolated Delta Facility
  - Central Valley Project Long-Term Contract Renewals
  - Sacramento River Water Reliability Study
  - City of Stockton Delta Water Supply Project
- Water Transfer and Acquisition Programs
  - Dry Year Water Purchase Program
  - Sacramento Valley Water Management Program
  - Delta Improvements Package

- Flood Control, Ecosystem Restoration and Fisheries Improvement Projects
  - North Delta Flood Control and Ecosystem Restoration Project
  - CALFED Ecosystem Restoration Program
  - San Joaquin River Restoration Settlement Act (Friant Settlement Legislation)
- Local Projects in the Yuba Region
  - Yuba River Development Project FERC Relicensing

These projects are described in Chapter 21 and qualitatively addressed below.

13.3.1 ENVIRONMENTAL IMPACTS/ENVIRONMENTAL CONSEQUENCES OF THE YUBA ACCORD ALTERNATIVE CUMULATIVE CONDITION COMPARED TO THE EXISTING CONDITION

For CEQA, the purpose of the cumulative analysis is to determine whether the incremental effects of the Proposed Project (Yuba Accord Alternative) would be expected to be "cumulatively considerable" when viewed in connection with the effects of past projects, other current projects, and probable future projects (PRC Section 21083, subdivision (b)(2)).[4]

For NEPA, the scope of an EIS must include "Cumulative actions, which when viewed with other proposed actions have cumulatively significant impacts and should therefore be discussed in the same impact statement (40 CFR Section 1508.25(a)(2)).

Because the CEQ regulations for implementing NEPA and the CEQA guidelines contain very similar requirements for analyzing, and definitions of, cumulative impacts, the discussions of cumulative impacts of the Yuba Accord Alternative Cumulative Condition relative to the Existing Condition will be the basis for evaluation of cumulative impacts for both CEQA and NEPA. In addition, an analysis of the Modified Flow Alternative Cumulative Condition relative to the Existing Condition is provided to fulfill NEPA requirements.

The following sections describe this analysis for the projects discussed in Section 13.3 above.

13.3.1.1 WATER STORAGE AND CONVEYANCE PROJECTS

Construction of new water storage and conveyance facilities may have short-term and/or long-term impacts on visual resources depending on their location and duration of facilities construction. Expansion of existing dam and reservoir facilities would raise water surface elevations at reservoirs and have short-term impacts on visual resources during construction, and would ultimately alter the visual character of the reservoir via the inundation of previously exposed shoreline areas surrounding existing reservoirs. Construction of new pipelines and canals for water conveyance could potentially alter the visual character of the landscape. However, the Yuba Accord Alternative would not contribute to cumulative effects (e.g., new facilities construction) on visual resources because no additional water storage or conveyance projects would be implemented as a part of the project.

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[4] The "*Guide to the California Environmental Quality Act*" (Remy *et al.* 1999) states *that "…although a project may cause an "individually limited" or "individually minor" incremental impact that, by itself, is not significant, the increment may be "cumulatively considerable", and thus significant, when viewed against the backdrop of past, present, and probable future projects."* (CEQA Guidelines, § 15064, subd. (i)(l), 15065, subd. (c), 15355, subd. (b)).

13.3.1.2 PROJECTS RELATED TO CVP/SWP SYSTEM OPERATIONS

Other projects related to CVP/SWP system operations that could contribute to cumulative visual resources impacts in the project study area generally would do so by affecting water surface elevation levels in CVP/SWP reservoirs, river flows in the Feather and Sacramento rivers and Delta inflows. The Yuba Accord Alternative would not contribute to cumulative effects (e.g., greater reductions in reservoir elevation) on the visual character of CVP/SWP reservoirs because water available for transfer would be released from New Bullards Bar Reservoir, which is not a reservoir operated by the CVP or the SWP. To meet increased future demands, several other projects would increase water diversions from the Sacramento River. Depending on the timing and operations of these future projects, reductions in river flow associated with these diversions could be offset by the increases in Yuba River flows that would occur under the Yuba Accord Alternative. However, due to the volume of water flowing through the lower reaches of the Feather and Sacramento rivers, it is not anticipated that the river flow would change to such a level as to cause a cumulatively significant effect on visual resources.

13.3.1.3 WATER TRANSFER AND ACQUISITION PROGRAMS

Other water transfer and acquisition programs (e.g., a long-term EWA Program or a program equivalent to the EWA) could purchase water from the same agency or reservoir, and, thus, could collectively draw down reservoirs further than under the Existing Condition. The additional water sold for other programs could reduce water surface elevations in CVP/SWP reservoirs, which could result in significant cumulative impacts if visual resource impacts were magnified by the effects of multiple projects. The Yuba Accord Alternative would not contribute to a cumulative effect on reservoir-related visual resources because water available for transfer would be released from New Bullards Bar Reservoir, which is not a reservoir operated by the CVP or the SWP. Because other water transfer and acquisition programs would not affect New Bullards Bar Reservoir, there is little potential for visual impacts to compound as a result of the Yuba Accord Alternative.

Groundwater substitution and water transfers from other acquisition programs in the CVP/SWP Upstream of the Delta Region would affect river hydrology (e.g., changing the timing and quantity of water released from reservoirs, and thus altering river flows) in the same rivers (e.g., lower Feather and lower Sacramento) as those that would be affected by the Yuba Accord Alternative. Depending on the timing and operations of other projects, water transfers from other agencies, in combination with the Yuba Accord Alternative, occurring along the Feather and Sacramento rivers could cause a cumulative effect by increasing river flows during transfer periods. However, the cumulative effect is not anticipated to cause a significant impact on visual resources because the river channel can accommodate a large range of flows, and the additional transfer flows would not be so great as to exceed channel capacity. It is not anticipated that the river flow would change to such a level as to cause a cumulatively significant effect on visual resources.

13.3.1.4 FLOOD CONTROL, ECOSYSTEM RESTORATION AND FISHERIES IMPROVEMENT PROJECTS

Flood control, ecosystem restoration and fisheries improvement projects would be targeted to improve aquatic habitat conditions within the project study area. Implementation of other projects, in addition to the Yuba Accord Alternative, could improve instream flow and water temperature conditions, physical habitat availability and ecosystem functions. Improvement of levee systems, channel capacities, and fish and wildlife habitat would not be expected to adversely affect visual resources.

13.3.1.5 LOCAL PROJECTS IN THE YUBA REGION

Proposed license terms and conditions, and PM&Es will be considered during development of the environmental documentation associated with the FERC relicensing process. As part of the process, it is anticipated that FERC would study the existing level of contrast and compatibility of Yuba Project facilities on aesthetic features of the landscape. In addition to developing terms and conditions that would govern Yuba Project operations affecting New Bullards Bar Reservoir and the lower Yuba River, FERC also could make recommendations regarding potential enhancements to preserve or improve visual resources within the Yuba River Basin. It is not anticipated that regulatory requirements resulting from the FERC relicensing process would contribute to potentially significant cumulative adverse impacts on visual resources.

13.3.1.6 OTHER CUMULATIVE VISUAL RESOURCES IMPACT CONSIDERATIONS

The quantitative operations-related impact considerations for the CEQA Yuba Accord Alternative, relative to the CEQA Existing Condition, are discussed in Section 13.2.5. Potential impacts identified in Section 13.2.5 are summarized below and provide an indication of the potential incremental contributions of the Yuba Accord Alternative to cumulative impacts. These potential impacts are summarized here:

- Impact 13.2.5-1: Changes in New Bullards Bar Reservoir monthly mean water surface elevations that could result in adverse impacts to the visual character of the landscape – Less than Significant
- Impact 13.2.5-2: Changes in lower Yuba River monthly mean flows that could result in adverse impacts to the visual character of the landscape – Less than Significant
- Impact 13.2.5-3: Changes in Oroville Reservoir monthly mean water surface elevations that could result in adverse impacts to the visual character of the landscape – Less than Significant
- Impact 13.2.5-4: Changes in Feather River monthly mean flows that could result in adverse impacts to the visual character of the landscape – Less than Significant
- Impact 13.2.5-5: Changes in monthly mean Sacramento River flows that could result in adverse impacts to the visual character of the landscape – Less than Significant
- Impact 13.2.5-6: Changes in monthly mean Delta inflows that could result in adverse impacts to the visual character of the landscape – Less than Significant
- Impact 13.2.5-7: Changes in San Luis Reservoir monthly mean water surface elevations that could result in adverse impacts to the visual character of the landscape – Less than Significant
- Impact 13.2.3-8: Changes in surface water conditions that could result in adverse impacts to the landscape character and the attractiveness of Class A and B resources – Less than Significant

Although these impacts would be less than significant, the potential exists for cumulative impacts nevertheless. Cumulative impact determinations are presented below, and are based upon consideration of the quantified Yuba Accord Alternative impacts relative to the Existing Condition, in combination with the potential impacts of other reasonably foreseeable projects. These cumulative impact determinations are summarized by region.

13.3.1.7 POTENTIAL FOR CUMULATIVE VISUAL RESOURCES IMPACTS WITHIN THE PROJECT STUDY AREA

Results from the quantitative analysis generally indicate that direct project-related visual resources impacts would be less than significant. Nevertheless, the Yuba Accord Alternative still could incrementally contribute to cumulative visual resources impacts within the project study area. The frequency and magnitude of the quantitative hydrologic changes associated with the Yuba Accord Alternative and the other qualitative analytical considerations discussed above both were considered during the development of the overall cumulative impact conclusions discussed below for the Yuba Accord Alternative Cumulative Condition, relative to the Existing Condition.

Impact 13.3.1.7-1: Potential for significant cumulative visual resources impacts within the Yuba Region

Of the projects discussed above, the Yuba Project FERC Relicensing has the potential to affect visual resources in the Yuba Region. While, as part of the relicensing, FERC may impose new regulatory constraints on the Yuba Project, which could affect New Bullards Bar Reservoir operations and YCWA's ability to manage releases into the lower Yuba River, it is not anticipated that FERC's new conditions would significantly affect visual resources. The overall effects on recreation in the Yuba Region, therefore, would be minor, or possibly beneficial, and the impacts of the Yuba Accord Alternative Cumulative Condition, compared to the Existing Condition, on visual resources in the Yuba Region would be less than significant.

Impact 13.3.1.7-2: Potential for significant cumulative visual resources impacts within the CVP/SWP Upstream of the Delta Region

For the reasons discussed above, it is anticipated that the water storage and conveyance facilities, CVP/SWP operations projects, new water transfer and acquisition programs and the new flood control, ecosystem restoration and fisheries improvement projects discussed above would not adversely impact visual resources and, therefore, would not have any cumulative impacts to the CVP/SWP Upstream of the Delta Region. Projects affecting CVP/SWP operations, in addition to the Yuba Accord Alternative, would create changes in the timing and quantity of water released from reservoirs, thus altering river flows. However, the overall effects on visual resources in the CVP/SWP Upstream of the Delta Region would be minor, and the potential cumulative impacts of the Yuba Accord Alternative Cumulative Condition, compared to the Existing Condition, would be less than significant.

Impact 13.3.1.7-3: Potential for significant cumulative visual resources impacts within the Delta Region

For the reasons discussed above, it is anticipated that the water storage and conveyance facilities, CVP/SWP operations projects, new water transfer and acquisition programs and the new flood control, ecosystem restoration and fisheries improvement projects discussed above would not adversely impact visual resources, and therefore would not have any cumulative impacts to the Delta Region. Other projects that would occur in addition to the Yuba Accord Alternative would contribute to changes in the timing and quantity of Delta inflows. However, the overall effects on visual resources in the Delta Region would be minor, and the potential cumulative impacts of the Yuba Accord Alternative Cumulative Condition, compared to the Existing Condition, would be less than significant.

Impact 13.3.1.7-4 Potential for significant cumulative visual resources impacts within the Export Service Area

For the reasons discussed above, it is anticipated that the water storage and conveyance facilities, CVP/SWP operations projects, new water transfer and acquisition programs and the new flood control, ecosystem restoration and fisheries improvement projects discussed above would not adversely impact visual resources, and therefore would not have any cumulative impacts in the Export Service Area (i.e., San Luis Reservoir). Future San Luis Reservoir operations would be expected to cause fluctuations (increases and decreases) in water surface elevations that would be within the range of historical variation currently observed and, thus, these changes would remain within the range of seasonal drawdown levels observed under the Existing Condition. Therefore, the overall effects on the visual character of San Luis Reservoir would be minor, and the potential cumulative impacts of the Yuba Accord Alternative Cumulative Condition, compared to the Existing Condition, would be less than significant.

13.3.2 ENVIRONMENTAL IMPACTS/ENVIRONMENTAL CONSEQUENCES OF THE MODIFIED FLOW ALTERNATIVE CUMULATIVE CONDITION COMPARED TO THE EXISTING CONDITION

It is anticipated that the Modified Flow Alternative Cumulative Condition would have the same potential for cumulative impacts as the Yuba Accord Alternative Cumulative Condition. Therefore, the description of the potential impacts in Section 13.3.1 also serves as the description of cumulative impacts associated with the Modified Flow Alternative. Thus, the Modified Flow Alternative Cumulative Condition would result in the following potential cumulative impacts:

- Yuba Region - Potential cumulative impacts on visual resources in the Yuba Region would be less than significant.
- CVP/SWP Upstream of the Delta Region - Potential cumulative impacts on visual resources in the CVP/SWP Upstream of the Delta Region would be less than significant.
- Delta Region - Potential cumulative impacts on visual resources in the Delta Region would be less than significant.
- Export Service Area - Potential cumulative impacts on visual resources in the Export Service Area (San Luis Reservoir) would be less than significant.

13.4 POTENTIAL CONDITIONS TO SUPPORT APPROVAL OF YCWA'S WATER RIGHTS PETITION

No unreasonable effects to visual resources would occur under the Proposed Project/Action or an action alternative and, thus, no impact avoidance measures or other protective conditions are identified for SWRCB consideration in determining whether or not to approve YCWA's petitions to implement the Yuba Accord.

13.5 MITIGATION MEASURES/ENVIRONMENTAL COMMITMENTS

No adverse effects would occur to visual resources under the Proposed Project/Action or an action alternative and, thus, no mitigation measures are required.

13.6 POTENTIALLY SIGNIFICANT UNAVOIDABLE IMPACTS

There are no potentially significant unavoidable impacts to visual resources associated with the implementation of the Proposed Project/Action or an action alternative.

CHAPTER 14
CULTURAL RESOURCES

Cultural resources defined within the framework of the regulations include archeological sites, historic sites, and traditional cultural properties associated with Native Americans and other cultural groups. Actions that physically disturb a site, alter its setting, or introduce elements out of character with the site may constitute a potential impact. Similarly, if a site is eligible for inclusion in the National Register of Historic Places (NRHP), any type of physical damage results in a permanent loss of information that reduces our understanding of the site's contribution to the past.

Cultural resources are evaluated because the Proposed Project/Action and alternatives considered in this EIR/EIS could alter environmental conditions (e.g., changes in water surface elevation levels) related to exposure or inundation of cultural resources within the project study area.

14.1 ENVIRONMENTAL SETTING/AFFECTED ENVIRONMENT

Information regarding traditional cultural properties, historic properties, and ethnographic resources located in the project study area can be used to characterize the prehistoric, ethnographic, and historic cultural resources that may be affected by the Proposed Project/Action and alternatives. The information provided below is organized by waterbody, and also identifies: (1) the early human and Native American groups that lived in the area; (2) cultural surveys performed at locations of archeological interest; and (3) the number and nature of sites of cultural or historical importance. Because of the ongoing, severe problem of pothunting or vandalism to cultural resources, documents describing site locations are exempt from public review under the California Public Records Act (PRC 6254.10). Therefore, cultural resource descriptions are discussed in general, by region.

14.1.1 YUBA REGION

The Yuba Region includes New Bullards Bar Reservoir, Englebright Reservoir, lower Yuba River downstream to the confluence with the Feather River, and groundwater well locations within Yuba County.

14.1.1.1 NEW BULLARDS BAR RESERVOIR

Investigation of the area around New Bullards Bar Reservoir revealed prehistoric evidence of the Northwestern Maidu settlements and earlier distinct Mesilla and Martis cultural complexes. The east side of New Bullards Bar Reservoir, which experienced a recent fire, was subject to an intense pedestrian survey of cultural resources; inventories of the reservoir's west side are few. The reservoir contains 12 recorded prehistoric sites, two of which also are historic sites. Ten of the sites are inundated. Nine studies comprise the body of literature pertaining to the area within reservoir boundaries (Baldrica 2000; Deal 1980; Meals 1978; Riddell and Olsen 1966).

14.1.1.2 LOWER YUBA RIVER

The Maidu and Nisenan occupied the areas around the Yuba River. The Maidu is the Native American group indigenous to Yuba County. Nisenan villages were generally located along the watercourses in the county with a major political Nisenan site near the mouth of the Yuba

River. Eels and salmon were caught in immense quantities in the larger watercourses and the Nisenan were able to transform huge seasonal surpluses of salmon into a reliable year-round staple by drying the fish and pounding it into a meal that could be preserved for at least a year. Traditional cultural practices of both the Maidu and Nisenan include weaving baskets and tule mats.

14.1.1.3 NORTH YUBA AND SOUTH YUBA SUBBASINS

The groundwater wells in Yuba County would be utilized under the conjunctive use component of the Yuba Accord Alternative. Under this program, groundwater pumping would remain within the safe yield of the groundwater aquifer to safeguard local agricultural, domestic, and municipal wells (see Chapter 6 for a description of groundwater operations).

14.1.1.4 YUBA COUNTY

PREHISTORY/ARCHEOLOGY

Most of what is presently known about the human prehistory of the valley portions of Yuba County is inferred form archaeological excavations of shell mounds in the Central Valley, Delta and San Francisco Bay regions. These excavations indicate what appears to be three distinct cultural periods, known to archaeologists as the Early, Middle, and Late horizons, spanning approximately the last 4,500 years (Beardsley 1948; Moratto 1984). It is likely that permanent year-round occupation of the valley floor in Yuba County began no earlier than in the Early horizon. The prehistory of the valley, foothill, and mountain regions of Yuba County culminated in the Nisenan Indian culture (County of Yuba 1994)

ETHNOHISTORY

The Indians who claimed most of what is now Yuba County were the Nisenan or Southern Maidu. The northeastern tip of Yuba County may have been occupied or claimed by either the Nisenan or Northeastern Maidu. They spoke a Maiduan language. Valley and hill Nisenan groups were culturally, linguistically, and presumably ethnically related, but these groups were more likely to have close relationships with peoples in their geographic surroundings. Valley Nisenan villages were generally distributed along the margins of primary watercourses and the valley-dwelling Nisenan were heavily dependent on fish and acorns for substance. Hill and mountain Nisenan villages were located on ridges adjacent to streams or on flats along the rivers. The hill Nisenan probably depended relatively less on fishing and more on hunting than their valley counterparts (Wilson and Towne 1978).

EURO-AMERICAN HISTORY

Spanish explorers were the first Europeans to visit Yuba County. White settlement of the area around Marysville began around 1841, when John Sutter established a huge domain consisting of Mexican land grants that included much of what is now Yuba County. John C. Fremont's famous expedition explored Yuba County in 1846 (Hoover *et al.* 1990). Yuba County was among the 27 original California counties established in 1850. The town of Marysville was laid out in 1850 and soon became the head of navigation on the Feather River and an important commercial center for the northern mines, resulting in phenomenal growth. The City of Wheatland also arose from a Mexican land grant, starting in 1844. In 1849, the United States government established Camp Far West about four miles east of Wheatland, however, the post was abandoned in 1852 and is now under the waters of the Camp Far West Reservoir (Hoover *et al*. 1990).

Many of the small rural communities of Yuba County, including Smartsville, Dobbins, Brownsville, Browns Valley, and Camptonville, had their beginnings as gold mining camps. It is believed by some historians that Jonas Spect was the first person to find gold in Yuba County in June 1848 at a place later called Rose's Bar on the Yuba River.

EXISTING CULTURAL RESOURCES

There are eight historical properties on the NRHP in Yuba County and eight additional sites have been determined eligible for the NRHP. Seven California Historical Landmarks exist in Yuba County and 12 properties have been determined to be California Points of Interest. There are 237 place names in Yuba County associated with gold mining (Gudde and Gudde 1975). County maps were commissioned in 1851, 1852 and 1854 and Camp Far West at Johnson's Rancho near Wheatland was the end of the California branch of the Oregon-California Trail that went through Donner Pass. There are 25 Yuba County sites that appear in the California Inventory of Historic Resources and seven gold districts including, Camptonville, Browns Valley, Brownsville, Dobbins, Hammonton, Smartville, and Wheatland, have been recognized in Yuba County (Clark 1970). Portions of the county that lie within these gold districts have high sensitivity with respect to historical resources.

14.1.2 CVP/SWP UPSTREAM OF THE DELTA REGION

The CVP/SWP Upstream of the Delta Region includes the Feather River Basin (i.e., Oroville Reservoir and associated facilities, and the lower Feather River from the Oroville facilities downstream to the confluence with the Sacramento River) and the Sacramento River Basin (i.e., Shasta Reservoir and the Sacramento River from Shasta Reservoir downstream to the Delta) and.

14.1.2.1 FEATHER RIVER BASIN

OROVILLE RESERVOIR

All of the prehistoric archaeological periods are represented at Oroville Reservoir, including the ethnographic settlement pattern of the village community and the period of historic contact with Euro-American settlers (Kroeber 1925; Riddell 1978). Several archaeological studies have been conducted in the area. Hines (1987) conducted an archaeological analysis and concluded that there were 196 sites, with 127 seasonally exposed during low pool elevations or completely above the inundation zone (i.e., 78 sites in the fluctuation zone between elevation 640 and 900 feet msl and 49 sites above the high pool elevation). Including surveys conducted since then, a revised total of 173 sites are now completely or periodically accessible (DWR 2001). Site types include lithic scatters, quarries and toolstone source locales, caves and rockshelters, seasonal camps, large village settlements and burial grounds. Associated elements include milling features, structural remains and rock art. The Oroville Reservoir area also has significant historic record. With the discovery of gold in 1849, thousands of gold seekers poured into the hills around Oroville and many foothill mining towns were established. These towns were short-lived and later deserted when the gold was depleted and the effort moved to river dredging at lower elevations. Remains of several of these towns were inundated by the reservoir.

Several historic properties associated with Oroville Reservoir have qualified for local, state, and federal recognition. Notable historic objects include the Bidwell Bar Bridge, Old Toll House, and Mother Orange Tree. However, no historic properties at Oroville Reservoir have been determined eligible or are listed on the NRHP (DWR 2001).

LOWER FEATHER RIVER

Prehistory/Archaeology

Evidence of the early human occupation along the headwaters of the Feather River dates from 2000 B.C. or earlier to 500 A.D. (Jensen and Reed 1979). Much of the pre-recorded history in the area is due to the intensive archaeological investigations that were conducted along the Feather River in association with the construction of Oroville Dam. The cultural resource sequence is divided into four phases that span 1000 B.C. to 1850 A.D.: Mesila, Bidwell, Sweetwater, and Oroville (DWR 2001).

Ethnohistory

Evidence indicates that the Wintun and Maidu people inhabited the Feather River region for thousands of years. The southernmost Maidu called themselves the Nisenan people, and occupied the lower drainages of the Feather River.

The Maidu occupied areas near the Feather River headwaters, and the Nisenan lived in the downstream areas south of the Middle Fork Feather River. Traditional cultural practices of the Maidu and Nisenan include weaving baskets and tule mats. Maidu and Nisenan would coil peeled willow and peeled and unpeeled redbud in a clockwise manner to form baskets. Baskets were made to hold water by overlaying hazel shoots, pine roots, and maidenhair fern shoots and covering with pitch (Swartz 1958). Maidu also wove tule mats that they used for seats, beds, camp roofing, and doors (Kroeber 1925).

Euro-American History

The Euro-American colonization of the areas around the Feather River was similar to that which is described for the Sacramento River Basin (see 14.1.2.2).

Existing Cultural Resources

Historic landmarks in the Feather River watershed include gold mining sites of Dogtown, Nugget, and Oregon City, along with the original propagation site of the Thompson seedless grape. In the lower Feather River area, archaeological sites indicate intensive occupation over a long time period; deep, stratified, multi-component midden deposits denote village settlements, with associated cemeteries, structural depressions, and milling stations. The Table Mountain Boulevard Bridge is the only resource in the lower Feather River area listed in the NRHP. Additionally, 20 sites that have been recorded are still thought to exist in the lower Feather River area (DWR 2001).

14.1.2.2 *Sacramento River Basin*

Sacramento River

Prehistory/Archaeology

Archaeological evidence of human occupation in the Sacramento Valley and nearby areas extends back several thousand years. Tribal oral histories would place Native American occupation back to "time immemorial." In the span between about 10,000 B.C. and A.D. 1774, prehistoric societies occupying the greater Sacramento Valley and surrounding areas underwent a series of slow but important changes in subsistence and economic orientation, population densities and distribution, and social organization. The evidence for these changes is found within the known archaeological record. Several models of prehistoric culture history are available for the region and are summarized by (Moratto 1984).

Ethnohistory

Native Americans initiated California's rich cultural heritage many generations before Europeans settled in the area. A third of all Native Americans within current United States boundaries lived in California. The Sacramento Valley includes a broad geographic area that encompassed a great deal of environmental and cultural diversity in prehistoric times and during the contact period when Native Americans encountered Spanish and Euro-American explorers and settlers. Native American tribes that occupied the areas around the Sacramento River at the time of contact included the Wintu, Yana, Nomlaki, and Patwin.

The Wintu territory covered parts of what is now Trinity, Shasta, Siskiyou, and Tehama counties, including the area north of Cottonwood Creek and extending from Cow Creek on the east to the South Fork of the Trinity on the west (Access Genealogy Website 2007). The Yana extended from Pit River to Rock Creek, and from the edge of the upper Sacramento Valley to the headwaters of the eastern tributaries of Sacramento River (Access Genealogy Website 2007). The Nomlaki consisted of two groups. The River Nomlaki lived in the Sacramento River Valley in present Tehama County, south of Cottonwood Creek, while the Hill Nomlaki lived in the foothills to the west, extending to the summit of the Coast Range in what is now Tehama and Glenn counties (Wikipedia Website 2007b). The Patwin were a southern branch of the Wintu group and native inhabitants of Northern California who occupied what is now Suisun, Vacaville, and Putah Creek (Wikipedia Website 2007a).

The climate and topography north of the Delta area supports a variety of forest, grassland, savannah, riparian, and wetland habitats. Native American groups that occupied the Sacramento River drainage survived on non-domesticated plants and animals that provided food and material for baskets, houses, and clothing. For generations, Native Americans created baskets from willows, sedge root, bulrush root and new shoots of the western redbud. Some modern Native Americans maintain their culture by gathering vegetation and wildlife formerly used by their ancestors and performing traditional ceremonies. USFS policy encourages, protects, and perpetuates traditional tribal practices by reserving areas on USFS lands for gathering basketry materials and practicing cultural traditions.

Euro-American History

Many areas in the northern Sacramento Valley saw the first major wave of Euro-American colonization following the Gold Rush. By the time the local Indians had been forcibly taken to reservations, many small towns and settlements had already been established. Copper replaced gold as the main mineral produced in Shasta County in 1897. Smoke and fumes from Shasta County smelters killed vegetation, fish, and fruit trees as far south as Anderson and Cottonwood. All the smelters were closed by court order by 1919.

Through the late 19th and 20th centuries, the spread of riverboat and ferry transportation and later railroad and highway transportation infrastructure increased access to more distant markets. The northern end of the Sacramento Valley developed a growing population sustained by a mix of mineral and timber extraction industries and farm and ranch operations. Large-scale irrigation was made possible in the mid-20th century by completion of Shasta Dam and other large water reservoirs and aqueduct projects.

Following the Gold Rush, Euro-American colonists developed the rich farmland in the central region and made use of its abundant water. After the Gold Rush, many disappointed miners became permanent settlers who raised cattle, sheep, wheat, and barley. Initially, the location of towns and settlements was influenced by access to water and water transportation routes. Emphasis shifted from livestock grazing to growing grain and orchard crops in the late 19th century.

The railroad progressed northward in the 1870s, carrying new settlers to the area and enabling such towns as Arbuckle, Williams, Maxwell, Willows, and Orland to be established. Large-scale, diversified farming was introduced as new lands were irrigated and brought into production and as shipment of local products to domestic and international markets increased as a result of the improved railroad and highway transportation system.

Existing Cultural Resources

Many prehistoric and/or ethnographic sites were recorded along the banks of the lower Sacramento River in 1934 by R.F. Heizer, who described them as burial mounds which had been partially or completely leveled for agriculture or other development (Heizer 1934). Many of these were built on or adjacent to the natural levees, and over time have been severely affected by river erosion and levee construction (Corps 1990). Excavations at a few of these mounds have shown them to contain human burials, grave offerings, and occupational debris, some of which are at least 2,000 years old (City of Sacramento 1994; Corps 1990; Olsen and Riddel 1963). These sites, wherever they may survive, are extremely important. To date, the most complete field inventory of the lower Sacramento River has been done by Far Western Anthropological Research Group, Inc. (Corps 1990) who surveyed and augered the toe of the levees between the Natomas Cross Canal and the town of Freeport. Two segments of the levee at the confluence have been recorded as historical features and one has been determined eligible for inclusion in the NRHP (Nilsson *et al.* 1995).

One historic feature adjacent to the river, the Walnut Grove Branch Line Railroad, is considered significant and eligible for inclusion on the NRHP (Corps 1991). There also is the potential for other important historic resources along the river, where many landings, ferries, small settlements, and private homes/ranches are known to have been established between the 1850s and the 1930s (Corps 1990). However, this survey did not detect the remains of any of these resources. The banks of the lower Sacramento River are considered highly sensitive for archaeological and historical resources.

14.1.3 DELTA REGION

The Delta is one of the most intensely investigated areas of California because of its high prehistoric population density and proximity to population centers. Although the bulk of cultural sites were recorded prior to 1960, there has been little systematic inventory for cultural resources. Most of the early archeological work in the region focuses on prominent prehistoric mounds. Documentation of historic sites has largely occurred within the last 20 to 30 years. At least 171 sites within the Delta Region have been listed in the NRHP as individual properties or districts. Six sites in the region also have been listed as California Historical Landmarks and four are listed as California Points of Historical Interest (CALFED 1998). Prehistoric site types include village sites, temporary campsites, milling-related activity sites, and lithic scatters. Potential historic resources in the Delta Region are largely related to agriculture. However, other types are present including farmsteads, labor camps, landings for the shipment of agricultural produce, canneries, pumping stations, siphons, canals, drains, unpaved roads, bridges, and ferry crossings. Forty known historic sites coincide with prehistoric sites (CALFED 1998).

Several Native American burial and cremation sites have been discovered in the Delta Region. Native Americans in the Delta at the time of European contact were the Northern Valley Yokuts who were settled along the San Joaquin River. Plains Miwok people lived primarily in the north with territory extending nearly to Sacramento (DWR and Reclamation 1996). Wintun and Nisenan occupied areas on the north and northeastern Delta. Those in the south Delta proper were the Chulamni or Nochochomne.

14.1.4 REGULATORY SETTING

Preserving the culture and history of our nation's past are the goals of regulations that include the American Antiquities Act of 1906, Historic Sites Act of 1935, National Historic Preservation Act (NHPA) of 1966, NEPA, Archaeological and Historic Preservation Act of 1974, American Indian Religious Freedom Act, Archeological Resource Protection Act of 1979, President's April 29, 1994 Memorandum, and Executive Order 13007. Similar state regulations protect archeological, paleontological, and historical sites and specifically provide for identification and protection of traditional Native American gathering and ceremonial sites on state lands. These organizations and individuals are integral in identifying issues related to historic properties that may be affected by the Proposed Project/Action or alternatives.

14.1.4.1 FEDERAL

AMERICAN ANTIQUITIES ACT OF 1906

The American Antiquities Act of 1906 (34 Stat. 225) authorizes the President of the United States to designate objects or areas of historic or scientific interest on lands owned or controlled by the United States as National Monuments. The act requires that a permit be obtained for examination of ruins, excavation of archaeological sites, and the gathering of objects of antiquity on lands under the jurisdiction of the Secretaries of Interior, Agriculture, and Army, and provided penalties for violations.

HISTORIC SITES ACT OF 1935

The Historic Sites Act of 1935 (49 Stat. 666), as amended by PL 89-249 in 1965 (79 Stat. 971) declares it a national policy to preserve historic sites and objects of national significance, including those located on refuges. The Act provides procedures for the designation, acquisition, administration, and protection of such sites. Among other things, National Historic and Natural Landmarks are designated under authority of this Act. As of 1989, 31 national wildlife refuges contained such sites.

NATIONAL HISTORIC PRESERVATION ACT

The NHPA of 1966, as amended, is the principal legislation that guides cultural resource management for federal agencies. Section 106 of the NHPA requires that federal agencies take into account the effects of an undertaking on historic properties listed or eligible for listing on the NRHP. The Section 106 review process is described in 36 CFR 800. The five steps in this process include: (1) initiation of the Section 106 process by identifying interested parties and an area of potential effect (APE); (2) identification and evaluation of historic properties within the APE; (3) assessment of the effects of the undertaking on historic properties within the APE; (4) preparation of an agreement document to address any identified adverse effects on historic properties within the APE; and (5) receipt from the Advisory Council on Historic Preservation (ACHP) of comments on the agreement or results of consultation. The Section 106 process requires consultation though each phase with the State Historic Preservation Officer (SHPO), Indian tribes, and interested parties.

NATIONAL ENVIRONMENTAL POLICY ACT

NEPA declares that it is the policy of the federal government to preserve important historical and cultural properties that represent our national heritage. NEPA requires consideration of adverse impacts to resources in the planning process for federal projects or privately initiated undertaking on federal lands or that require federal licensing, permits, or funding.

ARCHAEOLOGICAL AND HISTORIC PRESERVATION ACT OF 1974

PL 86-523, approved June 27, 1960, (74 Stat. 220) as amended by PL 93-291, approved May 24, 1974, (88 Stat. 174) to carry out the policy established by the Historic Sites Act of 1935, directs federal agencies to notify the Secretary of the Interior whenever they find a federal or federally assisted, licensed or permitted project may cause loss or destruction of significant scientific, prehistoric or archaeological data. The act authorizes use of appropriated, donated, or transferred funds for the recovery, protection and preservation of such data.

AMERICAN INDIAN RELIGIOUS FREEDOM ACT

This act became law on August 11, 1978 (PL 95-341, 42 U.S.C. 1996 and 1996a, as amended) and establishes a policy for the United States to protect and preserve American Indians inherent right of freedom to believe, express, and exercise the traditional religions of the American Indian, Eskimo, Aleut, and Native Hawaiians, including but not limited to, access to sites, use and possession of sacred objects, and the freedom to worship through ceremonials and traditional rites. The act also authorizes the President to direct the various federal departments, agencies, and other instrumentalities responsible for administering relevant laws, to evaluate their policies and procedures in consultation with Native American traditional religious leaders to determine appropriate changes necessary to protect and preserve Native American religious cultural rights and practices.

ARCHEOLOGICAL RESOURCE PROTECTION ACT OF 1979

PL 96-95, approved October 31, 1979, (93 Stat. 721) largely supplanted the resource protection provisions of the American Antiquities Act of 1906 for archaeological items. This act establishes detailed requirements for issuance of permits for any excavation for or removal of archaeological resources from federal or Indian lands. It also establishes civil and criminal penalties for the unauthorized excavation, removal, or damage of any such resources; for any trafficking in such resources removed from federal or Indian lands in violation of any provision of federal law; and for interstate and foreign commerce in such resources acquired, transported or received in violation of any state or local law.

PRESIDENT'S APRIL 29, 1994 MEMORANDUM – ENGAGEMENT OF FEDERALLY RECOGNIZED TRIBAL GOVERNMENTS IN THE PLANNING AND DEVELOPMENT OF PROJECTS

On April 29, 1994, President Clinton signed a memorandum outlining the principles that executive departments and agencies, including every component bureau and office, are to follow in their interactions with Native American tribal governments. The memorandum states that to ensure that the rights of sovereign tribal governments are fully respected, executive branch activities are to be guided by the following: (1) the head of each executive department and agency shall be responsible for ensuring that the department or agency operates within a government-to-government relationship with federally recognized tribal governments; (2) each executive department and agency shall consult, to the greatest extent practical and to the extent permitted by law, with tribal governments prior to taking actions that affect federally recognized tribal governments; (3) all such consultations are to be open and candid so that all interested parties may evaluate for themselves the potential impact of relevant proposals; (4) each executive department and agency shall assess the impact of federal government plans, projects, programs, and activities on tribal trust resources and assure that tribal government rights and concerns are considered during the development of such plans, projects, programs, and activities; (5) each executive department and agency shall take appropriate steps to remove any procedural impediments to working directly and effectively with tribal government rights of the tribes; and (6) each executive department and agency shall work cooperatively with other federal departments and agencies to enlist their interest and support in cooperative efforts, where appropriate, to accomplish the goals of the memorandum.

EXECUTIVE ORDER 13007 – INDIAN SACRED SITES

Executive Order 13007, signed by President Clinton on May 24, 1996, mandates that each executive branch agency with statutory or administrative responsibility for the management of federal lands shall, to the extent practical, permitted by law, and not clearly inconsistent with essential agency functions: (1) accommodate access to, and ceremonial use of, Indian sacred sites by Indian religious practitioners; and (2) avoid adversely affecting the physical integrity of such sacred sites. Where appropriate, agencies shall maintain the confidentiality of sacred sites.

14.1.4.2 STATE

TITLE 14 CALIFORNIA CODE OF REGULATIONS, SECTION 15064.5 AND SECTION 15126.4 (B)

Under Title 14 of the CCR, CEQA requires that public or private projects financed or approved by public agencies be assessed to determine the effects of the project on historical resources. The CEQA statues define historical resources to include the following: (1) the resource is listed in or determined eligible for listing in the California Register of Historic Resources (CRHR); (2) the resource is included in a local register of historical resources, as defined in Section 5020.1(k) of the Public Resources Code, or is identified as significant in a historical resources survey meeting the requirements of Section 5024.1(g) of the Public Resources Code, unless the preponderance of evidence demonstrates that it is not historically or culturally significant; or (3) the lead agency determines the resource to be significant, as supported by substantial evidence in light of the whole record (Title 14 CCR 15064.5[a]).

Generally, a resource shall be considered by the lead agency to be "historically significant" if the resource meets the criteria for listing on the CRHR. CEQA statutes also state that if implementation of a project would result in significant effects on historical resources, alternative plans or mitigation measures must be considered (Title 14 CCR 15126.4 (b)).

STATE HISTORIC PRESERVATION OFFICE COORDINATION

Cultural resources in California are regulated by the SHPO, which was established by the NHPA of 1966. This office is responsible for administering preservation programs established by state and federal law, including the NHPA, the Archeological and Historic Preservation Act (PL 93-291), the American Indian Religious Freedom Act (PL 96-34), and the Archeological Resources Protection Act (PL 96-95). Under Section 106 of the NHPA and CEQA, the SHPO, in conjunction with state and federal agencies, identifies resources that may be eligible for inclusion in the NRHP. If a project may affect a historic site, the SHPO must review the project impacts to that site and the proposed mitigation measures to reduce the significance of the impact. During this process, SHPO's Native American Coordinator ensures that Native American concerns for archeological sites and other cultural properties are also considered.

14.1.4.3 LOCAL

The Land Use Element of the Yuba County General Plan (County of Yuba 1996) is a collection of long-range objectives, policies and proposals concerning the physical, economic and social development of the county. The primary purpose of the Land Use Element is to promote a balanced and functional mix of land uses. The Land Use Element contains numerous goals to promote a balanced and functional mix of land uses, including those associated with new development. The goal is to ensure that new development is planned and occurs in a manner which will minimize grading, vegetation disturbance, intrusion on natural water courses, and encroachment onto archaeological, historic, or rare and endangered species sites. To implement this goal, significant natural, open space, and cultural resources shall be identified in advance of development and incorporated into site-specific project design, specific and community plans. The planning department will require that the necessary technical studies are conducted in advance of new development project approval to assure that unique features are identified and reflected in the project design and plans.

14.2 ENVIRONMENTAL IMPACTS/ENVIRONMENTAL CONSEQUENCES

The Proposed Yuba Accord includes ground-disturbing activities related to groundwater well pump conversions that could disturb cultural resources. Actions that physically disturb a cultural resource, alter its setting, or introduce elements out of character with the property might constitute an adverse impact. Potentially significant adverse impacts also occur indirectly through alteration of the character of the site setting and introduction of visual, audible, or atmospheric elements that change the character of a site or its setting, which might affect the eligibility of the site for inclusion in the NRHP or the CRHR. The groundwater well pump conversion may result in ground-disturbing activities that could result in alteration of the character of a site setting.

River flow fluctuations associated with deliveries to water diverters and changes in instream flow requirements could result in increased inundation of previously exposed areas or exposure of previously inundated lands. Changes in reservoir operations associated with water deliveries, carry-over storage, and refill criteria could increase or lower reservoir levels within the water level fluctuation zone, which could increase exposure of cultural resources to cycles of inundation and drawdown, potentially eroding the value and character of the historical resource. Cultural resources previously untouched by water could be inundated if the reservoir's water surface elevation rises above the maximum water elevation under the basis of comparison. Conversely, a water surface elevation below the reservoir's minimum level could expose cultural resources that were previously submerged. Additionally, and perhaps more significantly, if the Proposed Project/Action and alternatives result in a shift in the zone of fluctuation, cultural resources located within the zone also could be potentially affected through increased exposure to erosion, hydrologic sorting caused by wave action, and breakdown of organic matter through repeated wetting and drying. Any changes in water levels caused by increased diversions or other changes have the potential to impact important or unevaluated cultural resources within a particular reservoir basin. It is also the case; however, that many of the cultural deposits in the upper part of a reservoir have been scoured down to bare granite sand and bedrock. Studies of reservoir impacts to cultural sites have shown that the greatest impacts are from wave action, which erodes the deposit and moves artifacts, and from cycles of inundation and drawdown, which also cause erosion and movement, in addition to repeated wetting and drying of the deposit (DWR and Reclamation 1996; Foster *et al.* 1977; Foster and Bingham 1978; Henn and Sundahl 1986; Lenihan *et al.* 1981; Stoddard and Fredrickson 1978). The same studies suggest that sites that lie permanently submerged (e.g., within the deep pool of a reservoir), suffer much less damage than those within the drawdown zone. For sites that are already submerged, continued submergence does not constitute an effect. However, inundation to sites that lie above the present waterline (and that have not been subject to inundation before) potentially would be an adverse effect.

14.2.1 IMPACT ASSESSMENT METHODOLOGY

14.2.1.1 ANALYTICAL APPROACH FOR EVALUATING CULTURAL RESOURCES

Cultural resources are those sites, artifacts, and features associated with the prehistoric and historic past. *Sites* are those locations where discernible changes to the natural environment have occurred as a result of human activity or occupation. *Artifacts* are those objects manufactured, used or altered by humans. Common examples include tools, utensils, art, food remains, and other products of human activity (Clark 1970). *Features* include structures, cemeteries, fences, roads, dams, and other works of humans that are not sites of general human activity or occupation, but rather isolated objects that generally represent a single or specialized human activity. Features exist both alone or on a site. For example, within a prehistoric village *site*, archaeologists often refer to fire hearths as cultural *features*. Historical landmarks are sites, buildings, features, or events of statewide significance that have anthropological, cultural, military, political, architectural, economic, scientific, or technical, religious, experimental, or other value (Office of Historic Preservation Website 2007).

Actions that physically disturb a historic property, alter its setting, or introduce elements out of character with the property might constitute an adverse impact. The cultural resource impact assessment relies on the type of site, the type of impact, and the extent of the disturbance on historic properties or unique archeological resources. Potentially significant adverse impacts also occur indirectly through alteration of the character of the site setting and introduction of visual, audible, or atmospheric elements that change the character of a site or its setting, which might affect the eligibility of the site for inclusion in the NRHP or the CRHR. The Proposed Project/Action and alternatives were reviewed for their potential to cause these types of impacts.

More specifically, to evaluate potential impacts to cultural resources in and around project area reservoirs, a comparison was made between the Proposed Project/Action and alternatives and the basis of comparison to determine the changes in maximum, minimum, and average end-of-month water surface elevation fluctuations, and annual frequency of water level fluctuations. To estimate the magnitude and frequency of bank exposure and bank inundation along the rivers, a comparison was made between the Proposed Project/Action and alternatives and the basis of comparison to determine changes in the minimum and maximum monthly mean flows. Fluctuations in river flows could result in increased inundation of previously exposed areas or exposure of previously inundated lands. A qualitative analysis was utilized to determine the potential effects to the cultural resource sites associated with the groundwater wells. These impact indicators were then compared to established criteria to identify the significance of the potential impact.

14.2.2 Impact Indicators and Significance Criteria for Cultural Resources

Indicators of potential impacts were developed by evaluating the project scope, site conditions, and impact issues identified by the public. Applicable laws, ordinances, regulations, and standards and CEQA statutes also were consulted. Significance criteria were developed from the indicators to measure the impacts expected to occur as a result of implementing the Proposed Project/Action or an alternative.

CEQA requires that important cultural resources be protected. In addition to CEQA compliance, any project that involves federal undertakings, lands, funds, or permits must comply with Section 106 of the NHPA. State Historic Landmarks, and any cultural resource that has been determined eligible to the National Register, automatically qualify for the State Register. Where a cultural resource has not been evaluated for its importance, it is treated as potentially important until an evaluation can be done.

The impact indicators and significance criteria used in the evaluation of potential effects on cultural resources are presented in **Table 14-1.**

Table 14-1. Impact Indicators and Significance Criteria for Cultural Resources

Impact Indicator	Significance Criteria
Maximum, minimum and average end-of-month water surface elevation fluctuations and annual frequency of water level fluctuations for New Bullards Bar and Oroville reservoirs.	Substantial elevation or lowering water level fluctuation zone, relative to the basis of comparison, which would result in increased inundation of previously exposed areas or exposure of previously inundated lands, of sufficient frequency to adversely affect sensitive cultural resources, for any given month of the year over the 72-year simulation period.
Maximum and minimum monthly mean river flows in the lower Yuba, lower Feather, and Sacramento rivers.	Substantial increase in maximum monthly mean river flows or decrease in minimum monthly mean river flows, relative to the basis of comparison, which would result in increased inundation of previously exposed areas or exposure of previously inundated lands, of sufficient frequency to adversely affect sensitive cultural resources, for any given month of the year over the 72-year simulation period.
Character of a site or its setting and associated eligibility of the site for inclusion in the NRHP.	Alteration of the character of the site setting and introduction of visual, audible, or atmospheric elements that change the character of the site or its setting, which might affect the eligibility of the site for inclusion in the NRHP.

As discussed in Chapter 4, CEQA and NEPA have different legal and regulatory standards that require slightly different assumptions in the modeling runs used to compare the Proposed Project/Action and alternatives to the appropriate CEQA and NEPA bases of comparison in the impact assessments. Although only one project (the Yuba Accord Alternative) and one action alternative (the Modified Flow Alternative) are evaluated in this EIR/EIS, it is necessary to use separate NEPA and CEQA modeling scenarios for the Proposed Project/Action, alternatives and bases of comparisons to make the appropriate comparisons. As a result, the scenarios compared in the impact assessments below have either a "CEQA" or a "NEPA" prefix before the name of the alternative being evaluated. A detailed discussion of the different assumptions used for the CEQA and NEPA scenarios is included in Appendix D, Modeling Technical Memorandum.

As also discussed in Chapter 4, while the CEQA and NEPA analyses in this EIR/EIS refer to "potentially significant," "less than significant," "no" and "beneficial" impacts, the first two comparisons (CEQA Yuba Accord Alternative compared to the CEQA No Project Alternative and CEQA Modified Flow Alternative compared to the CEQA No Project Alternative) presented below instead refer to whether or not the proposed change would "unreasonably affect" the evaluated parameter. This is because these first two comparisons are made to determine whether the action alternative would satisfy the requirement of Water Code Section 1736 that the proposed change associated with the action alternative *"would not unreasonably affect fish, wildlife, or other instream beneficial uses."*

14.2.3 ENVIRONMENTAL IMPACTS/ENVIRONMENTAL CONSEQUENCES OF THE CEQA YUBA ACCORD ALTERNATIVE COMPARED TO THE CEQA NO PROJECT ALTERNATIVE

Impact 14.2.3-1: Changes in New Bullards Bar Reservoir water surface elevations that could result in adverse impacts to sensitive cultural resources

The CEQA Yuba Accord Alternative would not affect cultural resources because it would not result in substantial departures from the range of water surface elevations maintained under recent historical operating rules for water levels in New Bullards Bar Reservoir. The reservoir's long-term average monthly water surface elevations range from a minimum of 1,865 feet msl in November to a maximum of 1,934 feet msl in May under the CEQA No Project Alternative over the 72-year simulation period. Under the CEQA Yuba Accord Alternative, long-term average water surface elevations range from a minimum of 1,851 feet msl in November to a maximum of 1,933 feet msl in May. The lowest average monthly water surface elevation under the CEQA Yuba Accord Alternative is 1,798 feet msl and occurs in September of critical water year types. This elevation is approximately 10 feet msl lower than the lowest water surface elevation that occurs under the CEQA No Project Alternative during critical water years (Appendix F4, 3 vs. 2, pg. 50). However, these decreases in monthly water surface elevations are within the range of recent historical average monthly maximum and minimum elevations observed in New Bullards Bar Reservoir. Therefore, it is unlikely that the CEQA Yuba Accord Alternative would expose any previously inundated lands which would substantially impact cultural resources associated with New Bullards Bar Reservoir relative to the CEQA No Project Alternative.

Therefore, based on this analysis, changes in New Bullards Bar Reservoir water surface elevations in under the CEQA Yuba Accord Alternative, relative to the CEQA No Project Alternative, would not unreasonably affect cultural resources.

Impact 14.2.3-2: Alteration of the character of the New Bullards Bar Reservoir site setting that could affect eligibility for site inclusion in the NRHP

The CEQA Yuba Accord Alternative would not involve any activities that would introduce visual, audible, or atmospheric elements that change the character of the New Bullards Bar Reservoir site or its setting, and therefore, would not unreasonably affect the eligibility of the site for inclusion in the NRHP.

Impact 14.2.3-3: Changes in lower Yuba River monthly mean flows that could result in adverse impacts to sensitive cultural resources

Over the 72-year simulation period, the maximum long-term average flows at Marysville would occur during February under both the CEQA Yuba Accord Alternative and the CEQA No Project Alternative. During February, long-term average flows under the CEQA Yuba Accord Alternative would be approximately 3 percent higher than the CEQA No Project Alternative. Conversely, the minimum long-term average flows would occur in October under the CEQA Yuba Accord Alternative and the CEQA No Project Alternative. During October, long-term average flows under the CEQA Yuba Accord Alternative would be approximately 13 percent higher than the CEQA No Project Alternative (Appendix F4, 3 vs. 2, pg. 272). These changes in flow would be within the range of maximum and minimum flows that generally occur in the lower Yuba River under the CEQA No Project Alternative, and therefore are unlikely to result in an increased inundation of previously exposed areas or exposure of previously inundated lands to adversely impact sensitive cultural resources. Therefore, changes in lower Yuba River flows under the CEQA Yuba Accord Alternative, relative to the CEQA No Project Alternative, would not unreasonably affect cultural resources.

Impact 14.2.3-4: Alteration of the character of the lower Yuba River site setting that could affect eligibility for site inclusion in the NRHP

The CEQA Yuba Accord Alternative would not involve any activities that would introduce visual, audible, or atmospheric elements that change the character of the lower Yuba River site or its setting, and therefore, would not unreasonably affect the eligibility of the site for inclusion in the NRHP.

Impact 14.2.3-5: Changes in Oroville Reservoir monthly mean water surface elevations that could result in adverse impacts to sensitive cultural resources

Long-term average water surface elevations are essentially equivalent under the Yuba Accord and CEQA No Project Alternatives over the 72-year simulation period (Appendix F4, 3 vs. 2, pg. 455). Based on this analysis, the CEQA Yuba Accord Alternative would not affect cultural resources because it would not result in significant departures from the range of water surface elevations in Oroville Reservoir relative to the CEQA No Project Alternative.

Based on this analysis, changes in Oroville Reservoir water surface elevations under the CEQA Yuba Accord Alternative, relative to the CEQA No Project Alternative would not unreasonably affect cultural resources.

Impact 14.2.3-6: Alteration of the character of the Oroville Reservoir site setting that could affect eligibility for site inclusion in the NRHP

The CEQA Yuba Accord Alternative would not involve any activities that would introduce visual, audible, or atmospheric elements that change the character of the Oroville Reservoir site or its setting, and therefore, would not unreasonably affect the eligibility of the site for inclusion in the NRHP.

Impact 14.2.3-7: Changes in Feather River monthly mean flows that could result in adverse impacts to sensitive cultural resources

Differences in long-term average monthly flows in the Feather River under the CEQA Yuba Accord Alternative, compared to the CEQA No Project Alternative, are less than 10 percent over the 72-year simulation period (Appendix F4, 3 vs. 2, pg. 603). These differences in flow are within the normal range of minimum and maximum flows occurring in the Feather River under the CEQA No Project Alternative, and would not result in an increased inundation of previously exposed areas or exposure of previously inundated lands to adversely impact sensitive cultural resources. Therefore, changes in Feather River flows under the CEQA Yuba Accord Alternative, relative to the CEQA No Project Alternative, would not unreasonably affect cultural resources.

Impact 14.2.3-8: Alteration of the character of the Feather River site setting that could affect eligibility for site inclusion in the NRHP

The CEQA Yuba Accord Alternative would not involve any activities that would introduce visual, audible, or atmospheric elements that change the character of the Feather River site or its setting, and therefore, would not unreasonably affect the eligibility of the site for inclusion in the NRHP.

Impact 14.2.3-9: Changes in Sacramento River monthly mean flows that could result in adverse impacts to sensitive cultural resources

Over the 72-year simulation period, long-term average flows in the Sacramento River do not differ by more than 5 percent under the CEQA Yuba Accord Alternative, relative to the CEQA No Project Alternative (Appendix F4, 3 vs. 2, pg. 882). Relative to the CEQA No Project Alternative, these differences would be within the range of maximum and minimum average monthly flows, and are not likely to result in an increased inundation of previously exposed areas or exposure of previously inundated lands to adversely impact sensitive cultural resources. Therefore, changes in Sacramento River flows under the CEQA Yuba Accord

Alternative, relative to the CEQA No Project Alternative, would not unreasonably affect cultural resources.

Impact 14.2.3-10: Alteration of the character of the Sacramento River site setting that could affect eligibility for site inclusion in the NRHP

The CEQA Yuba Accord Alternative would not involve any activities that would introduce visual, audible, or atmospheric elements that change the character of the Sacramento River site or its setting, and therefore, would not unreasonably affect the eligibility of the site for inclusion in the NRHP.

14.2.4 ENVIRONMENTAL IMPACTS/ENVIRONMENTAL CONSEQUENCES OF THE CEQA MODIFIED FLOW ALTERNATIVE COMPARED TO THE CEQA NO PROJECT ALTERNATIVE

Impact 14.2.4-1: Changes in New Bullards Bar Reservoir water surface elevations that could result in adverse impacts to sensitive cultural resources

The CEQA Modified Flow Alternative would not affect cultural resources because it would not result in substantial departures from the range of water surface elevations maintained under recent historical operating rules for water levels in New Bullards Bar Reservoir. The reservoir's long-term average monthly water surface elevations range from a minimum of 1,865 feet msl in November to a maximum of 1,934 feet msl in May under the CEQA No Project Alternative during the 72-year simulation period. Under the CEQA Modified Flow Alternative, long-term average water surface elevations range from a minimum of 1,860 feet msl in November and October to a maximum of 1,936 feet msl in May. The lowest water surface elevation under the CEQA Modified Flow Alternative is 1,829 feet msl and occurs in September of critical water year types. This elevation is approximately 21 feet msl higher than the lowest long-term average elevation occurring under the CEQA No Project Alternative over the 72-year simulation period (Appendix F4, 4 vs. 2, pg. 50). Since average water surface elevations in New Bullards Bar Reservoir would not drop below the lowest elevation observed under the CEQA Modified Flow Alternative, it is unlikely that the CEQA Modified Flow Alternative would expose any previously inundated lands associated with New Bullards Bar Reservoir.

Based on this analysis, changes in New Bullards Bar Reservoir water surface elevations under the CEQA Modified Flow Alternative, relative to the CEQA No Project Alternative, would not unreasonably affect cultural resources.

Impact 14.2.4-2: Alteration of the character of the New Bullards Bar Reservoir site setting that could affect eligibility for site inclusion in the NRHP

The CEQA Modified Flow Alternative would not involve any activities that would introduce visual, audible, or atmospheric elements that change the character of the New Bullards Bar Reservoir site or its setting, and therefore, would not unreasonably affect the eligibility of the site for inclusion in the NRHP.

Impact 14.2.4-3: Changes in lower Yuba River monthly mean flows that could result in adverse impacts to sensitive cultural resources

Over the 72-year simulation period, the maximum long-term average monthly flows at Marysville would occur during February, and would be essentially equivalent under the CEQA Modified Flow Alternative and the CEQA No Project Alternative. Conversely, the minimum long-term average flows would occur in October under both the CEQA Modified Flow Alternative and the CEQA No Project Alternative. During October, long-term average flows under the CEQA Modified Flow Alternative would be up to approximately 2 percent higher than the CEQA No Project Alternative (Appendix F4, 4 vs. 2, pg. 272). These differences in flow would be within the range of maximum and minimum average monthly flows, relative to the CEQA No Project Alternative, and therefore are unlikely to result in an increased inundation of previous exposed areas or exposure of previously inundated lands to adversely impact sensitive cultural resources. Therefore, changes in lower Yuba River flows under the CEQA Modified Flow Alternative, relative to the CEQA No Project Alternative, would not unreasonably affect cultural resources.

Impact 14.2.4-4: Alteration of the character of the lower Yuba River site setting that could affect eligibility for site inclusion in the NRHP

The CEQA Modified Flow Alternative would not involve any activities that would introduce visual, audible, or atmospheric elements that change the character of the lower Yuba River site or its setting, and therefore, would not unreasonably affect the eligibility of the site for inclusion in the NRHP.

Impact 14.2.4-5: Changes in Oroville Reservoir water surface elevations that could result in adverse impacts to sensitive cultural resources

Over the 72-year simulation period, long-term average water surface elevations are essentially equivalent under the CEQA Modified Flow Alternative and the CEQA No Project Alternative (Appendix F4, 4 vs. 2, pg. 455). As a result, the CEQA Modified Flow Alternative would not unreasonably affect cultural resources because it would not result in significant departures from the range of water surface elevations in Oroville Reservoir, relative to the CEQA No Project Alternative.

Based on this analysis, changes in Oroville Reservoir water surface elevations under the CEQA Modified Flow Alternative, relative to the CEQA No Project Alternative, would not unreasonably affect cultural resources.

Impact 14.2.4-6: Alteration of the character of the Oroville Reservoir site setting that could affect eligibility for site inclusion in the NRHP

The CEQA Modified Flow Alternative would not involve any activities that would introduce visual, audible, or atmospheric elements that change the character of the Oroville Reservoir site or its setting, and therefore, would not unreasonably affect the eligibility of the site for inclusion in the NRHP.

Impact 14.2.4-7: Changes in Feather River monthly mean flows that could result in adverse impacts to sensitive cultural resources

Differences in long-term average flows in the Feather River under the CEQA Modified Flow Alternative, relative to the CEQA No Project Alternative, do not exceed approximately 2 percent over the 72-year simulation period (Appendix F4, 4 vs. 2, pg. 603). These differences in flow are within the normal range of minimum and maximum flows occurring in the Feather River and would not result in an increased inundation of previously exposed areas or exposure of previously inundated lands to adversely impact sensitive cultural resources. Therefore, changes in Feather River flows under the CEQA Modified Flow Alternative, relative to the CEQA No Project Alternative, would not unreasonably affect cultural resources.

Impact 14.2.4-8: Alteration of the character of the Feather River site setting that could affect eligibility for site inclusion in the NRHP

The CEQA Modified Flow Alternative would not involve any activities that would introduce visual, audible, or atmospheric elements that change the character of the Feather River site or its setting, and therefore, would not unreasonably affect the eligibility of the site for inclusion in the NRHP.

Impact 14.2.4-9: Changes in Sacramento River monthly mean flows that could result in adverse impacts to sensitive cultural resources

Over the 72-year simulation period, long-term average flows in the Sacramento River do not differ by more than 4 percent under the CEQA Modified Flow Alternative, relative to the CEQA No Project Alternative (Appendix F4, 4 vs. 2, pg. 882). Compared to the CEQA No Project Alternative, these differences in flow would be within the range of average monthly maximum and minimum flows, and are not likely to result in an increased inundation of previously exposed areas or exposure of previously inundated lands to adversely impact sensitive cultural resources. Therefore, changes in Sacramento River flows under the CEQA Modified Flow Alternative, relative to the CEQA No Project Alternative, would not unreasonably affect cultural resources.

Impact 14.2.4-10: Alteration of the character of the Sacramento River site setting that could affect eligibility for site inclusion in the NRHP

The CEQA Modified Flow Alternative would not involve any activities that would introduce visual, audible, or atmospheric elements that change the character of the Sacramento River site or its setting, and therefore, would not unreasonably affect the eligibility of the site for inclusion in the NRHP.

14.2.5 ENVIRONMENTAL IMPACTS/ENVIRONMENTAL CONSEQUENCES OF THE CEQA YUBA ACCORD ALTERNATIVE COMPARED TO THE CEQA EXISTING CONDITION

Impact 14.2.5-1: Change in New Bullards Bar Reservoir water surface elevations that could result in adverse impacts to sensitive cultural resources

The CEQA Yuba Accord Alternative would not affect cultural resources because it would not result in substantial departures from the range of water surface elevations maintained under recent historical operating rules for water levels in New Bullards Bar Reservoir. The reservoir's long-term average monthly water surface elevations range from a minimum of 1,856 feet msl in October to a maximum of 1,936 feet msl in May under the CEQA Existing Condition over the 72-year simulation period. Under the CEQA Yuba Accord Alternative, long-term average water surface elevations range from a minimum of 1,851 feet msl in November to a maximum of 1,933 feet msl in May. The lowest monthly average water surface elevation under the CEQA Yuba Accord Alternative is 1,798 feet msl and occurs in September of critical water year types, and is approximately 30 feet msl lower than the water surface elevation occurring under the CEQA Existing Condition (Appendix F4, 3 vs. 1, pg 50). However, these decreases in monthly water surface elevations are within the range of recent historical average monthly maximum and minimum elevations observed in New Bullards Bar Reservoir. Therefore, it is unlikely that the CEQA Yuba Accord Alternative would expose any previously inundated lands which would substantially impact cultural resources associated with New Bullards Bar Reservoir relative to the CEQA Existing Condition.

Based on this analysis, potential impacts on cultural resources from changes in New Bullards Bar Reservoir water surface elevations under the CEQA Yuba Accord Alternative, relative to the CEQA Existing Condition, would be less than significant.

Impact 14.2.5-2: Alteration of the character of the New Bullards Bar Reservoir site setting that could affect eligibility for site inclusion in the NRHP

The CEQA Yuba Accord Alternative would not involve any activities that would introduce visual, audible, or atmospheric elements that change the character of the New Bullards Bar Reservoir site or its setting, and therefore, would not affect the eligibility of the site for inclusion in the NRHP. Therefore, potential impacts under the CEQA Yuba Accord Alternative, relative to the CEQA Existing Condition, are considered less than significant.

Impact 14.2.5-3: Changes in lower Yuba River monthly mean flows that could result in adverse impacts to sensitive cultural resources

Over the 72-year simulation period, the maximum long-term average monthly flows at Marysville would occur during February, and would be about 2 percent lower under the CEQA Yuba Accord Alternative, relative to the CEQA Existing Condition. Conversely, the minimum long-term average flows would occur in October under both the CEQA Yuba Accord Alternative and the CEQA Existing Condition. During October, long-term average flows under the CEQA Yuba Accord Alternative would be approximately 5 percent higher than the CEQA Existing Condition (Appendix F4, 3 vs. 1, pg. 272). These differences in flow would be within the range of maximum and minimum flows, relative to the CEQA Existing Condition, and therefore are unlikely to result in an increased inundation of previously exposed areas or exposure of previously inundated lands to adversely affect sensitive cultural resources. Therefore, potential impacts on cultural resources resulting from changes in lower Yuba River flows under the CEQA Yuba Accord Alternative, relative to the CEQA Existing Condition, would be less than significant.

Impact 14.2.5-4: Alteration of the character of the lower Yuba River site setting that could affect eligibility for site inclusion in the NRHP

The CEQA Yuba Accord Alternative would not involve any activities that would introduce visual, audible, or atmospheric elements that change the character of the lower Yuba River site or its setting, and therefore, would not affect the eligibility of the site for inclusion in the NRHP. Therefore, potential impacts under the CEQA Yuba Accord Alternative, relative to the CEQA Existing Condition are considered less than significant.

Impact 14.2.3-5: Changes in Oroville Reservoir water surface elevations that could result in adverse impacts to sensitive cultural resources

Long-term average monthly water surface elevations are essentially equivalent under the CEQA Yuba Accord Alterative and the CEQA Existing Condition over the 72-year simulation period (Appendix F4, 3 vs. 1, pg. 455). As a result, the CEQA Yuba Accord Alternative, relative to the CEQA Existing Condition, would not affect cultural resources because it would not result in significant departures from the range of water surface elevations in Oroville Reservoir.

Based on this analysis, potential impacts on cultural resources from changes in maximum and minimum average monthly reservoir water surface elevations in Oroville Reservoir under the

CEQA Yuba Accord Alternative, relative to the CEQA Existing Condition, would be less than significant.

Impact 14.2.5-6: Alteration of the character of the Oroville Reservoir site setting that could affect eligibility for site inclusion in the NRHP

The CEQA Yuba Accord Alternative would not involve any activities that would introduce visual, audible, or atmospheric elements that change the character of the Oroville Reservoir site or its setting, and therefore, would not affect the eligibility of the site for inclusion in the NRHP. Therefore, potential impacts under the CEQA Yuba Accord Alternative, relative to the CEQA Existing Condition, are considered less than significant.

Impact 14.2.5-7: Changes in Feather River monthly mean flows that could result in adverse impacts to sensitive cultural resources

Differences in long-term average monthly flows in the Feather River under the CEQA Yuba Accord Alternative, compared to the CEQA Existing Condition, do not exceed approximately 3 percent over the 72-year simulation period (Appendix F4, 3 vs. 1, pg. 603). These differences in flow are within the normal range of maximum and minimum flows occurring in the Feather River and would not result in an increased inundation of previously exposed areas or exposure of previously inundated lands to adversely impact sensitive cultural resources. Therefore, potential impacts on cultural resources resulting from changes in Feather River flows under the CEQA Yuba Accord Alternative, relative to the CEQA Existing Condition, would be less than significant.

Impact 14.2.5-8: Alteration of the character of the Feather River site setting that could affect eligibility for site inclusion in the NRHP

The CEQA Yuba Accord Alternative would not involve any activities that would introduce visual, audible, or atmospheric elements that change the character of the Feather River site or its setting, and therefore, would not affect the eligibility of the site for inclusion in the NRHP. Therefore, potential impacts under the CEQA Yuba Accord Alternative, relative to the CEQA Existing Condition, are considered less than significant.

Impact 14.2.5-9: Changes in Sacramento River monthly mean flows that could result in adverse impacts to sensitive cultural resources

Long-term average monthly flows in the Sacramento River do not differ by more than 5 percent under the CEQA Yuba Accord Alternative, relative to the CEQA Existing Condition, over the 72-year simulation period (Appendix F4, 3 vs. 1, pg. 882). These differences in flow would be within the range of maximum and minimum average monthly flows, relative to the CEQA Existing Condition, and are not likely to result in an increased inundation of previously exposed areas or exposure of previously inundated lands to adversely impact sensitive cultural resources. Therefore, potential impacts on cultural resources resulting from changes in Sacramento River flows under the CEQA Yuba Accord Alternative, relative to the CEQA Existing Condition, would be less than significant.

Impact 14.2.5-10: Alteration of the character of the Sacramento River site setting that could affect eligibility for site inclusion in the NRHP

The CEQA Yuba Accord Alternative would not involve any activities that would introduce visual, audible, or atmospheric elements that change the character of the Sacramento River site or its setting, and therefore, would not affect the eligibility of the site for inclusion in the NRHP. Therefore, potential impacts under the CEQA Yuba Accord Alternative, relative to the CEQA Existing Condition, are considered less than significant.

14.2.6 Environmental Impacts/Environmental Consequences of the CEQA Modified Flow Alternative Compared to the CEQA Existing Condition

Impact 14.2.6-1: Change in New Bullards Bar Reservoir water surface elevations that could result in adverse impacts to sensitive cultural resources

The CEQA Modified Flow Alternative would not affect cultural resources because it would not result in substantial departures from the range of water surface elevations maintained under recent historical operating rules for water levels in New Bullards Bar Reservoir. The reservoir's long-term average monthly water surface elevations and average monthly water surface elevations by water year type are essentially equivalent under the CEQA Modified Flow Alternative, relative to the CEQA Existing Condition, over the 72-year simulation period (Appendix F4, 4 vs. 1, pg. 50).

Based on this analysis, potential impacts on cultural resources from changes in average monthly maximum and minimum reservoir water surface elevations in New Bullards Bar Reservoir under the CEQA Modified Flow Alternative, relative to the CEQA Existing Condition, would be less than significant.

Impact 14.2.6-2: Alteration of the character of the New Bullards Bar Reservoir site setting that could affect eligibility for site inclusion in the NRHP

The CEQA Modified Flow Alternative would not involve any activities that would introduce visual, audible, or atmospheric elements that change the character of the New Bullards Bar Reservoir site or its setting, and therefore, would not affect the eligibility of the site for inclusion in the NRHP. Therefore, potential impacts under the CEQA Modified Flow Alternative, relative to the CEQA Existing Condition, are considered less than significant.

Impact 14.2.6-3: Changes in lower Yuba River monthly mean flows that could result in adverse impacts to sensitive cultural resources

Over the 72-year simulation period, the maximum long-term average monthly flows at Marysville would occur during February under both the CEQA Modified Flow Alternative and the CEQA Existing Condition. Long-term average flows in February would be essentially equivalent under both the alternative and the basis of comparison. Conversely, the minimum long-term average flows would occur in October under both the CEQA Modified Flow Alternative and the CEQA Existing Condition. During October, long-term average flows under the CEQA Modified Flow Alternative would be about 5 percent lower than the CEQA Existing Condition (Appendix F4, 4 vs. 1, pg. 272). Therefore, the CEQA Modified Flow Alternative is unlikely to result in an increased inundation of previously exposed areas or exposure of previously inundated lands to adversely impact sensitive cultural resources. Therefore, potential impacts on cultural resources resulting from changes in lower Yuba River flows under the CEQA Modified Flow Alternative, relative to the CEQA Existing Condition, would be less than significant.

Impact 14.2.6-4: Alteration of the character of the lower Yuba River site setting that could affect eligibility for site inclusion in the NRHP

The CEQA Modified Flow Alternative would not involve any activities that would introduce visual, audible, or atmospheric elements that change the character of the lower Yuba River site or its setting, and therefore, would not affect the eligibility of the site for inclusion in the NRHP. Therefore, potential impacts under the CEQA Modified Flow Alternative, relative to the CEQA Existing Condition, are considered less than significant.

Impact 14.2.6-5: Changes in Oroville Reservoir water surface elevations that could result in adverse impacts to sensitive cultural resources

Long-term average monthly water surface elevations are essentially equivalent under the CEQA Modified Flow Alterative and the CEQA Existing Condition over the 72-year simulation period (Appendix F4, 4 vs. 1, pg 455). As a result, the CEQA Modified Flow Alternative, relative to the CEQA Existing Condition, would not affect cultural resources because it would not result in significant departures from the range of water surface elevations in Oroville Reservoir.

Based on this analysis, potential impacts on cultural resources from changes in Oroville Reservoir water surface elevations under the CEQA Modified Flow Alternative, relative to the CEQA Existing Condition, would be less than significant.

Impact 14.2.6-6: Alteration of the character of the Oroville Reservoir site setting that could affect eligibility for site inclusion in the NRHP

The CEQA Modified Flow Alternative would not involve any activities that would introduce visual, audible, or atmospheric elements that change the character of the Oroville Reservoir site or its setting, and therefore, would not affect the eligibility of the site for inclusion in the NRHP. Therefore, potential impacts under the CEQA Modified Flow Alternative, relative to the CEQA Existing Condition, are considered less than significant.

Impact 14.2.6-7: Changes in Feather River monthly mean flows that could result in adverse impacts to sensitive cultural resources

Long-term average monthly flows in the Feather River under the CEQA Modified Flow Alternative are essentially equivalent to the CEQA Existing Condition (Appendix F4, 4 vs. 1, pg. 603). These differences in flow are within the normal range of average monthly maximum and minimum flows occurring in the Feather River and would not result in an increased inundation of previously exposed areas or exposure of previously inundated lands to adversely impact sensitive cultural resources. Therefore, potential impacts on cultural resources resulting from changes in Feather River flows under the CEQA Modified Flow Alternative, relative to the CEQA Existing Condition, would be less than significant.

Impact 14.2.6-8: Alteration of the character of the Feather River site setting that could affect eligibility for site inclusion in the NRHP

The CEQA Modified Flow Alternative would not involve any activities that would introduce visual, audible, or atmospheric elements that change the character of the Feather River site or its setting, and therefore, would not affect the eligibility of the site for inclusion in the NRHP. Therefore, potential impacts under the CEQA Modified Flow Alternative, relative to the CEQA Existing Condition, are considered less than significant.

Impact 14.2.6-9: Changes in Sacramento River monthly mean flows that could result in adverse impacts to sensitive cultural resources

Long-term average monthly flows in the Sacramento River are essentially equivalent under the CEQA Modified Flow Alternative, relative to the CEQA Existing Condition, over the 72-year simulation period (Appendix F4, 4 vs. 1, pg. 882). Therefore, the CEQA Modified Flow Alternative, relative to the CEQA Existing Condition, is not likely to result in an increased inundation of previously exposed areas or exposure of previously inundated lands to adversely impact sensitive cultural resources. Therefore, potential impacts on cultural resources resulting from changes in Sacramento River flows under the CEQA Modified Flow Alternative, relative to the CEQA Existing Condition, would be less than significant.

Impact 14.2.6-10: Alteration of the character of the Sacramento River site setting that could affect eligibility for site inclusion in the NRHP

The CEQA Modified Flow Alternative would not involve any activities that would introduce visual, audible, or atmospheric elements that change the character of the Sacramento River site or its setting, and therefore, would not affect the eligibility of the site for inclusion in the NRHP. Therefore, potential impacts under the CEQA Modified Flow Alternative, relative to the CEQA Existing Condition, are considered less than significant.

14.2.7 Environmental Impacts/Environmental Consequences of the CEQA No Project/NEPA No Action Alternative Compared to the CEQA Existing Condition/NEPA Affected Environment

As discussed in Chapter 3, the key elements and activities (e.g., implementation of the RD-1644 Long-term instream flow requirements) for the CEQA No Project Alternative would be the same for the NEPA No Action Alternative. The primary differences between the CEQA No Project and NEPA No Action alternatives are various hydrologic and other modeling assumptions (see Section 4.5 and Appendix D). Because of these differences between the No Project and No Action alternatives, these alternatives are distinguished as separate alternatives for CEQA and NEPA evaluation purposes.

Based on current plans and consistent with available infrastructure and community services, the CEQA No Project Alternative in this EIR/EIS is based on current environmental conditions (e.g., project operations, water demands, and level of land development) plus potential future operational and environmental conditions (e.g., implementation of the RD-1644 Long-term instream flow requirements in the lower Yuba River) that probably would occur in the foreseeable future in the absence of the Proposed Project/Action or another action alternative. The NEPA No Action Alternative also is based on conditions without the proposed project, but uses a longer-term future timeframe that is not restricted by existing infrastructure or physical and regulatory environmental conditions. The differences between these modeling characterizations and assumptions for the CEQA No Project and the NEPA No Action alternatives, including the rationale for developing these two different scenarios for this EIR/EIS, are explained in Chapter 4[1].

[1] For modeling purposes related to CEQA analytical requirements, OCAP Study 3 (2001 level of development) is used as the foundational study upon which the modeling scenarios for the CEQA No Project Alternative and the CEQA Existing Condition were developed. For modeling purposes related to NEPA analytical requirements, OCAP

Although implementation of the RD-1644 Long-term instream flow requirements would occur under both the CEQA No Project and the NEPA No Action alternatives, the resultant model outputs for both scenarios are different because of variations in the way near-term and long-term future operations are characterized for other parameters in the CEQA and NEPA assumptions. As discussed in Chapter 4, the principal difference between the CEQA No Project Alternative and the NEPA No Action Alternative is that the NEPA No Action Alternative includes several potential future water projects in the Sacramento and San Joaquin valleys (e.g., CVP/SWP Intertie, FRWP, SDIP and a long-term EWA Program or a program equivalent to the EWA), while the CEQA No Project Alternative does not. Because many of the other assumed conditions for these two scenarios are similar, the longer-term analysis of the NEPA No Action Alternative compared to the NEPA Affected Environment builds upon the nearer-term analysis of the CEQA No Project Alternative compared to the CEQA Existing Condition.

Because the same foundational modeling base (OCAP Study 3) was used to characterize near-term conditions (2001 level of development) both the CEQA No Project Alternative and the CEQA Existing Condition, it was possible to conduct a detailed analysis to quantitatively evaluate the hydrologic changes in the Yuba Region and the CVP/SWP system that would be expected to occur under these conditions. Building on this CEQA analysis, the analysis of the NEPA No Action Alternative compared to the NEPA Affected Environment consists of two components: (1) an analysis of near-term future without project conditions quantified through the CEQA No Project Alternative, relative to the CEQA Existing Condition, and (2) a qualitative analysis of longer-term future without project conditions (the NEPA No Action Alternative)[2].

14.2.7.1 CEQA No Project Alternative Compared to the CEQA Existing Condition

Impact 14.2.7-1: Change in New Bullards Bar Reservoir water surface elevations that could result in adverse impacts to sensitive cultural resources

The CEQA No Project Alternative would not affect cultural resources relative to the CEQA Existing Condition because it would not result in substantial departures from the range of water surface elevations maintained under recent historical operating rules for water levels in New Bullards Bar Reservoir. Long-term average monthly water surface elevations are essentially equivalent under the CEQA No Project Alternative and CEQA Existing Condition over the 72-year simulation period (Appendix F4, 2 vs. 1, pg. 50). Since average monthly water surface elevations under the CEQA No Project Alternative in New Bullards Bar Reservoir do not drop below the lowest elevation observed, and do not increase above the highest elevation under the CEQA Existing Condition, it is unlikely that the CEQA No Project Alternative would expose any previously inundated lands, or inundate any previously exposed lands surrounding New Bullards Bar Reservoir.

Based on this analysis, potential impacts on cultural resources from changes in average monthly maximum and minimum reservoir water surface elevations in New Bullards Bar Reservoir under the CEQA No Project Alternative, relative to the CEQA Existing Condition, would be less than significant.

Study 5 (2020 level of development) is used as the foundational study upon which the modeling scenarios for the NEPA No Action Alternative was developed.

[2] The second analytical component cannot be evaluated quantitatively due to the differences in the underlying baseline assumptions for OCAP Study 3 and OCAP Study 5.

Impact 14.2.7-2: Alteration of the character of the New Bullards Bar Reservoir site setting that could affect eligibility for site inclusion in the NRHP

The CEQA No Project Alternative would not involve any activities that would introduce visual, audible, or atmospheric elements that change the character of the New Bullards Bar Reservoir site or its setting, and therefore, would not affect the eligibility of the site for inclusion in the NRHP. Therefore, potential impacts under the CEQA No Project Alternative, relative to the CEQA Existing Condition, are considered less than significant.

Impact 14.2.7-3: Changes in lower Yuba River monthly mean flows that could result in adverse impacts to sensitive cultural resources

Over the 72-year simulation period, the maximum long-term average monthly flows at Marysville would occur during February, and would be approximately 1 percent lower under the CEQA No Project Alternative, relative to the CEQA Existing Condition. Conversely, the minimum long-term average monthly flows would occur in October under the CEQA No Project Alternative and the CEQA Existing Condition. During October, long-term average flows under the CEQA No Project Alternative would be approximately 7 percent higher than the CEQA Existing Condition (Appendix F4, 2 vs. 1, pg. 272). Relative to the CEQA Existing Condition, these differences in flow would be within the range of maximum and minimum average monthly flows, and therefore are unlikely to result in an increased inundation of previously exposed areas or exposure of previously inundated lands to adversely impact sensitive cultural resources. Therefore, potential impacts on cultural resources resulting from changes in lower Yuba River flows under the CEQA No Project Alternative, relative to the CEQA Existing Condition, would be less than significant.

Impact 14.2.7-4: Alteration of the character of the lower Yuba River site setting that could affect eligibility for site inclusion in the NRHP

The CEQA No Project Alternative would not involve any activities that would introduce visual, audible, or atmospheric elements that change the character of the lower Yuba River site or its setting, and therefore, would not affect the eligibility of the site for inclusion in the NRHP. Therefore, potential impacts under the CEQA No Project Alternative, relative to the CEQA Existing Condition, are considered less than significant.

Impact 14.2.7-5: Changes in Oroville Reservoir water surface elevations that could result in adverse impacts to sensitive cultural resources

Long-term average monthly water surface elevations are essentially equivalent under the CEQA No Project Alterative and the CEQA Existing Condition over the 72-year simulation period (Appendix F4, 2 vs. 1, pg. 455). As a result, the CEQA No Project Alternative, relative to the CEQA Existing Condition, would not impact cultural resources because it would not result in significant departures from the range of water surface elevations in Oroville Reservoir.

Based on this analysis, potential impacts on cultural resources from changes in average monthly maximum and minimum reservoir water surface elevations in Oroville Reservoir under the CEQA No Project Alternative, relative to the CEQA Existing Condition, would be less than significant.

Impact 14.2.7-6: Alteration of the character of the Oroville Reservoir site setting that could affect eligibility for site inclusion in the NRHP

The CEQA No Project Alternative would not involve any activities that would introduce visual, audible, or atmospheric elements that change the character of the Oroville Reservoir site or its setting, and therefore, would not affect the eligibility of the site for inclusion in the NRHP. Therefore, potential impacts under the CEQA No Project Alternative, relative to the CEQA Existing Condition, are considered less than significant.

Impact 14.2.7-7: Changes in Feather River monthly mean flows that could result in adverse impacts to sensitive cultural resources

Differences in long-term average monthly flows in the Feather River under the CEQA No Project Alternative, compared to the CEQA Existing Condition, do not exceed approximately 10 percent over the 72-year simulation period (Appendix F4, 2 vs. 1, pg. 603). These differences in flow are within the normal range of minimum and maximum flows occurring in the Feather River occurring under the CEQA Existing Condition, and would not result in an increased inundation of previous exposed areas or exposure of previous inundated lands to adversely affect sensitive cultural resources. Therefore, potential impacts on cultural resources resulting from changes in Feather River flows under the CEQA No Project Alternative, relative to the CEQA Existing Condition, would be less than significant.

Impact 14.2.7-8: Alteration of the character of the Feather River site setting that could affect eligibility for site inclusion in the NRHP

The CEQA No Project Alternative would not involve any activities that would introduce visual, audible, or atmospheric elements that change the character of the Feather River site or its setting, and therefore, would not affect the eligibility of the site for inclusion in the NRHP. Therefore, potential impacts under the CEQA No Project Alternative, relative to the CEQA Existing Condition, are considered less than significant.

Impact 14.2.7-9: Changes in Sacramento River monthly mean flows that could result in adverse impacts to sensitive cultural resources

Long-term average flows in the Sacramento River do not differ by more than 5 percent under the CEQA No Project Alternative, relative to the CEQA Existing Condition, over the 72-year simulation period (Appendix F4, 2 vs. 1, pg. 882). These differences in flow would be within the range of average monthly maximum and minimum flows, relative to the CEQA Existing Condition, and are not likely to result in an increased inundation of previously exposed areas or exposure of previously inundated lands to adversely impact sensitive cultural resources. Therefore, potential impacts on cultural resources resulting from changes in Sacramento River flows under the CEQA No Project Alternative, relative to the CEQA Existing Condition, would be less than significant.

Impact 14.2.7-10: Alteration of the character of the Sacramento River site setting that could affect eligibility for site inclusion in the NRHP

The CEQA No Project Alternative would not involve any activities that would introduce visual, audible, or atmospheric elements that change the character of the Sacramento River site or its setting, and therefore, would not affect the eligibility of the site for inclusion in the NRHP. Therefore, potential impacts under the CEQA No Project Alternative, relative to the CEQA Existing Condition, are considered less than significant.

14.2.7.2 NEPA No Action Alternative Compared to the NEPA Affected Environment

In the Yuba Region, the primary differences between the NEPA No Action Alternative and the NEPA Affected Environment would be the changes in lower Yuba River flows associated with the implementation of the RD-1644 Long-term instream flow requirements, to replace the RD-1644 Interim instream flow requirements, and the increased local surface water demands for the Wheatland Water District. These also are the primary differences that would occur in the Yuba Region between the CEQA No Project Alternative and the CEQA Existing Condition. The potential effects to cultural resources that were evaluated in the quantitative analyses that is presented in Section 14.2.7.1 above for the CEQA No Project Alternative, relative to the CEQA Existing Condition (see also Appendix F4, 2 vs. 1) therefore also are used for comparison of the NEPA No Action Alternative, relative to the NEPA Affected Environment, and are not repeated here.

As discussed above, the analysis of the NEPA No Action Alternative includes several additional proposed projects in the project study area that are not included in the CEQA analysis. However, these other proposed projects would not significantly affect hydrologic conditions or cultural resources in the Yuba Region and, thus, are only discussed in the context of CVP/SWP operations upstream of and within the Delta.

Under the NEPA No Action Alternative, future levels of demand for water in California would be addressed through the implementation of numerous projects, including water storage and conveyance projects (e.g., SDIP[3]), water transfers and acquisition programs (e.g., a long-term EWA Program or a program equivalent to the EWA), and other projects related to CVP/SWP system operations (e.g., CVP/SWP Intertie and FRWP).

If not already completed, construction activities associated with future proposed water conveyance projects (e.g. FRWP and SDIP) along the Sacramento River and in the Delta under the NEPA No Action Alternative would require a cultural resources inventory and evaluation of property with the inundation zones and development of appropriate cultural resource protection to reduce impacts to a less than significant level. Other projects related to CVP/SWP system operations that could contribute to cultural resources impacts in the project study area generally would do so by affecting water surface elevations in the CVP/SWP reservoirs, river flows in the Feather and Sacramento rivers and Delta inflows.

To meet increased future demands, several other projects would increase water diversions from the Sacramento River under the NEPA No Action Alternative, relative to the NEPA Affected Environment. Water transfer and acquisition programs under the NEPA No Action Alternative could purchase water from the same agency or reservoir, and, thus, could collectively draw down reservoirs further than under the NEPA Affected Environment. The additional water sold for other programs could reduce water surface elevations in CVP/SWP reservoirs, which could result in potential impacts if previously inundated cultural resources were exposed. Although flows in the Sacramento and Feather rivers would vary as a result of implementing the other proposed projects identified above, these flow changes would generally occur during the lower flow conditions (e.g., July through September) and, thus, would not be expected to exceed the channel capacities of these rivers or the Delta. As a result, river flow changes and Delta inflows would not be likely to result in an increased inundation of previously exposed

[3] The SDIP includes a maximum pumping rate of 8,500 cfs at the Banks Pumping Plant.

areas or exposure of previously inundated lands to adversely impact sensitive cultural resources.

It is uncertain how the implementation of the various other proposed projects under the NEPA No Action Alternative would change evaluated parameters (e.g., exports) within the Delta Region. Water transfer and acquisition projects would be expected to result in increased water availability and therefore increased CVP/SWP operational flexibility to meet various instream beneficial uses. By contrast, some of the other proposed projects could be expected to result in decreased operational and management flexibility due to the primary purposes of increased diversions and water supplies associated with future levels of demand, which could result in reduced inflows and increased exports.

As discussed above, potential impacts under the NEPA No Action Alternative could occur if previously inundated cultural resources in CVP/SWP reservoirs were exposed as a result of the combined effects of increased future demands and the simultaneous activities of multiple water transfer and acquisition projects, which could collectively draw down reservoir water surface elevations to an extent that is greater than that which occurs under the NEPA Affected Environment. Therefore, the overall effects of water conveyance projects, new water transfer and acquisition programs and projects related to CVP/SWP operations under the NEPA No Action Alternative, relative to the NEPA Affected Environment, could result in potentially adverse effects to cultural resources in the CVP/SWP system.

14.2.8 ENVIRONMENTAL IMPACTS/ENVIRONMENTAL CONSEQUENCES OF THE NEPA YUBA ACCORD ALTERNATIVE COMPARED TO THE NEPA NO ACTION ALTERNATIVE

Impact 14.2.8-1: Change in New Bullards Bar Reservoir water surface elevations that could result in adverse impacts to sensitive cultural resources

The NEPA Yuba Accord Alternative would not affect cultural resources because it would not result in substantial departures from the range of water surface elevations maintained under recent historical operating rules for water levels in New Bullards Bar Reservoir. Over the 72-year simulation period, long-term average monthly mean water surface elevation in New Bullards Bar Reservoir under the NEPA Yuba Accord Alternative range from a minimum of 1,850 feet msl in November to a maximum of 1,933 feet msl in May. Under the NEPA No Action Alternative, long-term average water surface elevations range from a minimum of 1,865 feet msl in November to a high of 1,934 feet msl in May. The lowest average monthly water surface elevation under both the Yuba Accord (1,798 feet msl) and No Action (1,808 feet msl) alternatives occurs in September of critical water year types, and is 10 feet msl (1 percent) lower under the NEPA Yuba Accord Alternative, relative to the NEPA No Action Alternative (Appendix F4, 6 vs. 5, pg. 50). However, these decreases in monthly water surface elevations are within the range of recent historical average monthly maximum and minimum elevations observed in New Bullards Bar Reservoir. Therefore, it is unlikely that the NEPA Yuba Accord Alternative would expose any previously inundated lands which would substantially impact cultural resources associated with New Bullards Bar Reservoir relative to the NEPA No Action Alternative.

Based on this analysis, potential impacts on cultural resources from changes in average monthly maximum and minimum reservoir water surface elevations in New Bullards Bar Reservoir under the NEPA Yuba Accord Alternative, relative to the NEPA No Action Alternative would be less than significant.

Impact 14.2.8-2: Alteration of the character of the New Bullards Bar Reservoir site setting that could affect eligibility for site inclusion in the NRHP

The NEPA Yuba Accord Alternative would not involve any activities that would introduce visual, audible, or atmospheric elements that change the character of the New Bullards Bar Reservoir site or its setting, and therefore, would not affect the eligibility of the site for inclusion in the NRHP. Therefore, potential impacts under the NEPA Yuba Accord Alternative, relative to the NEPA No Action Alternative, are considered less than significant.

Impact 14.2.8-3: Changes in lower Yuba River monthly mean flows that could result in adverse impacts to sensitive cultural resources

Over the 72-year simulation period, the maximum long-term average monthly flows at Marysville would occur during February and would be approximately 3 percent lower under the NEPA Yuba Accord Alternative, relative to the NEPA No Action Alternative. Conversely, the minimum long-term average monthly flows would occur in October under the NEPA Yuba Accord Alternative and the NEPA No Action Alternative. During October, long-term average flows under the NEPA Yuba Accord Alternative would be approximately 13 percent higher (3,364 vs. 3,460 cfs) than the NEPA No Action Alternative (Appendix F4, 6 vs. 5, pg. 272). Average flows by water year type range from 557 cfs higher to 512 cfs lower during wet years. These changes in flow would be within the range of maximum and minimum flows that generally occur in the lower Yuba River under the NEPA No Action Alternative, and therefore are unlikely to result in an increased inundation of previously exposed areas or exposure of previously inundated lands to adversely impact sensitive cultural resources. Therefore, potential impacts on cultural resources resulting from changes in lower Yuba River flows under the NEPA Yuba Accord Alternative, relative to the NEPA No Action Alternative, would be less than significant.

Impact 14.2.8-4: Alteration of the character of the lower Yuba River site setting that could affect eligibility for site inclusion in the NRHP

The NEPA Yuba Accord Alternative would not involve any activities that would introduce visual, audible, or atmospheric elements that change the character of the lower Yuba River site or its setting, and therefore, would not affect the eligibility of the site for inclusion in the NRHP. Therefore, potential impacts under the NEPA Yuba Accord Alternative, relative to the NEPA No Action Alternative, are considered less than significant.

Impact 14.2.8-5: Changes in Oroville Reservoir water surface elevations that could result in adverse impacts to sensitive cultural resources

Long-term average monthly water surface elevations are essentially equivalent (0 percent change) under the NEPA Yuba Accord Alternative, relative to the NEPA No Action Alternative, over the 72-year simulation period (Appendix F4, 6 vs. 5, pg. 455). Therefore, the NEPA Yuba Accord Alternative, relative to the NEPA No Action Alternative, would not affect cultural resources because it would not result in significant departures from the range of water surface elevations in Oroville Reservoir.

Based on this analysis, potential impacts on cultural resources from changes in Oroville Reservoir water surface elevations under the NEPA Yuba Accord Alternative, relative to the NEPA No Action Alternative, would be less than significant.

Impact 14.2.8-6: Alteration of the character of the Oroville Reservoir site setting that could affect eligibility for site inclusion in the NRHP

The NEPA Yuba Accord Alternative would not involve any activities that would introduce visual, audible, or atmospheric elements that change the character of the Oroville Reservoir site or its setting, and therefore, would not affect the eligibility of the site for inclusion in the NRHP. Therefore, potential impacts under the NEPA Yuba Accord Alternative, relative to the NEPA No Action Alternative, are considered less than significant.

Impact 14.2.8-7: Changes in Feather River monthly mean flows that could result in adverse impacts to sensitive cultural resources

Differences in long-term average flows in the Feather River below Thermalito Afterbay outlet under the NEPA Yuba Accord Alternative compared to the NEPA No Action Alternative , are about 3 percent lower (4,735 vs. 4,886 cfs) over the 72-year simulation period (Appendix F4, 6 vs. 5, pg. 603). These differences in flow are within the normal range of average monthly minimum and maximum flows occurring in the Feather River under the NEPA No Action Alternative, and would not result in an increased inundation of previously exposed areas or exposure of previously inundated lands to adversely impact sensitive cultural resources. Therefore, potential impacts on cultural resources resulting from changes in Feather River flows under the NEPA Yuba Accord Alternative, relative to the NEPA No Action Alternative, would be less than significant.

Impact 14.2.8-8: Alteration of the character of the Feather River site setting that could affect eligibility for site inclusion in the NRHP

The NEPA Yuba Accord Alternative would not involve any activities that would introduce visual, audible, or atmospheric elements that change the character of the Feather River site or its setting, and therefore, would not affect the eligibility of the site for inclusion in the NRHP. Therefore, potential impacts under the NEPA Yuba Accord Alternative, relative to the NEPA No Action Alternative, are considered less than significant.

Impact 14.2.8-9: Changes in Sacramento River monthly mean flows that could result in adverse impacts to sensitive cultural resources

Long-term average monthly flows in the Sacramento River below the confluence with the Feather River do not differ by more than approximately 3.5 percent (12,809 vs. 12,402 cfs) under the NEPA Yuba Accord Alternative, relative to the NEPA No Action Alternative, over the 72-year simulation period (Appendix F4, 6 vs. 5, pg. 882). Relative to the NEPA No Action Alternative, these differences are within the range of average monthly maximum and minimum flows, and are not likely to result in an increased inundation of previously exposed areas or exposure of previously inundated lands to adversely impact sensitive cultural resources. Therefore, potential impacts on cultural resources resulting from changes in Sacramento River flows under the NEPA Yuba Accord Alternative, relative to the NEPA No Action Alternative, would be less than significant.

Impact 14.2.8-10: Alteration of the character of the Sacramento River site setting that could affect eligibility for site inclusion in the NRHP

The NEPA Yuba Accord Alternative would not involve any activities that would introduce visual, audible, or atmospheric elements that change the character of the Sacramento River site or its setting, and therefore, would not affect the eligibility of the site for inclusion in the NRHP.

Therefore, potential impacts under the NEPA Yuba Accord Alternative, relative to the NEPA No Action Alternative, are considered less than significant.

14.2.9 Environmental Impacts/Environmental Consequences of the NEPA Modified Flow Alternative Compared to the NEPA No Action Alternative

Impact 14.2.9-1: Change in New Bullards Bar Reservoir water surface elevations that could result in adverse impacts to sensitive cultural resources

The NEPA Modified Flow Alternative would not affect cultural resources because it would not result in substantial departures from the range of water surface elevations maintained under recent historical operating rules for water levels in New Bullards Bar Reservoir. Long-term average monthly water surface elevations in New Bullards Bar Reservoir under the NEPA Modified Flow Alternative range from a minimum of 1,857 feet msl in November to a maximum of 1,935 feet msl in May over the 72-year simulation period. Under the NEPA No Action Alternative, long-term average water surface elevations range from a minimum of 1,865 feet msl in November to a maximum of 1,934 feet msl in May. The lowest average monthly water surface elevation under the NEPA Modified Flow Alternative is 1,830 feet msl and occurs in September of critical water year types, compared to 1,808 feet msl under the NEPA No Action Alternative, which also occurs in September of critical water years (Appendix F4, 7 vs. 5, pg. 50). Since average monthly water surface elevations under the NEPA Modified Flow Alternative in New Bullards Bar Reservoir do not drop below, or increase above water surface elevations occurring under the NEPA No Action Alternative, it is unlikely that the NEPA Modified Flow Alternative would expose any previously inundated lands, or inundate any previously exposed lands surrounding New Bullards Bar Reservoir.

Based on this analysis, potential impacts on cultural resources from changes in average monthly maximum and minimum reservoir water surface elevations in New Bullards Bar Reservoir under the NEPA Modified Flow Alternative, relative to the NEPA No Action Alternative, would be less than significant.

Impact 14.2.9-2: Alteration of the character of the New Bullards Bar Reservoir site setting that could affect eligibility for site inclusion in the NRHP

The NEPA Modified Flow Alternative would not involve any activities that would introduce visual, audible, or atmospheric elements that change the character of the New Bullards Bar Reservoir site or its setting, and therefore, would not affect the eligibility of the site for inclusion in the NRHP. Therefore, potential impacts under the NEPA Modified Flow Alternative, relative to the NEPA No Action Alternative, are considered less than significant.

Impact 14.2.9-3: Changes in lower Yuba River monthly mean flows that could result in adverse impacts to sensitive cultural resources

Over the 72-year simulation period, the maximum long-term average monthly flows at Marysville would occur during February, and would be about 1 percent lower (3,410 vs. 3,460 cfs) under the NEPA Modified Flow Alternative, relative to the NEPA No Action Alternative. Conversely, the minimum long-term average monthly flows would occur in October under the NEPA Modified Flow Alternative and the NEPA No Action Alternative. During October, long-term average flows under the NEPA Modified Flow Alternative would be 13 percent higher (595 vs. 526 cfs) than the NEPA No Action Alternative (Appendix F4, 7 vs. 5, pg. 272). These average monthly maximum and minimum flows are within the range flows occurring in the lower Yuba River under the NEPA No Action Alternative, and therefore are unlikely to result in an increased inundation of previously exposed areas or exposure of previously inundated lands to adversely impact sensitive cultural resources. Therefore, potential impacts on cultural resources resulting from changes in lower Yuba River flows under the NEPA Modified Flow Alternative, relative to the NEPA No Action Alternative, would be less than significant.

Impact 14.2.9-4: Alteration of the character of the lower Yuba River site setting that could affect eligibility for site inclusion in the NRHP

The NEPA Modified Flow Alternative would not involve any activities that would introduce visual, audible, or atmospheric elements that change the character of the lower Yuba River site or its setting, and therefore, would not affect the eligibility of the site for inclusion in the NRHP. Therefore, potential impacts under the NEPA Modified Flow Alternative, relative to the NEPA No Action Alternative, are considered less than significant.

Impact 14.2.9-5: Changes in Oroville Reservoir water surface elevations that could result in adverse impacts to sensitive cultural resources

Long-term average monthly water surface elevations are essentially equivalent under the NEPA Modified Flow Alternative, relative to the NEPA No Action Alternative, over the 72-year simulation period (Appendix F4, 7 vs. 5, pg. 455). Based on this analysis, the NEPA Modified Flow Alternative, relative to the NEPA No Action Alternative, would not affect cultural resources because it would not result in significant departures from the range of water surface elevations in Oroville Reservoir.

Based on this analysis, potential impacts on cultural resources resulting from changes in Oroville Reservoir water surface elevations under the NEPA Modified Flow Alternative, relative to the NEPA No Action Alternative, would be less than significant.

Impact 14.2.9-6: Alteration of the character of the Oroville Reservoir site setting that could affect eligibility for site inclusion in the NRHP

The NEPA Modified Flow Alternative would not involve any activities that would introduce visual, audible, or atmospheric elements that change the character of the Oroville Reservoir site or its setting, and therefore, would not affect the eligibility of the site for inclusion in the NRHP. Therefore, potential impacts under the NEPA Modified Flow Alternative, relative to the NEPA No Action Alternative, are considered less than significant.

Impact 14.2.9-7: Changes in Feather River monthly mean flows that could result in adverse impacts to sensitive cultural resources

Differences in long-term average monthly flows in the Feather River below the Thermalito Afterbay outlet under the NEPA Modified Flow Alternative, compared to the NEPA No Action Alternative, are less than 2 percent higher (3,669 vs. 3,600 cfs) over the 72-year simulation period (Appendix F4, 7 vs. 5, pg. 603). These differences in flow are within the normal range of average monthly minimum and maximum flows occurring in the Feather River under the NEPA No Action Alternative, and would not result in an increased inundation of previously exposed areas or exposure of previously inundated lands to adversely impact sensitive cultural resources. Therefore, potential impacts on cultural resources resulting from changes in Feather River flows under the NEPA Modified Flow Alternative, relative to the NEPA No Action Alternative, would be less than significant.

Impact 14.2.9-8: Alteration of the character of the Feather River site setting that could affect eligibility for site inclusion in the NRHP

The NEPA Modified Flow Alternative would not involve any activities that would introduce visual, audible, or atmospheric elements that change the character of the Feather River site or its setting, and therefore, would not affect the eligibility of the site for inclusion in the NRHP. Therefore, potential impacts under the NEPA Modified Flow Alternative, relative to the NEPA No Action Alternative, are considered less than significant.

Impact 14.2.9-9: Changes in Sacramento River monthly mean flows that could result in adverse impacts to sensitive cultural resources

Long-term average flows in the Sacramento River below the confluence of the Feather River do not differ by more than approximately 2.5 percent higher (12,710 vs. 12,402 cfs) under the NEPA Modified Flow Alternative, relative to the NEPA No Action Alternative, over the 72-year simulation period (Appendix F4, 7 vs. 5, pg. 882). Relative to the NEPA No Action Alternative, these differences are within the range of average monthly maximum and minimum flows, and are not likely to result in an increased inundation of previously exposed areas or exposure of previously inundated lands to adversely impact sensitive cultural resources. Therefore, potential impacts on cultural resources resulting from changes in Sacramento River flows under the NEPA Modified Flow Alternative, relative to the NEPA No Action Alternative, would be less than significant.

Impact 14.2.9-10: Alteration of the character of the Sacramento River site setting that could affect eligibility for site inclusion in the NRHP

The NEPA Modified Flow Alternative would not involve any activities that would introduce visual, audible, or atmospheric elements that change the character of the Sacramento River site or its setting, and therefore, would not affect the eligibility of the site for inclusion in the NRHP. Therefore, potential impacts under the NEPA Modified Flow Alternative, relative to the NEPA No Action Alternative, are considered less than significant.

14.3 CUMULATIVE IMPACTS

Hydrologic modeling was used to evaluate the cumulative effects of the Yuba Accord Alternative and other likely changes in CVP/SWP operations on hydrology and water supply. The proposed projects that have been adequately defined (e.g., in recent project-level environmental documents or CALSIM II modeling) and that have the potential to contribute to cumulative impacts are included in the quantitative assessment of the Yuba Accord's impacts. For analytical purposes of this EIR/EIS, the projects that are considered well defined and "reasonably foreseeable" are described in Chapter 21. Additionally, the assumptions used to categorize future hydrologic cumulative conditions that are quantitatively simulated using CALSIM II and the post-processing tools are presented in Appendix D. To the extent feasible, potential cumulative impacts on resources dependent on hydrology or water supply (e.g., reservoir surface elevation) are analyzed quantitatively. Because several projects cannot be accurately characterized for hydrologic modeling purposes at this time, either due to the nature of the particular project or because specific operations details are only in the preliminary phases of development, these projects are evaluated qualitatively.

Only those projects that could affect cultural resources are included in the qualitative evaluation that is presented in subsequent sections of this chapter. Although most of the proposed projects described in Chapter 21 could have project-specific impacts that will be addressed in future project-specific environmental documentation, future implementation of these projects is not expected to result in cumulative impacts to regional water supply operations, or water-related and water dependent resources that also could be affected by the Proposed Project/Action or alternatives (see Chapter 21). For this reason, only the limited numbers of projects with the potential to cumulatively impact cultural resources in the project study area are specifically considered qualitatively in the cumulative impacts analysis for cultural resources:

- Water Storage and Conveyance Projects
  - Shasta Lake Water Resources Investigation (Shasta Reservoir Enlargement)
  - Upstream of Delta Off-Stream Storage (Sites Reservoir)
  - In-Delta Storage Program (Delta Wetlands Project)
  - Upper San Joaquin River Basin Storage Investigation
  - Los Vaqueros Reservoir Expansion Project
  - Folsom Dam Raise Project
- Projects Related to Changes in CVP/SWP System Operations
  - Trinity River Mainstream Fishery Restoration Act
  - Sacramento Valley Water Management Program
  - Long-term CVP and SWP Operations Criteria and Plan
  - Isolated Delta Facility
  - Delta-Mendota Canal/California Aqueduct Intertie
  - Clifton Court Forebay Intertie
  - CVP Long-term Contract Renewals
  - Sacramento River Water Reliability Study
  - San Joaquin River Restoration Settlement Act
  - Oroville Facilities FERC Relicensing
- Water Transfer and Acquisition Programs
  - Dry Year Water Purchase Program
  - Sacramento Valley Water Management Program
  - Delta Improvements Package
- Flood Control, Ecosystem Restoration an Fisheries Improvement Projects
  - North Delta Flood Control and Ecosystem Restoration Project
  - Suisun Marsh Levee and Habitat Restoration Program
  - CALFED Ecosystem Restoration Program
  - CALFED Levees Program
- Local Projects in the Yuba Region
  - Yuba Project FERC Relicensing

These projects are described in Chapter 21 and are qualitatively addressed below.

14.3.1 ENVIRONMENTAL IMPACTS/ENVIRONMENTAL CONSEQUENCES OF THE YUBA ACCORD ALTERNATIVE CUMULATIVE CONDITION COMPARED TO THE EXISTING CONDITION

For CEQA, the purpose of the cumulative analysis is to determine whether the incremental effects of the Proposed Project (Yuba Accord Alternative) would be expected to be "cumulatively considerable" when viewed in connection with the effects of past projects, other current projects, and probable future projects (Public Resources Code Section 21083, Subdivision (b)(2)).[4]

For NEPA, the scope of an EIS must include "*cumulative actions, which when viewed with other proposed actions have cumulatively significant impacts and should therefore be discussed in the same impact statement*" (40 CFR §1508.25(a)(2)).

Because the CEQ regulations implementing NEPA and the CEQA guidelines contain very similar requirements for analyzing, and definitions of, cumulative impacts, the discussions of cumulative impacts of the Yuba Accord Alternative Cumulative Condition relative to the Existing Condition will be the basis for evaluation of cumulative impacts for both CEQA and NEPA. In addition, an analysis of the Modified Flow Alternative Cumulative Condition relative to the Existing Condition is provided to fulfill NEPA requirements.

The following sections describe this analysis for the projects discussed in Section 14.3 above.

14.3.1.1 WATER STORAGE AND CONVEYANCE PROJECTS

Depending on their location, construction of new water storage and conveyance facilities may impact sensitive cultural resources. Expansion of existing dam and reservoir facilities would raise water surface elevations in reservoirs and potentially inundate previously exposed historic sites and/or landmarks surrounding existing reservoirs. However, activities associated with these projects would require a cultural resources inventory and evaluation of property with the inundation zones and development of appropriate cultural resource protection to reduce impacts to a less than significant level. The Yuba Accord Alternative would not contribute to cumulative effects (e.g., construction activities) on cultural resources because no additional water storage or conveyance projects are proposed as a part of the project.

14.3.1.2 PROJECTS RELATED TO CVP/SWP SYSTEM OPERATIONS

Other projects related to CVP/SWP system operations that could contribute to cumulative cultural resources impacts in the project study area generally would do so by affecting water surface elevation levels in CVP/SWP reservoirs, river flows in the Feather and Sacramento rivers and Delta inflows. The Yuba Accord Alternative would not contribute to cumulative effects (e.g., greater reductions in reservoir elevation) on cultural resources at CVP/SWP reservoirs because water available for transfer would be released from New Bullards Bar Reservoir, which is not a reservoir operated by the CVP or the SWP. To meet increased future demands, several other projects would increase water diversions from the Sacramento River. Depending on the timing and operations of these reasonably foreseeable future projects, reductions in river flow associated with these diversions could be offset by the increases in Yuba River flows that would occur under the Yuba Accord Alternative. However, due to the volume of water flowing through the lower reaches of the Feather and Sacramento rivers, it is not anticipated that the river flow would change to such a level as to cause a cumulatively significant effect on cultural resources.

[4] The "*Guide to the California Environmental Quality Act*" (Remy *et al.* 1999) states that "*…although a project may cause an "individually limited" or "individually minor" incremental impact that, by itself, is not significant, the increment may be "cumulatively considerable", and thus significant, when viewed against the backdrop of past, present, and probable future projects.*" (CEQA Guidelines, § 15064, subd. (i)(l), 15065, subd. (c), 15355, subd. (b))."

14.3.1.3 *WATER TRANSFER AND ACQUISITION PROGRAMS*

Other water transfer and acquisition programs (e.g. SVWMP, EWA) could purchase water from the same agency or reservoir, and, thus, could collectively draw down reservoirs further than under the Existing Condition. The additional water sold for other programs could reduce water surface elevations in CVP/SWP reservoirs, which could result in significant cumulative impacts if previously inundated cultural resources resource were exposed. The Yuba Accord Alternative would not contribute to a cumulative effect on reservoir-related cultural resources because water available for transfer would be released from New Bullards Bar Reservoir, which is not a reservoir operated by the CVP or the SWP. Because other water transfer and acquisition programs would not affect New Bullards Bar Reservoir, there is little potential for cultural resources impacts to compound as a result of the Yuba Accord Alternative.

14.3.1.4 *FLOOD CONTROL, ECOSYSTEM RESTORATION AND FISHERIES IMPROVEMENT PROJECTS*

Flood control, ecosystem restoration and fisheries improvement projects would be targeted to improve aquatic habitat conditions within the project study area. Implementation of other projects, in addition to the Yuba Accord Alternative, could improve instream flow and water temperature conditions, physical habitat availability and ecosystem functions. Improvement of levee systems, channel capacities, and fish and wildlife habitat could impact cultural resources through either exposure or burial of archeological sites. Potential impacts could occur from the placement of new levee structural material, addition of habitat-conducive elements, and grading and contouring. However, activities associated with these projects would require a cultural resources inventory and evaluation of property within the area of the project, and development of appropriate cultural resources protection measures to reduce impacts to a less than significant level. The Yuba Accord Alternative would not contribute to cumulative effects (e.g., construction activities) on cultural resources because no additional flood control or ecosystem restoration projects are proposed as a part of the project.

14.3.1.5 *LOCAL PROJECTS IN THE YUBA REGION*

Proposed license terms and conditions, and PM&Es will be considered during development of the regulatory and environmental documentation associated with the FERC relicensing process. However, it is not anticipated that regulatory requirements resulting from the FERC relicensing process would contribute to potentially significant cumulative adverse impacts on cultural resources.

14.3.1.6 *OTHER CUMULATIVE CULTURAL RESOURCES IMPACT CONSIDERATIONS*

The quantitative operations-related impact considerations for the CEQA Yuba Accord Alternative, relative to the Existing Condition, are discussed in Section 14.2.5. Potential impacts identified in Section 14.2.5 are summarized below and provide an indication of the potential incremental contributions of the Yuba Accord Alternative to cumulative impacts. These potential impacts are summarized here:

- Impact 14.2.5-1: Change in New Bullards Bar Reservoir water surface elevations that could result in adverse impacts to sensitive cultural resources – Less than Significant
- Impact 14.2.5-2: Alteration of the character of the New Bullards Bar Reservoir site setting that could affect eligibility for site inclusion in the NRHP – Less than Significant

- Impact 14.2.5-3: Changes in lower Yuba River monthly mean flows that could result in adverse impacts to sensitive cultural resources – Less than Significant
- Impact 14.2.5-4: Alteration of the character of the lower Yuba River site setting that could affect eligibility for site inclusion in the NRHP – Less than Significant
- Impact 14.2.3-5: Changes in Oroville Reservoir water surface elevations that could result in adverse impacts to sensitive cultural resources – Less than Significant
- Impact 14.2.5-6: Alteration of the character of the Oroville Reservoir site setting that could affect eligibility for site inclusion in the NRHP – Less than Significant
- Impact 14.2.5-7: Changes in Feather River monthly mean flows that could result in adverse impacts to sensitive cultural resources – Less than Significant
- Impact 14.2.5-8: Alteration of the character of the Feather River site setting that could affect eligibility for site inclusion in the NRHP – Less than Significant
- Impact 14.2.5-9: Changes in Sacramento River monthly mean flows that could result in adverse impacts to sensitive cultural resources – Less than Significant
- Impact 14.2.5-10: Alteration of the character of the Sacramento River site setting that could affect eligibility for site inclusion in the NRHP – Less than Significant

Although these impacts would be less than significant, the potential exists for cumulative impacts nevertheless. Cumulative impact determinations are presented below, and are based upon consideration of the quantified Yuba Accord Alternative impacts relative to the CEQA Existing Condition, in combination with the potential impacts of other reasonably foreseeable projects. These cumulative impact determinations are summarized by region.

14.3.1.7 POTENTIAL FOR CUMULATIVE CULTURAL RESOURCES IMPACTS WITHIN THE PROJECT STUDY AREA

Because results from the quantitative analysis generally indicate that direct project-related cultural resources impacts would be less than significant, the potential for the Yuba Accord Alternative to incrementally contribute to cumulative cultural resources impacts within the project study area would be minimal. The frequency and magnitude of these quantitative hydrologic changes, in concert with the other qualitative analytical considerations, are both contributing factors used to reach the overall cumulative impact conclusions discussed below for the Yuba Accord Alternative Cumulative Condition, relative to the Existing Condition.

Impact 14.3.1.7-1: Potential for significant cumulative cultural resources impacts within the Yuba Region

Of the projects discussed above, the Yuba Project FERC Relicensing has the potential to affect cultural resources in the Yuba Region. While, as part of the relicensing, FERC may impose new regulatory constraints on the Yuba Project, which could affect New Bullards Bar Reservoir operations and YCWA's ability to manage releases into the lower Yuba River, it is not anticipated that FERC's new conditions would significantly affect cultural resources. The overall effects on cultural resources in the Yuba Region under Yuba Accord Alternative Cumulative Condition, compared to the Existing Condition, would be less than significant.

Impact 14.3.1.7-2: Potential for potential cumulative cultural resources impacts within the CVP/SWP Upstream of the Delta Region

For the reasons discussed above, it is anticipated that the water storage and conveyance facilities, projects related to CVP/SWP operations, new water transfer and acquisition programs and new flood control, ecosystem restoration and fisheries improvement projects discussed above could result in potential cumulative impacts on cultural resources in the CVP/SWP Upstream of the Delta Region. Thus, compared to the Existing Condition, the overall effects of the Yuba Accord Alternative Cumulative Condition on cultural resources in the CVP/SWP Upstream of Delta Region could be potentially significant. While some projects would improve ecosystem function and fish and wildlife habitat, which could increase hunting and fishing opportunities associated with tribal entities, the creation of new reservoirs could result in adverse impacts to existing or potential archeological sites in the vicinity of the proposed structures and facilities. It can be reasonably assumed that each of these other projects would make every effort to avoid or minimize adverse impacts to cultural resources associated with their implementation, and individually could result in less than significant impacts. It can also be reasonably assumed, however, that the combination of a number of less than significant impacts could, in fact, result in cumulative potentially significant impacts.

Although there is a potential for cumulative impacts on cultural resources to occur in the CVP/SWP Upstream of the Delta Region as a result of other reasonably foreseeable projects being implemented, particularly construction-related projects, the incremental effects of the Yuba Accord Alternative would be restricted to flow changes in the Feather and Sacramento rivers. Although flows in these rivers will vary as a result of implementing the reasonably foreseeable future projects listed above, these flow changes in combination with those occurring under the Yuba Accord Alterative would generally occur during the lower flow conditions (e.g., July through September) and, thus, would not be expected to exceed the channel capacities of the Feather and Sacramento rivers. As a result, these flow changes would not be likely to result in an increased inundation of previously exposed areas or exposure of previously inundated lands to adversely impact sensitive cultural resources. Therefore, it is concluded that implementation of the Yuba Accord Alternative in combination with other reasonably foreseeable projects would result in a less than significant cumulative impact to cultural resources in the CVP/SWP Upstream of the Delta Region.

Impact 14.3.1.7-3: Potential for significant cumulative cultural resources impacts within the Delta Region

For the reasons discussed above, it is anticipated that the water storage and conveyance facilities, projects related to CVP/SWP operations, new water transfer and acquisition programs, and new flood control, ecosystem restoration and fisheries improvement projects discussed above could result in potential cumulative impacts on cultural resources in the Delta Region. Thus, compared to the Existing Condition, the overall effects of the Yuba Accord Alternative Cumulative Condition on cultural resources in the Delta Region could be potentially significant.

It is uncertain how the implementation of the various reasonably foreseeable projects listed above would change evaluated Delta parameters (e.g., inflows, exports) within the Delta Region. A number of these projects would be expected to result in increased water availability and therefore increased CVP/SWP operational flexibility to meet various instream beneficial uses. By contrast, some of the previously listed reasonably foreseeable projects could be expected to result in decreased operational and management flexibility due to the primary purposes of increased diversions and water supplies associated with future levels of demand, which could result in reduced inflows and increased exports.

Although there is a potential for cumulative impacts on cultural resources to occur in the Delta Region as a result of other reasonably foreseeable projects being implemented, particularly construction-related projects, the incremental effects of the Yuba Accord Alternative would be restricted to changes in Delta inflow from the Sacramento River. Although Delta inflows will vary as a result of implementing the reasonably foreseeable future projects listed above, these flow changes in combination with those occurring under the Yuba Accord Alterative would generally occur during the lower flow conditions (e.g., July through September) and, due to the total volume of water flowing through the Delta, would not be expected to increase inundation of previously exposed areas or exposure of previously inundated lands to adversely impact sensitive cultural resources. Therefore, it is concluded that implementation of the Yuba Accord Alternative in combination with other reasonably foreseeable projects would result in a less than significant cumulative impact to cultural resources in the Delta Region.

Impact 14.3.1.7-4: Potential for significant cumulative cultural resources impacts within the Export Service Area

For the reasons discussed above, it is anticipated that the water storage and conveyance facilities, CVP/SWP operations projects, new water transfer and acquisition programs and the new flood control, ecosystem restoration and fisheries improvement projects discussed above would not adversely impact cultural resources, and therefore would not have any cumulative impacts in the Export Service Area (i.e., San Luis Reservoir). Future San Luis Reservoir operations would be expected to cause fluctuations (increases and decreases) in water surface elevations that would be within the range of historical variation currently observed and, thus, these changes would remain within the range of seasonal drawdown levels observed under the Existing Condition. Therefore, the overall effects on cultural resources at San Luis Reservoir would not occur, and the potential cumulative impacts of the Yuba Accord Alternative Cumulative Condition, compared to the Existing Condition, would be less than significant.

14.3.2 ENVIRONMENTAL IMPACTS/ENVIRONMENTAL CONSEQUENCES OF THE MODIFIED FLOW ALTERNATIVE CUMULATIVE CONDITION COMPARED TO THE EXISTING CONDITION

It is anticipated that the Modified Flow Alternative Cumulative Condition will have the same potential for cumulative impacts as the Yuba Accord Cumulative Condition. Therefore, the description of the potential impacts in Section 14.3.1 also serves as the description of cumulative impacts associated with the Modified Flow Alternative. Thus, the Modified Flow Alternative Cumulative Condition would result in the following potential cumulative impacts:

- Yuba Region - Potential cumulative impacts on cultural resources in the Yuba Region would be less than significant.
- CVP/SWP Upstream of the Delta Region - Potential cumulative impacts on cultural resources in the CVP/SWP Upstream of the Delta Region would be less than significant.
- Delta Region - Potential cumulative impacts on cultural resources in the Delta Region would be less than significant.
- Export Service Area - Potential cumulative impacts on cultural resources in the Export Service Area (San Luis Reservoir) would be less than significant.

14.4 POTENTIAL CONDITIONS TO SUPPORT APPROVAL OF YCWA'S WATER RIGHTS PETITION

No unreasonable adverse effects to cultural resources would occur under the Proposed Project/Action or an action alternative and, thus, no impact avoidance measures or other protective conditions are identified for the SWRCB's consideration in determining whether or not to approve YCWA's petitions to implement the Yuba Accord.

14.5 MITIGATION MEASURES/ENVIRONMENTAL COMMITMENTS

No adverse effects would occur to cultural resources under the Proposed Project/Action or an action alternative and, thus, no mitigation measures are required.

14.6 POTENTIALLY SIGNIFICANT UNAVOIDABLE IMPACTS

There are no potentially significant unavoidable impacts to cultural resources associated with the implementation of the Proposed Project/Action or an action alternative.

CHAPTER 15
AIR QUALITY

This chapter describes existing air quality conditions, identifies current state and federal regulations, including the attainment classifications for various types of air pollutants, and evaluates the potential air quality effects that could occur as a result of implementing the Proposed Project/Action or an alternative. The potential impacts on air quality that could occur as a result of the Proposed Yuba Accord or an alternative would result from a change in the amount of pumping. Within the Yuba Region, groundwater pumping would increase over current levels for the Proposed Project/Action and alternatives. Depending on the type of energy used to power the increased pumping, there could be impacts to air quality. For example, if diesel engines are used to power the pumps, the emissions of certain pollutants could increase in the Yuba Region. Conversely, the increase in surface water deliveries available to agricultural users in the Export Service Area may reduce groundwater pumping in areas south of the Delta. This reduction in groundwater pumping in the Export Service Area may reduce emissions of pollutants.

15.1 ENVIRONMENTAL SETTING/AFFECTED ENVIRONMENT

The air quality of a particular area is influenced by several factors, including the amounts of pollutants released, the nature of the sources, and the ability of the atmosphere to transport and disperse the pollutants. The main determinants of transport and dispersion are wind, atmospheric stability or turbulence, topography, and the existence of inversion layers.

Air quality in California is regulated by the EPA and the California Air Resources Board (CARB). Regulation occurs at regional levels in designated Air Basins, and at local levels by Air Pollution Control Districts (APCD) or Air Quality Management Districts (AQMD). These districts are responsible for attaining both state and federal air quality targets. For some pollutants, separate targets have been established for different periods of the year. Most targets have been set to protect public health, although some standards have been based on other values, such as protection of crops, protection of materials, or avoidance of nuisance conditions. Various types of air pollutants are measured, including: (1) ozone; (2) carbon monoxide; (3) nitrogen dioxide; and (4) particulate matter that measures 10 microns or less (PM_{10}).

Of the 15 designated air basins (CARB) in California, the northern and southern portions of the Central Valley, where activities associated with the Proposed Yuba Accord would occur, are contained within in the Sacramento Valley Air Basin (SVAB) and the San Joaquin Valley Air Basin (SJVAB), respectively. Air quality in general, and specifically in these two basins, is affected by more than emissions. Meteorology and terrain also can influence air quality. Meteorology can cause year-to-year changes in air quality in which the benefits of emission reductions can be masked. California's terrain also plays a role in the formation of ozone. The Central Valley is characterized by a broad floor with the Cascade Mountain Range in the north, the Sierra Nevada Range in the east, and the Coast Range in the west. These mountains act as air current barriers, preventing dissipation of air pollutants outside of the valley.

Because the Proposed Project/Action and alternatives could potentially affect the SVAB and the SJVAB, the discussion below characterizes existing air quality conditions in the regional area considered to be part of either basin. Due to the nature of air quality issues, the discussion also centers on the regulatory language describing regional air quality pollutants of primary concern. For more information about the regulatory definitions associated with specific pollutants, see Section 15.1.5).

15.1.1 YUBA REGION

For purposes of this air quality evaluation, the Yuba Region is defined as Yuba County. Yuba County is contained within the Feather River AQMD and, together with 10 other counties, encompasses part of the larger regional SVAB.

Because Yuba County consistently exhibits low annual average oxides of nitrogen (NO_x) and PM_{10} emissions, relative to the other counties in the SVAB, it is generally considered to have relatively good air quality. There are currently no high-emitting facilities located within Yuba County. In addition, Yuba County air quality is designated as attainment (or unclassified) for all federal standards. State standards for pollutants are more stringent than federal standards. As a result of these more stringent state standards, Yuba County air quality is designated as moderate non-attainment for ozone (1 hour) and non-attainment for PM_{10}. For a complete description of regulatory designations see Section 15.1.5.

Pumping of groundwater for agricultural purposes has been conducted within Yuba County for many years. Pumping of groundwater to free up supplies of surface water for transfer (in-lieu groundwater substitution transfers) has occurred since 1991. Groundwater pumping volumes and impacts on the aquifer are described in Chapter 6. Over the past decade, efforts to better understand, monitor and control the use of groundwater in Yuba County have been underway, including efforts to monitor and improve potential air quality impacts associated with groundwater pumping.

15.1.1.1 GROUNDWATER PUMPING, AIR QUALITY MONITORING AND IMPROVEMENT PROGRAM

A number of transfers of surface water and groundwater have been consummated from Yuba County sources (see Table 5-5). For the past few years, the largest purchaser of water from Yuba County has been the EWA, and the second largest has been DWR. The proposed agreements that would constitute the Yuba Accord are structured to provide the first component of water in every year to EWA or its successor program.

The Final EIS/EIR for the existing EWA program (Reclamation *et al.* 2004) includes specific mitigation measures to avoid impacts to air quality by requiring willing sellers to utilize electric pumps, or to require sellers to obtain offsets for air quality impacts, as a condition for purchases of groundwater by EWA. YCWA has been working with DWR and local Member Units to develop a groundwater pumping, air quality monitoring and improvement program that would both meet the requirements of groundwater transfers to EWA and DWR, and improve the overall air quality of Yuba County.

Additionally, for the Proposed Yuba Accord, various commitments to continuing the reduction of potential air quality impacts associated with groundwater pumping are embodied in the agreements that constitute the Yuba Accord Alternative. Section 12.A of the Water Purchase Agreement includes the following provision:

> *In furtherance of the mitigation of potential impacts to air quality from implementation of the Accord, Yuba has implemented as part of the Conjunctive Use Agreements a program to convert certain pumps used to pump groundwater from diesel to electric, or to other forms of energy that reduce air quality impacts. Conversion of pumps to*

electricity or other forms of energy that reduce air quality impacts has been and will be performed by Yuba for purposes of this Agreement. Prior to submitting invoices to the Buyers under Section 10 ("Invoicing") of this Agreement, Yuba will: (1) submit to the Technical Committee for review documentation of the diesel conversion work performed and costs incurred from and after September 1, 2004 for purposes of this Agreement and the Accord; and (2) confirm to the Policy Committee that the work performed and costs incurred were in furtherance of mitigation of potential impacts on air quality from implementation of the Accord.

Additionally, Paragraph 15 of the Conjunctive Use Agreements commit to the following:

To avoid air quality impacts from the implementation of the settlement (including the groundwater substitution water transfer program), the Agency would coordinate with the Member Units in the development and implementation of a program to convert certain diesel pumps to electrical pumps. The Agency would reimburse the Member Units for electricity standby charges incurred to implement the conjunctive use program if the wells were not used to provide water for a groundwater substitution water transfer during the period of years that the standby charge is incurred.

The groundwater pumping air quality monitoring and improvement program that is underway in Yuba County is designed to achieve no net impact to air quality as a result of groundwater pumping in support of groundwater substitution transfers. A schematic of the program is shown in **Figure 15-1**.

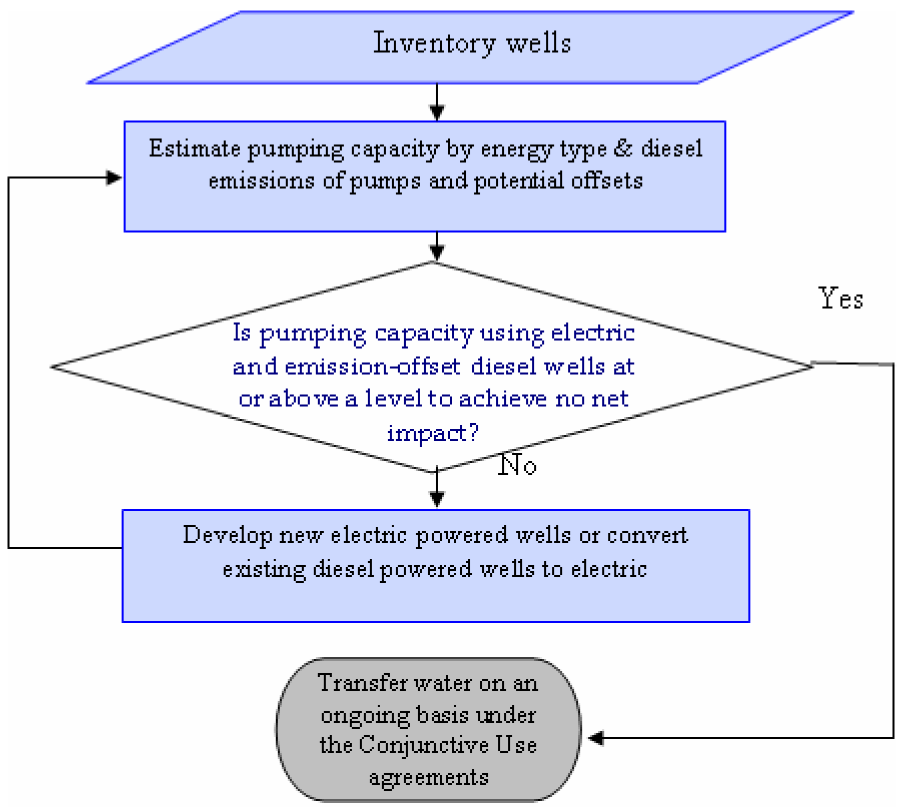

Figure 15-1. Flow Chart of Groundwater Pumping, Air Quality Monitoring and Improvement Program

YCWA has begun to implement the mitigation plan described above. YCWA, with funding from DWR, has nearly completed an inventory of grower-owned wells that could be used for pumping under the Conjunctive Use Agreements. The inventory includes an assessment of the pumping capacity of each well, the existing power source (electric or diesel) and information about the diesel engines used on wells (make, model, manufacturer and manufacture date) in order to estimate emissions.[1]

Currently, the well inventories of six out of the seven participating Member Units are complete. The most recent Yuba County well inventory, conducted in 2005 and 2006 by DWR, indicates that there are 235 groundwater wells distributed throughout the participating Member Units in both the North and South Yuba subbasins (Figure 6-2 and Figure 6-3). Approximately 90 percent, or 210, of the wells are currently powered by electricity. YCWA is in the process of working with the participating Member Units to convert some of the existing diesel-powered engines to electricity. In 2004, YCWA worked closely with two of the participating Member Units and the Feather River AQMD to submit applications for Carl Moyer grant funds[2] to convert four of the existing diesel engines to electricity. YCWA would continue to work closely with the Feather River AQMD and the participating Member Units to submit additional applications for Carl Moyer grant funds, as needed and desired. Additionally, the Proposed Project/Action provides funds to convert diesel wells to electricity as needed.

The second step in the program is to assess whether the necessary level of groundwater pumping is attainable with the pumping capacity of existing electric wells. With 90 percent of wells powered by electricity, and more conversions underway, electric pumping capacity for groundwater substitution transfers is generally sufficient (see Chapter 6 for a detailed analysis of likely pumping locations).

Verifying that the wells being pumped are electric is conducted as part of a groundwater substitution transfer. Field visits to the wells participating in groundwater substitution transfers occur every month during the transfer period. Currently, sites are visited to take readings from the flow meters attached to the groundwater pumps, as well as to verify the type of power used for the pumps.

Groundwater pumping to mitigate for surface water deficiencies would not be subject to controls or limitations on the use of non-electric motors for pumping.

15.1.2 CVP/SWP Upstream of the Delta Region

For the purposes of this air quality evaluation, the CVP/SWP Upstream of the Delta Region is comprised of the SVAB. As described previously, the SVAB is surrounded by mountains, with the Coast Range to the west, the Cascade Range to the north, and the Sierra Nevada Range to the east. In addition to Yuba County, the SVAB is comprised of all or parts of ten other

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[1] Pumping capacity is the lesser of the physical capacity of the well-to-pump water and the crop water demand for the field that the well is irrigating. Information about make, model, manufacturer and manufactured year is not always available. Where this information is not available, worst-case assumptions are made when estimating emissions volumes.

[2] The objective of the Carl Moyer grant program is to reduce air pollution emissions by providing grants for the incremental cost of cleaner vehicles and equipment. The program focuses on the replacement of older heavy-duty diesel engines with electric, alternative fuel, or cleaner diesel technology.

counties: Shasta, Tehama, Butte, Glenn, Sutter, Colusa, Yolo, Placer, Solano, and Sacramento counties.

During summer in the SVAB, the Pacific high pressure system can create low-elevation inversion layers where air descending from high pressure overlies shallow, cooler layers of air. This prevents normal mixing of the atmosphere and prevents the vertical dispersion of air above the boundary layer. As a result, air pollutants can become concentrated during summer, decreasing air quality until daytime heating of solid surfaces raises the inversion to the point where it breaks and allows full mixing. During winter, when the Pacific high-pressure system moves south, stormy, rainy weather visits the region intermittently and persistent inversions are less common. Prevailing winter winds from the southwest disperse pollutants, often resulting in clear, sunny weather and good air quality over most of this portion of the region. High particulate levels can, however, occur in winter when stable weather occurs and tule fog develops under cold air inversions. In the SVAB, ozone and PM_{10} are pollutants of concern because concentrations of these pollutants have been found to exceed standards (see Section 15.1.4). Ozone is a seasonal problem derived from photochemical reactions of hydrocarbons and oxides of nitrogen in the presence of sunlight, occurring predominantly from approximately May through October.

15.1.3 DELTA REGION

As stated above, the air quality analysis focuses on the SVAB and the SJVAB, which do not extend to the Delta Region. Because there are no actions associated with the Proposed Yuba Accord that could affect air quality in the Delta, a discussion of this region is not included in this chapter.

15.1.4 EXPORT SERVICE AREA

For the purposes of this air quality evaluation, the Export service area is defined as the San Joaquin Valley Air Basin. The area within the San Joaquin Valley Air Basin is managed by the San Joaquin Valley APCD. Air quality within the SJVAB has been noted in two different designations to be some of the worst in the Country. The San Joaquin Valley ranked third worst in the country of 1-hour ozone design values using 2000 through 2002 data (the 1-hour ozone design value is described in section 15.1.5) (California Air Resources Board 2005). The SJVAB ranks in the top eight western areas for non-attainment in PM_{10} (California Air Resources Board 2005). All of the counties within the San Joaquin Valley APCD are designated as non-attainment for all federal and state standards. For a complete description of regulatory designations see Section 15.1.5, Regulatory Setting, below.

15.1.5 REGULATORY SETTING

Air quality management responsibilities exist at local, state, and federal levels of government. Air quality management planning programs were developed during the past decade, generally in response to requirements established by the federal CAA. In most cases, state air quality standards are more stringent than the federal EPA standards. Pollutants for which federal and state standards have been established are termed "criteria" pollutants, because the standards are based on studies of health effects criteria that show a relationship between the pollutant concentration and its effect. From this relationship, the EPA and the state (i.e., CARB) also establish acceptable pollutant concentration levels and ambient air quality standards. Air quality criteria pollutants of primary concern are identified in California and federal ambient air quality standards for these criteria pollutants are presented in **Table 15-2.**

Table 15-1. Air Quality Criteria Pollutants of Primary Concern

Pollutant	Major Sources
Ozone	Combustion sources, such as factories and automobiles, evaporation of solvents and fuels.
Carbon Monoxide	Automobile exhaust, combustion of fuels, and combustion of wood in woodstoves and fireplaces.
Nitrogen Oxides	Automobile and diesel truck exhaust, industrial processes, fossil-fueled power plants.
Sulfur Dioxide	Diesel vehicle exhaust, oil-powered power plants, industrial processes.
PM_{10}	Dust, erosion, incinerators, automobile and aircraft exhaust, and open fires.

Table 15-2. State and Federal Short-term Air Quality Standards

Pollutant	Averaging Time	California Standards [a]	Federal Standards [b]	
		Concentration[c]	Primary [a, d]	Secondary[a, e]
Ozone (O_3)	1 Hour 8 Hours*	0.09 ppm (180 $\mu g/m^3$) 0.070 ppm (137 $\mu g/m^3$) [f]	-- 0.08 ppm (157 $\mu g/m^3$)	Same as Primary Standard
Respirable Particulate Matter (PM_{10})	24 Hours Annual arithmetic mean	50 $\mu g/m^3$ 20 $\mu g/m^3$	150 $\mu g/m^3$ 50 $\mu g/m^3$	Same as Primary Standard
Fine Particulate Matter (PM) [c]	24 Hours Annual arithmetic mean	No Separate State Std. 12 $\mu g/m^3$	65 $\mu g/m^3$ 15 $\mu g/m^3$	Same as Primary Standard
Carbon Monoxide (CO)	8 Hours 1 Hour 8 Hours (Lake Tahoe)	9.0 ppm (10 mg/m^3) 20 ppm (23 mg/m^3) 6 ppm (7 mg/m^3)	9.0 ppm (10 mg/m^3) 35 ppm (40 mg/m^3) --	None -- --
Nitrogen Oxides (NO_x)	Annual arithmetic mean 1 Hour	-- 0.25 ppm (470 $\mu g/m^3$)	0.053 ppm (100 $\mu g/m^3$) --	Same as Primary Standard
Sulfur Dioxide (SO_2)	Annual arithmetic men 24 Hours 3 Hours 1 Hour	-- 0.04 ppm (105 $\mu g/m^3$) -- 0.25 ppm (655 $\mu g/m^3$)	0.030 ppm (80 $\mu g/m^3$) 0.14 ppm (365 $\mu g/m^3$) -- --	-- -- 0.5 ppm (1300 $\mu g/m^3$) --
Lead [g]	30 Day Average Calendar Quarter	1.5 $\mu g/m^3$ --	-- 1.5 $\mu g/m^3$	-- Same as Primary Standard
Visibility Reducing Particles [h]	8 Hours		N/A	
Sulfates	24 Hours	25 $\mu g/m^3$		
Hydrogen Sulfide	1 Hour Calendar Quarter	0.03 ppm (42 $\mu g/m^3$) --		
Vinyl Chloride [e]	24 Hours	0.01 ppm (26 $\mu g/m^3$)		

[a] California standards for ozone, carbon monoxide (except Lake Tahoe), sulfur dioxide (1 and 24 hour), nitrogen dioxide, suspended particulate manner – PM_{10}, $PM_{2.5}$, and visibility reducing particulates , are quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the CCR.

[b] National standards (other than ozone, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest eight-hour concentration in a year, averaged over three years, is equal to or less than the standard. For PM^{10}, the 24-hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration is above 365 $\mu g/m^3$ is equal to or less than one. For $PM_{2.5}$, the 24-hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard.

[c] Concentrations are expressed first in units in which they were promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas

[d] National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.

[e] National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

[f] New federal 8-hour ozone and fine particulate matter standards were promulgated by EPA on July 18, 1997.

[g] The CARB has identified lead and vinyl chloride as "toxic air contaminants" with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

[h] Extinction coefficient of 0.23 per kilometer – visibility of ten miles or more (0.07 – 30 miles or more for Lake Tahoe) due to particles when relative humidity is less than 70 percent.

* This concentration was approved by CARB on April 28, 2005 and became effective in May 2007.

ppm - parts per million (by volume)

$\mu g/m^3$ - microgram per cubic meter

Source: (California Air Resources Board Website 2005)

15.1.5.1 FEDERAL

The federal CAA requires the EPA to establish and maintain standards for common air pollutants. These standards are used to manage air quality across the country, and regions are evaluated for compliance with the standards. Federal designations for criteria pollutants are defined as follows (see Section 107 (d)(1) of the CAA):

- **Non-attainment –** Any area that does not meet (or that contributes to ambient air quality in a nearby area that does not meet) the national primary or secondary ambient air quality standard for the pollutant;
- **Attainment –** Any area (other than an area identified as non-attainment above) that meets the national primary or secondary ambient air quality standard for the pollutant; and
- **Unclassifiable –** Any area that cannot be classified on the basis of available information as meeting or not meeting the national primary or secondary ambient air quality standard for the pollutant.

An area can be designated as a moderate, severe, serious, or extreme non-attainment area depending upon the level of pollutant concentrations.

Under the conformity provisions of the federal CAA, no federal agency may approve a project unless the project has been demonstrated to conform to federal Ambient Air Quality Standards. These conformity provisions were put in place to ensure that federal agencies would contribute to the efforts of attaining the National Ambient Air Quality Standards. The EPA has issued two sets of conformity guidelines: transportation conformity rules that apply to transportation plans and projects, and general conformity rules that apply to all other federal actions. A conformity determination[3] is only required for the alternative that is ultimately approved and selected.

15.1.5.2 STATE

The State of California has also adopted standards for criteria pollutants. State designations for criteria pollutants are defined as follows (CCR Title, 17 §§ 70303, 70304):

- **Attainment –** (1) Data for record show that no state standard for that pollutant was violated at any site in the area; and (2) data for record meet representativeness and completeness criteria for a location at which the pollutant concentrations are expected to be high based on the spatial distribution of emission sources in the area and the relationship of emissions to air quality. Data representativeness criteria are set forth in "Criteria for Determining Data Representativeness" contained in Appendix 1 to the CCR, Title 17, Division 3, Chapter 1, Subchapter 1.5, Article 3. Data completeness criteria are set forth in "Criteria for Determining Data Completeness" contained in Appendix 3 to this article, (see CCR Title 17, §70304).
- **Non-attainment –** (1) Data for record show at least one violation of a state standard for that pollutant in the area, and the measurement of the violation meets the representativeness criteria set forth in "Criteria for Determining Data Representativeness" contained in Appendix 1 to the CCR, Title 17; or (2) limited or no

[3] A conformity determination is a process that demonstrates how an action would conform to the applicable implementation plan. If the emissions cannot be reduced sufficiently, and if air dispersion modeling cannot demonstrate conformity, then either a plan for mitigating or a plan for offsetting the emissions must be pursued.

air quality data were collected in the area, but the state board finds, based on meteorology, topography, and air quality data for an adjacent non-attainment area, that there has been at least one violation of a state standard for that pollutant in the area being designated. An area will not be designated as non-attainment if the only recorded exceedance(s) of that state standard were based solely on data for record determined to be affected by a highly irregular or infrequent event. Data affected by a highly irregular or infrequent event will be identified as such by the executive officer in accordance with the "*Air Resources Board Procedure for Reviewing Air Quality Data Possibly Affected by a Highly Irregular or Infrequent Event*," set forth in Appendix 2 to Title 17, Division 3, Chapter1, Subchapter 1.5, Article 3 (CCR Title, 17 §§ 70303).

- **Unclassified** - A pollutant is designated unclassified if the data are incomplete and do not support a designation of attainment or non-attainment.

CALIFORNIA AIR RESOURCES BOARD

The CARB is responsible for ensuring implementation of the California Clean Air Act (CCAA), and establishing state and federal ambient air quality standards. The federal CAA requires states with non-attainment areas to develop plans, known as State Implementation Plans (SIPs), describing the measures the state will take to achieve attainment with national ambient air quality standards.

To better manage air pollution, California is divided into 15 air basins. Local air districts and other agencies prepare SIP elements for the areas under their regulatory jurisdictions, and submit these elements to CARB for review and approval. CARB incorporates the individual air district plans into a statewide SIP and the plan is then submitted to EPA for approval and publication in the Federal Register.

In 2003, CARB developed a statewide inventory for diesel-fueled agricultural irrigation pumps. As part of the update process CARB contacted seventeen air districts with significant irrigated agricultural acreage to obtain their best estimates of the number of pumps and emissions from stationary mobile diesel-fueled agricultural irrigation pumps. Air districts estimated that owners of fewer than 100 agricultural irrigation pumps were not contacted as part of the update and therefore are not reflected in the statewide inventory. The inventory did not include Yuba County. While the inventory may be modified before adoption of the next SIP, this inventory represents the best available data on agricultural irrigation pump emissions in California.

SACRAMENTO VALLEY AIR BASIN

The SVAB contains parts of eleven counties, stretching 150 miles from Shasta County in the north to Sacramento County in the south. The basin is ringed by the Coast Mountains to the west, the Cascade Range mountains to the north and the Sierra Nevada Range mountains to the east. Within the SVAB there are nine APCDs or AQMDs. Generally, each county has its own APCD or AQMD, with Yuba and Sutter counties combined to form the Feather River AQMD, and Yolo and Solano counties combined to form the Yolo-Solano AQMD.

On-road motor vehicles are the largest source of smog forming air pollution emissions in the SVAB. Seven percent of Californians live in the SVAB, generating 8 percent of all the vehicle miles driven in the state. Emissions of reactive organic gases (ROG), NO_x and carbon monoxide (CO) are all trending downward over the years because of cleaner cars, but emissions of PM_{10} have been increasing at the same time from area-wide sources, primarily fugitive dust from paved and unpaved roads and increased vehicle travel (California Air Resources Board Website 2006c).

In the SVAB, ozone and PM_{10} are pollutants of concern because concentrations of these pollutants have been found to exceed standards. Ozone is a seasonal pollutant derived from photochemical reactions of hydrocarbons and NO_x in the presence of sunlight, occurring predominantly from approximately May through October.

The estimated average annual emissions of several pollutants in the SVAB, the SVAB emissions as a percent of statewide totals and statewide totals for 2005 are presented in **Table 15-3**. These data were obtained from the air basin data directory on the CARB website. In addition, the federal and state attainment status for each county within the SVAB are presented in **Table 15-4.**

Table 15-3. Sacramento Valley Air Basin – 2005 Estimated Annual Average Emissions

	CO	NO_X	SO_X	PM	PM_{10}	$PM_{2.5}$
Sacramento Valley Air Basin (tons per day)	1,181.7	249.0	6.4	404.41	226.0	86.3
SVAB as a percent of statewide total	8.6%	7.7%	2.1%	10.4%	10.2%	10.0%
Statewide Total (tons per day)	**13,765.6**	**3,219.4**	**301.9**	**3,882.7**	**2,212.0**	**863.9**
Source: (California Air Resources Board Website 2006a)						

SACRAMENTO BASINWIDE AIR POLLUTION CONTROL COUNCIL

The Sacramento Valley Basinwide Air Pollution Control Council (BCC) is authorized pursuant to California Health and Safety Code (HSC) Section 40900, and consists of an elected official designated by the air pollution control district governing board of each district within the SVAB. There are nine council members currently sitting on the BCC.

The purpose of the BCC is to carry out the following activities pursuant to state law and the CCR (HSC Sections 41865 and 41866; CCR, Title 17, Sections 80100 et. seq.).

- Smoke Management Program
- Rice Straw Burning Reduction Act of 1991
- Conditional Rice Straw Burning Permit Program for the Sacramento Valley Air Basin
- Assistance to districts in the SVAB in coordinating all air pollution control activities to ensure that the entire SVAB is, or will be, in compliance with the requirements of state and federal law.

SAN JOAQUIN VALLEY AIR BASIN

The SJVAB stretches over 300 miles from San Joaquin County in the north to western Kern County in the south. The area is bounded on the west by the Coast Ranges, on the east by the Sierra Nevada and on the south by the Tehachapi Mountains. One APCD, the San Joaquin Valley APCD, is located within the SJVAB.

Table 15-4. Sacramento Valley Air Basin Ambient Air Quality Standards Attainment Status by County

Pollutant	Shasta County	Tehama County	Glenn County	Colusa County	Yolo County	Solano County	Butte County	Sutter County	Yuba County	Sacramento County
State										
Ozone	Non-attainment	Non-attainment	Non-attainment (Transitional)	Non-attainment (Transitional)	Non-attainment (Serious)	Non-attainment (Serious)	Non-attainment (Transitional)	Non-attainment (Southern portion – Moderate; northern portion – Serious)	Non-attainment (Moderate)	Non-attainment (Serious)
PM_{10}	Non-attainment	Non-attainment	Non-attainment	Non-attainment	Non-attainment	Non-attainment	Non-attainment	Non-attainment	Non-attainment	Non-attainment
CO	Unclassified	Unclassified	Unclassified	Unclassified	Attainment	Attainment	Attainment	Attainment	Unclassified	Attainment
Federal										
Ozone 1-hour Standard	Unclassified/ Attainment	Unclassified/ Attainment	Unclassified/ Attainment	Unclassified/ Attainment	Non-attainment (Severe)	Non-attainment (Severe)	Non-attainment (Section 185A)	Non-attainment (Southern portion – severe; northern portion – Section 185A)	Not Available	Non-attainment (Severe)
Ozone 8-hour Standard	Unclassified/ Attainment	Unclassified/ Attainment	Unclassified/ Attainment	Unclassified/ Attainment	Non-attainment (Serious)	Non-attainment (Portion – Serious)	Non-attainment (Basic)	Non-attainment (Southern portion – serious; northern portion – basic)	Unclassified/ Attainment	Non-attainment (Serious)
PM_{10}	Unclassified/ Attainment	Unclassified/ Attainment	Unclassified/ Attainment	Unclassified/ Attainment	Unclassified/ Attainment	Unclassified/ Attainment	Unclassified/ Attainment	Unclassified/ Attainment	Unclassified/ Attainment	Non-attainment (Moderate; Request for attainment redesignation has been filed)
$PM_{2.5}$	Unclassified/ Attainment	Unclassified/ Attainment	Unclassified/ Attainment	Unclassified/ Attainment	Unclassified/ Attainment	Unclassified/ Attainment	Unclassified/ Attainment	Unclassified/ Attainment	Unclassified/ Attainment	Unclassified/ Attainment
CO	Unclassified	Unclassified	Unclassified	Unclassified	Unclassified	Unclassified	Unclassified	Unclassified	Unclassified	Unclassified
Source: (California Air Resources Board Website 2006b)										

Most industry in the SJVAB is agricultural. Motor vehicles, forest products, oil production and refining industries are also sources of emissions. Nine percent of Californians live here, generating 12 percent of the vehicle miles driven and 14 percent of the state's air pollution. Overall, emissions levels have been decreasing since 1990, except for PM_{10} emissions, which are increasing, mainly due to fugitive dust(California Air Resources Board Website 2006c).

The estimated average annual emissions of several pollutants in the SJVAB, the SJVAB emissions as percentages of statewide totals and statewide totals for 2005 are presented in **Table 15-5**. In addition, the federal and state attainment status for each county within the SJVAB and each pollutant is presented in **Table 15-6.**

Table 15-5. San Joaquin Valley Air Basin – 2005 Estimated Annual Average Emissions

	CO	NO_X	SO_X	PM	PM_{10}	$PM_{2.5}$
San Joaquin Valley Air Basin (tons per day)	2,104.6	481.4	30.3	620.8	361.1	166.7
San Joaquin Valley Air Basin as a Percent of Statewide Total	15.3%	15.0%	10.0%	16.0%	16.3%	19.3%
Statewide Total (tons per day)	13,765.6	3,219.4	301.9	3,882.7	2,212.0	863.9
Source: (California Air Resources Board Website 2006b)						

SENATE BILL 700 (2003, FLOREZ)

California air quality management districts and air pollution control districts require any person that uses certain types of equipment that may emit air pollutants to obtain a permit. Prior to the enactment of Senate Bill 700 in 2003 (2003 Cal. Stats., c. 479), vehicles and certain types of equipment such as agricultural groundwater pumps were exempt from the permit requirement under California law. Senate Bill 700 eliminated that exemption for any equipment used in agricultural operations (see Health and Safety Code, §§39011.5, 42301.16). The law now requires permits to operate most agricultural equipment (see Health and Safety Code, §42300; Feather River AQMD Rule 4.1).

The bill generally defines "agricultural source" as a source, or group of sources, used in the production of crops or the raising of fowl or animals located on contiguous property and under common ownership or control, and specifically lists internal combustion engines, including portable and off-road engines as one of four categories of emissions sources that are part of the agricultural source.

15.1.5.3 LOCAL

At the local level, the Feather River AQMD has regulatory jurisdiction and air quality management responsibilities for Yuba and Sutter counties. The San Joaquin Valley AQMD has regulatory jurisdiction and air quality management responsibilities for the counties within the Export Service Area. The federal and state attainment status of both AQMDs is presented above in Tables 15-4 and 15-6. As previously discussed, the air quality in Yuba County is listed as unclassified or attainment for federal standards. For state standards, the district is classified as non-attainment for ozone (1-hour) and PM_{10}. The air quality in the San Joaquin Valley AQMD is non-attainment under both federal and state standards except for CO.

Table 15-6 San Joaquin Valley Air Basin Ambient Air Quality Standards Attainment Status by County

Pollutant	San Joaquin County	Stanislaus County	Merced County	Madera County	Fresno County	Kings County	Tulare County	western Kern County
State								
Ozone	Non-attainment	Non-attainment	Non-attainment	Non-attainment	Non-attainment	Non-attainment	Non-attainment	Non-attainment
PM_{10}	Non-attainment	Non-attainment	Non-attainment	Non-attainment	Non-attainment	Non-attainment	Non-attainment	Non-attainment
CO	Unclassified/ Attainment	Unclassified/ Attainment	Unclassified/ Attainment	Unclassified/ Attainment	Unclassified/ Attainment	Unclassified/ Attainment	Unclassified/ Attainment	Unclassified/ Attainment
Federal								
Ozone (1-hour Standard)	Non-attainment	Non-attainment	Non-attainment	Non-attainment	Non-attainment	Non-attainment	Non-attainment	Non-attainment
Ozone (8-hour Standard)	Non-attainment	Non-attainment	Non-attainment	Non-attainment	Non-attainment	Non-attainment	Non-attainment`	Non-attainment
PM_{10}	Non-attainment	Non-attainment	Non-attainment	Non-attainment	Non-attainment	Non-attainment	Non-attainment	Non-attainment
$PM_{2.5}$	Non-attainment	Non-attainment	Non-attainment	Non-attainment	Non-attainment	Non-attainment	Non-attainment	Non-attainment
CO	Unclassified	Unclassified	Unclassified	Unclassified	Unclassified	Unclassified	Unclassified	Unclassified
Source: (California Air Resources Board Website 2006b)								

15.2 ENVIRONMENTAL IMPACTS/ENVIRONMENTAL CONSEQUENCES

15.2.1 IMPACT ASSESSMENT METHODOLOGY

15.2.1.1 YUBA REGION

Implementation of any of the alternatives considered in this EIR/EIS could potentially result in changes to air quality conditions within the Yuba Region (i.e., local study area). The changes in air quality would occur through the use of diesel powered pumps by individual growers to pump groundwater. However, as described in Section 15.1.1.1, the groundwater pumping air quality monitoring and improvement program that is currently underway within Yuba County will impact all of the project alternatives, and particularly the action alternatives under consideration. As a result, all of the CEQA/NEPA scenarios and comparisons will be evaluated with the context of the monitoring and improvement program.

15.2.1.2 CVP/SWP UPSTREAM OF THE DELTA REGION

Activities (i.e., groundwater extraction operations that generate emissions due to the fuel and energy required for pumping and transporting groundwater, and groundwater well pump conversions from diesel to electric motors) associated with the Proposed Project/Action or alternatives would not be expected to cause air quality impacts of measurable or detectable quantities in the CVP/SWP Upstream of Delta Region. Therefore, further evaluation of this region is not warranted.

15.2.1.3 DELTA REGION

As stated above, the air quality analysis focuses on Yuba County and to a larger extent, the SVAB. However, the SVAB does not extend into the Delta Region. Consequently, localized changes and potential air quality impacts in Yuba County would not be expected to be transferred to the Delta Region. Therefore, further evaluation of this region is not warranted.

15.2.1.4 EXPORT SERVICE AREA

The Proposed Project/Action and alternatives potentially could result in impacts to air quality in the Export Service Area due to changes in agricultural pumping of groundwater and associated changes in emissions. Agricultural pumping of groundwater is often powered by diesel engines, as described above in Section 15.2.1.1.

The CARB develops emissions inventory data, which provide estimates of emissions by sources. **Table 15-7** lists the estimate of emissions of various pollutants of irrigation internal combustion engines which use diesel fuel. As can be seen in Table 15-7, the estimates of the amount of emissions from diesel engines are relatively small percentages of SJVAB total emissions. The estimate for NOx is 16.7 tons per day, or 3.5 percent of the total estimate for the SJVAB. The estimate of PM_{10} is 1.2 tons per day or 0.3 percent of the total estimate for the SJVAB.

Table 15-7. San Joaquin Valley Air Basin Estimate of Emissions from Diesel Powered Internal Combustion Engines

	CO	NO_X	SO_X	PM	PM_{10}	$PM_{2.5}$
Irrigation Internal Combustion Engines Diesel/Distillate (tons per day)	6.2	16.7	1.8	1.2	1.2	1.1
As a Percent of SJVAB Total Emissions	0.3%	3.5%	5.8%	0.2%	0.3%	0.7%
San Joaquin Valley Air Basin (tons per day)	2,104.6	481.4	30.3	620.8	361.1	166.7
Source: (California Air Resources Board Website 2006b)						

15.2.2 IMPACT INDICATORS AND SIGNIFICANCE CRITERIA FOR AIR QUALITY

The criteria used to evaluate potential air quality effects typically are based on standardized air emission levels. Potential air quality effects are considered significant if the implementation of the alternative would cause substantial adverse changes to the baseline (ambient) air quality conditions in the affected area. The range of such changes includes producing pollutants that would either on their own, or when combined with baseline emissions:

- Cause a lowering of attainment status;
- Conflict with an adopted air quality management plan, policy, or program;
- Violate air quality standards or contribute to an existing or projected air quality violation.

Many of the standards and regulations used to manage air quality are not easily applied to the Proposed Project/Action and alternatives. Generally, air quality regulations target a project that consists of one point-source of pollution and is considered an ongoing concern. However, the sources of potential emissions that could result from the Proposed Project/Action and alternatives are geographically distributed and emission production is cyclical, occurring intermittently over a span of 10 years during the irrigation season of June through October.

Recognizing the aforementioned considerations, impact indicators and significance criteria applied to the impacts analysis are presented in **Table 15-8**.

Table 15-8. Impact Indicator and Significance Criteria for Air Quality

Impact Indicator	Significance Criteria
Emission of criteria pollutants in Yuba County during the irrigation season	No increase in emissions.
Emission of criteria pollutants in the Export Service Area during the irrigation season	Substantial adverse changes to baseline (ambient) air quality conditions.

To provide a simple metric for evaluating the potential for increases in emissions in the Yuba Region, the level of groundwater pumping that can achieved using the existing electrical pumps and offsets is 98 TAF per year, as shown on the subsequent charts that indicate groundwater pumping volumes.

The Feather River AQMD also has established thresholds of significance for construction activities, which allow for 25 pounds per day of the ozone precursors NO_x and ROG, and 80 pounds per day of $PM_{10.}$ The significance criterion for this project is more stringent than these significance thresholds published by the Feather River AQMD. It is assumed that if no net emissions would occur, then the potential to cause or contribute to: (1) lowering of attainment status, (2) violating air quality standards, or (3) conflicting with adopted plans, policies, or programs, also would be unlikely to occur as a result of the project, relative to the basis of comparison.

As discussed in Chapter 4, CEQA and NEPA have different legal and regulatory standards that require slightly different assumptions in the modeling runs used to compare the Proposed Project/Action and alternatives to the appropriate CEQA and NEPA bases of comparison in the impact assessments. Although only one project (the Yuba Accord Alternative) and one action alternative (the Modified Flow Alternative) are evaluated in this EIR/EIS, it is necessary to use separate NEPA and CEQA modeling scenarios for the Proposed Project/Action, alternatives and bases of comparisons to make the appropriate comparisons. As a result, the scenarios compared in the impact assessments below have either a "CEQA" or a "NEPA" prefix before the name of the alternative being evaluated. A detailed discussion of the different assumptions used for the CEQA and NEPA scenarios is included in Appendix D, Modeling Technical Memorandum.

As also discussed in Chapter 4, while the CEQA and NEPA analyses in this EIR/EIS refer to "potentially significant," "less than significant," "no" and "beneficial" impacts, the first two comparisons (CEQA Yuba Accord Alternative compared to the CEQA No Project Alternative and CEQA Modified Flow Alternative compared to the CEQA No Project Alternative) presented below instead refer to whether or not the proposed change would "unreasonably affect" the evaluated parameter. This is because these first two comparisons are made to determine whether the action alternative would satisfy the requirement of Water Code section 1736 that the proposed change associated with the action alternative "would not unreasonably affect fish, wildlife, or other instream beneficial uses."

15.2.3 ENVIRONMENTAL IMPACTS/ENVIRONMENTAL CONSEQUENCES OF THE CEQA YUBA ACCORD ALTERNATIVE COMPARED TO THE CEQA NO PROJECT ALTERNATIVE

Impact 15.2.3-1: Changes in criteria pollutant emissions that could result in adverse impacts to air quality in the Yuba Region

Figure 15-2 shows the estimated annual groundwater pumping volumes under the CEQA Yuba Accord Alternative. With the exception of 1924 and 1977, the annual amounts necessary to meet demands for groundwater substitution transfers and surface water deficiencies would be less than 98 TAF, the amount that can be pumped using electric pumps.

Because 1924 and 1977 are the only years during which the estimated annual groundwater pumping volumes under the CEQA Yuba Accord Alternative would exceed the total amount of groundwater that can be pumped each year with electric pumps, these are the only years for which further analyses are needed.

Figure 15-3 shows the estimated annual groundwater pumping volumes under the CEQA No Project Alternative.

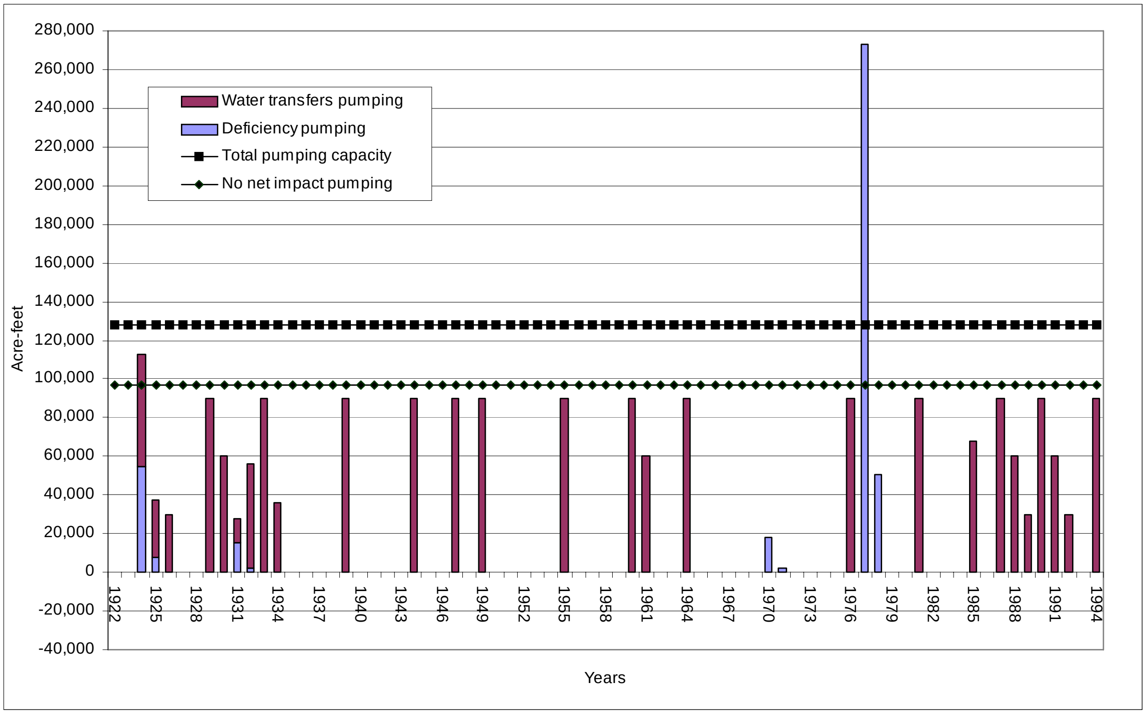

Figure 15-2. Estimated Volumes of Groundwater Pumped Under the CEQA Yuba Accord Alternative

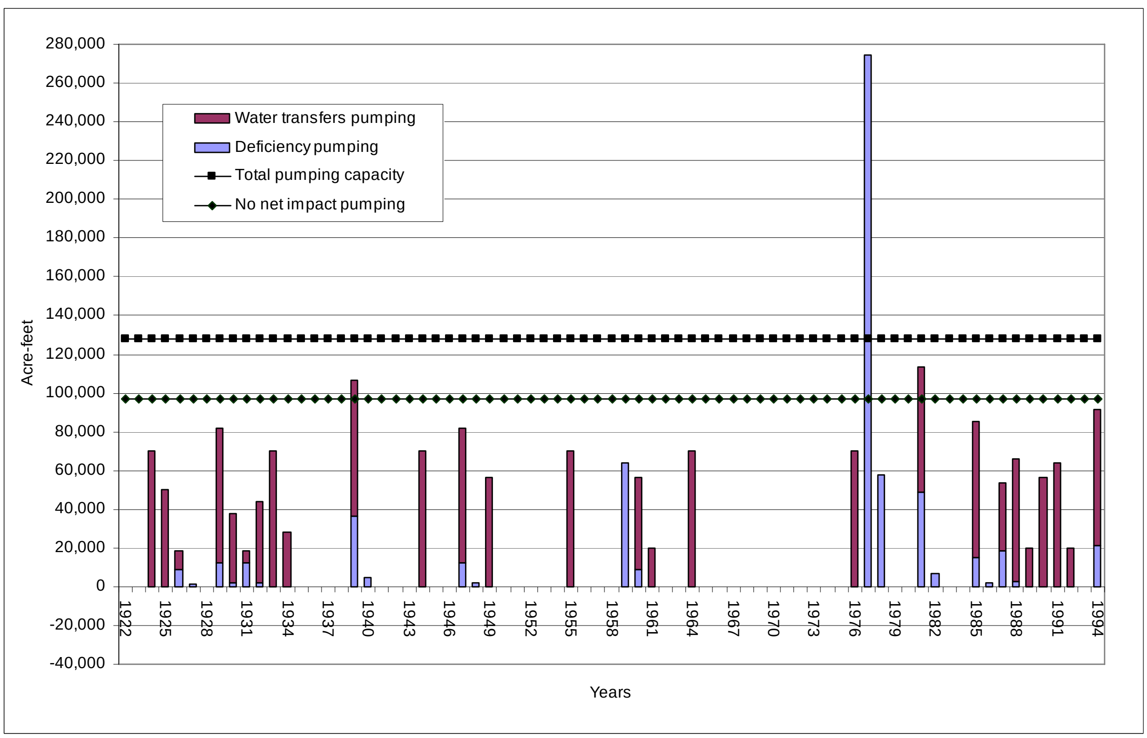

Figure 15-3. Estimated Volumes of Groundwater Pumped Under the CEQA No Project Alternative

In a year like 1924, if the total groundwater pumping needed for both deficiency pumping and water-transfer pumping would exceed the total amount of groundwater that can be pumped with electric pumps, and if the ongoing efforts to electrify existing diesel pumps had not made sufficient new capacity available to meet full deficiency pumping demands and the maximum potential groundwater-substitution volume, then the level of groundwater-substitution pumping would be reduced as necessary to ensure that no net impact to air quality from the groundwater-substitution program would occur (see Section 15.5).

In a year like 1977, no water transfer pumping would occur, and deficiency pumping would be the same under the CEQA Yuba Accord Alternative or the CEQA No Project Alternative.

With the implementation of the protective measures discussed in Section 15.5, there would be no net impact to air quality under the Yuba Accord Alternative. Therefore, the CEQA Yuba Accord Alternative, relative to the CEQA No Project Alternative, would not unreasonably affect air quality in the Yuba Region.

Impact 15.2.3-2: Changes in criteria pollutant emissions that could result in adverse impacts to air quality in the Export Service Area

The CEQA Yuba Accord Alternative could increase the water supply reliability of CVP and SWP users in the Export Service Area. Currently, CVP and SWP water users in the Export Service Area pump groundwater to supplement surface water supplies. The CEQA Yuba Accord Alternative could cause a reduction of emissions in the Export Service Area due to a reduction in agricultural pumping of groundwater.

The actual reduction in emissions from the reduction in groundwater pumping that would occur in the Export Service Area under the CEQA Yuba Accord Alternative is likely to be a small amount. Nonetheless, the CEQA Yuba Accord Alternative would have a positive impact to air quality in the Export Service Area. Therefore, the CEQA Yuba Accord Alternative, relative to the CEQA No Project Alternative, would not unreasonably affect air quality in the Export Service Area.

15.2.4 ENVIRONMENTAL IMPACTS/ENVIRONMENTAL CONSEQUENCES OF THE CEQA MODIFIED FLOW ALTERNATIVE COMPARED TO THE CEQA NO PROJECT ALTERNATIVE

Impact 15.2.4-1: Changes in criteria pollutant emissions that could result in adverse impacts to air quality in the Yuba Region

Figure 15-4 shows the estimated groundwater pumping volumes under the CEQA Modified Flow Alternative. With the exception of 1977, the electric-pumping capacity necessary to meet pumping demands for groundwater substitution transfers and deficiencies was in place as of 2005.

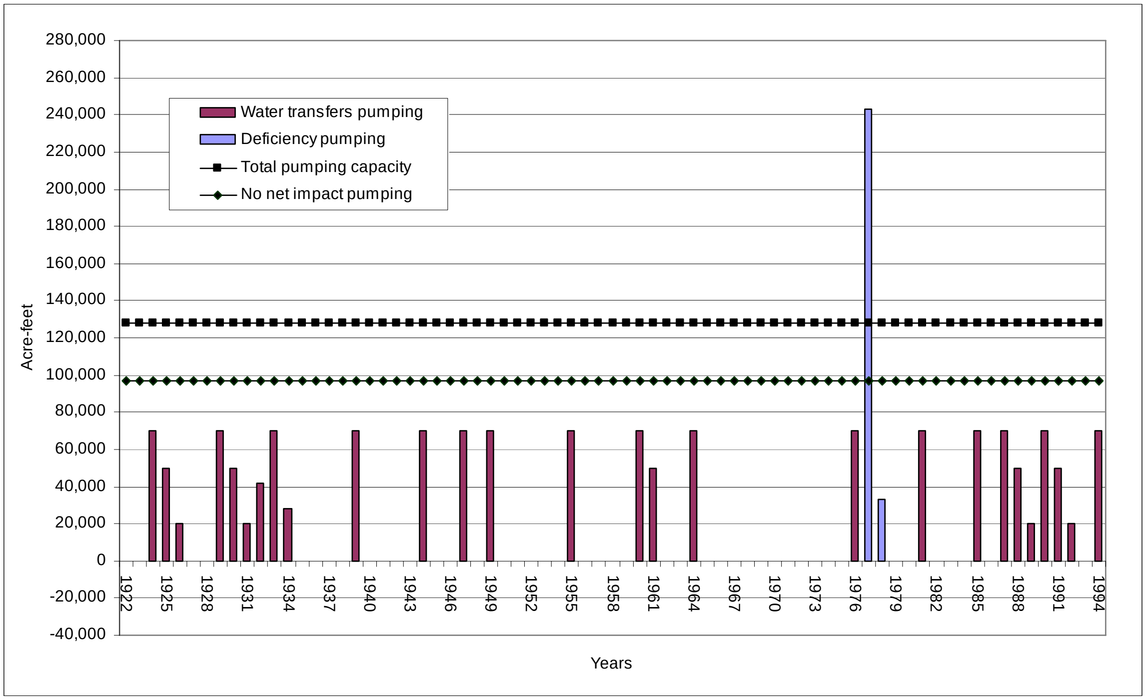

Figure 15-4. Estimated Volumes of Groundwater Pumped Under the CEQA Modified Flow Alternative

Because 1977 is the only year during which the estimated annual groundwater pumping volume under the CEQA Modified Flow Alternative would exceed the total amount of groundwater that can be pumped each year with electric pumps, it is the only year for which further analysis is needed. In a year like 1977, no water-transfer pumping would occur, and deficiency pumping would be lower under the CEQA Modified Flow Alternative than under the CEQA No Project Alternative. For these reasons, there would be no net impact to air quality under the CEQA Modified Flow Alternative, relative to the CEQA No Project Alternative. Therefore, the CEQA Modified Flow Alternative, relative to the CEQA No Project Alternative, would not unreasonably affect air quality.

Impact 15.2.4-2: Changes in criteria pollutant emissions that could result in adverse impacts to air quality in the Export Service Area

The CEQA Modified Flow Alternative is not anticipated to significantly change the water supply reliability of CVP and SWP users in the Export Service Area. Therefore, the CEQA Modified Flow Alternative relative to the CEQA No Project Alternative would not unreasonably affect air quality in the Export Service Area.

15.2.5 Environmental Impacts/Environmental Consequences of the CEQA Yuba Accord Alternative Compared to the CEQA Existing Condition

Impact 15.2.5-1: Changes in criteria pollutant emissions that could result in adverse impacts to air quality in the Yuba Region

Figure 15-2 shows the estimated groundwater pumping volumes under the CEQA Yuba Accord Alternative. **Figure 15-5** shows the estimated CEQA Existing Condition groundwater pumping volumes.

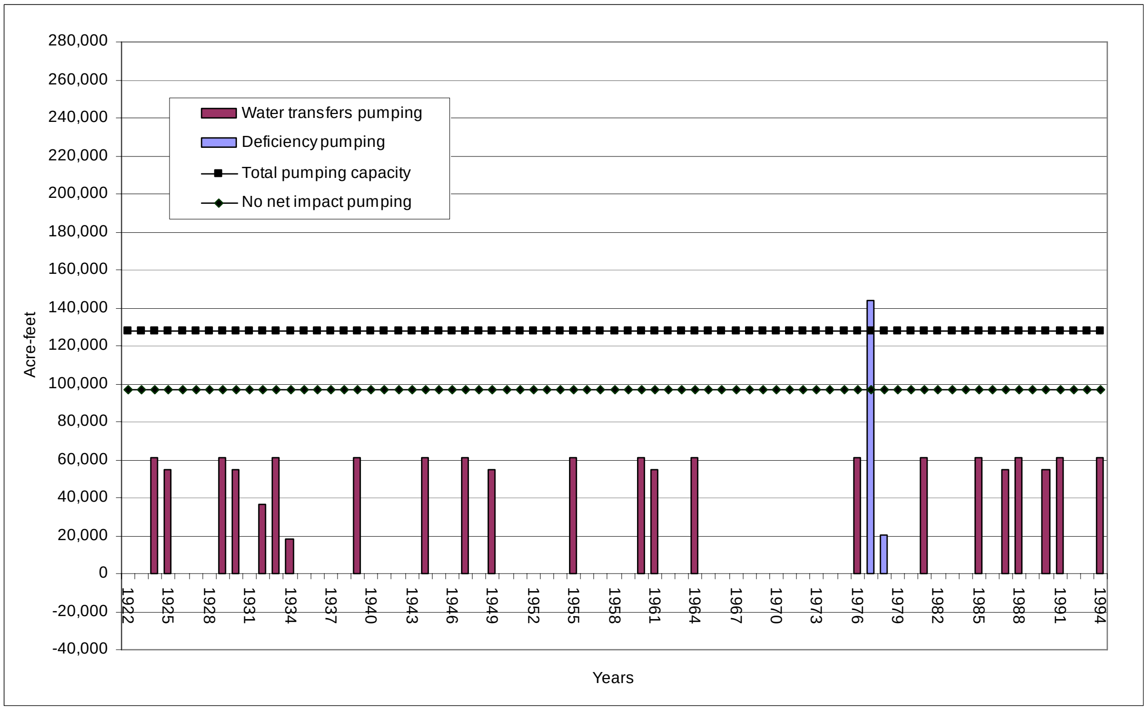

Figure 15-5. Estimated Volumes of Groundwater Pumped Under the CEQA Existing Condition

Because 1924 and 1977 are the only years during which the estimated annual groundwater pumping volumes under the CEQA Yuba Accord Alternative would exceed the total amount of groundwater that can be pumped each year with electric pumps, these are the only years for which further analyses are needed.

In a year like 1924, if the total groundwater pumping needed for both deficiency pumping and water-transfer pumping would exceed the total amount of groundwater that can be pumped with electric pumps, and if the ongoing efforts to electrify existing diesel pumps had not made sufficient new capacity available to meet full deficiency pumping demands and the maximum potential groundwater-substitution volume, then the level of groundwater-substitution pumping would be reduced as necessary to ensure that no net impact to air quality from the groundwater-substitution program would occur (see Section 15.5).

In a year like 1977, no water-transfer pumping would occur, but potential deficiency pumping would be greater under the CEQA Yuba Accord Alternative than under the CEQA Existing Condition. As described in Section 15.1.1.1, YCWA continues to implement an air quality improvement program associated with groundwater-substitution pumping. As a result, Yuba County will continue to increase the proportion of groundwater wells powered by nonpolluting sources; and although there may be an additional deficiency pumping under the CEQA Yuba Accord Alternative than under the CEQA Existing Condition, the net impact to air quality under the CEQA Yuba Accord Alternative would be improved relative to the CEQA Existing Condition.

With the implementation of the protective measures discussed in Section 15.5, there would be no net impact to air quality under the Yuba Accord Alternative. Therefore, the CEQA Yuba Accord Alternative, relative to the CEQA Existing Condition, would not significantly impact air quality.

Impact 15.2.5-2: Changes in criteria pollutant emissions that could result in adverse impacts to air quality in the Export Service Area

The CEQA Yuba Accord Alternative could increase the water supply reliability of CVP and SWP users in the Export Service Area. Currently, CVP and SWP water users in the Export Service Area pump groundwater to supplement surface water supplies. The CEQA Yuba Accord Alternative could cause a reduction of emissions in the Export Service Area due to a reduction in agricultural pumping of groundwater.

The actual reduction in emissions from the reduction in groundwater pumping that would occur in the Export Service Area under the CEQA Yuba Accord Alternative is likely to be a small amount. Nonetheless, the CEQA Yuba Accord Alternative would have a positive impact to air quality in the Export Service Area. Therefore, the CEQA Yuba Accord Alternative, relative to the CEQA Existing Condition, would result in a less than significant impact and may be beneficial to air quality in the Export Service Area.

15.2.6 ENVIRONMENTAL IMPACTS/ENVIRONMENTAL CONSEQUENCES OF THE CEQA MODIFIED FLOW ALTERNATIVE COMPARED TO THE CEQA EXISTING CONDITION

Impact 15.2.6-1: Changes in criteria pollutant emissions that could result in adverse impacts to air quality in the Yuba Region

Figure 15-4 shows the estimated groundwater pumping volumes under the CEQA Modified Flow Alternative. Figure 15-5 shows the estimated CEQA Existing Condition groundwater pumping volumes.

Because 1977 is the only year during which the estimated annual groundwater pumping volume under the CEQA Modified Flow Alternative would exceed the total amount of groundwater that can be pumped each year with electric pumps, it is the only year for which further analysis is needed. In a year like 1977, no water transfer pumping would occur, but potential deficiency pumping would be greater under the CEQA Modified Flow Alternative than under the CEQA Existing Condition.

As described in Section 15.1.1.1, YCWA continues to implement an air quality improvement program associated with groundwater-substitution pumping. As a result, Yuba County will continue to increase the proportion of groundwater wells powered by nonpolluting sources; and although there may be an additional deficiency pumping under the CEQA Modified Flow Alternative than under the CEQA Existing Condition, the net impact to air quality under the CEQA Modified Flow Alternative would be improved relative to the CEQA Existing Condition.

With the implementation of the protective measures discussed in Section 15.5, there would be no net impact to air quality under the CEQA Modified Flow Alternative. Therefore, the CEQA Modified Flow Alternative, relative to the CEQA Existing Condition, would not significantly impact air quality.

Impact 15.2.6-2: Changes in criteria pollutant emissions that could result in adverse impacts to air quality in the Export Service Area

The CEQA Modified Flow Alternative is not anticipated to significantly change the water supply reliability of CVP and SWP users in the Export Service Area. Therefore, the CEQA Modified Flow Alternative relative to the CEQA Existing Condition would result in a less than significant impact to air quality in the Export Service Area.

15.2.7 ENVIRONMENTAL IMPACTS/ENVIRONMENTAL CONSEQUENCES OF THE CEQA NO PROJECT/NEPA NO ACTION ALTERNATIVE COMPARED TO THE CEQA EXISTING CONDITION/NEPA AFFECTED ENVIRONMENT

As discussed in Chapter 3, the key elements and activities (e.g., implementation of the RD-1644 Long-term instream flow requirements) for the CEQA No Project Alternative would be the same for the NEPA No Action Alternative. The primary differences between the CEQA No Project and NEPA No Action alternatives are various hydrologic and other modeling assumptions (see Section 4.5 and Appendix D). Because of these differences between the No Project and No Action alternatives, these alternatives are distinguished as separate alternatives for CEQA and NEPA evaluation purposes.

Based on current plans and consistent with available infrastructure and community services, the CEQA No Project Alternative in this EIR/EIS is based on current environmental conditions (e.g., project operations, water demands, and level of land development) plus potential future operational and environmental conditions (e.g., implementation of the RD-1644 Long-term instream flow requirements in the lower Yuba River) that probably would occur in the foreseeable future in the absence of the Proposed Project/Action or another action alternative. The NEPA No Action Alternative also is based on conditions without the proposed project, but uses a longer-term future timeframe that is not restricted by existing infrastructure or physical and regulatory environmental conditions. The differences between these modeling characterizations and assumptions for the CEQA No Project and the NEPA No Action alternatives, including the rationale for developing these two different scenarios for this EIR/EIS, are explained in Chapter 4[4].

Although implementation of the RD-1644 Long-term instream flow requirements would occur under both the CEQA No Project and the NEPA No Action alternatives, the resultant model outputs for both scenarios are different because of variations in the way near-term and long-term future operations are characterized for other parameters in the CEQA and NEPA assumptions. As discussed in Chapter 4, the principal difference between the CEQA No Project Alternative and the NEPA No Action Alternative is that the NEPA No Action Alternative includes several potential future water projects in the Sacramento and San Joaquin valleys (e.g., CVP/SWP Intertie, FRWP, SDIP and a long-term EWA Program or a program equivalent to the EWA), while the CEQA No Project Alternative does not. Because many of the other assumed conditions for these two scenarios are similar, the longer-term analysis of the NEPA No Action Alternative compared to the NEPA Affected Environment builds upon the nearer-term analysis of the CEQA No Project Alternative compared to the CEQA Existing Condition.

Because the same foundational modeling base (OCAP Study 3) was used to characterize near-term conditions (2001 level of development) both the CEQA No Project Alternative and the CEQA Existing Condition, it was possible to conduct a detailed analysis to quantitatively evaluate the hydrologic changes in the Yuba Region and the CVP/SWP system that would be expected to occur under these conditions. Building on this CEQA analysis, the analysis of the NEPA No Action Alternative compared to the NEPA Affected Environment consists of two

[4] For modeling purposes related to CEQA analytical requirements, OCAP Study 3 (2001 level of development) is used as the foundational study upon which the modeling scenarios for the CEQA No Project Alternative and the CEQA Existing Condition were developed. For modeling purposes related to NEPA analytical requirements, OCAP Study 5 (2020 level of development) is used as the foundational study upon which the modeling scenarios for the NEPA No Action Alternative was developed.

components: (1) an analysis of near-term future without project conditions quantified through the CEQA No Project Alternative, relative to the CEQA Existing Condition; and (2) a qualitative analysis of longer-term future without project conditions (the NEPA No Action Alternative)[5].

15.2.7.1 CEQA No Project Alternative Compared to the CEQA Existing Condition

Impact 15.2.7.1-1: Changes in criteria pollutant emissions that could result in adverse impacts to air quality in the Yuba Region

Figure 15-3 shows the estimated groundwater pumping volumes under the CEQA No Project Alternative. Figure 15-5 shows the estimated CEQA Existing Condition groundwater pumping volumes.

Because 1977 is the only year during which the estimated annual groundwater pumping volume under the CEQA No Project Alternative would exceed the total amount of groundwater that can be pumped each year with electric pumps, it is the only year for which further analysis is needed. In a year like 1977, no water transfer pumping would occur, but potential deficiency pumping would be greater under the CEQA No Project Alternative than under the CEQA Existing Condition. To the extent that this additional pumping would be through electric pumps, no impacts to air quality would occur.

To the extent that additional deficiency pumping occurred under the CEQA No Project Alternative, and occurred with diesel pumps, it could cause significant and unavoidable impacts to air quality.

Impact 15.2.7.1-2: Changes in criteria pollutant emissions that could result in adverse impacts to air quality in the Export Service Area

Under the CEQA No Project Alternative, decreases in the water supply reliability of CVP and SWP users in the Export Service Area could occur. Currently, CVP and SWP water users in the Export Service Area pump groundwater to supplement surface water supplies. Groundwater pumping could increase to meet demands if surface water supplies are not available to CVP and SWP water users. Under the CEQA No Project Alternative, increases of emissions in the Export Service Area could occur to the extent that increases in agricultural pumping of groundwater occur.

These potential minor increases in emissions under the CEQA No Project Alternative would be insignificant and likely would not result in the lowering of attainment status, conflict with adopted air quality policies or programs, or violate any approved standards. Therefore, the CEQA Yuba Accord Alternative, relative to the CEQA Existing Condition, would result in a less than significant impact to air quality in the Export Service Area.

15.2.7.2 NEPA No Action Alternative Compared to the NEPA Affected Environment

In the Yuba Region, the primary differences between the NEPA No Action Alternative and the NEPA Affected Environment are changes in lower Yuba River flows associated with the implementation of the RD-1644 Long-term instream flow requirements, to replace the RD-1644

[5] The second analytical component cannot be evaluated quantitatively due to the differences in the underlying baseline assumptions for OCAP Study 3 and OCAP Study 5.

Interim instream flow requirements, implementation of the Wheatland Project, which will increase surface water diversions at Daguerre Point Dam because of decreases in groundwater pumping volumes, and groundwater substitution pumping associated with the SVWMP.

In the Yuba Region, the primary differences between the CEQA No Project and the Existing Condition are implementation of the RD-1644 Long-term instream flow requirements and implementation the Wheatland Project. Therefore, in the Yuba Region, assumptions regarding the volume of SVWMP groundwater substitution pumping that may occur in the future are the only difference between the NEPA No Action and the CEQA No Project alternatives. Although groundwater substitution transfers may take place under different programs (single-year transfers versus SVWMP), the total volume of groundwater substitution is similar. Because the total groundwater substitution pumping that would occur in the Yuba Region between the CEQA No Project Alternative and the CEQA Existing Condition is similar to the total groundwater substitution pumping that would occur under the NEPA No Action Alternative compared to the NEPA Affected Environment, these potential effects to air quality already have been evaluated in the quantitative analyses that is presented in Section 15.2.7.1 above. Trends in evaluation parameters previously presented for the CEQA No Project Alternative relative to the CEQA Existing Condition (Appendix F4, 2 vs. 1) are similar to the comparison of the NEPA No Action Alternative relative to the NEPA Affected Environment, and are not repeated here.

The NEPA No Action Alternative includes several additional proposed projects in the project study area that are not included in the CEQA No Project Alternative; however, these other proposed projects would not affect air quality in the Yuba Region and, thus, are only discussed in the context of the Export Service Area.

The NEPA No Action Alternative considers 2020 level of development in the Sacramento Valley and increased SWP Table A demands. The projects included in the NEPA No Action Alternative include water supply projects to meet increasing demand (FRWP, American River diversions in accordance with the Water Forum), water storage and conveyance projects (e.g., SDIP[6]), water transfer and acquisition programs (long-term EWA Program or a program equivalent to the EWA), and other projects related to CVP/SWP system operations (e.g., CVP/SWP Integration, FRWP).

The proposed projects included under the NEPA No Action Alternative could result in operational changes for the CVP, SWP, and local water supply systems, and could result in new diversions from upstream or Delta sources, changes to reservoir operations, river and channel flows, river and channel diversions and pumping and power generation facilities in the Export Service Area.

15.2.8 ENVIRONMENTAL IMPACTS/ENVIRONMENTAL CONSEQUENCES OF THE NEPA YUBA ACCORD ALTERNATIVE COMPARED TO THE NEPA NO ACTION ALTERNATIVE

Impact 15.2.8-1: Changes in criteria pollutant emissions that could result in adverse impacts to air quality in the Yuba Region

Figure 15-6 shows the volumes of water pumped under the NEPA No Action Alternative. **Figure 15-7** shows the volume of water pumped under the NEPA Yuba Accord Alternative.

[6] The SDIP includes a maximum pumping rate of 8,500 cfs at the Banks Pumping Plant.

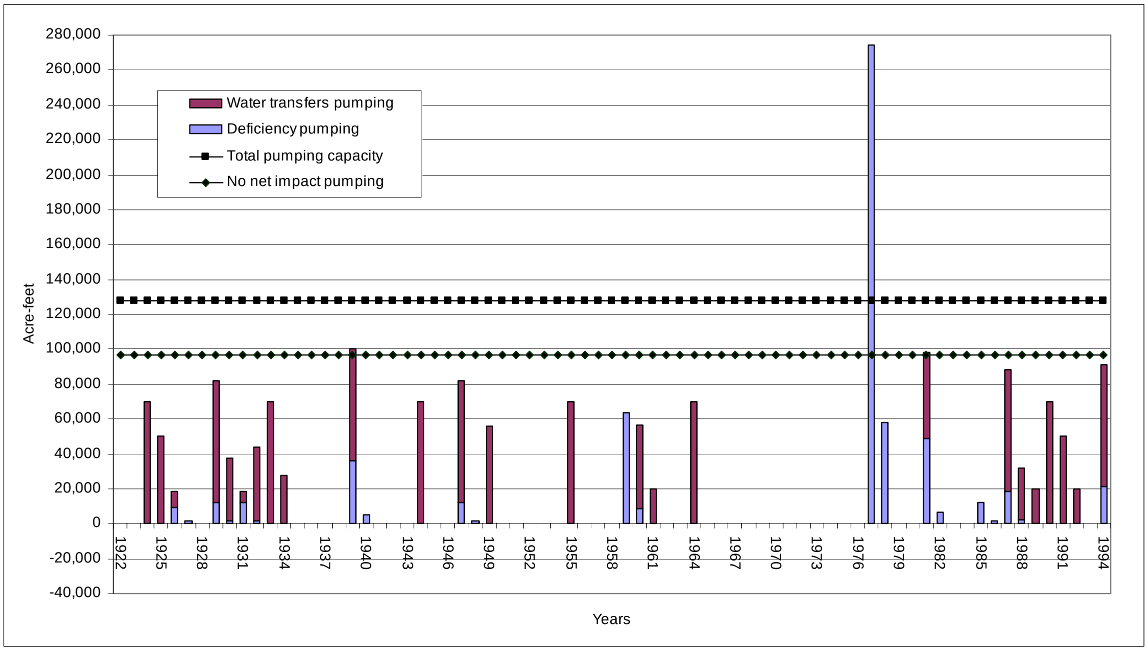

Figure 15-6. Estimated Volumes of Groundwater Pumped Under the NEPA No Action Alternative

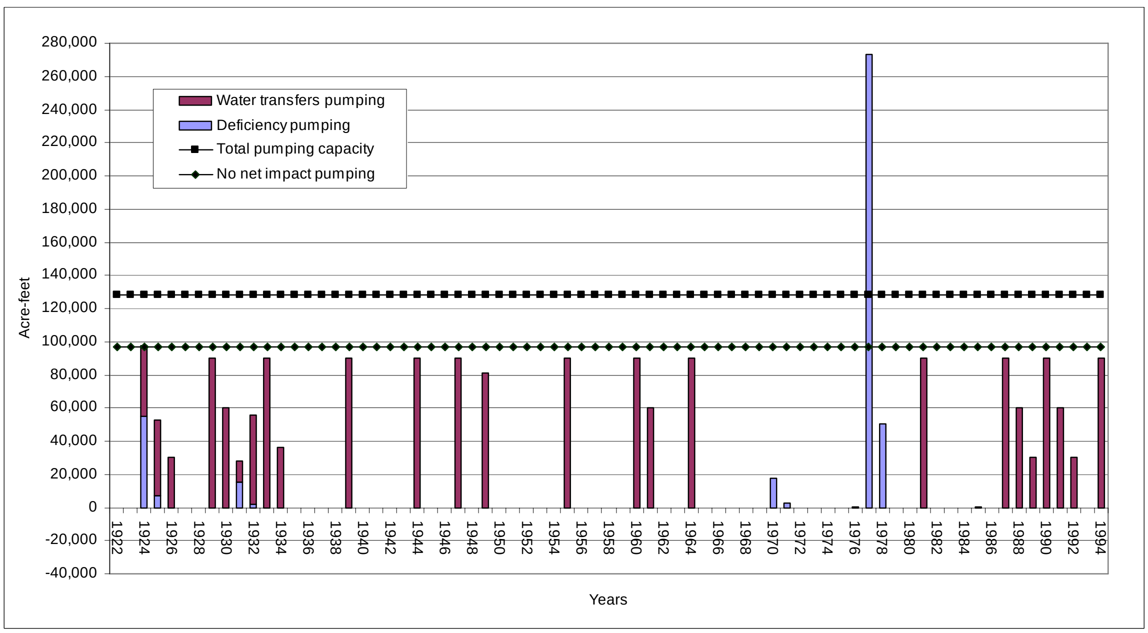

Figure 15-7. Estimated Volumes of Groundwater Pumped Under the NEPA Yuba Accord Alternative

Because 1977 is the only year during which the estimated annual groundwater pumping volume under the NEPA Yuba Accord Alternative would exceed the total amount of groundwater that can be pumped each year with electric pumps, it is the only year for which further analysis is needed. In a year like 1977, no water transfer pumping would occur, and deficiency pumping would be the same under the NEPA Yuba Accord Alternative and under the NEPA No Action Alternative. For these reasons, impacts to air quality would be less than significant under the NPEA Yuba Accord Alternative, relative to the NEPA No Action Alternative.

Impact 15.2.8-2: Changes in criteria pollutant emissions that could result in adverse impacts to air quality in the Export Service Area

The NEPA Yuba Accord Alternative could increase the water supply reliability of CVP and SWP users in the Export Service Area. Currently, CVP and SWP water users in the Export Service Area pump groundwater to supplement surface water supplies. The CEQA Yuba Accord Alternative could cause a reduction of emissions in the Export Service Area due to a reduction in agricultural pumping of groundwater.

The actual reduction in emissions from the reduction in groundwater pumping that would occur in the Export Service Area under the NEPA Yuba Accord Alternative is likely to be a small amount. Nonetheless, the NEPA Yuba Accord Alternative would have a positive impact to air quality in the Export Service Area. Therefore, the NEPA Yuba Accord Alternative, relative to the NEPA No Action Alternative, would result in a less than significant impact and may be beneficial to air quality in the Export Service Area.

15.2.9 ENVIRONMENTAL IMPACTS/ENVIRONMENTAL CONSEQUENCES OF THE NEPA MODIFIED FLOW ALTERNATIVE COMPARED TO THE NEPA NO ACTION ALTERNATIVE

Impact 15.2.9-1: Changes in criteria pollutant emissions that could result in adverse impacts to air quality in the Yuba Region

Figure 15-8 shows the volume of water pumped under the NEPA Modified Flow Alternative.

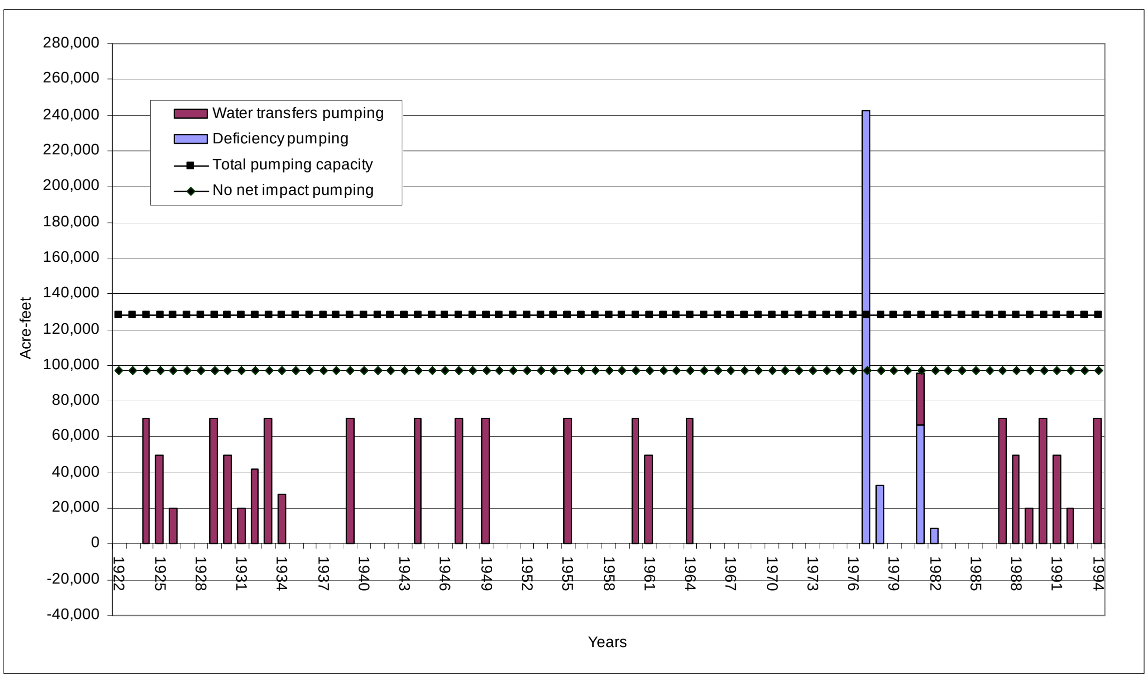

Figure 15-8. Estimated Volumes of Groundwater Pumped Under the NEPA Modified Flow Alternative

Because 1977 is the only year during which the estimated annual groundwater pumping volume under the NEPA Modified Flow Alternative would exceed the total amount of groundwater that can be pumped each year with electric pumps, it is the only year for which further analysis is needed. In a year like 1977 no water transfer pumping would occur, and deficiency pumping would be lower under the NEPA Modified Flow Alternative than under the NEPA No Action Alternative. For these reasons, impacts to air quality would be less than significant under the NEPA Modified Flow Alternative, relative to the NEPA No Action Alternative.

Impact 15.2.9-2: Changes in criteria pollutant emissions that could result in adverse impacts to air quality in the Export Service Area

The NEPA Modified Flow Alternative is not anticipated to significantly change the water supply reliability of CVP and SWP users in the Export Service Area. Therefore, the NEPA Modified Flow Alternative relative to the NEPA No Action Alternative would result in a less than significant impact to air quality in the Export Service Area.

15.3 CUMULATIVE IMPACTS

For CEQA, the purpose of the cumulative analysis is to determine whether the incremental effects of the Proposed Project (Yuba Accord Alternative) would be expected to be "cumulatively considerable" when viewed in connection with the effects of past projects, other current projects, and probable future projects (Public Resources Code section 21083, subdivision (b)(2)).[7]

For NEPA, the scope of an EIS must include "*cumulative actions, which when viewed with other proposed actions have cumulatively significant impacts and should therefore be discussed in the same impact statement*" (40 CFR §1508.25(a)(2)).

Because the CEQ regulations for implementing NEPA and the CEQA guidelines contain very similar requirements for analyzing, and definitions of, cumulative impacts, the discussions of cumulative impacts of the Yuba Accord Alternative Cumulative Condition relative to the Existing Condition is the basis for evaluation of cumulative impacts for both CEQA and NEPA. In addition, an analysis of the Modified Flow Alternative Cumulative Condition relative to the Existing Condition is provided to fulfill NEPA requirements.

For air quality, there would be no net impacts resulting from the Yuba Accord Alternative or the Modified Flow Alternative, relative to the Existing Condition; any potential air quality impacts that would occur as a result of an increase in emissions due to implementation of either the Yuba Accord or Modified Flow alternatives would be mitigated to a net change of zero. Thus, there would be no potential cumulative impacts resulting from implementation of either the Yuba Accord Alternative or the Modified Flow Alternative.

15.4 POTENTIAL CONDITIONS TO SUPPORT APPROVAL OF YCWA'S WATER RIGHTS PETITION

Because any potential air quality impacts would be avoided or reduced by ensuring that there would be no net increase in emissions (see Sections 15.1.1.1 and 15.5), no unreasonable adverse effects to air quality would occur under the Proposed Project/Action or an action alternative. Therefore, no other impact avoidance measures or protective conditions are identified for the SWRCB's consideration in determining whether or not to approve YCWA's petitions to implement the Yuba Accord.

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[7] The "*Guide to the California Environmental Quality Act*" (Remy *et al.* 1999) states that "*…although a project may cause an "individually limited" or "individually minor" incremental impact that, by itself, is not significant, the increment may be "cumulatively considerable", and thus significant, when viewed against the backdrop of past, present, and probable future projects.*" (CEQA Guidelines, § 15064, subd. (i)(l), 15065, subd. (c), 15355, subd. (b)).

15.5 MITIGATION MEASURES/ENVIRONMENTAL COMMITMENTS

For the Yuba Accord Alternative, all water transfers would be subject to the various Yuba Accord agreements, including the Conjunctive Use Agreements. Pursuant to the agreements, all new wells developed for use in the program would use electric motors. Additionally, under both the Yuba Accord and Modified Flow alternatives, YCWA would continue to pursue the ability to make groundwater substitution transfers to EWA, DWR and Reclamation, which would require that YCWA make these transfers with no net impact to air quality. YCWA and the Member Units have been engaged in a groundwater pumping air quality monitoring and improvement program with the purpose of both continuing to improve air quality in Yuba County as well as meet the practical goal of being able to transfer water without constraint by air quality.

In addition, YCWA will undertake the following mitigation measure during years in which a combination of groundwater-substitution and deficiency pumping has the potential to exceed that threshold of no net impacts to the air quality:

Mitigation Measure 15-1: Provide certification documentation to Reclamation and DWR indicating that groundwater pumping sources would not increase emissions, to ensure that no net impacts to air quality would occur.

To ensure that no net impact air quality would result from groundwater substitution pumping in addition to deficiency pumping during extremely dry years, YCWA will provide to Reclamation and DWR a statement, with appropriate supporting documentation, demonstrating that the total volume of groundwater to be pumped within Yuba County can be conducted using pumping sources that will not contribute to a air quality impacts. Such certification shall be furnished to the Technical Committee, pursuant to the requirements of the Yuba Accord agreements, as described in Section 15.1.1.1, above.

Impact Significance After Mitigation: Less than significant.

15.6 POTENTIALLY SIGNIFICANT UNAVOIDABLE IMPACTS

It is possible that levels of deficiency pumping in extremely dry years (such as 1977) under the CEQA No Project Alternative, relative to the CEQA Existing Condition, may invoke a potentially significant impact by inducing an increase in net emissions resulting from additional groundwater pumping utilizing diesel powered pumps. However, there are no significant unavoidable impacts to air quality associated with the implementation of the Proposed Project/Action or an action alternative.

CHAPTER 16
LAND USE

Counties and incorporated cities regulate land use within the Sacramento Valley. This section presents an overview of land use conditions in the Sacramento Valley, with specific attention to land uses that potentially could be affected by implementation of the alternatives considered in this EIR/EIS. Potential effects on land use, management and planning include:

- Changes to uses of existing lands that would alter the use of those lands, such as changes in levels or types of activities;
- Direct effects on adjacent land uses, such as those that could occur from placing incompatible land uses together;
- Removal or retirement of agricultural land from production;
- The potential for conflicts with lands owned or managed by local, state, or federal governments; and
- Changes in water temperature that would impact crop yield or productivity.

16.1 ENVIRONMENTAL SETTING/AFFECTED ENVIRONMENT

The land use and land management practices that are currently in place, and which may be influenced by implementation of the Proposed Project/Action and alternatives, are described below. Project study area regions include the Yuba Region, the CVP/SWP Upstream of the Delta Region, and the Delta Region. The land use information provided below is organized by region, and identifies those areas where land use activities could potentially be affected by the alternatives considered in this EIR/EIS.

16.1.1 YUBA REGION

The local study area for land use and land management activities in the Yuba Region is Yuba County. Agriculture is the most extensive land use in Yuba County and the most significant component of the county's economy. Approximately 278,943 acres, or 68 percent of the total county area, are comprised of agricultural croplands and pasture. The value of agricultural land is not limited to the provision of food, fiber and jobs. Agricultural land also provides open space, which has both psychological and aesthetic benefits, and provides important wildlife habitat. The importance of agricultural land preservation can, therefore, be viewed from both an economic and environmental perspective.

Yuba County recognizes the importance of agricultural land and the need to place an emphasis on its preservation. The county's desire to preserve its most valuable farmland and to support the economic viability of the agricultural economy is reflected in goals, objectives, policies and implementation strategies in the Yuba County General Plan. The General Plan is not intended to restrict existing, new, or expanding agricultural operations. In fact, agricultural operations including, but not limited to, the raising of livestock, all soil cultivation and related activities to crop production, harvesting, and processing, and timber management and harvesting are considered uses by right[1] in all Yuba County General Plan designations and zoning districts that permit agriculture (County of Yuba 1996).

Farmland maps are created by the Farmland Mapping and Monitoring Program (FMMP), under the direction of the U.S. Department of Agriculture **(Figure 16-1)**. In 2000, total Prime Farmland was measured at 44,486 acres, or 1,299 acres less than the 1998 total.

A considerable amount of land in Yuba County is used for rice production. Rice is cultivated in the majority of the Member Unit service areas, typically on clay or other poorly drained soils with impervious layers. These soil types are fairly impermeable to water, which increases their water use efficiency for rice production. Rice is an aquatic crop requiring almost continuous flooding until the time of harvest. Fields for rice crops typically are initially flooded during April or May and then irrigated through August, which accounts for the peak in agricultural water diversion volumes during this time period.

Rice farmers require warmer water during the spring and summer for germination of seeds and growth of rice (i.e., 65°F from approximately April through mid-May, and 59°F during the remainder of the growing season) (DWR 2001). Generally, water temperatures above 60°F to 65°F are reported to be suitable for rice production (Mutters *et al.* 2003a). Research indicates that an entire crop may be lost as a result of exposure to as little as 4 days (100 hours) of water temperatures below 55°F during the early part of the growing season, and about 60 percent yield reduction may occur as a result of exposure to as little as 8 days (200 hours) of water temperatures below 60°F (Mutters *et al*. 2003a).

Reduced water temperatures early in the growing season can cause delayed or failed germination, reduced growth rates, reduced or delayed tillering, panicle sterility, or seed head blanking (Williams and Wenning 2003). Yield reduction associated with cold water has been reported to be most pronounced when cold water exposure occurs early during the growing season (6 weeks to 7 weeks after planting) (Mutters et al. 2003a; Mutters et al. 2003b). However, reproduction, which occurs slightly later, reportedly also is affected by reduced water temperatures (Mutters et al. 2003b).

Water applied to rice paddies is diverted from the main diversion canals via turnouts. The temperature of water entering the paddy tends to be the coldest water temperature in the field, and effects of cold water on rice yield tend to be localized near the field irrigation inlet, although effects have been observed in adjacent checks where cold water has seeped though the dividing levees (Mutters *et al.* 2003b). Rice production within checks tends to be affected by cold water temperatures in a predictable pattern of distribution of varying severity of effect.

Because rice plants may be more susceptible to the effects of water temperature during the early phases of development when rice plants transition from growth to reproduction (Mutters *et al.* 2003b), which generally occurs prior to July 31, the analytical time period utilized for assessing potential water temperature-related impacts on agricultural production, represented by changes in rice production, is May 1 through July 31. Water temperature data at Daguerre Point Dam for this evaluation period are presented in Chapter 9.

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[1] Land uses permitted in a zoning district are classified in one of two ways, either as special uses or uses “by right”. Special use permits allow certain land uses in a given zoning district that require more in-depth studies than uses permitted "by right" in a zoning district. Special uses generally require an application to, and approval from, the City Council or other governing agency. Uses by right do not require special permission, although, in some instances, an individual may be required to submit a site plan or follow designated regulations (City of Radford Website 2007).

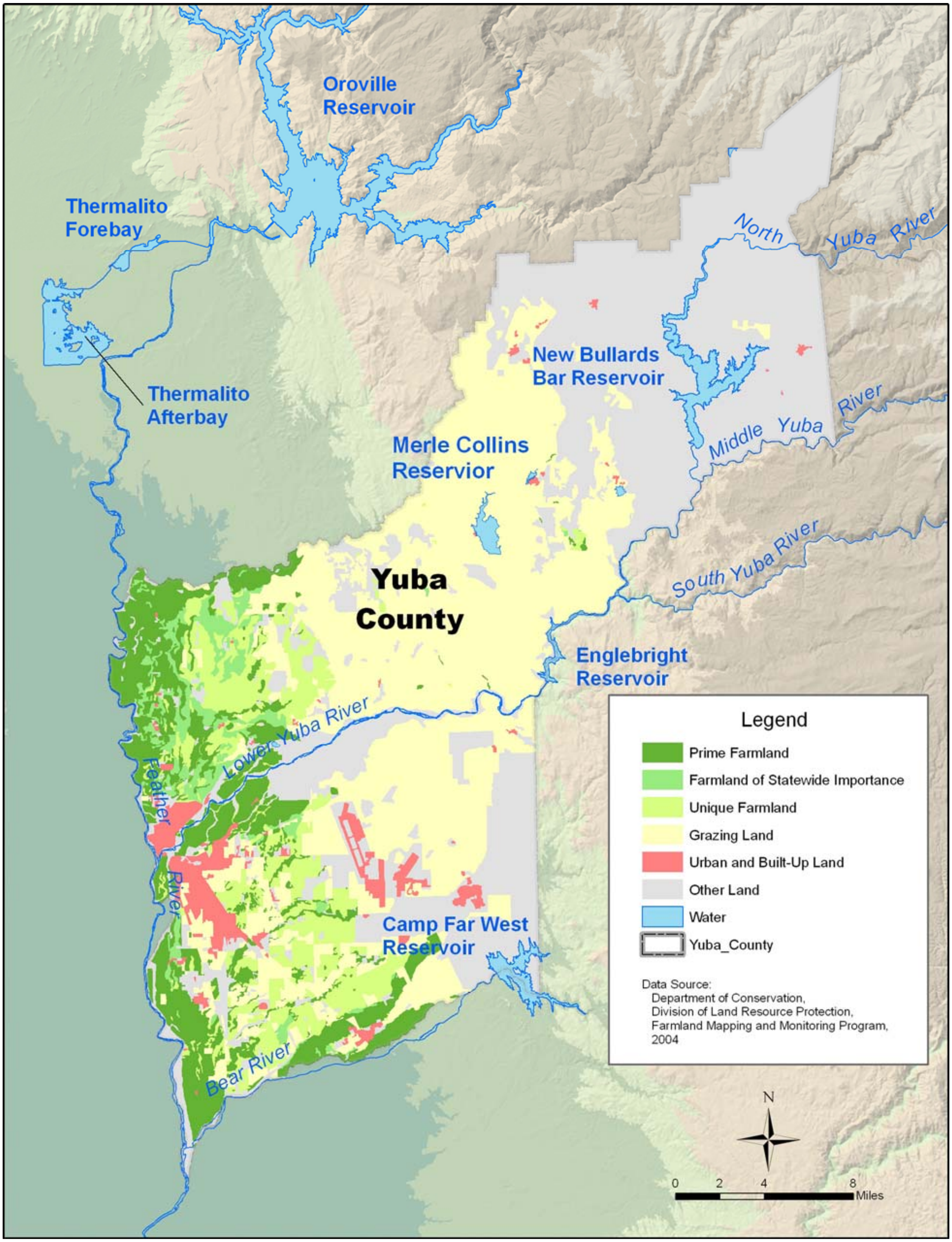

Figure 16-1. Yuba County Farmland Designations

16.1.2 CVP/SWP Upstream of the Delta Region

Counties located upstream of the Delta that are adjacent to the water bodies and facilities in this region (i.e., Shasta and Oroville reservoirs and the Feather River and Sacramento River corridors) include Shasta, Butte, Sutter, Colusa, Tehama, Yolo, and Sacramento. Land use in these counties is primarily of an agricultural nature (e.g., livestock grazing, irrigated crop production, and orchard and vineyard operations). Almost 80 percent of the irrigated land in California is located in the Central Valley. Water deliveries for agriculture average about 22.5 MAF per year, with the CVP providing about 25 percent, the SWP about 10 percent, local surface water rights about 30 percent, and groundwater about 35 percent. Farmers in irrigation districts that receive CVP supplies also use other supplies such as groundwater. Use of non-CVP sources varies annually because of changes in weather and crop market conditions (Reclamation Website 2004).

Actions associated with the Proposed Project/Action and alternatives could make additional water supplies available to Reclamation and DWR for delivery to CVP and SWP contractors during drier conditions when deficiencies may occur. However, no changes to existing land uses upstream of the Delta are anticipated, other than the potential for regional growth discussed in Chapter 18, which will likely occur whether or not the Proposed Project/Action or an alternative is approved and implemented. Because a portion of water from the Yuba Accord Alternative would be provided to the EWA Program to supplement CVP/SWP water supplies during drier conditions, it would improve CVP/SWP operational flexibility and federal and state water contractor supply reliability in deficiency years. Although Reclamation and DWR could choose to deliver all or a portion of the supplemental transfer water that would be provided by YCWA under the Proposed Project/Action and alternatives to federal or state water project contractors, the amounts delivered would not exceed the water delivery amounts and entitlements authorized in existing CVP/SWP water purchase contracts. Therefore, there would be no changes to land uses within the CVP/SWP Upstream of the Delta Region resulting from the alternatives evaluated in this EIR/EIS and, thus, further evaluation of such potential changes is not necessary.

16.1.3 Delta Region

As described above, actions associated with the Proposed Project/Action and alternatives could make additional water supplies available to Reclamation and DWR for delivery to CVP and SWP contractors during drier conditions when deficiencies may occur. Although Reclamation and DWR could choose to deliver all or a portion of the supplemental transfer water this would be provided by YCWA under the Proposed Project/Action and alternatives to federal or state water project contractors, the amounts delivered would not exceed the water delivery amounts and entitlements authorized in existing CVP/SWP water purchase contracts. Therefore, land uses within the Delta Region and south of the Delta would not change as a result of implementing an alternative evaluated in this EIR/EIS. Because no such changes are anticipated, further evaluation of such potential changes is not necessary.

16.1.4 Regulatory Setting

The following discussion, derived from the EWA Final EIS/EIR (Reclamation *et al.* 2004), describes state and federal land management programs that promote the preservation of agricultural lands in California.

16.1.4.1 FEDERAL

CONSERVATION RESERVE PROGRAM

The Conservation Reserve Program is a federal program administered by the Farm Service Agency. This voluntary program offers annual rental payments, incentive payments and annual maintenance payments for certain activities, and cost-share assistance to establish approved vegetative cover on eligible cropland. To be eligible for placement in the Conservation Reserve Program, land must be: (1) cropland, including field margins, planted or considered planted to an agricultural commodity during at least 4 of the 6 crop years from 1996 to 2001, and physically and legally capable of being planted in a normal manner to an agricultural commodity; or (2) certain marginal pastureland that is enrolled in the Water Bank Program or suitable for use as a riparian buffer or similar water quality purposes.

WETLANDS RESERVE PROGRAM

The Wetlands Reserve Program is a voluntary program offering landowners the opportunity to protect, restore, and enhance wetlands on their property. The U.S. Department of Agriculture Natural Resources Conservation Service provides technical and financial support to help landowners with wetland restoration. The goal of the Natural Resources Conservation Service is to achieve the greatest wetland functions and values, along with optimum wildlife habitat, on every acre enrolled in the program. The Wetlands Reserve Program offers landowners an opportunity to protect wildlife and establish long-term conservation and wildlife practices. In California, this program has focused on the restoration of a variety of wetland types throughout the state, including seasonal wetlands, semi-permanent marshes, vernal pools along the perimeter of the Central Valley, riparian corridors, and tidally influenced wetlands.

16.1.4.2 STATE

WILLIAMSON ACT

The California Land Conservation Act of 1965, commonly referred to as the Williamson Act, enables local governments to enter into contracts with private landowners for the purpose of restricting specific parcels of land to agricultural or related open space use. In return, landowners receive property tax assessments that are much lower than they otherwise would be because they are based on farming and open space uses as opposed to full market value. Local governments receive an annual subvention of forgone property tax revenues from the state via the Open Space Subvention Act of 1971.

Of California's 58 counties, 52 have adopted the Williamson Act program. Currently, Yuba County has not adopted the Williamson Act program.

CALIFORNIA FARMLAND CONSERVANCY PROGRAM

The California Farmland Conservancy Program is a voluntary program that seeks to encourage the long-term, private stewardship of agricultural lands through the use of agricultural conservation easements. The California Farmland Conservancy Program provides grant funding for projects that use and support agricultural conservation easements for protection of agricultural lands. An agricultural conservation easement is a voluntary, legally recorded restriction that is placed on a specific property used for agricultural production. The goal of an agricultural conservation easement is to maintain agricultural land in active production by removing development pressures from the land. Such an easement prohibits practices that would damage or interfere with the agricultural use of the land. Because the easement is a restriction on the property, the easement remains in effect even when the land changes ownership.

FARMLAND MAPPING AND MONITORING PROGRAM

The FMMP, established in 1982, produces maps and statistical data used for analyzing changes in California's agricultural resources. Every two years, the maps are updated using aerial photographs, a computer mapping system, public review, and field reconnaissance. The two-year period is called an update cycle. FMMP rates agricultural land according to soil quality and irrigation status, and designates the best quality land as Prime Farmland. The FMMP land use categories are as follows:

- ***Prime Farmland*** – Land with the best combination of physical and chemical features to sustain long-term production of agricultural crops. This land has the soil quality, growing season, and moisture supply needed to produce sustained high yields. Land must have been used for production of irrigated crops at some time during the two update cycles prior to the mapping date.
- ***Farmland of Statewide Importance*** – Land similar to Prime Farmland that has a good combination of physical and chemical characteristics for the production of crops. This land has minor shortcomings, such as greater slopes or less ability to store soil moisture than Prime Farmland. Land must have been used for production of irrigated crops at some time during the two update cycles prior to the mapping date.
- ***Unique Farmland*** – Land with lesser quality soils used for the production of the state's leading agricultural crops. This land is usually irrigated, but might include non-irrigated orchards or vineyards, as found in some climatic zones in California. Land must have been cropped at some time during the two update cycles prior to the mapping date.
- ***Farmland of Local Importance*** – Land of importance to the local agricultural economy, as determined by each county's board of supervisors and a local advisory committee.
- ***Grazing Land*** – Land on which the existing vegetation is suited to the grazing of livestock.
- ***Urban and Built-up Land*** – Land occupied by structures with a building density of at least one unit to 1.5 acres, or approximately six structures to a 10-acre parcel.
- ***Water*** – Water areas with an extent of at least 40 acres.
- ***Other Land*** – Land that does not meet the criteria of any other category.

INTERIM FARMLAND MAPPING CATEGORIES

Farmed areas that lack modern soil survey information or for which there is expressed local concern about farmland status use the following interim farmland mapping categories in place of FMMP land use categories:

- ***Irrigated Farmland*** – Cropped land with a developed irrigation water supply that is dependable and of adequate quality. Land must have been used for irrigated agricultural production at some time during the two update cycles prior to the mapping date.

- ***Non-irrigated Farmland*** – Land on which agricultural commodities are produced on a continuing or cyclic basis using only stored soil moisture.

16.1.4.3 LOCAL

YUBA COUNTY GENERAL PLAN

Adopted in 1996, the Yuba County General Plan contains a comprehensive plan for growth and development in Yuba County through 2015 (County of Yuba 1996). The General Plan includes the Land Use Element and Diagram, together with the Circulation and Open Space Elements, which together constitute the policy statements, designations and diagrams that support long-range planning and physical development in Yuba County. The Land Use Element of the General Plan has an overall goal of achieving and maintaining a balance among the conservation, development, and utilization of planned open space and natural resources. Overall, General Plan projections estimate that the population in Yuba County will increase to approximately 95,000 and will have an associated accommodation of approximately 34,000 total housing units by 2015. The General Plan also recognizes land use and planning changes occurring in association with the City of Wheatland, and states that the county shall cooperate with the cities of Marysville and Wheatland in land use and infrastructure planning and coordination of services essential to creating an environment in which economic development can occur.

CITY OF WHEATLAND GENERAL PLAN

Initially adopted in 1980, the City of Wheatland General Plan has subsequently undergone several updates (e.g., 1986 Land Use Element, the 1986 Circulation Element, and the 2004 Housing Element). The City of Wheatland recently completed an update to its General Plan, which identifies new land use and circulation designations for the city and surrounding planning area (Raney Planning & Management, Inc. Website 2006). The General Plan establishes a long-term vision for the physical evolution of the City of Wheatland and outlines policies, standards, and programs to guide day-to-day decisions concerning the city's development through 2025. General Plan projections estimate the city's population will increase from 3,000 in 2004 to approximately 30,100 in 2025. The City of Wheatland relies on the groundwater aquifer underlying the city for its municipal water supply. Consistent with the goals (to ensure a safe and adequate water supply for existing and future development) of the General Plan, YCWA has received approval and funding for a Yuba/Wheatland In-Lieu Groundwater Recharge and Storage Project, anticipated to begin construction in 2007. Although unrelated to the Proposed Yuba Accord, the Wheatland Project will extend the YCWA surface water delivery capabilities to the Wheatland area by providing additional conveyance facilities (see Chapter 5). Currently, all of the Wheatland area relies on groundwater.

CITY OF MARYSVILLE GENERAL PLAN

Adopted in 1985, the City of Marysville General Plan includes growth projections through 2005. The Marysville Housing Element, a part of the city's General Plan, was released in May 2005, and contains housing projections for the City of Marysville through 2008. The city generally is located on lands over the North Yuba Subbasin, and domestic water service in the city is obtained entirely from groundwater and provided by the California Water Service Company, a privately owned utility. According to the 2005 housing element update, extension of water supply services to developing sections of the city can be accomplished through 2008. However, if a significant amount of development occurs outside of existing areas of the city, then demand for water could exceed the water supply capacity. In such an event, the plan recommends that the city carefully reexamine the potential effects of proposed developments on water system capacity.

16.2 ENVIRONMENTAL IMPACTS/ENVIRONMENTAL CONSEQUENCES

Potential changes associated with the Proposed Project/Action and alternatives would directly alter both the timing and magnitude of storage volumes in New Bullards Bar Reservoir and flows in the lower Yuba River, with subsequent potential impacts to land use. Quantitative analysis of flows and temperatures has been conducted for the Yuba River system, and data from those analyses are used in this evaluation of impacts.

Qualitative evaluations in this section discuss overall land use, potential land use conversions, including agricultural land, and local and project planning objectives within Yuba County.

16.2.1 IMPACT ASSESSMENT METHODOLOGY

Implementation of the Proposed Project/Action or one of the alternatives evaluated in this EIR/EIS may result in changes to land use within the Yuba Region, including conversion of farmland. Baseline information for land use and important farmland were obtained from the FMMP in Geographic Information System format. Information on land use types and designations within Yuba County also were obtained from the Yuba County General Plan.

Qualitative evaluations in this section discuss the potential changes in land use within Yuba County. The analysis evaluates any permanent conversion of agricultural land to other uses under the Proposed Project/Action and alternatives relative to the bases of comparison. Other potential land use impacts, such as inconsistency with general plans and policies, and incompatibility with adjacent existing land uses, were evaluated by reviewing the Yuba County General Plan.

Rice yields are potentially affected by irrigation water temperatures diverted at Daguerre Point Dam, as water temperature is a very important factor in the productivity of rice. Yuba Project operations may potentially affect water temperatures at Daguerre Point Dam, where water for agricultural users is diverted from the lower Yuba River. Changes in water temperatures at Daguerre Point Dam could affect water temperatures at the agricultural diversions from the Main Canal (for additional information on potential water temperature changes expected to occur in the lower Yuba River, see Section 9.1.1.3).

16.2.2 IMPACT INDICATORS AND SIGNIFICANCE CRITERIA FOR LAND USE

Impact indicators and significance criteria utilized in this evaluation were determined from city, county and agency land use general plans for the Yuba Region. The CEQA Guidelines Environmental Checklist Form also provided general guidance in the identification of circumstances that may result in impacts on the environment related to land use. The impact indicators and significance criteria for land use are presented in **Table 16-1.**

Table 16-1. Impact Indicators and Significance Criteria for Land Use

Impact Indicator	Significance Criteria
Land use designations	Alteration of the existing or planned designated land uses of an area.
Compatibility with surrounding land uses and regional character	Change of the type or intensity of land uses resulting in incompatibility with existing surrounding land uses or incompatibility with the regional character.
Farmland and agricultural acreage	Substantial permanent reduction in agricultural acreage in a region or permanent conversion of any lands categorized as Prime Farmland, Farmland of Statewide Importance, or Unique Farmland under FMMP or Prime Farmland under the Williamson Act.
Protected lands	Substantial permanent conversion of lands through the Farmland Conservancy or other land protection programs
Local and regional planning objectives; project planning objectives	Conflict with adopted environmental plans and goals of local jurisdiction, as stated in its general, community, or other planning policy materials.
Agricultural impacts resulting from changes in water temperature	Change in monthly mean water temperature (°F) at Daguerre Point Dam, relative to the basis of comparison, of sufficient magnitude and frequency to substantially affect agricultural production, for any given month of the evaluation period over the 72-year simulation period.

As discussed in Chapter 4, CEQA and NEPA have different legal and regulatory standards that require slightly different assumptions in the modeling runs used to compare the Proposed Project/Action and alternatives to the appropriate CEQA and NEPA bases of comparison in the impact assessments. Although only one project (the Yuba Accord Alternative) and one action alternative (the Modified Flow Alternative) are evaluated in this EIR/EIS, it is necessary to use separate NEPA and CEQA modeling scenarios for the Proposed Project/Action, alternatives and bases of comparisons to make the appropriate comparisons. As a result, the scenarios compared in the impact assessments below have either a "CEQA" or a "NEPA" prefix before the name of the alternative being evaluated. A detailed discussion of the different assumptions used for the CEQA and NEPA scenarios is included in Appendix D.

As also discussed in Chapter 4, while the CEQA and NEPA analyses in this EIR/EIS refer to "potentially significant," "less than significant," "no" and "beneficial" impacts, the first two comparisons (CEQA Yuba Accord Alternative compared to the CEQA No Project Alternative and CEQA Modified Flow Alternative compared to the CEQA No Project Alternative) presented below instead refer to whether or not the proposed change would "unreasonably affect" the evaluated parameter. This is because these first two comparisons are made to determine whether the action alternative would satisfy the requirement of Water Code Section 1736 that the proposed change associated with the action alternative "*would not unreasonably affect fish, wildlife, or other instream beneficial uses*."

16.2.3 ENVIRONMENTAL IMPACTS/ENVIRONMENTAL CONSEQUENCES COMMON TO ALL SCENARIOS AND COMPARISONS

16.2.3-1: Changes in annual surface water deliveries that could result in potential impacts to existing land use designations

Land use designations within the Yuba Region would be susceptible to change if there were a substantial shift in water deliveries to agricultural lands in the region, or if there were some other disruption to water supply in the area. **Table 16-2** shows the total average annual surface water delivery for each of the scenarios being analyzed.

Table 16-2. Average Annual Surface Water Delivery (TAF), Yuba Region

Scenario	Annual Average Surface Water Delivery
CEQA Existing Condition	280.7
CEQA No Project Alternative	314.3
CEQA Yuba Accord Alternative	310.4
CEQA Modified Flow Alternative	316.8
NEPA No Action Alternative	316.5
NEPA Yuba Accord Alternative	312.7
NEPA Modified Flow Alternative	318.2

With the exception of the CEQA Existing Condition, the average annual surface water delivery among all of the alternatives varies by less than 3 percent, less than an amount that will trigger a change in land use designation as a result of change in water supply. Thus, no change in land use designation is anticipated for any of the scenario comparisons, and impacts to land use designations would be less than significant for all of these comparisons.

16.2.3-2: Changes in annual water deliveries and instream flow conditions that could result in potential impacts to the compatibility with surrounding land uses and regional character

As described in Impact 16.2.3-1, changes in average annual surface water deliveries within the Yuba Region under any of the scenarios being analyzed will be less than 3 percent, less than the amount that would be likely to trigger any change in type or intensity of agricultural land use as a result of water supply. Additionally, no element of the Yuba Accord or Modified Flow Alternatives requires or mandates any change from existing land use patterns as a perquisite for the alternative. Thus, no change in compatibility with surrounding land uses is anticipated for any of the scenario comparisons, and impacts resulting in changes in compatibility with surrounding land uses will be less than significant for all of these comparisons.

16.2.3-3: Changes in annual water deliveries that could result in potential impacts to farmland and agricultural acreage

As described in Impact 16.2.3-1, changes in average annual surface water deliveries within the Yuba Region are not anticipated to be sufficient to prompt a substantial change in farmland or agricultural acreage, nor would any changes in water deliveries be of sufficient magnitude to cause a substantial shift in crop patterns or rotation. It is possible that the Yuba Accord or Modified Flow Alternatives may provide slightly more certainty in water deliveries than the No Project/No Action Alternatives, and may therefore represent a greater chance of retaining farmland and agricultural use patterns. However, no substantial change in farmland and agricultural use patterns is anticipated for any of the scenario comparisons, and impacts to farmland and agricultural acreage will be less than significant for all of these comparisons.

16.2.3-4: Changes in annual water deliveries that could result in potential impacts to the conversion of lands to protected lands

As described in Impact 16.2.3-1, changes in average annual surface water deliveries within the Yuba Region are not anticipated to be sufficient to prompt a substantial change in farmland or agricultural acreage. Additionally, no aspect of the Yuba Accord Alternative or the Modified Flow Alternative requires or is likely to cause the conversion of land to some level of protected status. There is no reason to assume any conversion of land to some level of protected status would be more likely to occur under one of the action alternatives than under the No Project/No Action Alternatives; thus the action alternatives relative to the bases of comparison would have less than significant impacts on the conversion of land to protected status.

16.2.3-5: Changes in annual water deliveries and instream flow conditions that could result in potential impacts to local and regional planning objectives

None of the scenarios evaluated has substantial conflicts with adopted environmental plans or goals of the local jurisdictions within the Yuba Region; consequently none of the scenario comparisons is anticipated to have conflicts with adopted environmental plans or goals and impacts to local and regional planning objectives will be less than significant for all of these comparisons.

16.2.4 ENVIRONMENTAL IMPACTS/ENVIRONMENTAL CONSEQUENCES OF THE CEQA YUBA ACCORD ALTERNATIVE COMPARED TO THE CEQA NO PROJECT ALTERNATIVE

Impact 16.2.4-1: Agricultural impacts resulting from changes in water temperature

Table 16-3 provides a comparison of average monthly water temperatures for the Yuba River at Daguerre Point Dam based on modeling of 71 years of hydrologic record. Although the temperature at Daguerre Point Dam (the point of diversion of agricultural irrigation water for most of the irrigation demands in the Yuba Region) is not a precise proxy for temperatures of irrigation water as delivered to the fields, the point of diversion is the last location where any of the alternatives under consideration potentially impact agricultural water temperatures.

Table 16-3. CEQA Yuba Accord Alternative Compared to the CEQA No Project Alternative, Summary Statistics of Long-term Average Water Temperatures (°F)

Long-term Average Water Temperature, and Average Water Temperature by Water Year Type in the Yuba River at Daguerre Point Dam Under the CEQA Yuba Accord Alternative and CEQA No Project Alternative Conditions				
	Apr	**May**	**Jun**	**Jul**
Full Simulation Period				
CEQA Yuba Accord Alternative	53.1	54.9	57.5	57.5
CEQA No Project Alternative	53.1	54.7	57.5	58.1
Difference	0	0.2	0	-0.6
Wet				
CEQA Yuba Accord Alternative	52	53.2	55.6	55.7
CEQA No Project Alternative	52.1	53.3	55.7	56.3
Difference	-0.1	-0.1	-0.1	-0.6
Above Normal				
CEQA Yuba Accord Alternative	52.3	54.5	56.9	57.3
CEQA No Project Alternative	52.4	54.6	57.5	58.1
Difference	-0.1	-0.1	-0.6	-0.8
Below Normal				
CEQA Yuba Accord Alternative	53	54.9	57.5	57.8
CEQA No Project Alternative	52.9	54.6	57.6	58.7
Difference	0.1	0.3	-0.1	-0.9
Dry				
CEQA Yuba Accord Alternative	53.8	56	58.8	58.1
CEQA No Project Alternative	53.8	55.4	58.6	58.8
Difference	0	0.6	0.2	-0.7
Critical				
CEQA Yuba Accord Alternative	54.7	57	59.9	59.8
CEQA No Project Alternative	54.8	56.5	59.4	59.5
Difference	-0.1	0.5	0.5	0.3

As can be seen from Table 16-3, the CEQA Yuba Accord Alternative would produce average monthly temperatures that would differ only slightly (less than 1°F) from those under the CEQA No Project Alternative, and most of the temperature shifts would be less than 0.5°F up or down. Because these temperature changes are estimated at the river, actual temperature shifts at the field should be of lower magnitude due to attenuation of differences during transport.

Overall, the temperature changes are not expected to have a noticeable impact on agricultural production, and impacts on agricultural production resulting from changes in water temperature are not anticipated to unreasonably affect land use under the CEQA Yuba Accord Alternative, relative to the CEQA No Project Alternative.

16.2.5 ENVIRONMENTAL IMPACTS/ENVIRONMENTAL CONSEQUENCES OF THE CEQA MODIFIED FLOW ALTERNATIVE COMPARED TO THE CEQA NO PROJECT ALTERNATIVE

Impact 16.2.5-1: Agricultural impacts resulting from changes in water temperature

Table 16-4 provides a comparison of average monthly water temperatures for the Yuba River at Daguerre Point Dam based on modeling of 71 years of hydrologic record.

Table 16-4. CEQA Modified Flow Alternative Compared to the CEQA No Project Alternative, Summary Statistics of Long-term Average Water Temperatures (°F)

Long-term Average Water Temperature, and Average Water Temperature by Water Year Type in the Yuba River at Daguerre Point Dam under CEQA Modified Flow Alternative and CEQA No Project Alternative Conditions				
	Apr	**May**	**Jun**	**Jul**
Full Simulation Period				
CEQA Modified Flow Alternative	53.2	54.9	57.7	57.3
CEQA No Project Alternative	53.1	54.7	57.5	58.1
Difference	0.1	0.2	0.2	-0.8
Wet				
CEQA Modified Flow Alternative	52.1	53.3	55.7	55.4
CEQA No Project Alternative	52.1	53.3	55.7	56.3
Difference	0	0	0	-0.9
Above Normal				
CEQA Modified Flow Alternative	52.4	54.6	57.5	56.8
CEQA No Project Alternative	52.4	54.6	57.5	58.1
Difference	0	0	0	-1.3
Below Normal				
CEQA Modified Flow Alternative	52.9	54.7	57.6	57.6
CEQA No Project Alternative	52.9	54.6	57.6	58.7
Difference	0	0.1	0	-1.1
Dry				
CEQA Modified Flow Alternative	54	55.9	59	58.2
CEQA No Project Alternative	53.8	55.4	58.6	58.8
Difference	0.2	0.5	0.4	-0.6
Critical				
CEQA Modified Flow Alternative	55	57.4	60.2	59.7
CEQA No Project Alternative	54.8	56.5	59.4	59.5
Difference	0.2	0.9	0.8	0.2

As can be seen from Table 16-4, the CEQA Modified Flow Alternative would produce average monthly temperatures that would differ only slightly (maximum 1.3°F) from those under the

CEQA No Project Alternative, and most of the temperature shifts would be less than 0.5°F up or down. Because these temperature changes are estimated at the river, actual temperature shifts at the field should be of lower magnitude due to attenuation of differences during transport.

Overall, the temperature changes are not expected to have a noticeable impact on agricultural production, and impacts on agricultural production resulting from changes in water temperature are not anticipated to unreasonably affect land use under the CEQA Modified Flow Alternative, relative to the CEQA No Project Alternative.

16.2.6 Environmental Impacts/Environmental Consequences of the CEQA Yuba Accord Alternative Compared to the CEQA Existing Condition

Impact 16.2.6-1: Agricultural impacts resulting from changes in water temperature

Table 16-5 provides a comparison of average monthly water temperatures for the Yuba River at Daguerre Point Dam based on modeling of 71 years of hydrologic record.

Table 16-5. CEQA Yuba Accord Alternative Compared to the CEQA Existing Condition, Summary Statistics of Long-term Average Water Temperatures (°F)

Long-term Average Water Temperature, and Average Water Temperature by Water Year Type in the Yuba River at Daguerre Point Dam under CEQA Yuba Accord Alternative and CEQA Existing Condition				
	Apr	**May**	**Jun**	**Jul**
Full Simulation Period				
CEQA Yuba Accord Alternative	53.1	54.9	57.5	57.5
CEQA Existing Condition	53.2	55	57.8	57.1
Difference	-0.1	-0.1	-0.3	0.4
Wet				
CEQA Yuba Accord Alternative	52	53.2	55.6	55.7
CEQA Existing Condition	52.1	53.3	55.7	55.1
Difference	-0.1	-0.1	-0.1	0.6
Above Normal				
CEQA Yuba Accord Alternative	52.3	54.5	56.9	57.3
CEQA Existing Condition	52.4	54.6	57.4	56.4
Difference	-0.1	-0.1	-0.5	0.9
Below Normal				
CEQA Yuba Accord Alternative	53	54.9	57.5	57.8
CEQA Existing Condition	53.1	54.8	57.7	57.3
Difference	-0.1	0.1	-0.2	0.5
Dry				
CEQA Yuba Accord Alternative	53.8	56	58.8	58.1
CEQA Existing Condition	54.1	56	59.2	58.1
Difference	-0.3	0	-0.4	0
Critical				
CEQA Yuba Accord Alternative	54.7	57	59.9	59.8
CEQA Existing Condition	55.1	57.4	60.4	59.7
Difference	-0.4	-0.4	-0.5	0.1

As can be seen from Table 16-5, the CEQA Yuba Accord Alternative would produce average monthly temperatures that would differ only slightly (less than 1°F) from those under the CEQA Existing Condition, and most of the temperature shifts would be less than 0.5°F up or down. Because these temperature changes are estimated at the river, actual temperature shifts at the field should be of lower magnitude due to attenuation during transport.

Overall, the temperature changes are not expected to have a noticeable impact on agricultural production, and impacts on agricultural production resulting from changes in water temperature are anticipated to be less than significant for the CEQA Yuba Accord Alternative, relative to the CEQA Existing Condition.

16.2.7 ENVIRONMENTAL IMPACTS/ENVIRONMENTAL CONSEQUENCES OF THE CEQA MODIFIED FLOW ALTERNATIVE COMPARED TO THE CEQA EXISTING CONDITION

Impact 16.2.7-1: Agricultural impacts resulting from changes in water temperature

Table 16-6 provides a comparison of average monthly water temperatures for the Yuba River at Daguerre Point Dam based on modeling of 71 years of hydrologic record.

Table 16-6. CEQA Modified Flow Alternative Compared to the CEQA Existing Condition, Summary Statistics of Long-term Average Water Temperatures (°F)

Long-term Average Water Temperature, and Average Water Temperature by Water Year Type in the Yuba River at Daguerre Point Dam under CEQA Modified Flow Alternative and CEQA Existing Condition Conditions				
	Apr	**May**	**Jun**	**Jul**
Full Simulation Period				
CEQA Modified Flow Alternative	53.2	54.9	57.7	57.3
CEQA Existing Condition	53.2	55	57.8	57.1
Difference	0	-0.1	-0.1	0.2
Wet				
CEQA Modified Flow Alternative	52.1	53.3	55.7	55.4
CEQA Existing Condition	52.1	53.3	55.7	55.1
Difference	0	0	0	0.3
Above Normal				
CEQA Modified Flow Alternative	52.4	54.6	57.5	56.8
CEQA Existing Condition	52.4	54.6	57.4	56.4
Difference	0	0	0.1	0.4
Below Normal				
CEQA Modified Flow Alternative	52.9	54.7	57.6	57.6
CEQA Existing Condition	53.1	54.8	57.7	57.3
Difference	-0.2	-0.1	-0.1	0.3
Dry				
CEQA Modified Flow Alternative	54	55.9	59	58.2
CEQA Existing Condition	54.1	56	59.2	58.1
Difference	-0.1	-0.1	-0.2	0.1
Critical				
CEQA Modified Flow Alternative	55	57.4	60.2	59.7
CEQA Existing Condition	55.1	57.4	60.4	59.7
Difference	-0.1	0	-0.2	0

As can be seen from Table 16-6, the CEQA Modified Flow Alternative would produce average monthly temperatures that would differ only slightly (less than 1°F) from those under the CEQA Existing Condition, and most of the temperature shifts would be less than 0.5°F up or down. Because these temperature changes are estimated at the river, actual temperature shifts at the field should be of lower magnitude due to attenuation of differences during transport.

Overall, the temperature changes are not expected to have a noticeable impact on agricultural production, and impacts on agricultural production resulting from changes in water temperature are anticipated to be less than significant for the CEQA Modified Flow Alternative, relative to the CEQA Existing Condition.

16.2.8 ENVIRONMENTAL IMPACTS/ENVIRONMENTAL CONSEQUENCES OF THE CEQA NO PROJECT/NEPA NO ACTION ALTERNATIVE COMPARED TO THE CEQA EXISTING CONDITION/NEPA AFFECTED ENVIRONMENT

As discussed in Chapter 3, the key elements and activities (e.g., implementation of the RD-1644 Long-term instream flow requirements) for the CEQA No Project Alternative would be the same for the NEPA No Action Alternative. The primary differences between the CEQA No Project and NEPA No Action alternatives are various hydrologic and other modeling assumptions (see Section 4.5 and Appendix D). Because of these differences between the No Project and No Action alternatives, these alternatives are distinguished as separate alternatives for CEQA and NEPA evaluation purposes.

Based on current plans and consistent with available infrastructure and community services, the CEQA No Project Alternative in this EIR/EIS is based on current environmental conditions (e.g., project operations, water demands, and level of land development) plus potential future operational and environmental conditions (e.g., implementation of the RD-1644 Long-term instream flow requirements in the lower Yuba River) that probably would occur in the foreseeable future in the absence of the Proposed Project/Action or another action alternative. The NEPA No Action Alternative also is based on conditions without the proposed project, but uses a longer-term future timeframe that is not restricted by existing infrastructure or physical and regulatory environmental conditions. The differences between these modeling characterizations and assumptions for the CEQA No Project and the NEPA No Action alternatives, including the rationale for developing these two different scenarios for this EIR/EIS, are explained in Chapter 4[2].

Although implementation of the RD-1644 Long-term instream flow requirements would occur under both the CEQA No Project and the NEPA No Action alternatives, the resultant model outputs for both scenarios are different because of variations in the way near-term and long-term future operations are characterized for other parameters in the CEQA and NEPA assumptions. As discussed in Chapter 4, the principal difference between the CEQA No Project Alternative and the NEPA No Action Alternative is that the NEPA No Action Alternative includes several potential future water projects in the Sacramento and San Joaquin valleys (e.g., CVP/SWP Intertie, FRWP, SDIP and a long-term EWA Program or a program equivalent to the EWA), while the CEQA No Project Alternative does not. Because many of the other assumed conditions for these two scenarios are similar, the longer-term analysis of the NEPA No Action Alternative compared to the NEPA Affected Environment builds upon the nearer-term analysis of the CEQA No Project Alternative compared to the CEQA Existing Condition.

[2] For modeling purposes related to CEQA analytical requirements, OCAP Study 3 (2001 level of development) is used as the foundational study upon which the modeling scenarios for the CEQA No Project Alternative and the CEQA Existing Condition were developed. For modeling purposes related to NEPA analytical requirements, OCAP Study 5 (2020 level of development) is used as the foundational study upon which the modeling scenarios for the NEPA No Action Alternative was developed.

Because the same foundational modeling base (OCAP Study 3) was used to characterize near-term conditions (2001 level of development) both the CEQA No Project Alternative and the CEQA Existing Condition, it was possible to conduct a detailed analysis to quantitatively evaluate the hydrologic changes in the Yuba Region and the CVP/SWP system that would be expected to occur under these conditions. Building on this CEQA analysis, the analysis of the NEPA No Action Alternative compared to the NEPA Affected Environment consists of two components: (1) an analysis of near-term future without project conditions quantified through the CEQA No Project Alternative, relative to the CEQA Existing Condition; and (2) a qualitative analysis of longer-term future without project conditions (the NEPA No Action Alternative)[3].

16.2.8.1 CEQA No Project Alternative Compared to the CEQA Existing Condition

Impact 16.2.8.1-1: Agricultural impacts resulting from changes in water temperature

Table 16-7 provides a comparison of average monthly water temperatures for the Yuba River at Daguerre Point Dam based on modeling of 71 years of hydrologic record.

Table 16-7. CEQA No Project Alternative Compared to the CEQA Existing Condition, Summary Statistics of Long-term Average Water Temperatures (°F)

Long-term Average Water Temperature, and Average Water Temperature by Water Year Type in the Yuba River at Daguerre Point Dam under CEQA No Project Alternative and CEQA Existing Condition				
	Apr	May	Jun	Jul
Full Simulation Period				
CEQA No Project Alternative	53.1	54.7	57.5	58.1
CEQA Existing Condition	53.2	55	57.8	57.1
Difference	-0.1	-0.3	-0.3	1
Wet				
CEQA No Project Alternative	52.1	53.3	55.7	56.3
CEQA Existing Condition	52.1	53.3	55.7	55.1
Difference	0	0	0	1.2
Above Normal				
CEQA No Project Alternative	52.4	54.6	57.5	58.1
CEQA Existing Condition	52.4	54.6	57.4	56.4
Difference	0	0	0.1	1.7
Below Normal				
CEQA No Project Alternative	52.9	54.6	57.6	58.7
CEQA Existing Condition	53.1	54.8	57.7	57.3
Difference	-0.2	-0.2	-0.1	1.4
Dry				
CEQA No Project Alternative	53.8	55.4	58.6	58.8
CEQA Existing Condition	54.1	56	59.2	58.1
Difference	-0.3	-0.6	-0.6	0.7
Critical				
CEQA No Project Alternative	54.8	56.5	59.4	59.5
CEQA Existing Condition	55.1	57.4	60.4	59.7
Difference	-0.3	-0.9	-1	-0.2

[3] The second analytical component cannot be evaluated quantitatively due to the differences in the underlying baseline assumptions for OCAP Study 3 and OCAP Study 5.

As can be seen from Table 16-7, the CEQA No Project Alternative would produce average monthly temperatures that differ slightly (less than 2°F) from those under the CEQA Existing Condition, with temperature shifts of less than 1.0°F down and as much as 1.7°F up in some year classes. Because these temperature changes are estimated at the river, actual temperature shifts at the field should be of lower magnitude due to attenuation of differences during transport.

Overall, the temperature changes are not expected to have a noticeable impact on agricultural production; especially considering that the larger temperature shifts are towards warmer temperatures that are more favorable to agriculture. As a result, impacts on agricultural production resulting from changes in water temperature are anticipated to be less than significant for the CEQA No Project Alternative, relative to the CEQA Existing Condition.

16.2.8.2 NEPA No Action Alternative Compared to the NEPA Affected Environment

In the Yuba Region, the primary difference between the NEPA No Action Alternative and the NEPA Affected Environment would be the changes in lower Yuba River flows associated with the implementation of the RD-1644 Long-term instream flow requirements, to replace the RD-1644 Interim instream flow requirements. These also are the primary differences that would occur in the Yuba Region between the CEQA No Project Alternative and the CEQA Existing Condition. The potential effects to land use that were evaluated in the quantitative analyses that is presented in Section 16.2.8.1 above for the CEQA No Project Alternative relative to the CEQA Existing Condition (see also Appendix F4, 2 vs. 1) therefore also used for comparison of the NEPA No Action Alternative relative to the NEPA Affected Environment, and are not repeated here.

As discussed above, the analysis of the NEPA No Action Alternative includes several additional proposed projects in the project study area that are not included in the CEQA analysis. However, these other proposed projects would not affect hydrologic conditions in the Yuba Region.

The NEPA No Action Alternative considers 2020 level of development in the Sacramento Valley. In general, the types of change associated with a future level of demand that could affect land uses in Yuba County include increased agricultural land conversion. However, future land uses in Yuba County through 2013 are specified in the Yuba County General Plan. The General Plan is a comprehensive plan for growth and development in Yuba County and applies to all of the unincorporated area of the county outside of the cities of Marysville and Wheatland, which have their own general plans. The Yuba County General Plan states that "on the valley floor, lands that are the least productive for agricultural purposes will be committed to development while higher value agricultural land (which includes along the Feather River, Bear River, and in Reclamation District 10) will be protected from encroachment and preserved for future generations of farmers" (County of Yuba 1996).

The Yuba County General Plan describes that, although agriculture will continue to play a significant role, overall agricultural land acreage will be reduced around Marysville, Linda, Olivehurst, Wheatland, and elsewhere. Yuba County previously evaluated potential environmental impacts associated with conversion of agricultural lands to other, urbanized uses in its General Plan EIR and determined that resource development in the county will be carried out in a manner sensitive to the environment and compatible with neighboring uses. Therefore, the NEPA No Action Alternative, relative to NEPA Affected Environment, is not anticipated to conflict with adopted environmental plans or goals, or result in impacts to local and regional planning objectives.

16.2.9 ENVIRONMENTAL IMPACTS/ENVIRONMENTAL CONSEQUENCES OF THE NEPA YUBA ACCORD ALTERNATIVE COMPARED TO THE NEPA NO ACTION ALTERNATIVE

Impact 16.2.9-1: Agricultural impacts resulting from changes in water temperature

Table 16-8 provides a comparison of average monthly water temperatures for the Yuba River at Daguerre Point Dam based on modeling of 71 years of hydrologic record.

As can be seen from **Table 16-8,** the NEPA Yuba Accord Alternative would produce average monthly temperatures that would differ only slightly (less than 1°F) from those under the NEPA No Action Alternative, and most of the temperature shifts would be less than 0.5°F up or down. Because these temperature changes estimated at the river, actual temperature shifts at the field should be of lower magnitude due to attenuation of differences during transport.

Overall, the temperature changes are not expected to have a noticeable impact on agricultural production, and impacts on agricultural production resulting from changes in water temperature are anticipated to be less than significant for the NEPA Yuba Accord Alternative, relative to the NEPA No Action Alternative.

Table 16-8. NEPA Yuba Accord Alternative Compared to the NEPA No Action Alternative, Summary Statistics of Long-term Average Water Temperatures (°F)

Long-term Average Water Temperature, and Average Water Temperature by Water Year Type in the Yuba River at Daguerre Point Dam under NEPA Yuba Accord Alternative and NEPA No Action Alternative Conditions				
	Apr	May	Jun	Jul
Full Simulation Period				
NEPA Yuba Accord Alternative	53.1	54.9	57.5	57.4
NEPA No Action Alternative	53.1	54.7	57.5	58.1
Difference	0	0.2	0	-0.7
Wet				
NEPA Yuba Accord Alternative	52	53.2	55.6	55.7
NEPA No Action Alternative	52.1	53.3	55.7	56.3
Difference	-0.1	-0.1	-0.1	-0.6
Above Normal				
NEPA Yuba Accord Alternative	52.3	54.5	56.9	57.3
NEPA No Action Alternative	52.4	54.6	57.5	58.1
Difference	-0.1	-0.1	-0.6	-0.8
Below Normal				
NEPA Yuba Accord Alternative	53	54.9	57.5	57.8
NEPA No Action Alternative	52.9	54.6	57.6	58.7
Difference	0.1	0.3	-0.1	-0.9
Dry				
NEPA Yuba Accord Alternative	53.8	56	58.8	57.9
NEPA No Action Alternative	53.8	55.3	58.6	58.9
Difference	0	0.7	0.2	-1
Critical				
NEPA Yuba Accord Alternative	54.7	57	59.9	59.8
NEPA No Action Alternative	54.8	56.4	59.4	59.6
Difference	-0.1	0.6	0.5	0.2

16.2.10 ENVIRONMENTAL IMPACTS/ENVIRONMENTAL CONSEQUENCES OF THE NEPA MODIFIED FLOW ALTERNATIVE COMPARED TO THE NEPA NO ACTION ALTERNATIVE

Impact 16.2.10-1: Agricultural impacts resulting from changes in water temperature

Table 16-9 provides a comparison of average monthly water temperatures for the Yuba River at Daguerre Point Dam based on modeling of 71 years of hydrologic record.

As can be seen from Table 16-9, the NEPA Modified Flow Alternative would produce average monthly temperatures that would differ only slightly (less than 1°F) from those under the NEPA No Action Alternative, and most of the temperature shifts would be less than 0.5°F up or down. Because these temperature changes are estimated at the river, actual temperature shifts at the field should be of lower magnitude due to attenuation of differences during transport.

Overall, the temperature changes are not expected to have a noticeable impact on agricultural production, and impacts on agricultural production resulting from changes in water temperature are anticipated to be less than significant for the NEPA Modified Flow Alternative, relative to the NEPA No Action Alternative.

Table 16-9. NEPA Modified Flow Alternative Compared to the NEPA No Action Alternative, Summary Statistics of Long-term Average Water Temperatures

Long-term Average Water Temperature, and Average Water Temperature by Water Year Type in the Yuba River at Daguerre Point Dam under NEPA Modified Flow Alternative and NEPA No Action Alternative Conditions				
	Apr	**May**	**Jun**	**Jul**
Full Simulation Period				
NEPA Modified Flow Alternative	53.2	54.9	57.7	57.4
NEPA No Action Alternative	53.1	54.7	57.5	58.1
Difference	0.1	0.2	0.2	-0.7
Wet				
NEPA Modified Flow Alternative	52.1	53.3	55.7	55.5
NEPA No Action Alternative	52.1	53.3	55.7	56.3
Difference	0	0	0	-0.8
Above Normal				
NEPA Modified Flow Alternative	52.4	54.6	57.5	57.1
NEPA No Action Alternative	52.4	54.6	57.5	58.1
Difference	0	0	0	-1
Below Normal				
NEPA Modified Flow Alternative	52.9	54.7	57.6	57.8
NEPA No Action Alternative	52.9	54.6	57.6	58.7
Difference	0	0.1	0	-0.9
Dry				
NEPA Modified Flow Alternative	54.1	55.9	59	58.3
NEPA No Action Alternative	53.8	55.3	58.6	58.9
Difference	0.3	0.6	0.4	-0.6
Critical				
NEPA Modified Flow Alternative	55	57.3	60.2	59.8
NEPA No Action Alternative	54.8	56.4	59.4	59.6
Difference	0.2	0.9	0.8	0.2

16.3 CUMULATIVE IMPACTS

Hydrologic modeling was used to evaluate the cumulative effects of the Yuba Accord Alternative and other likely changes in CVP/SWP operations on hydrology and other resources. The proposed projects that have been adequately defined (e.g., in recent project-level environmental documents or CALSIM II modeling) and that have the potential to contribute to cumulative impacts are included in the quantitative assessment of the Yuba Accord's impacts. For analytical purposes of this EIR/EIS, the projects that are considered well defined and "reasonably foreseeable" are described in Chapter 21. Additionally, the assumptions used to characterize future hydrologic cumulative conditions that are quantitatively simulated using CALSIM II are presented in Appendix D. To the extent feasible, potential cumulative impacts on resources (e.g., aquatic resources, water quality) dependent on hydrology or water supply are analyzed quantitatively. Because several projects cannot be accurately characterized for hydrologic modeling purposes at this time, either due to the nature of a particular project or because specific operational details are only in the preliminary phases of development, these projects are evaluated qualitatively.

Only those projects that could affect land use are included in the qualitative evaluation that is presented in subsequent sections of this chapter. Although most of the proposed projects described in Chapter 21 could have project-specific impacts that will be addressed in future project-specific environmental documentation, the future implementation of these projects is not expected to result in cumulative impacts to regional water supply operations, or water-related and water dependent resources that also could be affected by the Proposed Project/Action or an action alternative (see Chapter 21). For this reason, only one project has the potential to cumulatively impact land use in the project study area. That project is the relicensing of the Yuba Project, which will occur in 2016.

For CEQA, the purpose of the cumulative analysis is to determine whether the incremental effects of the Proposed Project (Yuba Accord Alternative) would be expected to be "cumulatively considerable" when viewed in connection with the effects of past projects, other current projects, and probable future projects (Public Resources Code Section 21083, subdivision (b)(2)).[4]

For NEPA, the scope of an EIS must include "Cumulative actions, which when viewed with other proposed actions have cumulatively significant impacts and should therefore be discussed in the same impact statement (40 CFR Section 1508.25(a)(2)).

Because the CEQ regulations for implementing NEPA and the CEQA guidelines contain very similar requirements for analyzing, and definitions of, cumulative impacts, the discussions of cumulative impacts of the Yuba Accord Alternative Cumulative Condition relative to the Existing Condition will be the basis for evaluation of cumulative impacts for both CEQA and NEPA. In addition, an analysis of the Modified Flow Alternative Cumulative Condition relative to the Existing Condition is provided to fulfill NEPA requirements.

[4] The "*Guide to the California Environmental Quality Act*" (Remy *et al.* 1999) states that "*…although a project may cause an "individually limited" or "individually minor" incremental impact that, by itself, is not significant, the increment may be "cumulatively considerable", and thus significant, when viewed against the backdrop of past, present, and probable future projects.*" (CEQA Guidelines, § 15064, subd. (i)(l), 15065, subd. (c), 15355, subd. (b)).

16.3.1 Environmental Impacts/Environmental Consequences of the Yuba Accord Alternative Cumulative Condition Compared to the Existing Condition

Deliveries of surface water are substantially greater under the Yuba Accord Alternative, relative to the Existing Condition (see Table 16-2). This is due to a variety of factors, primarily related to the expansion of the surface water delivery service area to include the WWD. As discussed in Section 16.3, the only project with the potential to cumulatively impact land use in the project study area is the relicensing of the Yuba Project. It is possible that the relicensing of the Yuba Project will result in lower levels of surface water deliveries to the YCWA Member Units due to modified instream flow requirements or other outcomes of the relicensing. However, it is doubtful that the impacts of the relicensing would be substantial enough to reduce surface water deliveries to a level equal to, or lower than, the Existing Condition. As a result, it is extremely unlikely that the cumulative impacts of the Yuba Accord Alternative, plus the potential impacts of reasonably foreseeable future projects in the Yuba Region, will have an impact on land use. Thus, there are no potentially significant impacts of the Yuba Accord Alternative Cumulative Condition compared to the Existing Condition.

16.3.2 Environmental Impacts/Environmental Consequences of the Modified Flow Alternative Cumulative Condition Compared to the Existing Condition

It is anticipated that the Modified Flow Alternative Cumulative Condition will have the same potential for cumulative impacts as the Yuba Accord Alternative Cumulative Condition. Therefore, the description of the potential impacts in Section 16.3.1 also serves as the description of cumulative impacts associated with the Modified Flow Alternative. Thus, the Modified Flow Alternative Cumulative Condition would have no potentially significant impacts compared to the Existing Condition.

16.4 Potential Conditions to Support Approval of YCWA's Water Rights Petition

No unreasonable adverse effects to land use would occur under the Proposed Project/Action or an action alternative and, thus, no impact avoidance measures or other protective conditions are identified for the SWRCB's consideration in determining whether or not to approve YCWA's petitions to implement the Yuba Accord.

16.5 Mitigation Measures/Environmental Commitments

No adverse effects would occur to land use under the Proposed Project/Action or an action alternative, relative to the bases of comparison, and, thus, no mitigation measures are required.

16.6 Potentially Significant Unavoidable Impacts

There are no potentially significant unavoidable impacts to land use associated with the implementation of the Proposed Project/Action or an action alternative, relative to the bases of comparison.

CHAPTER 17
SOCIOECONOMICS

This chapter describes the potential socioeconomic impacts that could occur as a result of implementing the alternatives evaluated in this EIR/EIS. The analysis involves reporting, assessing, and applying data and projections related to population, employment, income and various other sociological and economic factors.

17.1 ENVIRONMENTAL SETTING/AFFECTED ENVIRONMENT

This section describes the current socioeconomic conditions within the various regions of the project study area. The discussion of the Yuba Region provides an overview of the economy of Yuba County, followed by descriptions of the CVP/SWP Upstream of the Delta Region, the Delta Region and the Export Service Area.

17.1.1 YUBA REGION

Yuba County is a relatively economically depressed area of the state. The historical per capita income of the county ranges between 60 percent and 75 percent of the per capita income of California.

This section presents an overview of the current economic conditions of Yuba County. County-level statistics will be compared to the same statistics for California to provide a frame of reference. Statistics that will be used in the overview of the economy include:

- Unemployment rate
- County total personal income per capita income
- Personal income by sector and industry
- On-farm income and expenses

17.1.1.1 UNEMPLOYMENT

Unemployment rates in Yuba County and California from 1999 through 2003 are presented in **Table 17-1**. Yuba County unemployment in 1999 was more than double the unemployment rate for the state, and in every year the unemployment rate in Yuba County was at least 2.8 percent higher than the unemployment rate for the state.

Table 17-1. Annual Unemployment Rates (1999 through 2003)

	Annual Unemployment Rate (%)				
	1999	**2000**	**2001**	**2002**	**2003**
Yuba County	11.7	7.9	8.5	9.9	10.8
California	5.3	5.0	5.4	6.7	6.8
Source: (U.S. Department of Labor Website 2007)					

17.1.1.2 TOTAL COUNTY PERSONAL INCOME AND PER CAPITA INCOME

The personal income of an area is the income that is received by, or on behalf of, all the individuals who live in the area (U.S. Department of Commerce Website 2007). The personal incomes calculated for Yuba County and the state of California during the five year period between 1999 and 2003 are presented in **Table 17-2**. The per capita personal income, calculated as personal income divided by population, also is listed in Table 17-2. For the period shown, per capita personal income in Yuba County ranged between 59 and 66 percent of the per capita personal income of the state.

Table 17-2. Total County Personal Income and Per Capita Personal Income (1999 through 2003) [a]

	1999	2000	2001	2002	2003
California					
Personal Income [b]	999,228,183	1,103,841,912	1,135,304,060	149,183,269	1,184,996,911
Population	33,499,204	34,002,467	34,532,163	34,988,261	35,462,712
Per Capita Personal Income	29.8	32.5	32.9	32.8	33.4
Yuba County					
Personal Income [b]	1,104,429	1,154,696	1,246,013	1,320,227	1,392,915
Population	59,881	60,330	61,373	62,360	63,594
Per Capita Personal Income	18.4	19.1	20.3	21.2	21.9
As a Percent of State per Capita Income	62%	59%	62%	64%	66%

[a] County personal income and per capita personal income is calculated in thousands of dollars.
[b] Personal Income is the income that is received by all persons from all sources. It is calculated as the sum of wage and salary disbursements, supplements to wages and salaries, proprietors' income with inventory valuation and capital consumption adjustments, rental income of persons with capital consumption adjustment, personal dividend income, personal interest income, and personal current transfer receipts, less contributions for government social insurance. All state and local area dollar estimates are in current dollars (not adjusted for inflation).
Source: (U.S. Department of Commerce Website 2007)

17.1.1.3 Personal Income by Sector and Industry

Personal income is disaggregated into four sectors: (1) farm; (2) private industry; (3) government; and (4) other sources (e.g. rent, interest and dividends). The distribution of 2003 Yuba County and state personal income, by each of these four sectors, is shown on **Figure 17-1.** The government sector, which is the single largest sector, contributes 41 percent of personal income in Yuba County. The large contribution from the government section is from Beale AFB, located in the southeastern part of Yuba County. Comparatively, the government sector only comprises 12 percent of personal income for the state. Private industry contributes the second largest amount to personal income in Yuba County at 33 percent, compared to the 66 percent contribution from the private industry sector at the state level. The farm sector contributes 1 and 2 percent to personal income for Yuba County and the state, respectively.

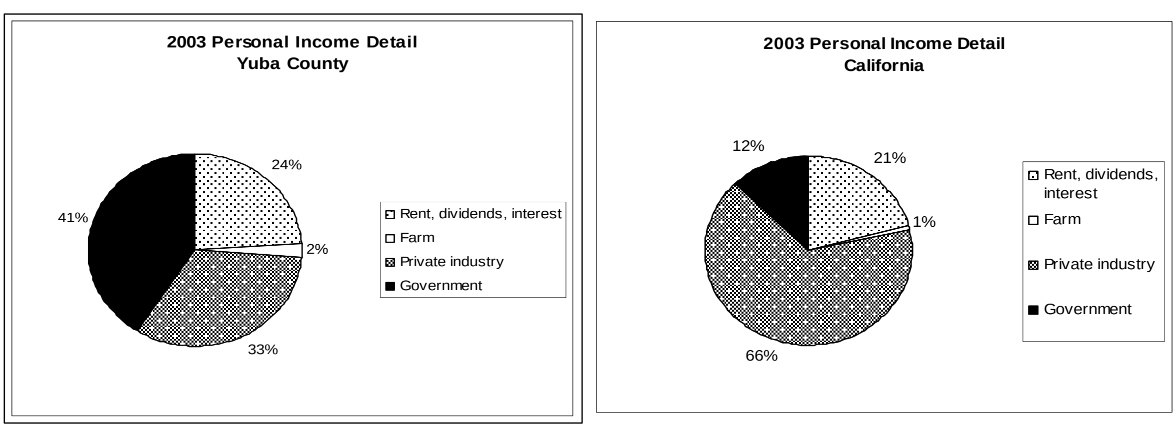

Figure 17-1. 2003 Personal Income for Yuba County and California, by Sector

Two of the four sectors of personal income described above, namely the farm sector and the private industry sector, potentially could be impacted by the Proposed Project/Action and alternatives. The sum of income from the farm sector and the private industry sector is presented in **Table 17-3**. Additionally, Figure 17-1 provides a breakdown of income by specific industry within the private sector. The sum of personal income from the farm and private industry sectors ranged from $431.2 million to $454.8 million for the 1999 to 2003 period. The largest individual industries contributing to the total over the years 1999 to 2003 have been health care and social assistance (17.7 percent), construction (13 percent), manufacturing (10.9 percent) and retail trade (10.6 percent). Farming contributes the next largest percent to the sum of the private industry sector and the farm sector after retail trade (7.5 percent).

17.1.1.4 ON-FARM INCOME AND EXPENSES

California is the number one agricultural producer in the United States, earning $27.6 billion in agricultural markets during 2001. The total land acreage dedicated to farming in California is 27.7 million acres, and 13 percent of the national gross cash receipts from farming can be attributed to California farming products (CDFA 2002). Rice production ranks in the top 20 most valuable crops produced in California, and contributes about $342 million to the state's economy (Bransford 2006). During 2001, rice production accounted for $209 million of the agricultural production value in California, or approximately 1 percent of California's total gross cash income from farming (CDFA 2002).

Notwithstanding the smaller contribution that the farm sector makes to personal income in Yuba County relative to the private industry sector, the farm sector contributes a relatively substantial amount to the agricultural output of California. Potential impacts on agricultural production and the farm sector that would be expected to result from the Proposed Project/Action and alternatives are discussed in Chapter 16 (Section 16.2).

In 2003 Yuba County ranked fifth in the state for the value of production of rice and second for the value of production of dried plums. The types of crops grown in Yuba County, listed in descending order of value in production, are presented in **Table 17-3.** The crops listed in **Table 17-4** represent 87 percent of the value of crops grown in Yuba County.

In addition to providing flood control, recreation, hydropower and fisheries enhancement, the Yuba Project supplies surface water to many of the agricultural users in Yuba County. Almost a million acre feet of water from the North and Middle Yuba River and Oregon Creek are stored in New Bullards Bar Reservoir. The stored surface water supplies have provided a reliable supply of water to agriculture in the county and reversed groundwater overdraft.

17.1.2 CVP/SWP UPSTREAM OF THE DELTA REGION

Within this region, the primary areas of consideration include the Sacramento Valley portions of Shasta, Glenn, Colusa, Yolo, Solano, Butte, Sutter, Yuba, Nevada, Placer, and Sacramento counties. The Sacramento Valley is an important agricultural region for both the state of California and the United States. Sacramento Valley crop production reached $1.9 billion in 1997, with rice, tomatoes, and orchard crops providing the highest revenues. Approximately 10 percent of the applied water within the Sacramento Valley is provided through CVP contracts (Reclamation Website 2004). In most of the irrigation districts that serve this region, annual crop patterns have remained stable since the mid-1970s. For most of the districts, water needs have been a function of water year type rather than changes in crop patterns (Reclamation Website 2004).

Table 17-3. Farm and Private Industry Personal Income Detail for Yuba County (1999 through 2003) [a]

	1999	2000	2001	2002	2003	5-Year Average	Average (%)
Farm Earnings	50,434	38,285	26,526	23,880	30,562	33,937	7.5%
Private Industry	380,772	401,797	417,888	441,035	462,860	420,870	92.5%
Health care and social assistance	64,511	68,249	77,009	91,078	101,213	80,412	17.7%
Construction	46,337	50,316	67,664	60,688	70,833	59,168	13.0%
Manufacturing	55,336	58,367	40,226	45,999	49,061	49,798	10.9%
Retail trade	52,031	53,915	45,642	47,675	42,665	48,386	10.6%
Professional and technical services	16,357	19,354	35,747	40,079	42,378	30,783	6.8%
Transportation	51,694	50,641	16,565	15,582	16,532	30,203	6.6%
Administrative and waste services	23,750	25,544	22,795	23,688	D	23,944	5.3%
Other services	NR	NR	20,882	22,199	22,350	21,810	4.8%
Ag services, forestry, fishing, other	20,399	26,158	17,624	17,316	17,679	19,835	4.4%
Finance and Insurance	10,478	10,655	10,113	10,659	12,545	10,890	2.4%
Accommodation and food services	5,254	5,547	12,072	12,998	14,275	10,029	2.2%
Wholesale trade	7,582	6,717	D	D	D	7,150	1.6%
Mining	5,193	5,795	6,937	7,233	8,185	6,669	1.5%
Information	NR	NR	8,444	4,649	5,026	6,040	1.3%
Real estate	3,954	3,151	6,601	6,907	9,112	5,945	1.3%
Art, entertainment and recreation	3,547	3,752	3,655	4,199	3,285	3,688	0.8%
Educational services	1,380	1,201	873	1,122	1,085	1,132	0.2%
Management of companies	NR	NR	1,080	893	D	987	0.2%
Utilities	D	D	D	D	D	D	D
Total Private Industry and Farm Income	**431,206**	**440,082**	**444,414**	**464,915**	**493,422**	**454,808**	**100.0%**

[a] Calculated as thousands of dollars.
NR – Aggregation method changed between 2000 and 2001. Not reported in 1999 and 2000.
D – Not shown to avoid disclosure of confidential information, but the estimates for this item are included in the totals.
Source: (U.S. Department of Commerce Website 2007)

Table 17-4. Crop Types Grown in Yuba County, Ranked by Value

		Year					2003 Rank
Crop	Statistic	1999	2000	2001	2002	2003	in State [b]
Rice							
	Value ($ 000s)	$29,808	$41,527	$35,347	$35,284	$43,571	5
	Acres (000s)	36.0	36.6	35.8	35.5	35.6	
	Price/ton ($)	$240	$270	$253	$250	$314	
Peaches							
	Value ($ 000s)	$17,188	$23,831	$19,265	$20,765	$21,289	N/A
	Acres (000s)	5.5	5.7	5.4	5.8	6.0	
	Price/ton ($)	$217	$238	$230	$234	$235	
Prunes							
	Value ($ 000s)	$7,302	$24,336	$12,210	$19,983	$19,596	12
	Acres (000s)	12.2	11.7	11.0	11.1	12.0	
	Price/ton ($)	$630	$800	$740	$825	$710	
Walnuts							
	Value ($ 000s)	$14,552	$16,433	$17,017	$14,805	$18,706	N/A
	Acres (000s)	8.6	9.3	9.1	9.2	9.8	
	Price/ton ($)	$1,140	$1,178	$1,100	$1,080	$1,060	
Irrigated Pasture [a]							
	Value ($ 000s)	$1,104	$1,152	$1,200	$1,200	$1,152	N/A
	Acres (000s)	9.6	9.6	9.6	9.6	9.6	
	Price/ton ($)	NR	NR	NR	NR	NR	
Other							
	Value ($ 000s)	$14,532	$15,349	$15,814	$14,132	$16,029	
	Acres (000s)	11.3	11.0	10.1	9.6	9.4	
	Price/ton ($)	NA	NA	NA	NA	NA	
Subtotal Irrigated Cropland							
	Value ($ 000s)	$84,486	$122,628	$100,853	$106,169	$120,343	
	Acres (000s)	83.3	83.9	81.0	80.8	82.3	
	Price/ton ($)	NA	NA	NA	NA	NA	
Non-irrigated Pasture							
	Value ($ 000s)	$1,584	$1,773	$2,162	$2,156	$2,145	
	Acres (000s)	198.0	197.0	196.5	196.0	195.0	
	Price/ton ($)	NR	NR	NR	NR	NR	
Total Cropland							
	Value ($ 000s)	$86,070	$124,401	$103,015	$108,325	$122,488	32
	Acres (000s)	281.3	280.9	277.5	276.8	277.3	
	Price/ton ($)	NA	NA	NA	NA	NA	

NA - Not applicable
NR - Not reported
[a] The value of irrigated pasture does not rank fifth in the county. However, it is called out separately in this table because of the relatively large number of acres in production.
[b] Out of 58 counties throughout the state.
Source: (USDA Website 2007)

Actions associated with the Proposed Yuba Accord alternatives could make additional water supplies available to Reclamation and DWR for delivery to federal and state water project contractors, particularly during drier conditions when water supply deficiencies may occur. However, no changes to existing socioeconomic conditions upstream of the Delta are anticipated, other than the potential for regional growth discussed in Chapter 18, which will likely occur whether or not one of the alternatives evaluated in this EIR/EIS is approved and implemented.

Because a portion of water from the Yuba Accord Alternative would be provided to the EWA Program to supplement CVP/SWP water supplies during drier conditions, it would improve CVP/SWP operational flexibility and federal and state water contractor supply reliability in deficiency years. Supplemental water for CVP and SWP contract allocations provided by the Yuba Accord Alternative would not result in the contractors receiving a quantity of water that would be in excess of either previously authorized CVP contract allocations or SWP Table A amounts. Although Reclamation and DWR could choose to deliver all or a portion of the supplemental transfer water provided by YCWA to the federal or state water project contractors, the additional quantities that could be delivered would not exceed the water delivery amounts and entitlements authorized through existing CVP/SWP water purchase contracts. Therefore, socioeconomic conditions within the CVP/SWP Upstream of the Delta Region would not be expected to change as a result of implementing an alternative evaluated in this EIR/EIS.

17.1.3 Delta Region and Export Service Area

As described above, actions associated with the Proposed Project/Action and alternatives could make additional water supplies available to Reclamation and DWR for delivery to federal and state water project contractors, particularly during drier conditions when deficiencies may occur. For the reasons described in Section 17.1.2 above, the amount of supplemental transfer water deliveries would not exceed the water delivery amounts and entitlements authorized in existing CVP/SWP water purchase contracts. Therefore, socioeconomic conditions within the areas served by the CVP, including the Delta Region, would not be expected to change as a result of implementing an alternative evaluated in this EIR/EIS.

17.1.4 Regulatory Setting

17.1.4.1 Federal and State

Numerous federal and state agencies are involved in regulating and providing socioeconomic assistance to individuals, businesses, and local government agencies in Yuba County. Particularly in Yuba County, the assistance from these agencies is often focused on supporting rural development, infrastructure improvement, and the creation and maintenance of small businesses. Assistance can come in the form of technical expertise, contracting preferences, tax incentives, grants, and loans, as well as other types of economic, workforce or educational support. A detailed overview of the federal and state incentive programs important to the local setting of Yuba County is in the "*Economic Development Strategic Plan*" for Yuba County (County of Yuba 2006).

17.1.4.2 Local

Yuba County released an updated "*Economic Development Strategic Plan*" in March 2006 (County of Yuba 2006), which outlines: (1) goals and objectives regarding attraction, retention and development of targeted industries; (2) county business incentives including availability of loan, grant and contracting programs; (3) coordination with other jurisdictions (i.e., local towns/cities), educational institutions, and development entities; and (4) existing and anticipated infrastructure conditions. This document was produced by the County of Yuba Employment Task Force and Strategic Plan Committee through the coordinating efforts of the Yuba County Economic Development Department. The first strategic plan was produced in 2000, and as a proactive mechanism, has continually undergone regular input and refinements from numerous agencies, constituents and organizations, including Yuba County businesses and residents, the cities of Marysville and Wheatland, Yuba-Sutter Economic Development Corporation, Yuba-Sutter Chamber of Commerce, and Beale AFB.

17.2 ENVIRONMENTAL IMPACTS/ENVIRONMENTAL CONSEQUENCES

17.2.1 IMPACT ANALYSES METHODOLOGY

The potential impacts of the Proposed Project/Action and alternatives on socioeconomic conditions in Yuba County could include:

- Potential revenue from groundwater substitution transfers for some agricultural producers in the Yuba Region
- Changes to the cost or reliability of water supplies, resulting in potential impacts on decisions on use of land

This approach to the analysis follows CEQA Guidelines Section 15131, which states:

> *(a) Economic and social effects of a project shall not be treated as significant effects on the environment. An EIR may trace a chain of cause and effect from a proposed decision on a project through anticipated economic or social changes resulting from the project to physical changes caused in turn by the economic or social changes. The intermediate economic or social changes need not be analyzed in any detail greater than necessary to trace the chain of cause and effect. The focus of the analysis shall be on the physical changes.*

The potential impact of the Proposed Project/Action and alternatives on socioeconomic conditions in Yuba County primarily includes changes to the reliability or cost of pumping groundwater. Under the Proposed Project/Action, groundwater pumping primarily would occur to facilitate groundwater substitution transfers, where participating Member Units would elect to pump groundwater for use on their individual fields in lieu of receiving surface water deliveries. Because the Member Units would use the groundwater directly on their fields, and because the majority of crops would be planted prior to the voluntary election to participate in the current year's groundwater substitution transfer, Member Units with sensitive crops could elect not to pump groundwater. Therefore, cropping patterns are not anticipated to change due to implementation of any of the Proposed Project/Action or an alternative.

The portion of Yuba County that could be impacted by groundwater pumping is defined by the boundaries of both the North Yuba Subbasin and the South Yuba Subbasin (see Chapter 2, Figure 2-2). The majority of land overlying those two groundwater subbasins is contained within the boundaries of one of the seven participating YCWA Member Units. Through the Conjunctive Use Agreements, the participating Member Units would receive compensation to offset the cost of pumping groundwater.

Parties within Yuba County that could potentially be impacted by groundwater pumping under the Proposed Project/Action or an alternative are municipal and industrial water purveyors, non-participating Member Units, other agricultural purveyors and independent groundwater users (both agricultural and domestic).

Local impacts are estimated by calculating the increased cost of groundwater pumping that could occur under the Proposed Project/Action or an alternative. The potential change in the cost of pumping will be evaluated based on estimated changes in groundwater elevations, published rates for electricity, and industry standard averages for pump efficiency.

Table 17-5 shows a range of pumping costs (per acre-foot) varying over increasing pump lift and pump efficiency. The cost of lifting an acre-foot of water 10 feet, representative of pumping water out of a canal when pump efficiency is 65 percent, is estimated to be $2.84. In comparison, the cost of lifting an acre-foot of water 60 feet, such as from a groundwater aquifer, at the same efficiency, is $17.01.[1] As a result, the relative change in cost per acre foot to farmers could be substantial, and is used as the primary evaluation parameter. The impact of potentially higher groundwater costs to the farm sector will be calculated using the Enterprise Budgets available from University of California Cooperative Extension (as available) for the top five crops in Yuba County.

Table 17-5. Varying Costs of Pumping Groundwater, Per Acre-foot

Electricity Cost of Groundwater Pumping per Acre-foot						
Dollars per KWH 0.18						
		Head (feet)				
Pump Efficiency (percent)		**10.00**	**30.00**	**60.00**	**90.00**	**120.00**
	0.585	$3.15	$9.45	$18.90	$28.36	$37.81
	0.618	$2.98	$8.95	$17.91	$26.86	$35.82
	0.650	$2.84	$8.51	$17.01	$25.52	$34.03
	0.683	$2.70	$8.10	$16.20	$24.31	$32.41
	0.715	$2.58	$7.73	$15.47	$23.20	$30.93
Minimum electricity cost per acre-foot = $2.58. Maximum electricity cost per acre-foot = $37.81.						

17.2.2 IMPACT INDICATORS AND SIGNIFICANCE CRITERIA

Impact indicators and significance criteria in this analysis first consider the socioeconomic changes that may result from the project. If any significant socioeconomic changes are identified, then the resulting physical changes will be considered. This approach to the analysis follows CEQA Guidelines Section 15131, which states:

> *(b) Economic and social effects of a project shall not be treated as significant effects on the environment. An EIR may trace a chain of cause and effect fro a proposed decision on a project through anticipated economic or social changes resulting from the project to physical changes caused in turn by the economic or social changes. The intermediate economic or social changes need not be analyzed in any detail greater than necessary to trace the chain of cause and effect. The focus of the analysis shall be on the physical changes.*

The largest potential impact to regional socioeconomic conditions from the implementation of the Proposed Project/Action or an alternative could be the retirement of farmland as a consequence of a reduction in the existing highly reliable supply of water for irrigation. As stated in Chapter 16, alternatives analyzed in this EIR/EIS assume that estimated shortages in surface water deliveries for irrigation will be met by substituting groundwater, at sustainable volumes, to meet total local agricultural demand. Therefore whether existing farm land is retired as a consequence of implementing the Proposed Project/Action depends upon individual decisions by growers in Yuba County as to whether they will continue to farm.

Whether a grower will choose to continue to farm, using groundwater as a substitute for shortages in surface water supplies depends in large part on the following.

- ❑ The availability of groundwater;
- ❑ The sustainability of groundwater extraction;
- ❑ The pumping capacity of the growers;

[1] As discussed later in this chapter, a reasonable assumption is that these groundwater pumping costs average $20 per acre-foot.

- Whether pumping groundwater is economically feasible; and
- The growers' expectation that irrigation water will continue to be highly reliable throughout the eight-year term of the Proposed Project/Action.

The availability of groundwater is discussed in Chapter 6. Both the sustainable extraction volumes of groundwater and the existing pumping capacity of growers were taken into account during the development of the Conjunctive Use Agreements for the Proposed Project/Action and the modeling (see Chapter 6 and Appendix D). The economic feasibility of substituting pumped groundwater for surface water shortages is discussed in this chapter.

The impact indicators and significance criteria for the socioeconomic evaluation are presented in **Table 17-6.**

Table 17-6 Impact Indicators and Significance Criteria for Socioeconomics

Impact Indicator	Significance Criteria
Cost of pumping groundwater in the agricultural sector Net cost or benefit of pumping groundwater in the regional area	An increase in the average annual cost of pumping groundwater that would result in a decrease to the net returns for a single crop during that year, relative to the basis of comparison. If the cost of pumping groundwater in the regional area is greater than the price received for pumping then individual growers are facing new cost structures in their decisions to continue to farm.
Cost of pumping groundwater in the M&I sector	An increase in the average annual cost of pumping groundwater for M&I uses over the 8-year duration of the project, relative to the basis of comparison.

For M&I pumping, Yuba County is anticipated to experience significant urban development over the next 10 to 15 years. The majority of new development will occur in the South Yuba Subbasin in the Linda, Olivehurst, and Plumas Lakes regions. Based on the projected land use conversion from existing irrigated land to urban, total increase in demand within these areas is estimated to be 30 TAF (SWRCB 2000). In the absence of new surface water supplies, this demand would be met by groundwater pumping. As described in Chapter 6, there is 40 TAF less groundwater pumping in the WWD under all scenarios analyzed. This is anticipated to offset the 30 TAF increase in M&I demand, so the net effect in groundwater levels and storage would be minimal. With minimal changes to pumping levels (and therefore minimal impacts to pumping costs), the additional costs of pumping for M&I are expected to be negligible for all scenarios.

Because impacts to M&I pumping costs are anticipated to be negligible, the primary socioeconomic impact indicator used in this chapter to estimate the potential regional socioeconomic impact is the cost to growers, within the participating member units, of pumping the volume of groundwater estimated by the model, relative to the CEQA Existing Condition and/or the CEQA No Project Alternative. If the per acre-foot payment for pumping groundwater is greater than or equal to the estimated cost of pumping groundwater, then it is assumed that land will not be retired by individual growers as a consequence of actions proposed under this EIR/EIS. The analysis of impacts and significance presented below calculates the compensation for pumping groundwater, estimated under each proposed alternative, and compares the compensation to an estimate for the cost of pumping groundwater.

Table 17-7 presents various categories of groundwater pumping considered under the actions proposed in this EIR/EIS. Reasons for groundwater pumping under the categories listed in Table 17-7 are to: (1) make up for surface water shortages (deficiency pumping), (2) meet instream flow requirements in Schedule 6 years (which occur only under the Proposed Project/Action), (3) meet YCWA's contribution to the SVWMP Settlement Agreement, and (4) for groundwater substitution transfers. Under the Proposed Project/Action, YCWA's Member Units would receive payment under every category of groundwater pumping. The Member Units would not be paid to pump groundwater to make up for surface water shortages under the CEQA basis of comparison (Existing Condition and Cumulative Without Project Condition), the NEPA No Action Alternative, or the Modified Flow Alternative.

Table 17-7. Assumed Payments per Acre-foot, by Groundwater Pumping Category

Category of Pumping	Category Description	Occurrence in Baseline and Alternatives	Estimated per Acre-foot Payment	
			CEQA and NEPA Baselines, Modified Flow Alternative	Yuba Accord Alternative
Surface Water Shortages (Deficiencies)	Groundwater that is pumped for irrigation purposes when surface water supplies are insufficient to meet demand	Occurs in CEQA and NEPA baselines (CEQA Existing Condition, and NEPA No Action Alternative) and every alternative examined	$0	Cost of pumping groundwater [a]
Schedule 6	Pumping up to 30 TAF to meet instream flow requirements	Yuba Accord Alternative	Not applicable	$50 per acre-foot upfront for the commitment to pump and $50 per acre-foot when pumped [b]
Payments for SVWMP Pumping	Pumping to meet YCWA's support of the settlement of the SVWMP SWRCB's Bay-Delta Hearings	Occurs in all NEPA alternatives Does not occur under CEQA Existing Condition, or CEQA alternatives, except for the Cumulative Condition with Proposed Project	At minimum, the energy cost of pumping groundwater [c]	
Groundwater Substitution Transfers	As possible and sustainable in addition to the Yuba Accord Alternative and SVWMP	Occurs in CEQA Existing Condition, and all other NEPA and CEQA alternatives	For the purposes of estimating potential impacts under this EIR/EIS, the price of water is assumed the same as under the SVWMP ($50, $75, $100 or $125 per acre-foot for YRI water year types; above normal, below normal, dry and critical). YCWA would pass through to the participating Member Units the purchase price less $10 per acre-foot to administer the transfer [d]	

[a] Stated in the Conjunctive Use Agreement as *"$20 per acre-foot (i.e., an amount to reimburse for groundwater pumping energy costs…"* (Paragraph 9, Page 5).
[b] See Paragraph 6 of the Conjunctive Use Agreement.
[c] Under the SVWMP Agreement, YCWA will receive $50, $75, $100 or $125per acre-foot, depending upon the YRI water year type. The difference between the energy costs of pumping and the payment to YCWA will be deposited into an account that YCWA uses to fund the ongoing cost of its Groundwater Management Program (GPM). If there were any unused revenues in this account, they would be split between the Member Units and YCWA. See Paragraph 8 of the Conjunctive Use Agreement.
[d] See Paragraph 12 of the Conjunctive Use Agreement.

Table 17-8 shows the estimated payments to growers net of estimated costs for every category listed in Table 17-7. The costs are both administrative costs paid to YCWA and the variable costs of pumping. For the calculations shown in Table 17-8, the variable cost of pumping groundwater is assumed to be $20 per acre-foot. Under the Proposed Project/Action, the growers recover, at a minimum, the cost of pumping groundwater under each category.

Table 17-8 Per Acre-foot Payment to Individual Growers for Pumping Groundwater, Net of Costs, by Category

			Groundwater Substitution Transfers					SVWMP				
	Deficiency	Schedule 6	Wet [a]	Above Normal	Below Normal	Dry	Critical	Wet [a]	Above Normal [b]	Below Normal	Dry	Critical
Yuba Accord Alternative												
Payment to Growers	$20	$100	N/A	$50	$75	$100	$125	N/A	N/A	$75	$100	$125
Costs												
YCWA Admin/ GMP	$0	$0	N/A	$10	$10	$10	$10	N/A	N/A	$55	$80	$105
Pumping	$20	$20	N/A	$20	$20	$20	$20	N/A	N/A	$20	$20	$20
Payment Net of Costs	$0	$80	N/A	$20	$45	$70	$95	N/A	N/A	$0	$0	$0
CEQA Existing Condition, NEPA No Action Alternative, Modified Flow Alternative												
Payment to Growers	$0	N/A	N/A	$50	$75	$100	$125	N/A	N/A	$75	$100	$125
Costs												
YCWA Admin/GMP	$0	N/A	N/A	$10	$10	$10	$10	N/A	N/A	$55	$80	$105
Pumping	$20	N/A	N/A	$20	$20	$20	$20	N/A	N/A	$20	$20	$20
Payment Net of Costs	$-20	N/A	N/A	$20	$45	$70	$95	N/A	N/A	$0	$0	$0

[a] SRI wet year type groundwater substitutions are not assumed. Under the SVWMP, wet year transfers are not required.

[b] In above normal year types, water is transferred under the SVWMP at the discretion of YCWA. For modeling purposes, it was assumed no transfers would occur under the SVWMP in above normal year types.

[c] Under the SVWMP, YCWA will pay individual growers variable pumping costs. The remainder of the funds will be deposited into a fund to pay the costs of implementing the Yuba County GMP. Any remaining funds will be distributed back to the growers.

For deficiency pumping the growers are reimbursed at variable cost. The growers would receive payments of $100 per acre-foot for pumping groundwater in Schedule 6 years.

The payments to growers for groundwater substitution based transfers would vary by year-type. For this example, the per acre-foot water price is assumed to be the same as the SVWMP Settlement Agreement Block 1 water. Because growers would be compensated under every category of groundwater pumping under the Proposed Project/Action, it is assumed that growers would find pumping groundwater economically feasible and therefore would not choose to retire land as a consequence of implementing the Proposed Project/Action.

Under all other baselines and alternatives, the growers would not recover the costs of pumping groundwater to make up for deficiencies in surface water supplies. However, growers would receive payments for groundwater substitution transfers. Therefore, the economic feasibility of other alternatives considered in this EIR/EIS depends on the comparison of the volume of deficiency pumping that the growers would pay for, to the volume of groundwater substitution transfer income that they would receive. The groundwater substitution income could be used to offset costs incurred for deficiency pumping. If the groundwater substitution income is greater than the cost of pumping for deficiencies, then the action would not have an impact on the financial viability of individual growers to continue to farm.

The following sections contain descriptions of the difference in net payments available to the grower between the CEQA/Existing Condition and alternatives. The net payments to the grower used are the same shown in Table 17-8. The descriptions detail: (1) the deficiency payments; (2) the revenue from groundwater substitutions; and (3) the cumulative total. With the exception of the comparisons of the CEQA No Project Alternative to the CEQA Existing Condition, each of the comparisons of modeled cumulative income indicates that there would be an increase in revenue to growers who participated in groundwater pumping. The range of income would be between $180,000 to $690,000 per year, depending on water year type. Therefore, no negative socioeconomic impacts would occur under the Proposed Project/Action and alternatives evaluated in this EIR/EIS.

As discussed in Chapter 4, CEQA and NEPA have different legal and regulatory standards that require slightly different assumptions in the modeling runs used to compare the Proposed Project/Action and alternatives to the appropriate CEQA and NEPA bases of comparison in the impact assessments. Although only one project (the Yuba Accord Alternative) and one action alternative (the Modified Flow Alternative) are evaluated in this EIR/EIS, it is necessary to use separate NEPA and CEQA modeling scenarios for the Proposed Project/Action, alternatives and bases of comparisons to make the appropriate comparisons. As a result, the scenarios compared in the impact assessments below have either a “CEQA” or a “NEPA” prefix before the name of the alternative being evaluated. A detailed discussion of the different assumptions used for the CEQA and NEPA scenarios is included in Appendix D, Modeling Technical Memorandum.

As also discussed in Chapter 4, while the CEQA and NEPA analyses in this EIR/EIS refer to “potentially significant,” “less than significant,” “no” and “beneficial” impacts, the first two comparisons (CEQA Yuba Accord Alternative compared to the CEQA No Project Alternative and CEQA Modified Flow Alternative compared to the CEQA No Project Alternative) presented below instead refer to whether or not the proposed change would “unreasonably affect” the evaluated parameter. This is because these first two comparisons are made to determine whether the action alternative would satisfy the requirement of Water Code section

1736 that the proposed change associated with the action alternative "would not unreasonably affect fish, wildlife, or other instream beneficial uses."

17.2.3 ENVIRONMENTAL IMPACTS/ENVIRONMENTAL CONSEQUENCES OF THE CEQA YUBA ACCORD ALTERNATIVE COMPARED TO THE CEQA NO PROJECT ALTERNATIVE

Impact 17.2.3-3: Decreases in cumulative net revenues that could result in adverse impacts to the annual incomes of local growers

Figure 17-2 shows the differences in revenue from groundwater substitutions, cost of deficiency pumping and the cumulative net revenues between the CEQA Yuba Accord Alternative and the CEQA No Project Alternative. For the 72 years modeled, the difference in total net revenues to growers would be $45 million. The annual average would be $625,000 per year. The number of growers participating in the program may vary year to year but, based on historical groundwater substitution based transfers, would likely be between 60 and 100, resulting in annual average increase in revenue to an individual grower of between $10,500 and $6,000. Because there would be an increase in revenue, there would not be any adverse socioeconomic impacts or any resulting physical impacts.

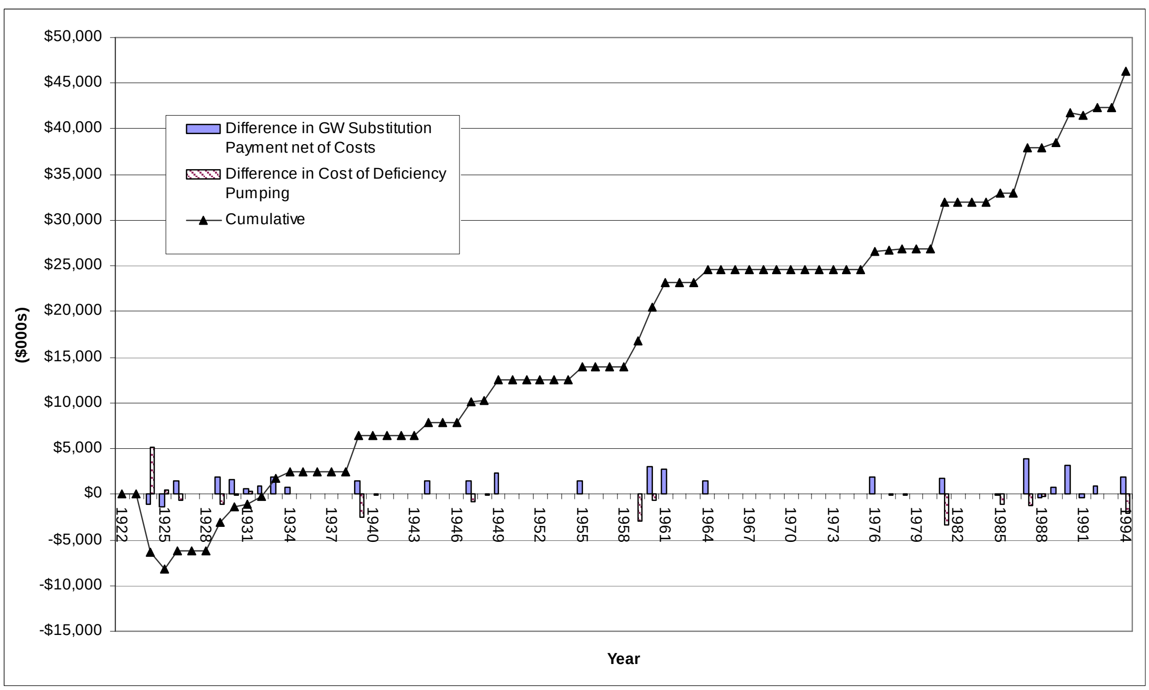

Figure 17-2. Difference in Net Payments Available Between the CEQA Yuba Accord Alternative and the CEQA No Project Alternative

17.2.4 ENVIRONMENTAL IMPACTS/ENVIRONMENTAL CONSEQUENCES OF THE CEQA MODIFIED FLOW ALTERNATIVE COMPARED TO THE CEQA NO PROJECT ALTERNATIVE

Impact 17.2.4-1: Decreases in cumulative net revenues that could result in adverse impacts to the annual income of local growers

Figure 17-3 shows the differences in revenue from groundwater substitutions, cost of deficiency pumping and the cumulative net revenues between the CEQA Modified Flow Alternative and the CEQA No Project Alternative. For the 72 years modeled, the difference in total net revenues to growers would be $30 million. The annual average would be $410,000 per year. The number of growers participating in the program may vary year to year but, based on historical groundwater substitution based transfers, would likely be between 60 and 100, resulting in annual average increase in revenue to an individual grower of between $6,800 and $4,100. Because there would be an increase in revenue, there would not be any adverse socioeconomic impacts or any resulting physical impacts.

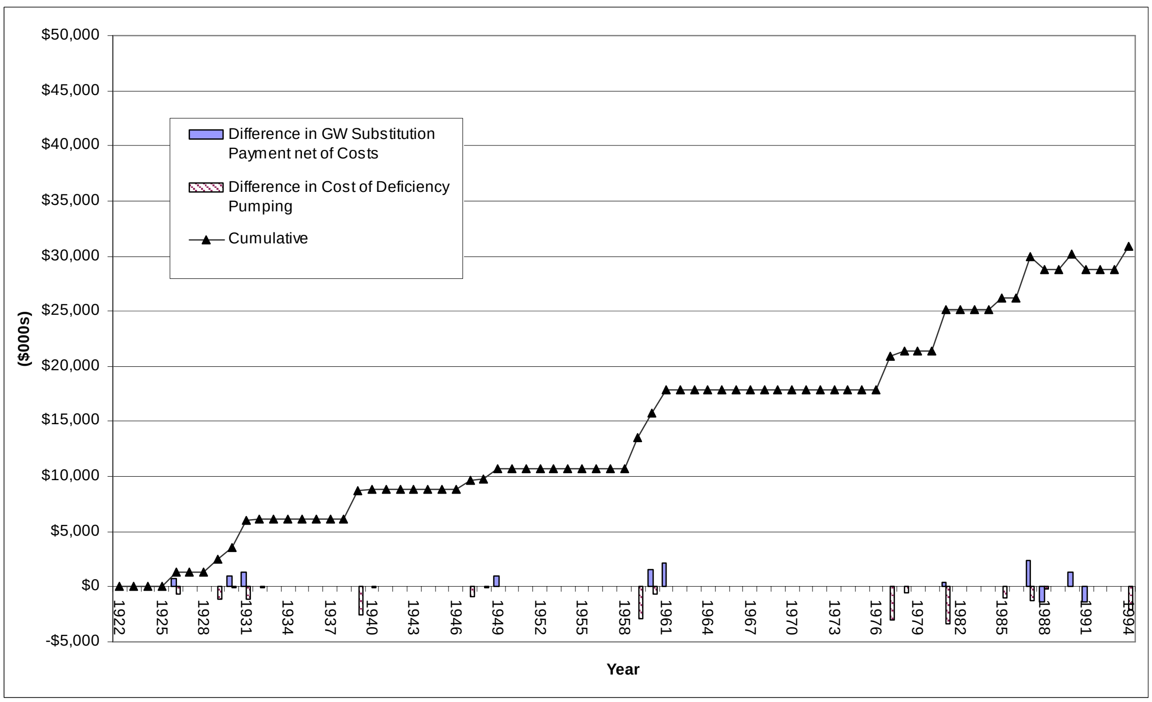

Figure 17-3. Difference in Net Payment Available Between the CEQA Modified Flow Alternative and the CEQA Existing Condition

17.2.5 ENVIRONMENTAL IMPACTS/ENVIRONMENTAL CONSEQUENCES OF THE CEQA YUBA ACCORD ALTERNATIVE COMPARED TO THE CEQA EXISTING CONDITION

Impact 17.2.5-1: Decreases in cumulative net revenues that could result in adverse impacts to the annual income of local growers

Figure 17-4 shows the differences in revenue from groundwater substitutions, cost of deficiency pumping and the cumulative net revenues between the CEQA Yuba Accord Alternative and the CEQA Existing Condition. For the 72 years modeled, instead of the eight-year agreement, the difference in total net revenues to growers would be just under $50 million. The annual average would be $690,000 per year. The number of growers participating in the program may vary year to year but, based on historical groundwater substitution based transfers, would likely be between 60 and 100, resulting in annual average increase in revenue to an individual grower of between $11,500 and $6,900. Because there would be an increase in revenue, there would not be any significant socioeconomic impacts or any resulting physical impacts.

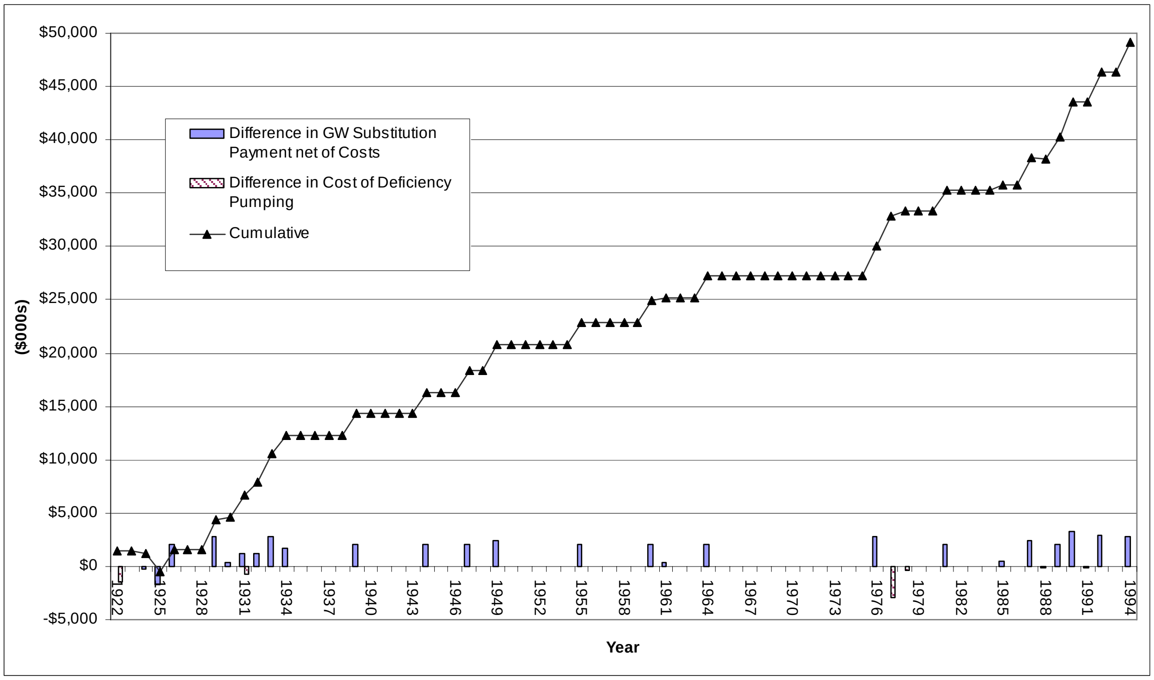

Figure 17-4. Difference in Net Payment Available Between the CEQA Yuba Accord Alternative and the CEQA Existing Condition

17.2.6 ENVIRONMENTAL IMPACTS/ENVIRONMENTAL CONSEQUENCES OF THE CEQA MODIFIED FLOW ALTERNATIVE COMPARED TO THE CEQA EXISTING CONDITION

Impact 17.2.6-1: Decreases in cumulative net revenues that could result in adverse impacts to the annual income of local growers

Figure 17-5 shows the differences in revenue from groundwater substitutions, cost of deficiency pumping and the cumulative net revenues between the CEQA Modified Flow Alternative and the CEQA Existing Condition. For the 72 years modeled, the difference in total net revenues to growers would be just under $15 million. The annual average would be $205,000 per year. The number of growers participating in the program may vary year to year but, based on historical groundwater substitution based transfers, would likely be between 60 and 100, resulting in annual average increase in revenue to an individual grower of between $3,400 and $2,050. Because there would be an increase in revenue, there would not be any significant socioeconomic impacts or any resulting physical impacts.

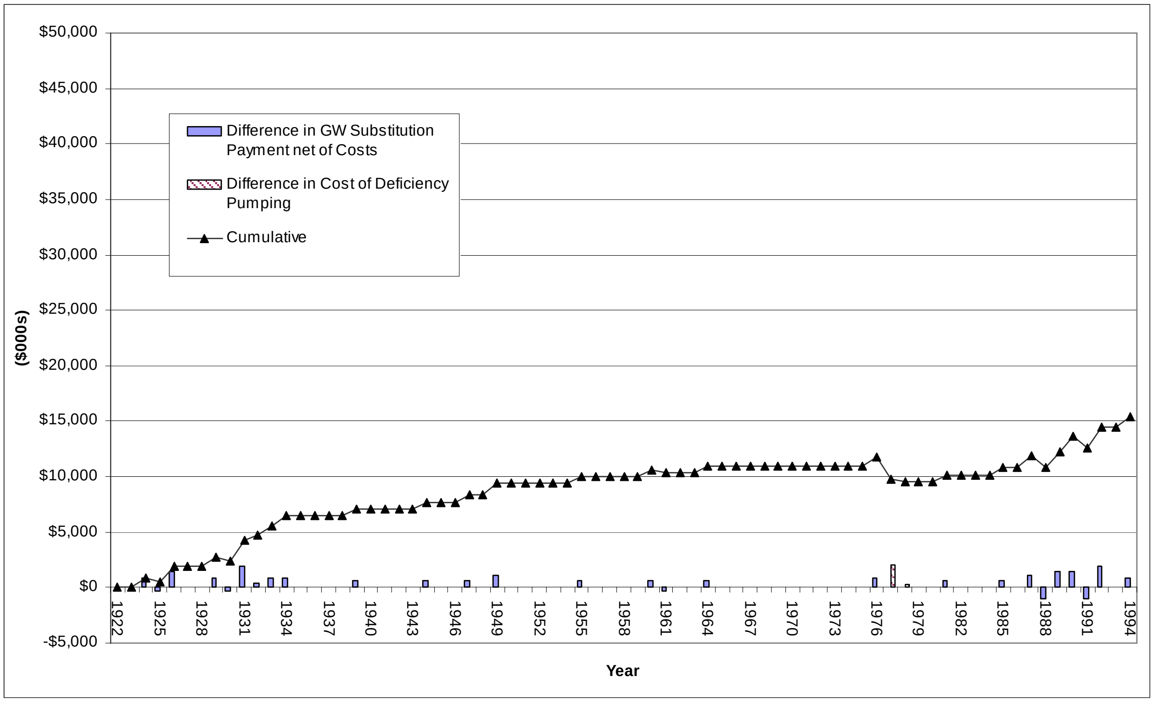

Figure 17-5. Difference in Net Payment Available Between the CEQA Modified Flow Alternative and the CEQA Existing Condition

17.2.7 ENVIRONMENTAL IMPACTS/ENVIRONMENTAL CONSEQUENCES OF THE CEQA NO PROJECT ALTERNATIVE/NEPA NO ACTION ALTERNATIVE COMPARED TO THE CEQA EXISTING CONDITION/NEPA AFFECTED ENVIRONMENT

As discussed in Chapter 3, the key elements and activities (e.g., implementation of the RD-1644 Long-term instream flow requirements) for the CEQA No Project Alternative would be the same for the NEPA No Action Alternative. The primary differences between the CEQA No Project and NEPA No Action alternatives are various hydrologic and other modeling assumptions (see Section 4.5 and Appendix D). Because of these differences between the No Project and No Action alternatives, these alternatives are distinguished as separate alternatives for CEQA and NEPA evaluation purposes.

Based on current plans and consistent with available infrastructure and community services, the CEQA No Project Alternative in this EIR/EIS is based on current environmental conditions (e.g., project operations, water demands, and level of land development) plus potential future operational and environmental conditions (e.g., implementation of the RD-1644 Long-term instream flow requirements in the lower Yuba River) that probably would occur in the foreseeable future in the absence of the Proposed Project/Action or another action alternative. The NEPA No Action Alternative also is based on conditions without the proposed project, but uses a longer-term future timeframe that is not restricted by existing infrastructure or physical and regulatory environmental conditions. The differences between these modeling characterizations and assumptions for the CEQA No Project and the NEPA No Action alternatives, including the rationale for developing these two different scenarios for this EIR/EIS, are explained in Chapter 4[2].

Although implementation of the RD-1644 Long-term instream flow requirements would occur under both the CEQA No Project and the NEPA No Action alternatives, the resultant model outputs for both scenarios are different because of variations in the way near-term and long-term future operations are characterized for other parameters in the CEQA and NEPA assumptions. As discussed in Chapter 4, the principal difference between the CEQA No Project Alternative and the NEPA No Action Alternative is that the NEPA No Action Alternative includes several potential future water projects in the Sacramento and San Joaquin valleys (e.g., CVP/SWP Intertie, FRWP, SDIP and a long-term EWA Program or a program equivalent to the EWA), while the CEQA No Project Alternative does not. Because many of the other assumed conditions for these two scenarios are similar, the longer-term analysis of the NEPA No Action Alternative compared to the NEPA Affected Environment builds upon the nearer-term analysis of the CEQA No Project Alternative compared to the CEQA Existing Condition.

Because the same foundational modeling base (OCAP Study 3) was used to characterize near-term conditions (2001 level of development) both the CEQA No Project Alternative and the CEQA Existing Condition, it was possible to conduct a detailed analysis to quantitatively evaluate the hydrologic changes in the Yuba Region and the CVP/SWP system that would be expected to occur under these conditions. Building on this CEQA analysis, the analysis of the NEPA No Action Alternative compared to the NEPA Affected Environment consists of two components: (1) an analysis of near-term future without project conditions quantified through the CEQA No Project Alternative, relative to the CEQA Existing Condition, and (2) a qualitative analysis of longer-term future without project conditions (the NEPA No Action Alternative)[3].

17.2.7.1 CEQA No Project Alternative Compared to the CEQA Existing Condition

Impact 17.2.7.1-1: Decreases in cumulative net revenues that could result in adverse impacts to the annual income of local growers

Figure 17-6 shows the differences in revenue from groundwater substitutions, cost of deficiency pumping and the cumulative net revenues between the CEQA No Project Alternative and the CEQA Existing Condition. For the 72 years modeled, the difference in total net revenues to growers would be relatively small, and the results are dependent on the pattern of water year types. For example, Figure 17-6 shows periods of time when growers would suffer cumulative losses, specifically beginning in 1977 and turning around beginning in 1989. During such periods, there could be resulting significant physical impacts, potentially including those that could result from the fallowing of farmlands or the abandonment of some agricultural

[2] For modeling purposes related to CEQA analytical requirements, OCAP Study 3 (2001 level of development) is used as the foundational study upon which the modeling scenarios for the CEQA No Project Alternative and the CEQA Existing Condition were developed. For modeling purposes related to NEPA analytical requirements, OCAP Study 5 (2020 level of development) is used as the foundational study upon which the modeling scenarios for the NEPA No Action Alternative was developed.

[3] The second analytical component cannot be evaluated quantitatively due to the differences in the underlying baseline assumptions for OCAP Study 3 and OCAP Study 5.

production. Therefore, the CEQA No Project Alternative, relative to the CEQA Existing Condition, would be anticipated to result in potentially significant socioeconomic impacts.

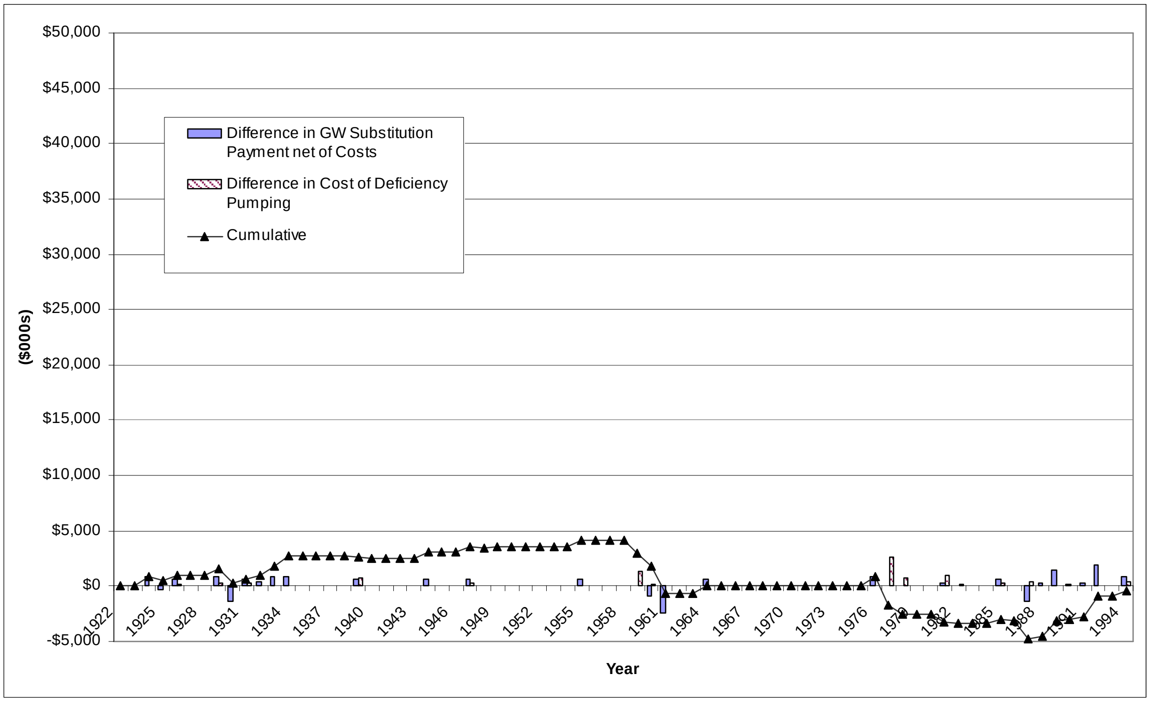

Figure 17-6. Difference in Net Payment Available Between the CEQA No Project Alternative and the CEQA Existing Condition

17.2.7.2 NEPA No Action Alternative Compared to the NEPA Affected Environment

In the Yuba Region, differences between the NEPA No Action Alternative and the NEPA Affected Environment include implementation of the Wheatland Project that will increase surface water diversions at Daguerre Point Dam because of decreases in groundwater pumping volumes and groundwater substitution pumping associated with the SVWMP.

In the Yuba Region, the difference between the CEQA No Project and the Existing Condition includes implementation the Wheatland Project. Therefore, in the Yuba Region, assumptions regarding the volume of groundwater substitution pumping that may occur in the future are the only difference between the NEPA No Action and the CEQA No Project alternatives. Although groundwater substitution transfers may take place under different programs (single-year transfers versus SVWMP), the total volume of groundwater substitution is similar. Quantitative analysis for the CEQA No Project Alternative compared to the CEQA Existing Condition is presented in Section 17.2.7.1 above. Trends in evaluation parameters previously presented for the CEQA No Project Alternative relative to the CEQA Existing Condition (Appendix F4, 2 vs. 1) are similar to the comparison of the NEPA No Action Alternative relative to the NEPA Affected Environment. Therefore, the NEPA No Action Alternative, relative to the NEPA Affected Environment, would be anticipated to result in potentially significant socioeconomic impacts.

17.2.8 ENVIRONMENTAL IMPACTS/ENVIRONMENTAL CONSEQUENCES OF THE NEPA YUBA ACCORD ALTERNATIVE COMPARED TO THE NEPA NO ACTION ALTERNATIVE

Impact 17.2.8-1: Decreases in cumulative net revenues that could result in adverse impacts to the annual income of local growers

Figure 17-7 shows the differences in revenue from groundwater substitutions, cost of deficiency pumping and the cumulative net revenues between the NEPA Yuba Accord Alternative and the NEPA No Action Alternative. For the 72 years modeled, the difference in total net revenues to growers would be just under $50 million. The annual average would be $685,000 per year. The number of growers participating in the program may vary year to year but, based on historical groundwater substitution based transfers, would likely be between 60 and 100, resulting in annual average increase in revenue to an individual grower of between $11,400 and $6,850. Because there would be an increase in revenue, there would not be any significant socioeconomic impacts or any resulting physical impacts.

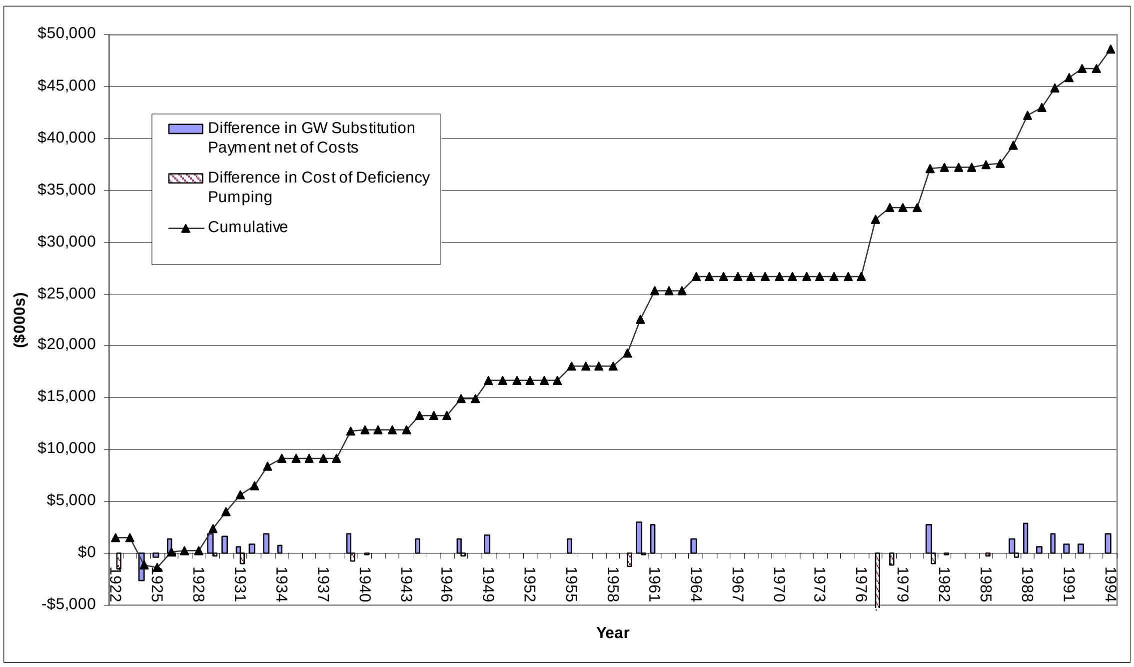

Figure 17-7. Difference in Net Payment Available Between the NEPA Yuba Accord Alternative and the NEPA No Action Alternative

17.2.9 ENVIRONMENTAL IMPACTS/ENVIRONMENTAL CONSEQUENCES OF THE NEPA MODIFIED FLOW ALTERNATIVE COMPARED TO THE NEPA NO ACTION ALTERNATIVE

Impact 17.2.9-1: Decreases in cumulative net revenues that could result in adverse impacts to the annual income of local growers

Figure 17-8 shows the differences in revenue from groundwater substitutions, cost of deficiency pumping and the cumulative net revenues between the NEPA Modified Flow Alternative and the NEPA No Action Alternative. For the 72 years modeled, the difference in total net revenues to growers would be just under $15 million. The annual average would be approximately

$205,000 per year. The number of growers participating in the program may vary year to year but, based on historical groundwater substitution based transfers, would likely be between 60 and 100, resulting in annual average increase in revenue to an individual grower of between $3,400 and $2,050. Because there would be an increase in revenue, there would not be any significant socioeconomic impacts or any resulting physical impacts.

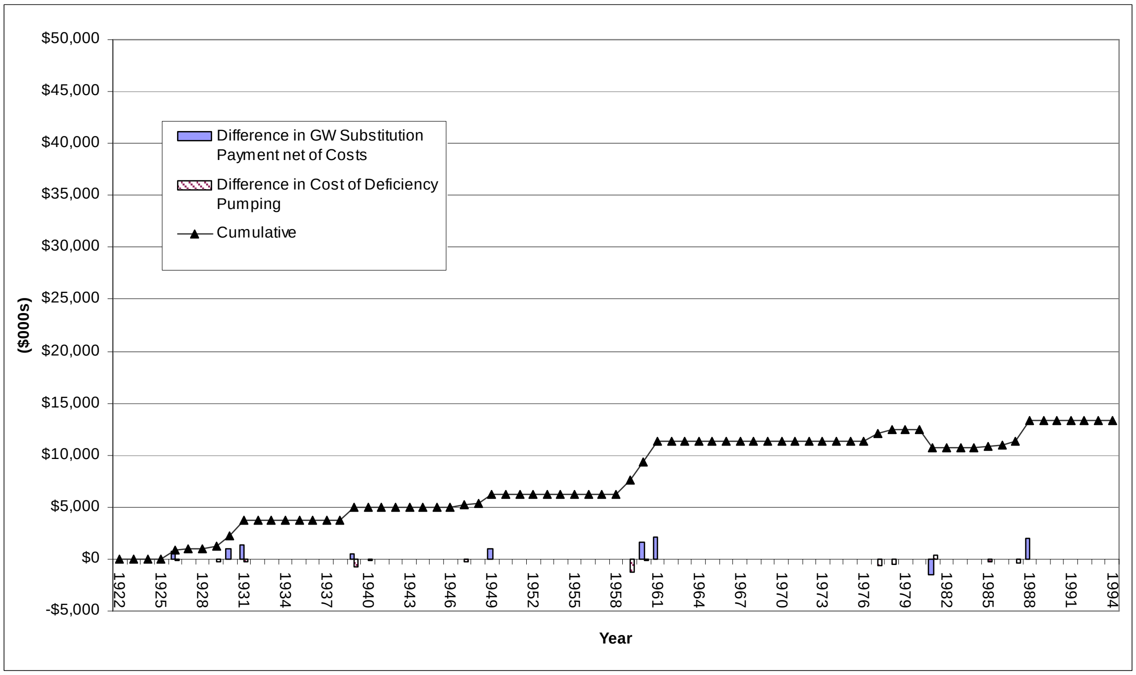

Figure 17-8. Difference in Net Payment Available Between the NEPA Modified Flow Alternative and the NEPA No Action Alternative

With the exception of the comparisons of the CEQA No Project Alternative, relative to the CEQA Existing Condition, and the NEPA No Action Alternative, relative to the NEPA Affected Environment, each of the above comparisons of simulated cumulative income indicates that there would be an increase in revenue to growers who participate in groundwater pumping. The range of income, over the 72-year simulation period would range from about $13 million to just under $50 million, or from $180,000 to $690,000, depending on water year type. Therefore, no potentially significant socioeconomic impacts and no associated physical impacts would be anticipated to occur under the Proposed Project/Action and alternatives evaluated in this EIR/EIS, relative to the bases of comparison.

17.3 CUMULATIVE IMPACTS

Hydrologic modeling was used to evaluate the cumulative effects of the Yuba Accord Alternative and other likely changes in CVP/SWP operations on hydrology and other resources. The proposed projects that have been adequately defined (e.g., in recent project-level environmental documents or CALSIM II modeling) and that have the potential to contribute to cumulative impacts are included in the quantitative assessment of the Yuba Accord's impacts. For analytical purposes of this EIR/EIS, the projects that are considered well defined and "reasonably foreseeable" are described in Chapter 21. Additionally, the assumptions used to characterize future hydrologic cumulative conditions that are quantitatively simulated using CALSIM II are presented in Appendix D. To the extent feasible, potential cumulative impacts on resources (e.g., aquatic resources, water quality) dependent on hydrology or water supply are analyzed quantitatively. Because several projects cannot be accurately characterized for hydrologic modeling purposes at this time, either due to the nature of a particular project or because specific operational details are only in the preliminary phases of development, these projects are evaluated qualitatively.

Only those projects that could affect socioeconomics are included in the qualitative evaluation that is presented in subsequent sections of this chapter. Although most of the proposed projects described in Chapter 21 could have project-specific impacts that will be addressed in future project-specific environmental documentation, the future implementation of these projects is not expected to result in cumulative impacts to regional water supply operations, or water-related and water dependent resources that also could be affected by the Proposed Project/Action or an action alternative (see Chapter 21). For this reason, only one project has the potential to cumulatively impact socioeconomics in the project study area. That project is the relicensing of the Yuba Project, which will occur in 2016.

For CEQA, the purpose of the cumulative analysis is to determine whether the incremental effects of the Proposed Project (Yuba Accord Alternative) would be expected to be "cumulatively considerable" when viewed in connection with the effects of past projects, other current projects, and probable future projects (Public Resources Code Section 21083, subdivision (b)(2)).[4]

For NEPA, the scope of an EIS must include "*cumulative actions, which when viewed with other proposed actions have cumulatively significant impacts and should therefore be discussed in the same impact statement*" (40 CFR §1508.25(a)(2)).

Because the CEQ regulations for implementing NEPA and the CEQA guidelines contain very similar requirements for analyzing, and definitions of, cumulative impacts, the discussions of cumulative impacts of the Yuba Accord Alternative Cumulative Condition relative to the Existing Condition will be the basis for evaluation of cumulative impacts for both CEQA and NEPA. In addition, an analysis of the Modified Flow Alternative Cumulative Condition relative to the Existing Condition is provided to fulfill NEPA requirements.

17.3.1 ENVIRONMENTAL IMPACTS/ENVIRONMENTAL CONSEQUENCES OF THE YUBA ACCORD ALTERNATIVE CUMULATIVE CONDITION COMPARED TO THE EXISTING CONDITION

Because the Yuba Accord Alternative will not have any socioeconomic impacts, relative to the Existing Condition, the Yuba Accord Alternative will not have any cumulative socioeconomics impacts or any associated cumulative physical impacts.

[4] The "Guide to the California Environmental Quality Act" (Remy *et al.* 1999) states that "*…although a project may cause an "individually limited" or "individually minor" incremental impact that, by itself, is not significant, the increment may be "cumulatively considerable", and thus significant, when viewed against the backdrop of past, present, and probable future projects.*" (CEQA Guidelines, § 15064, subd. (i)(l), 15065, subd. (c), 15355, subd. (b)).

17.3.2 Environmental Impacts/Environmental Consequences of the Modified Flow Alternative Cumulative Condition Compared to the Existing Condition

It is anticipated that the Modified Flow Alternative Cumulative Condition will have the same potential for cumulative impacts as the Yuba Accord Alternative Cumulative Condition. Therefore, the description of the potential impacts in Section 17.2.1 also serves as the description of cumulative impacts associated with the Modified Flow Alternative. Thus, the Modified Flow Alternative Cumulative Condition would have no potentially significant impacts compared to the Existing Condition.

17.4 Potential Conditions to Support Approval of YCWA's Water Rights Petition

No unreasonable adverse socioeconomic effects would occur under the Proposed Project/Action or an action alternative and, thus, no impact avoidance measures or other protective conditions are identified for the SWRCB's consideration in determining whether or not to approve YCWA's petitions to implement the Yuba Accord.

17.5 Mitigation Measures/Environmental Commitments

No adverse socioeconomic impacts would occur under the Proposed Project/Action or an action alternative, relative to the bases of comparison, and, thus, no mitigation measures are required.

17.6 Potentially Significant Unavoidable Impacts

There are no potentially significant unavoidable impacts to socioeconomics associated with the implementation of the Proposed Project/Action or an action alternative, relative to the bases of comparison.

CHAPTER 18
GROWTH INDUCEMENT

CEQA Guidelines (Title 14 CCR 15126.2[d]) and federal NEPA regulations (40 CFR § 1508.8[b]), require that an EIR/EIS discuss how a project, if implemented, could induce growth. This chapter discusses the potential growth-inducing impacts of the Proposed Yuba Accord.

As described in Chapter 1, the purpose of the Proposed Yuba Accord is to resolve instream flow issues associated with operation of the Yuba Project in a way that protects and enhances lower Yuba River fisheries and local water-supply reliability. Additionally, YCWA has a goal to provide revenues for local flood control and water supply projects, while Reclamation and DWR seek to obtain water to use for fisheries protection and for improvements in statewide water supply management, including supplemental water for the CVP and the SWP. Along with in-river actions to help meet YCWA's goals in the Yuba Region, the Yuba Accord Alternative also is expected to improve water supply reliability for the Yuba County farming economy through a conjunctive use program. To help meet Reclamation and DWR's goals for the CVP/SWP, the Yuba Accord Alternative is expected to improve water supply reliability for Reclamation and DWR with a firm commitment of 60 TAF per year for fisheries and other protective actions in the Delta (through the EWA Program or a program equivalent to the EWA), and up to an additional 140 TAF per year of water in drier years for the CVP and SWP, which also could be used for water quality or fish and wildlife purposes. Depending on whether there are willing purchasers and sufficient available capacity at the Delta pumping facilities, water provided for meeting these objectives also could be sold to downstream water users, and ultimately go to consumptive uses in CVP and SWP export service areas.

This chapter defines growth-inducing impacts and evaluates the potential for the Proposed Project/Action and alternatives to directly or indirectly induce growth. The organizational format of this chapter varies slightly from that of other resources presented in this EIR/EIS because there are no specific thresholds from which to measure potential impacts. Rather, the question is how growth could lead to physical environmental impacts in the various resource categories (e.g., reduced air quality, changes in land use, or the demand for public services). Growth in itself does not have physical environmental impacts and is thus not treated as an environmental resource.

18.1 ENVIRONMENTAL SETTING/AFFECTED ENVIRONMENT

18.1.1 YUBA REGION

Yuba County's population has grown at a slow to moderate rate over the last few decades (County of Yuba 2006). Since 2000, the Yuba County population has grown at a steady rate, with a 10.8 percent change from 2000 to 2005. In addition, lower land costs compared to other areas (e.g., Sacramento), particularly related to housing, are expected to keep growth steady and positive (County of Yuba 2006). Overall, the population in Yuba County is forecasted to increase from about 60,000 in 2000 to about 110,000 people by 2025 (County of Yuba 2006). The City of Marysville is the most populous city in the county, and its population has increased 2.9 percent from 2000 to 2005. During that same period, the City of Wheatland population has experienced an increase of 50.8 percent (County of Yuba 2006). The Wheatland area is projected to be the fastest growing city in Yuba County (County of Yuba 2006), and General Plan projections estimate Wheatland's population will increase from 3,000 in 2004 to approximately 30,100 in 2025 (City of Wheatland 2005).

To accommodate this level of previously approved growth, several city and county General Plans have been updated in recent years and have authorized conversion of M&I water supplies from groundwater to surface water sources. Additionally, several community-based planning documents have identified goals of providing a high level of public services and reducing the dependence on groundwater supplies in the Sierra foothills (County of Yuba 1992; PMC 2005). As an example of local efforts to ensure that an adequate supply of water is available to serve existing and future needs, Yuba City is evaluating options related to converting from a groundwater supply to a surface water supply, or treating groundwater to meet all primary and secondary standards (City of Yuba City 2004). Consistent with the goals to ensure a safe and adequate water supply for existing and future development identified in the City of Wheatland General Plan, YCWA has received approval and funding for a Yuba/Wheatland In-Lieu Groundwater Recharge and Storage Project (Wheatland Project), anticipated to begin construction in 2007. Although unrelated to the Proposed Yuba Accord, the purpose of the Wheatland Project is to extend the YCWA surface water delivery capabilities to the Wheatland area through additional conveyance facilities (see Chapter 5 for additional details).

18.1.2 CVP/SWP Upstream of the Delta Region

In California, the majority of projected growth is anticipated to occur in the south coast region and in the Central Valley, part of which is in the CVP/SWP Upstream of the Delta Region (WEF Website 2006). Within this region, the primary areas of consideration for the Proposed Yuba Accord include the Central Valley portions of Shasta, Glenn, Colusa, Yolo, Solano, Butte, Sutter, Yuba, Nevada, Placer, and Sacramento counties, as well as CVP and SWP service areas located upstream of the Delta. Over the 25-year period from 1995 to 2020, projected growth rates for the counties within this region range from 40 to over 100 percent (DWR 2005). From 1990 through 1999, the population in the Central Valley increased faster than in any other California region, and it is predicted to grow by another 24 percent between 2000 and 2010 (Great Valley Center 2005). Land uses in the CVP/SWP Upstream of the Delta Region vary. Developed areas range in character from the City of Sacramento, which is heavily populated, to smaller communities such as Willows and Colusa. Most of the region, however, is rural in character and used primarily for agriculture.

Although growth is projected to occur in the CVP/SWP Upstream of the Delta Region, it is likely to occur regardless of whether or not the Proposed Project/Action or an alternative is implemented. Growth in this area has been planned for in city and county general plans, it is not dependent on implementation of any of the alternatives evaluated in this EIR/EIS, nor would the additional water supplied by any of the alternatives be used to support growth in this region.

18.1.3 Sacramento-San Joaquin Delta Region

The areas considered for this region are based on the legal definition of the Delta[1], and encompass portions of Alameda, Contra Costa, Sacramento, San Joaquin Solano and Yolo

[1] The Delta refers to all tidal waters contained within the legal definition of the San Francisco Bay-Sacramento-San Joaquin River Delta, as specified in Section 12220 of the California Water Code of 1969.

counties, as well as various state and federal jurisdictions (DWR 2005). According to the 2000 Census, it is estimated that approximately 462,000 people are residing in areas of these counties located in the legal Delta (DWR 2005). Although the majority of land in the Delta is used for agricultural purposes, other land uses include urban and commercial properties, open water and areas consisting of undeveloped natural vegetation. Water use in the Delta is primarily for agricultural purposes. Small communities in the Delta primarily use groundwater wells for their water needs, and urban water use in the Delta only accounts for a small percentage of the total developed supply[2] (DWR 2005).

Although growth is projected to occur in the Delta Region, it is likely to occur regardless of whether or not the Proposed Project/Action or an alternative is implemented. Water transfers potentially occurring under the Yuba Accord Alternative would be conveyed to CVP/SWP export service areas and, thus, would not be expected to directly or indirectly affect community services in the Delta Region. Although growth in this area has been planned for in city and county general plans, it is not dependent on implementation of any of the alternatives evaluated in this EIR/EIS, nor would the additional water supplied by any of the alternatives be used to support growth in this region.

18.1.4 EXPORT SERVICE AREA

The CVP supplies water to more than 250 long-term water contractors in the Central Valley, the Santa Clara Valley, and the San Francisco Bay area. Historically, approximately 90 percent of CVP water has been delivered to agricultural users. Total annual contracts exceed 9 MAF. The SWP provides water to 29 long-term contractors in northern California, the San Joaquin Valley, the San Francisco Bay area, the Central Coast, and Southern California. In these areas, the SWP provides water to an estimated population of more than 23 million people and approximately 755,000 acres of irrigated farmland (DWR Website 2006b). As described in Chapters 3 and 5, Reclamation could allocate Component 2, 3 and 4 water to CVP contractors in proportion to their CVP contract allocations, and DWR could allocate water to SWP contractors in proportion to their Table A amounts, under the Tier 3 Agreements. Full Table A amounts for the SWP total approximately 4,133 TAF. CVP and SWP service areas south of the Delta that could be affected by implementation of the Proposed Project/Action or an alternative are shown on Figure 2-5.

18.1.5 OTHER REGIONAL CONSIDERATIONS

Although CVP and SWP Export Service Areas south of the Delta generally are not included as one of the regions evaluated for other resource categories being addressed in this EIR/EIS, these areas are considered on a programmatic level in this chapter because of the potential growth-inducing concerns associated with the Proposed Project/Action and alternatives.

2 One important exception is the Contra Costa Water District, which provides treated Delta surface water to approximately 500,000 people, but not all of the serviced population is within the legal Delta (DWR 2005).

18.2 REGULATORY SETTING

18.2.1 NEPA AND CEQA REQUIREMENTS

CEQA Guidelines require an EIR to discuss how a proposed project may induce growth and the potential impacts of this induced growth upon project implementation. Specifically, CEQA requires an EIR to:

> *"Discuss the ways in which the proposed project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment. Included in this are projects which would remove obstacles to population growth (a major expansion of a waste water treatment plant might, for example, allow for more construction in service areas). Increases in the population may tax existing community service facilities, requiring construction of new facilities that could cause significant environmental effects. Also discuss the characteristic of some projects which may encourage and facilitate other activities that could significantly affect the environment, either individually or cumulatively"* (Title 14 CCR 15126.2[d]).

The guideline also states that, *"It must not be assumed that growth in any area is necessarily beneficial, detrimental, or of little significance to the environment."* In other words, growth inducement must be considered on an individual and neutral basis. Also, impacts on resources resulting from growth might be too far removed from the actions of the lead agency or ultimate retail water delivery agency to require mitigation.

Under NEPA, environmental compliance documents are required to analyze indirect growth-inducing impacts, defined in the following way:

> *"Indirect effects shall include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems"* (40 CFR § 1508.8[b]).

In general, an action would be considered growth inducing if it caused or contributed directly or indirectly to economic growth, population growth, or an increase in population density. Growth-inducing effects include indirect impacts such as changes in land use and related impacts on the environment beyond those that would have occurred from other factors. Thus, a growth-inducing action would promote or encourage growth beyond that which could be attributed to other factors known to have a relationship to economic or population growth. For operational impacts, this analysis looks at increases in water availability created by the Proposed Yuba Accord and whether they would have a determinative impact on decisions related to permitting of land use changes; that is, whether the supplemental water supply created by the Proposed Yuba Accord would remove an impediment to growth.

Except where supply limitations have been identified as the impediment to development approvals, water supply reliability alone is not the determinative factor inducing growth in any region of California. Water supply reliability for urban population growth and development is taken into account to varying degrees by local planning agencies, in general plans of land use jurisdictions and water supply master plans of water-serving organizations (water districts, irrigation districts, private utilities, cities, etc.) The sophistication and complexity of this process has increased in the past decade as better predictive models for assessing demands and supply, and data available to these models, have been developed. Public attention has also focused on the recognition that water supply is one of the key factors to consider when planning new developments. Community planners, developers, industries, and others seeking to implement or realize urban growth in California are required to demonstrate that a reliable water supply will exist under specified conditions.

18.2.2 RELATIONSHIP TO SENATE BILL 610 AND SENATE BILL 221

Land use planning agencies in California plan growth based on a number of different factors, many of which are unrelated to available water supplies, including economic factors and population dynamics. Under California law, water suppliers are required to serve the needs of users within their service areas (see, e.g., *Swanson v. Marin Municipal Water Dist.* (1976) 56 Cal.App.3d 512, 524 [water district has a "*continuing obligation to exert every reasonable effort to augment its available water supply in order to meet increasing demands*"]).

The coordination between water supply and land use planning was strengthened in 2001 by the passage of SB 610 (Costa) and SB 221 (Kuehl), which require cities and counties to obtain assessments of the availability of water to supply new developments over a certain size (more than 500 housing units, or their equivalent in demands for commercial and industrial projects), and to obtain assurance from water suppliers that sufficient water is available before approving such new developments. For small jurisdictions, projects representing a 10 percent increase in demand trigger the need for water supply assessments. SB 221 defines "sufficient water supply" as the "*total water supplies available during normal, single-dry, and multiple-dry years within a 20-year projection that would meet the projected demand*." The law does not speak, however, to levels of service, allowing local jurisdictions to define sufficiency in terms of how often and severe water shortages due to droughts and other events can be. Therefore, one jurisdiction might conclude from its own perspective that a sufficient supply exists, while another, under exactly the same hydrologic conditions, might conclude otherwise.

The ultimate decision on water supply sufficiency in the context of land development approval rests with the land use jurisdiction and not the water supply entity, unless they are the same entity. Therefore, unless a local agency has imposed growth restrictions due to a water supply constraint, or has specified a standard of reliability against which a new supply can be assessed, determining a specific growth-inducing impact due to the added supply is difficult without knowledge of the facts surrounding specific development situations. There are areas within the state, and some within the SWP service areas, where water supply is acting as a constraint in the development approval process. Where this occurs and where it could be determined that a new supply would relieve that constraint, growth inducement would occur.

The combined effect of SB 610 and SB 221 is to impose upon cities and counties the ultimate responsibility for determining the sufficiency and availability of water as part of their environmental review and approval processes. In addition, a recent court case (Save Our Peninsula Committee v. Monterey County Board of Supervisors [2001] 87 Cal.App.4th 99) discussed how water supply sufficiency and the impacts of a proposed project on limited local supply sources were the key factors in deciding the adequacy of an EIR. Water supply availability in this instance also was clearly a determining factor in whether development was allowable.

SB 610 and 221 require only that water supply agencies inform land use jurisdictions regarding the availability of water supplies, the types of infrastructure necessary to deliver the water, and the impacts of new development on supply reliability. SB 610 allows local land use agencies to approve a development despite a water agency's conclusion that the supplier's reliability levels would be compromised. Specifically, a water supplier could report to the local land use agency that water supplies are insufficient and development could still proceed, should the land use authority decide to procure alternate supplies or, in the case of SB 610, adopt a statement of overriding considerations with respect to significant water supply impacts. Further, while SB 610 and SB 221 do attempt to increase the consideration of water supply factors in development decision-making, many proposed projects are not large enough (i.e., 500 or more residences, non-residential uses that would supply more than 1,000 persons, or mixed-use projects that would have a water demand equivalent to the demand of 500 residential units) to trigger the requirement to prepare a water supply assessment pursuant to SB 610.

18.2.3 CALIFORNIA DEPARTMENT OF WATER RESOURCES WATER DELIVERY RELIABILITY REPORT

In 2002, DWR published the first in a biannual series of SWP delivery reliability reports to provide information on the ability of the SWP to deliver water under existing and future development conditions. DWR issued this report to assist SWP contractors to assess the adequacy of the SWP component of their overall water supplies. The report states, *"Information in this report may be used by local agencies in preparing or amending their water management plans and identifying the new facilities or programs that may be necessary to meet future water needs."* The report also states, *"Agencies will also find this report useful in conducting analyses mandated by legislation authored by Senator Sheila Kuehl (SB 221) and Senator Jim Costa (SB 610)."*

The heart of the report is an analysis that provides forecasts of the delivery capability of the SWP under a variety of hydrologic circumstances with both 2001 and 2021 demands. These forecasts were created using the CALSIM hydrologic model. This information was not used directly in the analysis for this EIR/EIS, but it was described here because it provides some context for the overall water supply capabilities of DWR.

18.2.4 CALFED PROGRAMMATIC RECORD OF DECISION

The Proposed Yuba Accord would provide water for the CALFED EWA Program (or functional equivalent) for use in the protection of Delta fisheries and to improve water supply reliability for Reclamation and DWR. The EWA Program is one of the key water conveyance projects identified in the CALFED ROD. Therefore, for background purposes, it is useful to understand what conclusions regarding the relationship between increased water supply and growth were presented in the CALFED ROD. Although the full CALFED ROD (CALFED 2000) text is incorporated by reference, a synopsis of the conclusions related to the relationship between increased water supply and growth is presented in the bulleted list below.

- *"The Preferred Program Alternative is expected to result in an improvement in water supply reliability for beneficial use in the Bay Region, Sacramento River Region, and San Joaquin River Region, and South-of-Delta SWP and CVP Service Areas…."*
- With respect to how an increase in water supply reliability could affect growth, the CALFED ROD concluded that, *". . . because this issue cannot be determined with certainty at this programmatic level of analysis, the assumption was made for this document that the improvement in water supply reliability that is associated with the Program could stimulate growth."*
- *"At this programmatic level, it is unknown what level of growth or the likely location of any increases in population or construction of additional housing would take place. Increases in the*

population in the solution area are projected over the next 30 years, regardless of CALFED actions. "

- *"When additional growth occurs, these changes will be subject to local land use and regulatory decisions by individual cities and counties in the areas where they occur. Future development at the local level is guided by many considerations, only one of which is the reliability of water supply. These other factors include the policies in local general plans and zoning ordinance restrictions; the availability of a wide range of community services and infrastructure, such as sewage treatment facilities and transportation infrastructure; the availability of developable land; the types and availability of employment opportunities; and the analysis and conclusions based on an environmental review of proposed projects pursuant to CEQA. When additional population growth or new development occurs, and additional information is available, local, regional, State, and Federal governments will need to consider and address these potential adverse environmental impacts and methods to avoid or mitigate them."*

Based on the CALFED ROD findings, there are other growth-inducing factors to be considered besides water supply reliability, and each municipality or county controls growth at the local level through land use policies in each jurisdiction. Additionally, it is important to note that the Lower Yuba River Accord EIR/EIS stands on its own and does not rely on the analysis contained in the CALFED Programmatic EIR/EIS. The CALFED ROD conclusions summarized above are provided for informational purposes only. The Lower Yuba River Accord EIR/EIS includes an independently developed analysis, including analysis of potential growth-inducing impacts.

18.2.5 GROWTH PROJECTIONS

There is little doubt that California is expected to experience substantial growth over the next two decades. Numerous state, regional, and local agencies prepare estimates of growth to assist in planning for the effects of that growth, including the need for water supply, additional housing, roads and bridges, sewerage infrastructure, schools, hospitals, police and fire services, and to mitigate the projected negative impacts.

State and regional service and planning agencies, such as the California Department of Finance, Southern California Association of Governments, Bay Area Association of Governments, Sacramento Area Council of Governments, Council of Fresno County Governments, and the Butte County Association of Governments have prepared extensive studies and reports forecasting California's economy, population, and resources. These studies and reports have been approved and adopted by the respective agencies, in cooperation with local jurisdictions, as the most likely scenarios for growth in California.

The primary objectives of these demographic projections, and the planning policies on which they are based, are to evaluate the potential social, economic, environmental, and fiscal impacts that may result from this level of projected growth and to identify mitigation measures required to reduce or eliminate these impacts (MWD and BLM 2001). These projections take into account the predicted adverse impacts of growth. In other words, state and regional planning agencies project growth to occur despite possible shortfalls in water supply, heavy traffic, and other factors that are sometimes assumed to be growth limiting. These assumptions suggest that some level of growth will occur with or without the Proposed Yuba Accord or CALFED programs (e.g., EWA).

18.3 ENVIRONMENTAL IMPACTS/ENVIRONMENTAL CONSEQUENCES

18.3.1 IMPACT ASSESSMENT METHODOLOGY

The benchmark for analysis of the No Project Alternative, the No Action Alternative and the Proposed Project/Action, in terms of the impact of water supply on growth, is current conditions. Current conditions include meeting all current Bay-Delta water quality objectives, as required under SWRCB's D-1641 and BOs governing flows to and through the Delta. Because this EIR/EIS is evaluating the implementation of alternatives that are of a relatively short-term duration (eight years), the No Project/No Action benchmark, or baseline, assumes Bay-Delta water quality objectives would continue to be implemented by Reclamation and the DWR during this period. It should be noted, however, that supplies available to the downstream water users prior to D-1641 and the governing BOs were greater than supplies subsequent to D-1641 (i.e., a higher or more reliable supply baseline). While SWP demand levels never approached full delivery capability prior to current Bay-Delta standards, full CVP contract amounts were delivered before D-1641. In other words, supplies were more plentiful from the federal and state water projects prior to D-1641, and an additional water supply that may be provided from the Proposed Project/Action or an alternative would not restore them to anywhere near their prior levels. This analysis compares project conditions to baseline conditions subsequent to D-1641. The analysis also assumes that existing conditions would continue in the future under the No Project Alternative and the No Action Alternative. Thus, the benchmark for the growth inducement analysis would be growth that would have occurred without the Proposed Project/Action or an alternative under existing supply conditions. The analysis benchmark also assumes currently available supplies to upstream water users (i.e., north of the Delta) would continue under the No Project Alternative and the No Action Alternative.

18.3.1.1 LEVEL OF ANALYSIS

Referring to the discussion of CEQA regulations described in Section 18.2.1, two CEQA-related concepts are important to consider in determining the level of analysis to be provided. First, CEQA is concerned with identifying impacts related to physical changes in the environment. To evaluate the growth-related physical changes in the environment that may occur from a project, it is necessary to identify where and to what extent future growth will occur. The direct growth-related effects of a water supply project would involve localized economic effects such as job growth and temporary increased demand for housing related to project construction. The indirect effects of water supply projects are related to the physical changes (i.e., new construction) that would occur as a result of the additional water supplies being available to local governments. It can be difficult to identify with any degree of precision potential indirect growth-related effects resulting from an increase in water supply *(Napa Citizens for Honest Government v. Napa County Board of Supervisors* [2001] 91 Cal. App. 4th 342; *Defend the Bay v. City of Irvine* [2004] 119 Cal. App. 4th 1261).

The second important concept to consider is that CEQA does not require undue speculation in predicting actual environmental consequences (see CEQA Guidelines Title 14 CCR 15144, 15145). Thus, while it is acknowledged that additional water supplies can be growth-inducing, it is the responsibility of the lead agencies to describe the impacts of their projects only to the extent that those impacts can be either known or reasonably predicted. Further, they are not required to adopt mitigation for impacts that require a great deal of speculation even to describe, and that are ultimately not within their control or statutory authority (*Napa Citizens for Honest Government v. Board of Supervisors* [2001] 91 Cal.App.4th 342).

Methodology for Evaluating Growth-related Effects In the Yuba Region

Existing water supply conditions and delivery procedures serve as the benchmark for analysis of the Proposed Project/Action and alternatives. In Yuba County, elements of the Proposed Project/Action that would extend from 2016 to 2025 are evaluated to determine whether there would be a potential to increase water supply availability for either agricultural or M&I purposes, which could increase growth beyond levels identified in local planning documents. For operational impacts, the analysis considers potential increases in water availability created by the Proposed Project/Action and alternatives and evaluates whether these changes would have a determinative impact on decisions related to permitting of land use changes; that is, whether new supply created by the Proposed Project/Action and alternatives would remove an impediment to growth.

Methodology for Evaluating Growth-related Effects Associated with Increased CVP and SWP Water Deliveries

Implementation of the Proposed Project/Action and alternatives could potentially result in growth via three types of operations-related impacts: (1) effects resulting from changes in agricultural land and water use patterns because of increased CVP and SWP water deliveries; (2) growth in urban areas resulting from increases in CVP and SWP water deliveries; and (3) growth in urban areas resulting from third-party water transfers facilitated by the increase in allowable exports. For the purposes of this analysis, third party entities may include upstream CVP and/or SWP water supply contractors that could acquire water through the EWA Program or an equivalent program, or the SVWMP[3], or other CVP and/or SWP contractors that could acquire water in the Sacramento Valley and export it from the Delta.

For operational impacts, the analysis considers potential increases in water availability created by the Proposed Project/Action or an alternative and evaluates whether these changes would have a determinative impact on decisions related to permitting of land use changes; that is, whether new supply created by the Proposed Project/Action or an alternative would remove an impediment to growth.

This EIR/EIS refers to the analysis conducted for the existing EWA Program, and uses a methodology for evaluating potential growth-inducing impacts similar to that which was used in other recent Reclamation documents. It is assumed that EWA operations (or a functionally equivalent program) in the future would continue as they are under the CEQA Existing Condition. The analytical approach described below is developed to mimic the analyses conducted for the existing EWA Program; however, it is designed only to evaluate potential changes that would be expected to occur with the alternatives considered in this EIR/EIS. To satisfy CEQA and NEPA analytical requirements pertaining to growth-related issues, separate

[3] As described in Chapter 3, while it is uncertain at this time whether a long-term EWA Program or a program equivalent or the EWA, and the SVWMP, or similar programs will be implemented in the future, it is possible that such implementation will occur. The analyses in this EIR/EIS that concern future conditions therefore assume that a long-term EWA Program, or an equivalent program, and the SVWMP will be implemented.

findings have been determined for the Proposed Lower Yuba River Accord based on a combination of the following: (1) independent review (also see Chapter 5) of the previously approved CVP/SWP service area analysis conducted for the existing EWA Program EIS/EIR, which is incorporated by reference; and (2) a quantitative analysis of potential impacts associated with changes to CVP and SWP water contractor deliveries provided to the Export Service Area as a result of the Proposed Project/Action and alternatives, which is discussed below and supported by model output presented in Appendix F1.

ANALYTICAL APPROACH FOR EVALUATING POTENTIAL GROWTH-INDUCING EFFECTS IN THE EXPORT SERVICE AREA

To evaluate potential service area impacts associated with the provision of water under the Tier 2 and Tier 3 Agreements proposed in the Yuba Accord Alternative, this EIR/EIS includes an analysis of the quantities of Component 2, 3 and 4 water likely to be provided to CVP and SWP contractors, by water year type. Under the Tier 3 Agreements, Reclamation would allocate Component 2 through 4 water to CVP contractors in proportion to their CVP contract allocations, and DWR would allocate water to SWP Contractors in proportion to their Table A[4] amounts (see Chapter 3). Water transfers also could occur under the Modified Flow Alternative, although the amount of water available for transfer would be less than that which is considered for the Yuba Accord Alternative.

Potential impacts associated with CVP service areas and water allocations previously were evaluated and approved through Reclamation's CVPIA Long-term Water Service Contract renewal process. Transfer water that could be furnished by the Proposed Project/Action and alternatives is considered to be an additional supply that could be delivered under existing authorized water supply contracts, which have previously completed all necessary environmental compliance documentation. No new or amended contracts are required, and existing contracts have NEPA and ESA coverage in place.

Potential impacts associated with SWP service areas and water allocations are addressed by comparing changes associated with the Proposed Project/Action and alternatives to previously approved Table A allocations. DWR also considers the transfer water that could be furnished by the alternatives evaluated in this EIR/EIS as an additional supply of water that could be delivered under existing water supply contracts and Table A allocations. To address south of Delta export service area considerations, the EIR/EIS will address potential changes in SWP water contractor allocations by providing information on the Table A amounts available for each contractor under the basis of comparison, and then describing how an additional increase in Component 2 through 4 water under the Proposed Project/Action and alternatives could be allocated to participating contractors in proportion to their respective Table A percentages.

As previously described for the Yuba Accord Alternative in Chapter 5, Component 1 water is designed for EWA uses and purposes described in the certified EIS/EIR (Reclamation *et al.* 2004) for the existing EWA Program, which is anticipated to expire on December 31, 2007. If the existing EWA Program ends, it is anticipated that Component 1 water would continue to be

[4] A "Table A" amount is the maximum contractual quantity of water that a SWP long-term water contractor can request each year. A 100 percent allocation amounts to 4.13 MAF of water, distributed among the 29 SWP Contractors that provide water to more than 23 million Californians and about 750,000 acres of irrigated farmland throughout the state (DWR Website 2006a).

used for similar purposes. Currently, Reclamation and DWR plan to temporarily extend the existing EWA Program, and they are in the process of completing supplemental environmental documentation for this extension of the program that is anticipated to be released by the end of the year. While it is uncertain at this time whether a long-term EWA Program or a program equivalent to the EWA will be implemented in the future, or what the elements of such a program will be, the best assumption that can be made at this time is that the EWA Program of an equivalent program will continue, with conditions similar to those for the existing EWA Program. For this reason, the analyses in this EIR/EIS that concern future conditions assume that a long-term EWA Program or a program equivalent to the EWA will be implemented, with conditions similar to those for the existing EWA Program. Because it is anticipated that the Proposed Project/Action or alternatives would provide water to DWR for EWA-related purposes, it is necessary for this EIR/EIS to address potential service area issues associated with this water in a manner sufficient to provide interim coverage until the environmental documentation for the extension of the EWA Program is completed. The impact assessment methodology used to address these issues is presented below.

ANALYTICAL APPROACH FOR EVALUATING TRANSFER OF COMPONENT 2 THROUGH 4 WATER TO CVP AND SWP LONG-TERM WATER CONTRACTOR SERVICE AREAS

For CEQA purposes related to DWR and the SWP, a technical review of the existing EWA EIS/EIR was first conducted to determine the evaluated parameters (e.g., volume of water, timing and duration), assessment methodology, impact indicators and significance criteria used to support the conclusions presented in the existing EWA EIS/EIR. The existing EWA water supply analysis was separated into the potential effects on agencies and their users from transferring water to the EWA, water users receiving water from the EWA, and water users not selling water to the EWA (Reclamation *et al.* 2003). To provide maximum flexibility, the EWA analysis included many potential transfers when the EWA Project agencies would likely not need all transfers in a given year. The EWA analysis also evaluated the timing of transfers to the timing of the demand. To compare potential water supply changes associated with the Proposed Project/Action and alternatives compared to those identified for the existing EWA Program, a separate analysis designed to mimic the approach used in the existing EWA EIS/EIR was conducted for this EIR/EIS. Because conditions associated with the existing EWA Program represent the basis of comparison (i.e., Existing Condition), the modeling used to characterize the CEQA Existing Condition includes operational assumptions for the existing EWA Program, as modeled in Reclamation's OCAP Study 3. Using OCAP Study 3 as the modeling baseline, transfer water provided to the EWA Program under the Proposed Project/Action and alternatives is post-processed to determine the amount of change expected to occur in evaluated Delta parameters (e.g., export pumping), relative to the existing EWA Program. The modeling results for the Proposed Project/Action and alternatives are compared to the modeled existing EWA EIR/EIS results to determine whether potential changes in water supply deliveries associated with transfers to the EWA Program (or functionally equivalent state program) under the Proposed Project/Action and alternatives would produce hydrologic changes similar to those occurring under the Existing Condition and, thus, be within the range of effects identified by the existing EWA Program. Following independent review and comparison of these two analyses, separate findings are made for this project and presented in this EIR/EIS.

Secondly, under the Tier 2 Agreement between Reclamation and DWR, the agencies would make a 50-50 split of Component 2 through 4 water for delivery to CVP and SWP water contractors, respectively. Under the Tier 3 Agreements, Reclamation could allocate Component 2 through 4 water to CVP contractors in proportion to their CVP contract allocations, and DWR could allocate water to SWP Contractors in proportion to their Table A amounts. Full Table A amounts for the SWP total approximately 4,133 TAF. Table A amounts for SWP contractors upstream of the Delta (not including North Bay Aqueduct) total 37.1 TAF (0.9 percent). Table A amounts for SWP long-term contractors served by the North Bay Aqueduct total 76.8 TAF (1.9 percent). Because these percentages are so small, the modeling assumes that all Yuba River water for the SWP would be exported to service areas south of the Delta.

The analysis evaluates how annual CVP and SWP contract allocations could change as a result of the Proposed Project/Action and alternatives, relative to the bases of comparison. Reclamation and DWR would elect to proportionally distribute the additional water supplied by the Yuba Accord Alternative to CVP and SWP contractors according to authorized federal CVP contracts and state SWP Table A allocations, respectively. The increase in annual allocation of Component 2, 3 and 4 water, by contractor and water year type, is compared to current delivery allocations under the basis of comparison to determine the percent change that would be expected to occur as a result of the Proposed Project/Action and alternatives. Additionally, the percent increase in CVP and SWP dry and critical year deliveries provided by the Component 2, 3 and 4 water is calculated for comparative purposes. Because the Proposed Project/Action and alternatives, relative to the bases of comparison, could change the frequency of CVP and SWP allocations, the frequency of modeled changes occurring by water year type and over the 72-year simulation period is evaluated to determine whether potential water supply impacts are expected to occur.

18.3.2 Environmental Impacts/Environmental Consequences Common to All Alternatives

Impact 18.3.2-1: Potential local growth-inducing considerations in the Yuba Region

The direct effects of the Proposed Project/Action and alternatives, through the stimulation of the local economy in Yuba County by increased water supply reliability, are not expected to accommodate or induce growth. Although growth is projected to occur in Yuba County, it would occur whether or not the Proposed Project/Action or an alternative is implemented. Growth in Yuba County has been planned for in city and county general plans, and many of these planning documents also identify water supply sources, which do not include the Proposed Yuba Accord, to accommodate previously approved levels of growth. Because the Proposed Project/Action or an alternative would be in place for a period of approximately eight years and would provide water for agricultural purposes only, new Yuba County development projects requiring long-term water supply sources for M&I purposes would not be served by this project.

After 2016, there also is the potential that YCWA could identify the need to divert up to an additional 30 TAF per year of water from Daguerre Point Dam, which would be used for M&I purposes in Yuba County. Although this projected need was on the planning horizon when the Water Purchase Agreement was developed, there is a high degree of uncertainty as to when the demand for this water will arise in the future. At the earliest, local General Plan information and preliminary growth estimates do not anticipate a need for this water until 2016, but this demand may not even be likely to occur until 2025 or later.

Because future water supply demands are related to the rate of continued growth, specific details regarding population demands and related project facilities necessary to supply this water have yet to be developed. Multiple factors could influence future Yuba County population growth and the need for community facilities in various service areas, many of which are beyond the control of this project. To illustrate, several potential considerations associated with these uncertainties are identified below:

- Changes in local and county governments may occur, which could alter future general plan decisions regarding land use and agricultural land conversion;
- The U.S. Government may decide to close Beale AFB, which could result in substantial impacts to the local economy;
- It is not possible, with certainty, to identify the specific areas or communities in Yuba County that will develop the most rapidly and, thus, the proximity of these fast-growing areas to the underlying groundwater basins cannot yet be determined;
- Using existing technology, it is not possible to accurately predict what the safe yield of the aquifer underlying the North Yuba and South Yuba subbasins would be in 2016;
- Because impacts could be dispersed throughout Yuba County, it is not possible to quantitatively determine, based on modeling tools available to date, where potential impacts would be likely to occur because of the highly speculative nature of modeling assumptions available to date, which would render any results almost meaningless. However, there is the potential that improved modeling tools and real-time monitoring data will be available in the future, which could provide decision-makers with a better understanding of groundwater/surface water interactions and other environmental interactions and processes; and
- Potential water management constraints may be imposed as a result of the 2016 FERC relicensing for the Yuba Project, which could limit or preclude YCWA's ability to provide additional water supplies to meet increased future demands.

Because future water supply demands are related to the rate of continued growth, specific details regarding population demands and related project facilities necessary to supply this water as early as 2016, or as late as post-2025, also are very uncertain at this time. Recognizing that FERC is expected to issue a new long-term license for the Yuba Project around 2016, it is anticipated that water supply issues and Yuba County demands will be better understood as that process nears implementation. Although there is the possibility that future delivery of an additional 30 TAF after 2016 could have some effect on growth and community facilities in Yuba County, these effects, if they occur, would likely be extremely small, especially in comparison to other social and economic variables that can influence growth and services. Nevertheless, preliminary mechanisms are identified in the Water Purchase Agreement to provide a partial means of addressing water supply needs associated with this increased demand, which most likely would involve future environmental analyses and possible development of mitigation measures (e.g., Feather River second point of diversion, groundwater substitution), if deemed necessary.

As part of the planning and environmental compliance activities associated with the FERC relicensing process, this additional 30 TAF of water to meet future M&I demands will be considered in more detail, along with more up-to-date local community information related to clarifying the uncertainties listed above, as conditions changes and more accurate information becomes available. Moreover, it is likely that if YCWA were to pursue these actions, separate environmental documentation would be required to address regulatory compliance requirements associated with the construction of a second point of diversion and related operations and maintenance activities associated with a new water supply component (i.e., 30 TAF). For the reasons described above, potential local growth-inducing impacts associated with the Proposed Project/Action and alternatives would not be expected to occur.

Impact 18.3.2-2: Potential regional growth-inducing considerations in the Export Service Area

Review of land use plans and interviews with planning officials indicate that water supply is not currently viewed as an impediment to urban growth. With no directly identifiable water-related impediments to growth, potential increases in supply are not expected to change the amount of growth that would have occurred without the Proposed Yuba Accord. Further, given the 8-year duration of this project and the unknown disposition of water supplies which could exist at its termination, the likelihood is low that a water supply growth impediment would arise during the term of this project that could be alleviated by the supplies created under the Proposed Project/Action or an alternative.

Water supply improvements of up to 140 TAF per year per year are expected in CVP and SWP export service areas through the Proposed Project/Action, over the 8-year term of the Water Purchase Agreement. Any extension of these supplies would be subject to additional discretionary action and review. It is currently anticipated that the SWP would receive 50 percent of additional supplies, up to 70 TAF in some years, particularly in the drier years when supplies are generally more constrained. Approximately half of these supplies would be available to the Metropolitan Water District of Southern California, and the remaining additional water would be available to the other Southern California SWP contractors, as provided under current SWP contract allocations.

With respect to potential growth-inducing concerns associated with specific uses of Components 2 through 4 water provided to the Export Service Area, the following discussion is provided to address the following: (1) Reclamation and federal CVP water contractor service area considerations; and (2) DWR and SWP water contractor service area considerations. Although the Proposed Yuba Accord is intended to improve water supply reliability and provide a supplemental water supply during drier years, the actions (e.g., increased flows, water transfers) required to implement these benefits only would extend for a relatively short period of time (i.e., 8 years). When cities and counties plan for increased local or regional growth, the law requires the obtainment of assurances that sufficient water supplies would be available over a range of normal and dry year conditions within a 20-year planning projection. Because the Proposed Yuba Accord would only have a duration of approximately eight years, it could not be used to fulfill this requirement. Thus, it would not be expected to cause or remove an obstacle to growth and, thus, would not be expected to contribute to new growth-inducing effects. In support of these findings, the quantitative analyses presented in subsequent sections discuss the anticipated water delivery changes resulting from the Proposed Project/Action and alternatives in comparison to existing authorized CVP contract allocations and SWP Table A amounts.

For organizational and comparative purposes, this information is presented in a format similar to that which is used for the water rights, CEQA, and NEPA analytical purposes in other chapters of this EIR/EIS.

As discussed in Chapter 4, CEQA and NEPA have different legal and regulatory standards that require slightly different assumptions in the modeling runs used to compare the Proposed Project/Action and alternatives to the appropriate CEQA and NEPA bases of comparison in the impact assessments. Although only one project (the Yuba Accord Alternative) and one action alternative (the Modified Flow Alternative) are evaluated in this EIR/EIS, it is necessary to use separate NEPA and CEQA modeling scenarios for the Proposed Project/Action, alternatives and bases of comparisons to make the appropriate comparisons. As a result, the scenarios compared in the impact assessments below have either a "CEQA" or a "NEPA" prefix before the name of the alternative being evaluated. A detailed discussion of the different assumptions used for the CEQA and NEPA scenarios is included in Appendix D.

As also discussed in Chapter 4, while the CEQA and NEPA analyses in this EIR/EIS refer to "potentially significant," "less than significant," "no" and "beneficial" impacts, the first two comparisons (CEQA Yuba Accord Alternative compared to the CEQA No Project Alternative and CEQA Modified Flow Alternative compared to the CEQA No Project Alternative) presented below instead refer to whether or not the proposed change would "unreasonably affect" the evaluated parameter. This is because these first two comparisons are made to determine whether the action alternative would satisfy the requirement of Water Code section 1736 that the proposed change associated with the action alternative "*would not unreasonably affect fish, wildlife, or other instream beneficial uses*."

18.3.3 ENVIRONMENTAL IMPACTS/ENVIRONMENTAL CONSEQUENCES OF THE CEQA YUBA ACCORD ALTERNATIVE COMPARED TO THE CEQA NO PROJECT ALTERNATIVE

Impact 18.3.3-1: Increases in water deliveries to CVP contractor service areas that could remove an impediment to growth or contribute to growth inducement in the Export Service Area

Model output demonstrates that slight increases and decreases in total CVP contractor deliveries would occur during some water years. Because changes in long-term water deliveries to CVP contractor service areas would be relatively small, (no greater than 1 percent) and only for the duration of the Yuba Accord, the additional water supply and reliability provided by the CEQA Yuba Accord Alternative, relative to the CEQA No Project Alternative, would not be of sufficient quantity to remove an impediment to growth or contribute to growth inducement in the Export Service Area. Therefore, potential growth-inducing impacts associated with changes in water deliveries to CVP contractor service areas would not be expected to occur (see Appendix F1, Table F1-3).

Impact 18.3.3-2: Increases in water deliveries to SWP contractor service areas that could remove an impediment to growth or contribute to growth inducement in the Export Service Area

As previously described in Chapter 5, the proportional distribution of water supplied by the CEQA Yuba Accord Alternative to individual SWP contractors would result in slight increases and decreases that would vary by water year. Because changes in long-term water deliveries to SWP contractor service areas would be relatively small (no greater than 1 percent) under the CEQA Yuba Accord Alternative, and only for the duration of the Yuba Accord, these changes would not be of sufficient quantity to remove an impediment to growth or contribute to growth inducement in the Export Service Area. Therefore, potential growth-inducing impacts associated with changes in water deliveries to SWP contractor service areas would not be expected to occur (see Appendix F1, Table F1-4).

18.3.4 ENVIRONMENTAL IMPACTS/ENVIRONMENTAL CONSEQUENCES OF THE CEQA MODIFIED FLOW ALTERNATIVE COMPARED TO THE CEQA NO PROJECT ALTERNATIVE

Impact 18.3.4-1: Increases in water deliveries to CVP contractor service areas that could remove an impediment to growth or contribute to growth inducement in the Export Service Area

Total CVP contractor deliveries would increase and decrease slightly during most water years; however, these changes would be no greater than 1 percent compared to total amount of CVP contractor deliveries. Because changes in long-term water deliveries to CVP contractor service areas would be relatively small, the additional water supply and improved reliability provided by the CEQA Modified Flow Alternative, relative to the CEQA No Project Alternative, would not be of sufficient quantity to remove an impediment to growth or contribute to growth inducement in the Export Service Area. Therefore, potential growth-inducing impacts associated with changes to water deliveries in CVP contractor service areas would not be expected to occur (see Appendix F1, Table F1-11).

Impact 18.3.4-2: Increases in water deliveries to SWP contractor service areas that could remove an impediment to growth or contribute to growth inducement in the Export Service Area

The proportional distribution of water supplied to individual SWP contractors would result in slight increases and decreases that would vary by water year under the CEQA Modified Flow Alternative, relative to the CEQA No Project Alternative. Because changes in long-term water deliveries to SWP contractor service areas would be relatively small (no greater than 1 percent) under the CEQA Modified Flow Alternative, these changes would not be of sufficient quantity to remove an impediment to growth or contribute to growth inducement in the Export Service Area. Therefore, potential growth-inducing impacts associated with changes in water deliveries to SWP contractor service areas would not be expected to occur see Appendix F1, Table F1-12).

18.3.5 ENVIRONMENTAL IMPACTS/ENVIRONMENTAL CONSEQUENCES OF THE CEQA YUBA ACCORD ALTERNATIVE COMPARED TO THE CEQA EXISTING CONDITION

Impact 18.3.5-1: Increases in water deliveries to CVP contractor service areas that could remove an impediment to growth or contribute to growth inducement in the Export Service Area

Because changes in long-term water deliveries to CVP contractor service areas would be relatively small and only for the duration of the Yuba Accord, the additional water supply provided by the CEQA Yuba Accord Alternative, relative to the CEQA Existing Condition, would not be of sufficient quantity to remove an impediment to growth or contribute to growth inducement in the Export Service Area. Therefore, potential growth-inducing impacts are considered less than significant (see Appendix F1, Table F1-19).

Impact 18.3.5-2: Increases in water deliveries to SWP contractor service areas that could remove an impediment to growth or contribute to growth inducement in the Export Service Area

The proportional distribution of water supplied to individual SWP contractors generally would decrease slightly in most water years, and would increase slightly in critical years under the CEQA Yuba Accord Alternative, relative to the CEQA Existing Condition. Because changes in long-term water deliveries to SWP contractor service areas would be relatively small (no greater than 1 percent) under the CEQA Yuba Accord Alternative, and only for the duration of the Yuba Accord, these changes would not be of sufficient quantity to remove an impediment to growth or contribute to growth inducement in the Export Service Area. Therefore, potential growth-inducing impacts associated with changes in water deliveries to SWP contractor service areas would not be expected to occur (see Appendix F1, Table F1-20).

18.3.6 ENVIRONMENTAL IMPACTS/ENVIRONMENTAL CONSEQUENCES OF THE CEQA MODIFIED FLOW ALTERNATIVE COMPARED TO THE CEQA EXISTING CONDITION

Impact 18.3.6-1: Increases in water deliveries to CVP contractor service areas that could remove an impediment to growth or contribute to growth inducement in the Export Service Area

Although total CVP contractor deliveries would decrease slightly during all water years, these reductions would not be greater than about 1 percent of the total amount of CVP contractor deliveries under the CEQA Existing Condition. Changes in long-term water deliveries to CVP contractor service areas would be relatively small under the CEQA Modified Flow Alternative, relative to the CEQA Existing Condition and, thus, would not be of sufficient quantity to remove an impediment to growth or contribute to growth inducement in the Export Service Area. Therefore, potential growth-inducing impacts are considered less than significant (see Appendix F1, Table F1-27).

Impact 18.3.6-2: Increases in water deliveries to SWP contractor service areas that could remove an impediment to growth or contribute to growth inducement in the Export Service Area

Because changes in long-term water deliveries to SWP contractor service areas would be relatively small (1 percent or less) under the CEQA Modified Flow Alternative, these changes would not be of sufficient quantity to remove an impediment to growth or contribute to growth inducement in the Export Service Area. Therefore, potential growth-inducing impacts associated with changes in water deliveries to SWP contractor service areas would not be expected to occur (see Appendix F1, Table F1-28).

18.3.7 ENVIRONMENTAL IMPACTS/ENVIRONMENTAL CONSEQUENCES OF THE CEQA NO PROJECT/NEPA NO ACTION ALTERNATIVE COMPARED TO THE CEQA EXISTING CONDITION/NEPA AFFECTED ENVIRONMENT

As discussed in Chapter 3, the key elements and activities (e.g., implementation of the RD-1644 Long-term instream flow requirements) for the CEQA No Project Alternative would be the same for the NEPA No Action Alternative. The primary differences between the CEQA No Project and NEPA No Action alternatives are various hydrologic and other modeling assumptions (see Section 4.5 and Appendix D). Because of these differences between the No Project and No Action alternatives, these alternatives are distinguished as separate alternatives for CEQA and NEPA evaluation purposes.

Based on current plans and consistent with available infrastructure and community services, the CEQA No Project Alternative in this EIR/EIS is based on current environmental conditions (e.g., project operations, water demands, and level of land development) plus potential future operational and environmental conditions (e.g., implementation of the RD-1644 Long-term instream flow requirements in the lower Yuba River) that probably would occur in the foreseeable future in the absence of the Proposed Project/Action or another action alternative. The NEPA No Action Alternative also is based on conditions without the proposed project, but uses a longer-term future timeframe that is not restricted by existing infrastructure or physical and regulatory environmental conditions. The differences between these modeling characterizations and assumptions for the CEQA No Project and the NEPA No Action alternatives, including the rationale for developing these two different scenarios for this EIR/EIS, are explained in Chapter 4[5].

Although implementation of the RD-1644 Long-term instream flow requirements would occur under both the CEQA No Project and the NEPA No Action alternatives, the resultant model outputs for both scenarios are different because of variations in the way near-term and long-term future operations are characterized for other parameters in the CEQA and NEPA assumptions. As discussed in Chapter 4, the principal difference between the CEQA No Project Alternative and the NEPA No Action Alternative is that the NEPA No Action Alternative includes several potential future water projects in the Sacramento and San Joaquin valleys (e.g., CVP/SWP Intertie, FRWP, SDIP and a long-term EWA Program or a program equivalent to the EWA), while the CEQA No Project Alternative does not. Because many of the other assumed conditions for these two scenarios are similar, the longer-term analysis of the NEPA No Action Alternative compared to the NEPA Affected Environment builds upon the nearer-term analysis of the CEQA No Project Alternative compared to the CEQA Existing Condition.

Because the same foundational modeling base (OCAP Study 3) was used to characterize near-term conditions (2001 level of development) both the CEQA No Project Alternative and the CEQA Existing Condition, it was possible to conduct a detailed analysis to quantitatively evaluate the hydrologic changes in the Yuba Region and the CVP/SWP system that would be expected to occur under these conditions. Building on this CEQA analysis, the analysis of the NEPA No Action Alternative compared to the NEPA Affected Environment consists of two components: (1) an analysis of near-term future without project conditions quantified through the CEQA No Project Alternative, relative to the CEQA Existing Condition, and (2) a qualitative analysis of longer-term future without project conditions (the NEPA No Action Alternative)[6].

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[5] For modeling purposes related to CEQA analytical requirements, OCAP Study 3 (2001 level of development) is used as the foundational study upon which the modeling scenarios for the CEQA No Project Alternative and the CEQA Existing Condition were developed. For modeling purposes related to NEPA analytical requirements, OCAP Study 5 (2020 level of development) is used as the foundational study upon which the modeling scenarios for the NEPA No Action Alternative was developed.

[6] The second analytical component cannot be evaluated quantitatively due to the differences in the underlying baseline assumptions for OCAP Study 3 and OCAP Study 5.

18.3.7.1 CEQA No Project Alternative Compared to the CEQA Existing Condition

Impact 18.3.7.1-1: Increases in water deliveries to CVP contractor service areas that could remove an impediment to growth or contribute to growth inducement in the Export Service Area

Total CVP contractor deliveries would not be greater than about 1 percent of the total amount of CVP contractor deliveries under the CEQA Existing Condition (Appendix F1, Table F1-43). Because changes in long-term water deliveries to CVP contractor service areas would be relatively small, the No Project Alternative, relative to the CEQA Existing Condition, would not be of sufficient quantity to remove an impediment to growth or contribute to growth inducement in the Export Service Area. Therefore, potential growth-inducing impacts are considered less than significant (see Appendix F1, Table F1-35).

Impact 18.3.7-2: Increases in water deliveries to SWP contractor service areas that could remove an impediment to growth or contribute to growth inducement in the Export Service Area

The proportional distribution of water supplied to individual SWP contractors generally would decrease slightly (1 percent) in below normal and dry years and would increase slightly (1 percent) in critical years under the CEQA No Project Alternative, relative to the CEQA Existing Condition. Because changes in long-term water deliveries to SWP contractor service areas would be relatively small under the CEQA No Project Alternative, relative to the CEQA Existing Condition, these changes would not be of sufficient quantity to remove an impediment to growth or contribute to growth inducement in the Export Service Area. Therefore, potential growth-inducing impacts associated with changes in water deliveries to SWP contractor service areas would not be expected to occur (see Appendix F1, Table F1-36).

18.3.7.2 NEPA No Action Alternative Compared to the NEPA Affected Environment

Under the NEPA No Action Alternative, the long-term average annual CVP contract and SWP Table A deliveries to the Export Service Area would be expected to increase for the following reasons:

- Implementation of CVP/SWP conveyance projects (e.g., SDIP, CVP/SWP Intertie);
- Implementation of CVP/SWP operational changes (e.g., CVP/SWP Integration); and
- Increased SWP Table A demands associated with the future level of development.

CVP deliveries (excluding sing-year water transfer volumes) to water service contractors with service areas south of the Delta are expected to increase by an average of 70 TAF per year. However, critical year deliveries are expected to increase by an average of 18 TAF per year. Most of this increase in water supply would be delivered to agricultural water districts for irrigation rather than for M&I purposes.

Table A deliveries (excluding single-year water transfer volumes) to SWP contractors with service areas south of the Delta are expected to increase by an average of approximately 230 TAF per year. SWP Table A deliveries in critical years would increase by approximately 150 TAF per year.

18.3.8 ENVIRONMENTAL IMPACTS/ENVIRONMENTAL CONSEQUENCES OF THE NEPA YUBA ACCORD ALTERNATIVE COMPARED TO THE NEPA NO ACTION ALTERNATIVE

Impact 18.3.8-1: Increases in water deliveries to CVP contractor service areas that could remove an impediment to growth or contribute to growth inducement in the Export Service Area

Because changes in long-term water deliveries to CVP contractor service areas would be relatively small and only for the duration of the Yuba Accord, the additional water supply provided by the NEPA Yuba Accord Alternative, relative to the NEPA No Action Alternative, would not be of sufficient quantity to remove an impediment to growth or contribute to growth inducement in the Export Service Area. Therefore, potential growth-inducing impacts are considered less than significant (see Appendix F1, Table F1-43).

Impact 18.3.8-2: Increases in water deliveries to SWP contractor service areas that could remove an impediment to growth or contribute to growth inducement in the Export Service Area

Although the amount of water supplied to individual SWP contractors generally would increase slightly in most years (i.e., wet, above normal, below normal and dry) under the NEPA Yuba Accord Alternative, relative to the NEPA No Action Alterative, these changes represent an increase in deliveries of about 1 percent for individual SWP contractors. Comparatively, delivery reductions that would occur in critical years under the NEPA Yuba Accord Alternative also represent a change of about 1 percent compared to the NEPA No Action Alternative.

Because changes in long-term water deliveries to SWP contractor service areas would be relatively small under the NEPA Yuba Accord Alterative, relative to the NEPA No Action Alternative, and only for the duration of the Yuba Accord, these changes would not be of sufficient quantity to remove an impediment to growth or contribute to growth inducement in the Export Service Area. Therefore, potential growth-inducing impacts associated with changes in water deliveries to SWP contractor service areas would not be expected to occur (see Appendix F1, Table F1-44).

18.3.9 ENVIRONMENTAL IMPACTS/ENVIRONMENTAL CONSEQUENCES OF THE NEPA MODIFIED FLOW ALTERNATIVE COMPARED TO THE NEPA NO ACTION ALTERNATIVE

Impact 18.3.9-1: Increases in water deliveries to CVP contractor service areas that could remove an impediment to growth or contribute to growth inducement in the Export Service Area

Total CVP contractor deliveries would decrease slightly during critical years and would increase slightly during all other years. However, none of these changes would be greater than about 1 percent of the total amount of CVP contractor deliveries under the NEPA No Action Alternative. Changes in long-term water deliveries to CVP contractor service areas would be relatively small under the NEPA Modified Flow Alternative, relative to the NEPA No Action Alternative and, thus, they would not be of sufficient quantity to remove an impediment to growth or contribute to growth inducement in the Export Service Area. Therefore, potential growth-inducing impacts are considered less than significant (see Appendix F1, Table F1-51).

Impact 18.3.9-2: Increases in water deliveries to SWP contractor service areas that could remove an impediment to growth or contribute to growth inducement in the Export Service Area

The proportional distribution of water supplied to individual SWP contractors generally would increase slightly (1 percent) in below normal years, and would decrease slightly (1 percent) in critical years under the NEPA Modified Flow Alternative, relative to the NEPA No Action Alternative. Because changes in long-term water deliveries to SWP contractor service areas would be relatively small (no greater than 1 percent) under the NEPA Modified Flow Alternative, relative to the NEPA No Action Alternative, these changes would not be of sufficient quantity to remove an impediment to growth or contribute to growth inducement in the Export Service Area. Therefore, potential growth-inducing impacts associated with changes in water deliveries to SWP contractor service areas would not be expected to occur (see Appendix F1, Table F1-52).

18.4 MITIGATION MEASURES/ENVIRONMENTAL COMMITMENTS

Because specific growth-inducing impacts associated with the Proposed Project/Action and alternatives were not identified in the analysis, no mitigation is required. Should Export Service Area conditions change and additional growth occur as a result of water being made available by this project, mitigation responsibility would reside with the land use jurisdiction approving that growth under CEQA, and the federal agencies that might be involved in those developments should NEPA or other federal statutes apply, not Reclamation or DWR. The impacts of this growth, if any, would be (and in some cases have been) analyzed in detail either in general plan EIRs for the local jurisdictions or in project-level CEQA compliance documents. Mitigation measures could include locating the growth in areas where sensitive resources are absent, minimizing the loss of these resources, or replacing any loss.

18.5 POTENTIALLY SIGNIFICANT UNAVOIDABLE IMPACTS

Environmental impacts most commonly identified as significant and unavoidable from planned growth may include conversion of farmland and agricultural resources, increases in air pollution in a non-attainment area and cumulative loss of wildlife habitat. Overall, the authority to implement mitigation for these types of impacts associated with planned growth resides with the jurisdictions in the study area identified for a particular project.

However, as presented in the analytical sections above, the Proposed Project/Action and the action alternatives, relative to the CEQA and NEPA bases of comparisons, would not result in potentially significant impacts or contribute to growth inducement. Thus, implementation of the Proposed Project/Action or an action alternative would not result in any potentially significant unavoidable growth-inducing impacts.

CHAPTER 19
ENVIRONMENTAL JUSTICE

The concept of environmental justice embraces the principles of fair treatment of all people regardless of race, color, nation of origin, or income and meaningful involvement of people within communities. Environmental justice communities are commonly identified as those where residents are: (1) predominantly minorities or low-income; (2) excluded from the environmental policy setting or decision-making process; (3) subject to a disproportionate impact from one or more environmental hazards; and (4) subject to disparate implementation of environmental regulations, requirements, practices and activities. Environmental justice efforts attempt to address the inequities of environmental protection within these communities. Legal authorities to support these efforts include both statutory and common-law protections. Both the federal government and the State of California have taken formal steps in recent years to address this issue (CALFED 2001).

Environmental justice considerations associated with the alternatives evaluated for the EIR/EIS are presented below. Potential effects related to socioeconomics and growth inducement are discussed in Chapters 17 and 18, respectively.

19.1 ENVIRONMENTAL SETTING/AFFECTED ENVIRONMENT

Because the communities that could be affected by the Proposed Project/Action and alternatives are located in the Yuba Region, vital statistics such as race, ethnic origin, and poverty status were obtained for Yuba County. Data collected is based on the 2000 U.S. Census, which for the purposes of this analysis, is considered to represent the baseline condition (i.e., CEQA Existing Condition/NEPA Affected Environment).

19.1.1 YUBA REGION

In 2000, Yuba County had a population of just over 64,000 people. Growth within Yuba County has been roughly 3.4 percent over the past decade (DWR Website 2006). Approximately 60 percent of the population in Yuba County reside in the communities of Linda, Olivehurst, and Marysville (DWR Website 2006). The racial composition of the population in Yuba County is predominantly white, which is displayed in **Table 19-1**.

Table 19-1. Yuba County Ethnicities

Race/Ethnicity	Number	Percent
White	42,537	70.6
Black or African American	1,904	3.2
American Indian or Alaska Native	1,569	2.6
Asian	4,519	7.5
Native Hawaiian or Other Pacific Islander	123	0.2
Other Race	5,989	9.9
Two or More Races	3,578	5.9
Source: (DWR Website 2006; U.S. Census Bureau Website 2006)		

The 1999 median household income in Yuba County was approximately $30,000 and approximately 21 percent of the population in Yuba County was living in poverty. The unemployment rate in Yuba County during 2000 was approximately 6 percent (DWR Website

2006; U.S. Census Bureau Website 2006). The division of the Yuba County industry workforce is shown in **Table 19-2**.

Table 19-2. Yuba County Industry Workforce

Industry Occupation	Number	Percent
Agriculture, Forestry, Fishing and Hunting, and Mining	1,347	6.7
Construction	1,886	9.3
Manufacturing	1,830	9.0
Wholesale Trade	701	3.5
Retail Trade	2,662	13.2
Transportation and Warehousing, and Utilities	1,239	6.1
Information	400	2.0
Finance, Insurance, Real Estate, and Rental and Leasing	659	3.3
Professional, Scientific, Management, Administrative, and Waste Management Services	1,626	8.0
Education, Health, and Social Services	4,133	20.4
Arts, Entertainment, Recreation, Accommodation and Food Services	1,407	7.0
Public Administration	1,049	5.2
Other Services	1,284	6.3
Source: (DWR Website 2006; U.S. Census Bureau Website 2006)		

19.1.2 CVP/SWP UPSTREAM OF THE DELTA REGION

In general, water supplied by the CVP/SWP is considered to be more reliable and affordable than alternative water sources and thus, improves the economy where the businesses are located. Actions associated with the Proposed Project/Action and alternatives could make additional water supplies available to Reclamation and DWR for delivery to federal and state water project contractors, particularly during drier conditions when deficiencies may occur. However, no changes to the existing social, economic or growth conditions are anticipated to occur within the CVP/SWP Upstream of the Delta Region, other than the potential for regional growth discussed in Chapter 18, which will likely occur whether or not the Proposed Project/Action or an alternative is approved and implemented.

Because a portion of water from the Yuba Accord Alternative would be provided to the EWA Program to supplement CVP/SWP water supplies during drier conditions, it would improve CVP/SWP operational flexibility, and federal and state water contractor supply reliability in deficiency years. Although Reclamation and DWR could choose to deliver all or a portion of the supplemental transfer water, this would be provided by YCWA under the Proposed Project/Action and alternatives to federal or state water project contractors, and the amount delivered would not exceed the water delivery amounts and entitlements authorized in existing CVP/SWP water purchase contracts (see Chapter 5). Therefore, the potential impacts on minorities and low-income communities in the CVP/SWP Upstream of the Delta Region would not be beyond the effects that occur under the CEQA Existing Condition/NEPA Affected Environment, and further consideration of environmental justice issues in this region is not warranted.

19.1.3 DELTA REGION

As described above, actions associated with the Proposed Project/Action and alternatives could make additional water supplies available to Reclamation and DWR for delivery to federal and state water project contractors, particularly during drier conditions when deficiencies may occur. For the reasons previously described in Section 19.1.2, the amount of supplemental transfer water deliveries would not exceed the water delivery amounts and entitlements authorized in existing CVP/SWP water purchase contracts (see Chapter 5). Therefore, the potential impacts on minorities and low-income communities in the Delta Region would not be beyond the effects that occur under the CEQA Existing Condition/NEPA Affected Environment, and further consideration of environmental justice issues in this region is not warranted.

19.1.4 REGULATORY SETTING

19.1.4.1 FEDERAL

EXECUTIVE ORDER 12898

Executive Order 12898, "*Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*", requires that each federal agency, to the greatest extent practical and permitted by law, shall "*make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations in the United States and its territories and possessions…*" Thus, federal agencies are to ensure that their actions do not result directly of indirectly in discrimination on the basis of color, race, or national origin, and that potential impacts on minority or low-income populations be taken into account during preparation of environmental and socioeconomic analyses of projects or programs that are proposed, funded, or licensed by federal agencies.

19.1.4.2 STATE

CALIFORNIA GOVERNMENT CODE SECTION 65040.12

California Government Code, Section 65040.12(e), defines environmental justice as "*the fair treatment of people of all races, cultures, and incomes with respect to the development, adoption, implementation and enforcement of environmental laws, regulations, and policies*." California Government Code, Section 65040.12(a) designates the Governor's Office of Planning and Research (OPR) as the coordinating agency in state government for environmental justice programs, and requires OPR to develop guidelines for incorporating environmental justice into general plans.

TITLE 14 CALIFORNIA CODE OF REGULATIONS SECTION 15131

Title 14, CCR Section 15131, provides that economic or social information may be included in an EIR, but those economic or social effects shall not be considered as significant effects on the environment. In an EIR, the lead agency can trace the chain of cause and effect from the proposed decision on the project through anticipated economic or social changes resulting from the project that, in turn, lead to physical changes in the environment. Identified potential economic/social changes also can be used to determine the significance of the physical changes on the environment.

19.1.4.3 LOCAL

The Land Use Element of the Yuba County General Plan (County of Yuba 1996) is a collection of long-range objectives, policies and proposals concerning the physical, economic and social development of the county. The primary purpose of the Land Use Element is to promote a balanced and functional mix of land uses, and it contains numerous goals to promote a balanced and functional mix of land uses, including those associated with providing opportunities for all economic and cultural groups. These goals also are consistent with those developed in the Housing Element of the Yuba County General Plan (Yuba County 1996), and include:

- Waiving or reducing fees for new development projects that provide substantial benefits to the community, such as large numbers of primary wage earner jobs, affordable housing, or other needed facilities;
- Achieving a balance between jobs and housing availability within Yuba County, while promoting housing development in all areas of the county that is affordable and available to all economic and cultural groups; and
- Creating a variety of housing types and densities in valley communities, including adequate provisions for multiple family sites, rentals and large families, to assure affordability and consistency with Housing Element goals where existing or planned sewer and water infrastructure and other services are adequate.

In order to meet these goals, the Yuba County Planning Department and other supervising and administrative authorities have identified the following implementation strategies.

- Initiate a comprehensive economic development plan for Yuba County, which focuses efforts on the policy directions contained in the General Plan, and which recognizes common interests in the bi-county region (i.e., Sutter and Yuba counties) as well as the unique interests of Yuba County;
- Create a sufficient number of jobs to permit at least 75 percent of future employed residents to work in Yuba County; and
- Prepare an annual jobs objectives attainment report for the Board of Supervisors.

19.2 ENVIRONMENTAL IMPACTS/ENVIRONMENTAL CONSEQUENCES

The Proposed Project/Action and alternatives could be expected to alter conditions affecting local water supply reliability, revenue generating mechanisms to support future Yuba County improvements (e.g., flood control and water supply projects), and water supply management and reliability for federal and state water contractors. Water deliveries contribute important economic benefits that are experienced by residential water users, as well as by the owners, employees, and customers of a wide variety of agricultural, municipal, and industrial businesses. Municipal water utilities and irrigation districts that receive water deliveries then provide water to individual residents and businesses for direct consumption and use.

19.2.1 IMPACT ASSESSMENT METHODOLOGY

Although the environmental justice approaches contained within Executive Order 12898 and California Government Code Section 65040.12 differ, the underlying intention of both regulations is the fair and equal treatment of all races, cultures, and incomes. In addition, the CEQA Guidelines, Section 15131, provide guidance in determining potential environmental justice impacts, and although the CEQA Guidelines do not recognize an economic or social change as a significant impact, social change may be considered as it relates to determining the significance of a physical change on the environment.

The analysis of environmental justice impacts examines the extent to which each alternative would affect a local economy and the different socioeconomic groups participating in the local economy. For the purposes of this chapter, qualitative methods were used to evaluate whether the alternatives considered as part of this EIR/EIS would result in fair and equal treatment of minorities and low-income persons in the Yuba Region.

19.2.2 IMPACT INDICATORS AND SIGNIFICANCE CRITERIA

Concerns associated with environmental justice relate to minority and low-income populations that could be disproportionately affected by implementation of a proposed project. The following factors are considered in evaluating the environmental justice impacts of implementing the Proposed Project/Action or an alternative, and include:

- Whether there is, or would be a direct or cumulative impact on the natural or physical environment that would result in a proportionately high or adverse impact on a minority or low-income population, considering the population levels or income levels of all affected groups.

19.2.3 ENVIRONMENTAL IMPACTS/ENVIRONMENTAL CONSEQUENCES

The Proposed Project/Action and alternatives would make additional water supplies available to Reclamation and DWR for delivery to federal and state water project contractors. Because existing water supplies would not be reduced as part of the Proposed Project/Action, potential impacts that could constrain water supply availability, preclude use, or cause other environmental justice effects would not be expected to occur as a result of the project.

Therefore, the Proposed Project/Action and alternatives would not result in unfair or unequal treatment of any socioeconomic group within the Yuba Region and would not result in any disproportionately high or adverse impacts on minority or low-income communities.

19.3 CUMULATIVE IMPACTS

The Proposed Project/Action and alternatives would not result in any environmental justice impacts and, therefore, would not contribute to cumulative impacts.

19.4 POTENTIAL CONDITIONS TO SUPPORT APPROVAL OF YCWA'S WATER RIGHTS PETITION

No unreasonable adverse effects to environmental justice would occur under the Proposed Project/Action or an action alternative and, thus, no impact avoidance measures or other protective conditions are identified for the SWRCB's consideration in determining whether or not to approve YCWA's petitions to implement the Yuba Accord.

19.5 MITIGATION MEASURES/ENVIRONMENTAL COMMITMENTS

The Proposed Project/Action and alternatives would not result in any adverse impacts to minority or low-income communities and, thus, no mitigation measures are required.

19.6 POTENTIALLY SIGNIFICANT UNAVOIDABLE IMPACTS

There are no potentially significant unavoidable environmental justice impacts associated with the implementation of the Proposed Project/Action or an alternative.

CHAPTER 20
INDIAN TRUST ASSETS

ITAs are legal interests in property held in trust by the United States for federally recognized Indian tribes or individual Indians. An Indian Trust has three components: (1) the trustee; (2) the beneficiary; and (3) the trust asset. ITAs can include land, minerals, federally reserved hunting and fishing rights, federally reserved water rights, and instream flows associated with trust land. Beneficiaries of the Indian Trust relationship are federally recognized Indian tribes with trust land; the United States is the trustee.

By definition, ITAs cannot be sold, leased, or otherwise encumbered without approval of the United States. The characterization and application of the United States trust relationship have been defined by case law that interprets Congressional acts, executive orders, and historic treaty provisions.

All bureaus are responsible for, among other things, identifying any impact of their plans, projects, programs or activities on ITAs; ensuring that potential impacts are explicitly addressed in planning, decision, and operational documents; and consulting with recognized tribes who may be affected by proposed activities. Consistent with this, Reclamation's Indian Trust policy states that Reclamation will carry out its activities in a manner which protects ITAs and avoids adverse impacts when possible, or provides appropriate mitigation or compensation when it is not. To carry out this policy, Reclamation incorporated procedures into its NEPA compliance procedures to require evaluation of the potential effects of its proposed actions on trust assets (Reclamation 1997).

20.1 ENVIRONMENTAL SETTING/AFFECTED ENVIRONMENT

Information regarding traditional cultural properties, historic properties, ITAs, and ethnographic resources located in the project area can be used to characterize the prehistoric, ethnographic, and historic cultural resources and ITAs that may be affected by implementation of the Proposed Project/Action and alternatives. The information provided below is organized by waterbody, and also identifies the early human and Native American groups that lived in the area; cultural surveys performed at locations of archeological interest; and number and nature of sites of cultural or historical importance. Because of ongoing, severe problems of pothunting or vandalism to cultural resources, documents describing site locations are exempt from public review under the California Public Records Act (PRC 6254.10). Therefore, cultural resource descriptions are discussed in general, by region.

20.1.1 YUBA REGION

The Yuba Region includes New Bullards Bar Reservoir, lower Yuba River downstream to the confluence with the Feather River, and groundwater well locations within Yuba County.

Federally recognized tribal interests in Yuba County include the Rumsey Rancheria, Strawberry Valley Maidu Tribe, and Estom Yumeka Maidu Tribe. In the existing EWA EIS/EIR (Reclamation *et al.* 2003), it was reportedly determined that the nearest Indian Trust land is located 9.2 miles from reservoirs (e.g., New Bullards Bar Reservoir) identified as providing EWA assets. Reclamation (2003) further presumed there were no off-reservation, federally reserved hunting, fishing, or gathering rights near reservoirs proposed for stored reservoir water transfer. Additionally, Reclamation's existing records indicate that there are no Indian Trust lands in Yuba County (Reclamation 2005). However, a fee-to-trust transfer involving a 40-acre parcel of land located southeast of the Community of Olivehurst in Yuba County is proposed by the Estom Yumeka Maidu Tribe and the BIA (70 FR 29363 (May 20, 2005)).

20.1.1.1 NEW BULLARDS BAR RESERVOIR

Investigation of the area around New Bullards Bar Reservoir revealed prehistoric evidence of the Northwestern Maidu settlements and earlier distinct Mesilla and Martis cultural complexes. The east side of New Bullards Bar Reservoir, which experienced a recent fire, was subject to an intense pedestrian survey of cultural resources; inventories of the reservoir's west side are few. The reservoir contains 12 recorded prehistoric sites, two of which also are historic sites. Ten of the sites are inundated. Nine studies comprise the body of literature pertaining to the area within reservoir boundaries (Baldrica 2000; Deal 1980; Meals 1978; Riddell and Olsen 1966).

20.1.1.2 LOWER YUBA RIVER

The Maidu and Nisenan occupied the areas around the Yuba River. The Maidu is the Native American group indigenous to Yuba County. Nisenan villages were generally located along the watercourses in the county with a major political Nisenan site near the mouth of the Yuba River. Eels and salmon were caught in immense quantities in the larger watercourses and the Nisenan were able to transform huge seasonal surpluses of salmon into a reliable year-round staple by drying the fish and pounding it into a meal that could be preserved for at least a year.

20.1.1.3 NORTH YUBA AND SOUTH YUBA SUBBASINS

The groundwater wells in Yuba County would be utilized under the conjunctive use component of the Yuba Accord Alternative. Under this program, groundwater pumping would remain within the safe yield of the groundwater aquifer to safeguard local agricultural, domestic, and municipal wells (see Chapter 6 for a description of groundwater operations). Because the groundwater table would remain within adequate levels to support federally reserved water rights and Indian Trust lands that may be within the groundwater basins, these areas do not warrant additional evaluation.

20.1.1.4 YUBA COUNTY

INDIAN TRUST ASSETS

Reclamation's existing records indicate that there are no Indian Trust lands in Yuba County (Reclamation 2005).

20.1.2 CVP/SWP UPSTREAM OF THE DELTA REGION

The CVP/SWP Upstream of the Delta Region includes the Sacramento River Basin (i.e., Sacramento River downstream from the confluence of the Feather River to the Delta) and the Feather River Basin (i.e., Oroville Reservoir and associated facilities, and the lower Feather River from the Oroville facilities downstream to the confluence with the Sacramento River).

With respect to ITAs, the activities associated with the Proposed Project/Action would make additional water supplies available for state and federal water contractors; however, existing water supplies would not be reduced (see Chapter 5 for additional information on water supply). Because water supplies would not be reduced below existing levels, changes in river flows and reservoir operations would not decrease opportunities for the exercise of federally reserved water, hunting, gathering and fishing rights, and there would be no additional impacts on the ITAs located in this region. Groundwater pumping activities associated with the Proposed Project/Action would be limited to existing groundwater wells located in Yuba County. Therefore, Indian Trust lands or federally reserved water rights associated with surface water and groundwater use in the CVP/SWP Upstream of the Delta Region would not be affected beyond the effects that occur under existing conditions, and further consideration of ITAs in this region is not warranted. Because potential hydrologic changes could affect cultural resources in each of the waterbodies listed above, the discussion presented below primarily focuses on cultural resources, and will be used to support the evaluations to be conducted in subsequent sections of this chapter.

20.1.2.1 FEATHER RIVER BASIN

OROVILLE RESERVOIR

All of the prehistoric archaeological periods are represented at Oroville Reservoir, including the ethnographic settlement pattern of the village community and the period of historic contact with Euro-American settlers (Kroeber 1925; Riddell 1978). Several archaeological studies have been conducted in the area. Hines (1987) conducted an archaeological analysis and concluded that there were 196 sites, with 127 seasonally exposed during low pool elevations or completely above the inundation zone (i.e., 78 sites in the fluctuation zone between elevation 640 and 900 feet and 49 sites above the high pool elevation). Including surveys conducted since then, a revised total of 173 sites are now completely or periodically accessible (DWR 2001). Site types include lithic scatters, quarries and toolstone source locales, caves and rockshelters, seasonal camps, large village settlements and burial grounds. Associated elements include milling features, structural remains and rock art. The Oroville Reservoir area also has significant historic record. With the discovery of gold in 1849, thousands of gold seekers poured into the hills around Oroville and many foothill mining towns were established. These towns were short lived and later deserted when the gold was depleted and the effort moved to river dredging at lower elevations. Remains of several of these towns were inundated by the reservoir.

Several historic properties associated with Oroville Reservoir have qualified for local, state, and federal recognition. Notable historic objects include the Bidwell Bar Bridge, Old Toll House, and Mother Orange Tree. However, no historic properties at Oroville Reservoir have been determined eligible or are listed on the NRHP (DWR 2001).

LOWER FEATHER RIVER

Ethnohistory

Evidence indicates that the Wintun and Maidu people inhabited the Feather River region for thousands of years. The southernmost Maidu called themselves the Nisenan people, and occupied the lower drainages of the Feather River.

The Maidu occupied areas near the Feather River headwaters, and the Nisenan lived in the downstream areas south of the Middle Fork Feather River. Traditional cultural practices of the Maidu and Nisenan include weaving baskets and tule mats. Maidu and Nisenan would coil peeled willow and peeled and unpeeled redbud in a clockwise manner to form baskets. Baskets were made to hold water by overlaying hazel shoots, pine roots, and maidenhair fern shoots and covering with pitch (Swartz 1958). Maidu also wove tule mats that they used for seats, beds, camp roofing, and doors (Kroeber 1925).

20.1.2.2 Sacramento River Basin

Sacramento River

Ethnohistory

Native Americans initiated California's rich cultural heritage many generations before Europeans settled in the area. A third of all Native Americans within current United States boundaries lived in California. The Sacramento Valley includes a broad geographic area that encompassed a great deal of environmental and cultural diversity in prehistoric times and during the contact period when Native Americans encountered Spanish and Euro-American explorers and settlers. Native American tribes that occupied the areas around the Sacramento River at the time of contact included the Wintu, Yana, Nomlaki, and Patwin.

The Wintu territory covered parts of what is now Trinity, Shasta, Siskiyou, and Tehama counties, including the area north of Cottonwood Creek and extending from Cow Creek on the east to the South Fork of the Trinity on the west (Access Genealogy Website 2007). The Yana extended from Pit River to Rock Creek, and from the edge of the upper Sacramento Valley to the headwaters of the eastern tributaries of Sacramento River (Access Genealogy Website 2007). The Nomlaki consisted of two groups. The River Nomlaki lived in the Sacramento River Valley in present Tehama County, south of Cottonwood Creek, while the Hill Nomlaki lived in the foothills to the west, extending to the summit of the Coast Range in what is now Tehama and Glenn counties (Wikipedia Website 2007a). The Patwin were a southern branch of the Wintu group and native inhabitants of Northern California who occupied what is now Suisun, Vacaville, and Putah Creek (Wikipedia Website 2007b)

The climate and topography north of the Delta area supports a variety of forest, grassland, savannah, riparian, and wetland habitats. Native American groups that occupied the Sacramento River drainage survived on non-domesticated plants and animals that provided food and material for baskets, houses, and clothing. For generations, Native Californians created baskets from willows, sedge root, bulrush root and new shoots of the western redbud. Some modern Native Americans maintain their culture by gathering vegetation and wildlife formerly used by their ancestors and performing traditional ceremonies. USFS policy encourages, protects, and perpetuates traditional tribal practices by reserving areas on USFS lands for gathering basketry materials and practicing cultural traditions.

Euro-American History

Many areas in the northern Sacramento Valley saw the first major wave of Euro-American colonization following the Gold Rush. By the time the local Indians had been forcibly taken to reservations, many small towns and settlements had already been established. Copper replaced gold as the main mineral produced in Shasta County in 1897. Smoke and fumes from Shasta County smelters killed vegetation, fish, and fruit trees as far south as Anderson and Cottonwood. All the smelters were closed by court order by 1919.

Through the late nineteenth and twentieth centuries, the spread of riverboat and ferry transportation and later railroad and highway transportation infrastructure increased access to more distant markets. The northern end of the Sacramento Valley developed a growing population sustained by a mix of mineral and timber extraction industries and farm and ranch operations. Large-scale irrigation was made possible in the mid-20th century by completion of Shasta Dam and other large water reservoirs and aqueduct projects.

Following the Gold Rush, Euro-American colonists developed the rich farmland in the central region and made use of its abundant water. After the Gold Rush, many disappointed miners became permanent settlers who raised cattle, sheep, wheat, and barley. Initially, the location of towns and settlements was influenced by access to water and water transportation routes. Emphasis shifted from livestock grazing to growing grain and orchard crops in the late nineteenth century.

The railroad progressed northward in the 1870s, carrying new settlers to the area and enabling such towns as Arbuckle, Williams, Maxwell, Willows, and Orland to be established. Large-scale, diversified farming was introduced as new lands were irrigated and brought into production and as shipment of local products to domestic and international markets increased as a result of the improved railroad and highway transportation system.

20.1.3 DELTA REGION

Because there are no Indian Trust lands located in the Delta (Reclamation *et al.* 2003), and no actions potentially affecting ITAs are planned in the Delta, this geographic area is removed from further consideration. However, because potential hydrologic changes could affect cultural resources in the Delta, the discussion presented below primarily focuses on cultural resources, and will be used to support the evaluations conducted in subsequent sections of the chapter.

The Delta is one of the most intensely investigated areas of California because of its high prehistoric population density and proximity to population centers. Although the bulk of cultural sites were recorded prior to 1960, there has been little systematic inventory for cultural resources. Most of the early archeological work in the region focuses on prominent prehistoric mounds. Documentation of historic sites has largely occurred within the last 20 to 30 years. At least 171 sites within the Delta Region have been listed in the NRHP as individual properties or districts. Six sites in the region also have been listed as California Historical Landmarks and four are listed as California Points of Historical Interest (CALFED 1998). Prehistoric site types include village sites, temporary campsites, milling-related activity sites, and lithic scatters. Potential historic resources in the Delta Region are largely related to agriculture; however, other types are present including farmsteads, labor camps, landings for the shipment of agricultural produce, canneries, pumping stations, siphons, canals, drains, unpaved roads, bridges, and ferry crossings. Forty known historic sites coincide with prehistoric sites (CALFED 1998).

Several Native American burial and cremation sites have been discovered in the Delta Region. Native Americans in the Delta at the time of European contact were Northern Valley Yokuts who were settled along the San Joaquin River. Plains Miwok people lived primarily in the north with territory extending nearly to Sacramento (DWR and Reclamation 1996). Wintun and Nisenan occupied areas on the north and northeastern Delta. Those in the south Delta proper were the Chulamni or Nochochomne.

20.1.4 REGULATORY SETTING

Preserving the culture and history of our nation's past are the goals of regulations including ITAs and the United States Trust Responsibility to Indian Tribes. There are no state or local regulations pertaining to ITAs.

The laws, policies and other regulatory requirements that pertain to ITAs are discussed below.

20.1.4.1 FEDERAL

INDIAN TRUST ASSETS

In accordance with the Presidential Memorandum of April 29, 1994, agencies assess the impacts of programs on tribal trust resources and tribal governmental rights and concerns. Agencies must actively engage federally recognized tribal governments and consult with such tribes on a government-to-government level before taking actions that affect those governments. The Interior's Department Manual, Part 512, Chapter 2, (DOI Website 1995) ascribes the responsibility for ensuring protection and preservation of ITAs from loss, damage, and unlawful alienation, waste, and depletion to the heads of Department of the Interior bureaus and offices. Interior's policy is to carry out activities in a manner that protects ITAs and avoids adverse impacts whenever possible.

UNITED STATES TRUST RESPONSIBILITY TO INDIAN TRIBES

The unique and distinctive political relationship between the United States and Indian tribes is defined by treaties, statutes, executive orders, judicial decisions, and agreements, and differentiates tribes from other entities that deal with, or are affected by, the federal government. The relationship has given rise to a special federal trust responsibility, involving the legal responsibilities and obligations of the United States toward Indian tribes and the application of fiduciary standards of due care with respect to Indian lands, tribal trust resources, and the exercise of tribal rights.

20.2 INDIAN TRUST ASSETS ENVIRONMENTAL IMPACTS/ ENVIRONMENTAL CONSEQUENCES

For those regions where ITAs are identified, potential impacts of the Proposed Project/Action include actions or activities that would affect Indian Trust lands and federally reserved hunting, fishing, gathering, water, or other rights. Groundwater pumping activities associated with groundwater substitution could result in increased depth in the groundwater table or increase costs of groundwater pumping, potentially interfering with federally reserved water rights and Indian Trust lands. Changes in reservoir operations associated with water deliveries, carry-over storage, and refill criteria could interfere with federally reserved water rights for Indian lands located in the vicinity of upland reservoir sites. River flow fluctuations associated with deliveries to water diverters and changes in instream flow requirements could degrade the water quality or adversely affect fish, vegetation and wildlife, thereby decreasing opportunities for federally reserved water, hunting, gathering and fishing rights.

20.2.1 IMPACT ASSESSMENT METHODOLOGY

20.2.1.1 ANALYTICAL APPROACH FOR EVALUATING INDIAN TRUST ASSETS

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

Consistent with the President's 1994 Memorandum, "*Government-to-Government Relations with Native American Tribal Governments*," Reclamation assesses the effect of its programs on tribal trust resources and federally-recognized tribal governments. Reclamation is tasked to actively engage federally recognized tribal governments and consult with such tribes on government-to-government level (59 FR 440 (January 4, 1994)) when its actions affect ITAs. The Interior Departmental Manual Part 512.2 ascribes the responsibility for ensuring protection of ITAs to the heads of bureaus and offices (DOI Website 1995). Part 512, Chapter 2 of the Departmental Manual states that it is the policy of the Interior to recognize and fulfill its legal obligations to identify, protect, and conserve the trust resources of federally recognized Indian tribes and tribal members. All bureaus are responsible for, among other things, identifying any impact of their plans, projects, programs or activities on Indian Trust assets; ensuring that potential impacts are explicitly addressed in planning, decision, and operational documents; and consulting with recognized tribes who may be affected by proposed activities. Consistent with this, Reclamation's Indian Trust policy states that Reclamation will carry out its activities in a manner which protects Indian Trust assets and avoids adverse impacts when possible, or provides appropriate mitigation or compensation when it is not. To carry out this policy, Reclamation incorporated procedures into its NEPA compliance procedures to require evaluation of the potential effects of its proposed actions on trust assets (Reclamation July 2, 1993) (pers. comm., Rivera, Reclamation 2007).

Reclamation is responsible for assessing whether the actions taken to resolve instream flow issues associated with operation of the Yuba Project have the potential to affect ITAs. Reclamation will comply with procedures contained in Departmental Manual Part 512.2, Guidelines, which protect ITAs. The Proposed Project/Action does not affect ITAs. The nearest Indian Trust Asset to this action is located at the Mooretown Rancheria and the distance is approximately 10 miles north.

20.3 Potential Conditions to Support Approval of YCWA's Water Rights Petition

No unreasonable adverse effects to ITAs would occur under the Proposed Project/Action or an action alternative and, thus, no impact avoidance measures or other protective conditions are identified for the SWRCB's consideration in determining whether or not to approve YCWA's petitions to implement the Yuba Accord.

20.4 Mitigation Measures/Environmental Commitments

No adverse effects would occur to ITAs under the Proposed Project/Action or an action alternative and, thus, no mitigation measures are required.

20.5 Potentially Significant Unavoidable Impacts

There are no potentially significant unavoidable impacts to ITAs associated with the implementation of the Proposed Project/Action or an action alternative.

CHAPTER 21
CUMULATIVE IMPACTS

21.1 INTRODUCTION

State CEQA guidelines and federal NEPA regulations require that the cumulative impacts of a proposed project be addressed in an EIR/EIS. This cumulative impact analysis discusses the cumulative impacts of the Proposed Project/Action and alternatives, and other closely related, reasonably foreseeable projects. This chapter describes the methodology used for evaluating cumulative impacts, and other projects and their relationships to the Proposed Yuba Accord, summarizes the cumulative impacts in each resource area, and recommends mitigation measures for identified significant cumulative impacts. The cumulative impact analysis uses both quantitative tools (e.g., hydrologic modeling) and qualitative analyses to determine the potential cumulative impacts of the Proposed Yuba Accord and other closely related projects.

21.2 APPROACH TO CUMULATIVE IMPACT ANALYSES

21.2.1 LEGAL REQUIREMENTS

CEQA and NEPA require that the cumulative impacts of a proposed project be addressed in an EIR/EIS when the cumulative impacts may be significant and, when the project's incremental effect is cumulatively considerable (Title 14 CCR 15130(a), 40 CFR 1508.25(a)(2)). Cumulative impacts are impacts on the environment that result from the combined incremental impacts of the project and other past, present and reasonably foreseeable future actions, regardless of which agency (federal or non-federal) or person may undertake such other actions (Guidelines 15355(b), 40 CFR 1508.7). Such impacts can result from individually minor but collectively significant actions taking place over time (40 CFR 1508.7).

Section 15130 of the CEQA Guidelines states that the discussion of cumulative impacts need not provide as much detail as the discussion of effects attributable to the project alone. The level of detail should be guided by what is practical and reasonable (Title 14 CCR 15130). The NEPA regulations do not specify a required format for displaying cumulative impacts. An EIS is required, however, to include cumulative impacts within the scope of its analysis (40 CFR 1508.25(a)(2)).

21.2.2 CUMULATIVE IMPACT ASSESSMENT METHODOLOGY

According to the CEQA Guidelines (Title 14 CCR 15130(b)), an adequate discussion of significant cumulative impacts should contain the following elements:

- A list or summary of related past, present, and future projects or planned developments that would affect resources in the project area similar to those affected by the proposed project;
- Definition of the geographic scope of the area affected by the cumulative effect and a reasonable explanation for the geographic scope used;
- A summary of the expected environmental effects that may be produced by those projects, with specific references to additional information stating where that information is available; and

- A reasonable analysis of the cumulative impacts of the relevant projects. An EIR shall examine reasonable, feasible options for mitigating or avoiding the project's contribution to any significant cumulative effects.

To identify the related projects, the CEQA Guidelines (Title 14 CCR 15130(b)([1)(A)) recommend either the "list" or "projection" approach. This analysis uses the list approach, which entails listing past, present, and probable future projects that may produce related or cumulative impacts, including, if necessary, those projects outside the control of the agency. To determine which projects to include, factors including the nature of each environmental resource being examined, the location of the project, and its type have been considered.

Although NEPA does not provide specific guidance on how to conduct a cumulative impact assessment, Reclamation's NEPA Handbook states that an EIS should "*identify associated actions (past, present, or future) which, when viewed with the proposed or alternative actions, may have cumulative significant impacts. Future cumulative impacts should not be speculative but should be based on known long-range plans, regulations, or operating agreements*" (Reclamation 2000).

Potential cumulative impacts associated with the Proposed Project/Action and alternatives are analyzed both quantitatively and qualitatively in this EIR/EIS. CEQA and NEPA alternatives comparisons that are evaluated in this EIR/EIS for cumulative effects purposes are:

- Yuba Accord Alternative Cumulative Condition compared to the Existing Condition
- Modified Flow Alternative Cumulative Condition compared to the Existing Condition

The purpose of the alternatives comparisons identified above is to determine whether the incremental effects of the Proposed Project/Action and alternatives would be expected to be "cumulatively considerable" when viewed in connection with the effects of past projects, the other current projects, and probable future projects (PRC Section 21083, subdivision (b)(2)). "*The [proposed] project must make some contribution to the impact; otherwise it cannot be characterized as a cumulative impact of that project*" (*Sierra Club v. West Side Irrigation Dist. (2005) 128 Cal.App.4th 690, 700*). Thus, "*[t]he mere existence of significant cumulative impacts caused by other projects alone shall not constitute substantial evidence that the proposed project's incremental effects are cumulatively considerable*" (CEQA Guidelines, Section 15064, subd. (h)(4)). Also, even if the Proposed Project/Action and alternatives will not have an incremental effect that is "cumulatively considerable", the lead agencies still are required to briefly describe the basis for reaching this conclusion in the EIR (CEQA Guidelines, Section 15130(a)).

Applying these rules to the cumulative analysis conducted for this EIR/EIS, the resource-specific findings in each of the EIR/EIS chapters may conclude that the Proposed Project/Action or an alternative would not result in any significant cumulative impacts on a resource category, if the analysis concludes that the Proposed Project/Action or an alternative would not have any impacts on that resource category. These types of conclusions can be supported by the latter two comparisons listed above (also see Table 4-3 in Chapter 4). For resource categories where these comparisons show no impacts, it is appropriate for the discussion in the respective EIR/EIS chapter to state that conclusion and then explain that, for this reason, the Proposed Project/Action or an alternative would not have any cumulative impacts on the resource category.

As previously discussed in other chapters of this EIR/EIS, model output was used to demonstrate whether hydrologic changes associated with the Proposed Project/Action or an alternative would be expected to directly result in resource-specific impacts. Building on this approach, model output also was used as a tool in the cumulative impact assessment to help demonstrate not only whether hydrologic changes associated with the Proposed Project/Action or alternative would be expected to directly result in a significant impact, but also to determine whether it would be likely that such hydrologic changes would or would not be expected to result in an incremental contribution to potentially significant cumulative impacts.

To quantitatively evaluate changes in hydrologic conditions that may be caused by projects, they must be well-defined and reasonably foreseeable. Although the CALFED ROD identifies many projects, few of them are far enough along in the planning stage to be considered well-defined. Although many related programs would likely compete for water and conveyance and pumping capacity, it is not possible now to determine how each program would operate or even which projects will be completed. Therefore, only those projects that have been adequately defined (i.e., in recent project-level environmental documents or CALSIM II modeling) and that have the potential to contribute to cumulative impacts are included in the quantitative assessment. This quantitative analysis focuses largely on water-related issues because the anticipated future cumulative conditions have been established through the CALSIM II modeling process. To the extent possible, cumulative impacts related to resources such as surface water supply and management, hydropower, surface water quality, fisheries and aquatic resources, terrestrial resources, recreation, visual resources, and cultural resources are evaluated quantitatively utilizing model output to provide an indication of the potential incremental contributions of the Proposed Project/Action and alternatives to cumulative impacts. However, to fully address cumulative impacts, these analyses also may be supplemented with an accompanying qualitative analysis.

The qualitative analysis of cumulative effects takes into account the other projects that are being discussed by various entities but which are not yet sufficiently defined to be considered "reasonably foreseeable" for modeling purposes. Cumulative impacts related to resources such as groundwater, air quality, land use, socioeconomics, and environmental justice generally are evaluated qualitatively. The following sections describe each approach.

21.2.2.1 Quantitative Cumulative Impact Assessment Methodology

The quantitative assessment of potential cumulative impacts associated with the Proposed Project/Action and alternatives takes into account reasonably foreseeable future increased water use by water rights holders, the CVP, the SWP, and system-wide operations under the EWA and CVPIA requirements. The quantitative assessment includes the projected water use by agencies holding contracts for water supplies from the CVP/SWP system. Use of these assumptions defines the extent to which cumulative impacts of the Proposed Project/Action and alternatives can reasonably be analyzed quantitatively. Part of the technical approach for conducting the cumulative impact assessment involved quantitatively comparing CALSIM II hydrologic model output for the 2020 level of development with the Proposed Project/Action and alternatives (CALSIM II 2020 benchmark study) to the Existing Condition (2005 level of development without the Proposed Yuba Accord or alternatives). This 2020 level of development is representative of long-term future land use patterns and related water demands projected under DWR's Bulletin 160-98 (DWR 1998).

CALSIM II hydrologic model output was used to identify the potential increment of change that could be attributed to the Proposed Project/Action and alternatives (e.g., Yuba Accord Alternative), which was used in combination with anticipated effects of other projects and then compared against the Existing Condition. OCAP Study 5 was utilized to characterize these cumulative modeling scenarios. Assumptions under OCAP Study 5 are similar to those described for OCAP Study 3 (see Appendix D, Modeling Technical Memorandum). However, OCAP Study 5 includes assumptions for additional projects, including: (1) the SDIP[1]; (2) SWP/CVP Integration; (3) FRWP; and (4) the Delta-Mendota Canal/California Aqueduct Intertie (CVP/SWP Intertie), and was modified to account for Long-term RD-1644 flow requirements. Details regarding these OCAP studies are further described in Appendix D.

The analysis of resource-specific cumulative impacts is presented in each resource chapter of this EIR/EIS. For cumulative impacts assessment purposes, the tools, approach, impact indicators, and significance criteria used to determine the environmental impacts of hydrologic changes are the same as those used in the resource-specific impact analysis. The level of detail associated with the cumulative analysis may vary by resource, and is dependent upon whether the Proposed Project/Action or an alternative would result in any potential impacts to the resource. To assess the incremental contribution of the Proposed Project/Action and alternatives to cumulative impacts, the future with-project conditions are compared to the future without-project conditions[2]. By subtracting the Proposed Project/Action conditions from the future without-project conditions, the incremental contribution of the project to overall cumulative impacts can be determined (see discussion above).

The approach for addressing potential cumulative impacts associated with other future actions that cannot be defined quantitatively at this time are discussed in the following sections.

21.2.2.2 Qualitative Cumulative Impact Assessment Methodology

The qualitative analysis of cumulative impacts considers projects that are in the planning stage or are being discussed by various entities (such as various CALFED actions), but that have not been sufficiently defined to be considered "reasonably foreseeable" and quantifiable. Projects that are not yet quantifiable using CALSIM simulations, but that could have an effect on various resources, are addressed qualitatively to provide as much information on potential cumulative impacts as possible. For some resources including surface water supply and management, surface water quality, and fisheries resources, this qualitative analysis complements the discussion that is based on a quantitative evaluation, and provides additional context for potential future impacts and benefits. All other resource topics that are not dependent on hydrology, water level, or water quality or that are not effectively evaluated using hydrologic modeling (i.e., groundwater, air quality, land use, socioeconomics, and environmental justice) are assessed in a qualitative manner.

Reasonably foreseeable projects to be included in the resources-specific qualitative analyses were identified through a collaborative, multi-step process that included input provided by the lead agencies and application of several decision-making criteria. The criteria used to identify individual projects for consideration in the cumulative analysis included the following: (1) whether the project is under active consideration; (2) whether the project would be operational or completed within the timeframe being considered for the Proposed Project/Action and alternatives; and (3) whether the project, in combination with the Proposed Project/Action and alternatives, has the potential to affect the same resources. Projects determined to meet all three of the above criteria are considered to be reasonably foreseeable and within the planning horizon for the Proposed Yuba Accord and, thus, were selected for inclusion in the qualitative cumulative analysis presented in each of the resource-specific chapters of this EIR/EIS (**Table 21-1)**.

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[1] The SDIP includes a maximum pumping rate of 8,500 cfs at the Banks Pumping Plant.

[2] OCAP Study 5 is used to characterize the No Action Alternative.

Table 21-1. Summary of Reasonably Foreseeable Programs and Projects Considered in the Resource-specific Cumulative Impacts Analyses

Line	Reasonably Foreseeable Programs and Projects	Surface Water Supply and Management	Groundwater Resources	Power Production and Energy Consumption	Flood Control	Surface Water Quality	Fisheries and Aquatic Resources	Terrestrial Resources	Recreation	Visual Resources	Cultural Resources	Air Quality	Land Use	Socioeconomics	Notes
	CALFED Storage Programs														
1	Shasta Lake Water Resources Investigation (Shasta Reservoir Enlargement)	√	---	√	√	√	√	√	√	√	√	---	---	---	Addressed in the qualitative cumulative analysis
2	Upstream of Delta Off-Stream Storage (Sites Reservoir)	√	---	---	√	√	√	√	√	√	√	---	---	---	Addressed in the qualitative cumulative analysis
3	Upper San Joaquin River Basin Storage Investigation	√	---	√	√	√	√	---	√	√	√	√	---	---	Addressed in the qualitative cumulative analysis
4	In-Delta Storage Program (Delta Wetlands Project)	√	---	---	---	√	---	√	√	√	√	---	---	---	Addressed in the qualitative cumulative analysis
5	Los Vaqueros Reservoir Expansion Project	√	---	---	---	√	---	√	√	√	√	---	---	---	Addressed in the qualitative cumulative analysis
	CALFED Conveyance Program														
6	South Delta Improvements Program (SDIP)	√	---	√	---	√	√	√	---	---	---	---	---	---	Included in the modeling (quantitative analysis); discussion of water quality effects of permanent operable barriers on south Delta agricultural diverters addressed in the qualitative cumulative analysis
7	8,500 cfs at Banks (included in SDIP)	√	---	√	---	√	√	---	---	---	---	---	---	---	Included in the modeling (quantitative analysis)
8	10,300 cfs at Banks	---	---	---	---	---	---	---	---	---	---	---	---	---	Not included
9	Tracy Fish Test Facility	---	---	---	---	---	---	---	---	---	---	---	---	---	Not included
10	Lower San Joaquin Flood Improvement Project	---	---	---	√	---	---	√	---	---	---	---	---	---	Addressed in the qualitative cumulative analysis
11	Rock Slough and Old River Water Quality Improvement Projects	√	---	---	---	√	---	---	---	---	---	---	---	---	Addressed in the qualitative cumulative analysis
12	Delta Cross Channel Reoperation and Through-Delta Facility	√	---	√	√	√	√	√	---	---	---	---	---	---	Addressed in the qualitative cumulative analysis
13	North Delta Flood Control and Ecosystem Restoration Project	√	---	---	√	---	√	√	√	√	√	---	---	---	Addressed in the qualitative cumulative analysis
14	Delta-Mendota Canal/California Aqueduct Intertie (CVP/SWP Intertie)	√	---	---	---	√	√	---	---	√	√	---	---	---	Included in the modeling (quantitative analysis)
15	Clifton Court Forebay- Jones Pumping Plant Intertie	---	---	---	---	---	---	---	---	√	√	---	---	---	Not included
	CALFED Drinking Water Quality Program														
16	Bay Area Water Quality and Supply Reliability Program	√	---	---	---	√	---	---	---	---	---	---	---	---	Addressed in the qualitative cumulative analysis
17	San Joaquin Valley/Southern California Water Exchange Program	√	---	---	---	√	√	√	---	---	---	---	---	---	Addressed in the qualitative cumulative analysis
18	North Bay Aqueduct Improvements	---	---	---	---	√	---	---	---	---	---	---	---	---	Addressed in the qualitative cumulative analysis
19	South Bay Aqueduct Improvement and Enlargement Project	---	---	---	---	---	---	---	---	---	---	---	---	---	Not included
20	San Luis Reservoir Low Point Improvement Project	---	---	---	---	√	---	---	---	---	---	---	---	---	Addressed in the qualitative cumulative analysis
	Projects Related to CVP/SWP System Operations														
21	Trinity River Mainstream Fishery Restoration Program	---	---	---	---	---	---	---	---	---	√	---	---	---	Included in the modeling (quantitative analysis)
22	Sacramento Valley Water Management Program	√	√	√	√	---	---	√	√	√	√	---	---	---	Partially included in the modeling (quantitative analysis); partially addressed in the qualitative cumulative analysis
23	Long-Term CVP and SWP Operations Criteria and Plan (OCAP)	√	---	√	√	√	√	√	√	√	√	---	---	---	Included in the modeling (quantitative analysis); OCAP reconsultation addressed in the qualitative cumulative analysis
24	Central Valley Project Long-Term Contract Renewals	√	---	---	---	√	√	√	√	√	√	---	√	---	Included in the modeling (quantitative analysis); interim contract renewals included in the discussion of long-term contracts;
25	Sacramento River Water Reliability Study	√	---	---	---	√	√	√	√	√	√	---	---	---	Addressed in the qualitative cumulative analysis
26	Freeport Regional Water Project	√	---	---	√	√	√	√	√	---	---	---	---	---	Included in the modeling (quantitative analysis)
27	CVP/SWP Integration Proposition	√	√	√	√	√	√	√	---	---	---	---	---	---	Addressed in the qualitative cumulative analysis
28	Isolated Delta Facility (Peripheral Canal)	√	---	√	√	√	√	√	√	√	√	---	---	---	Addressed in the qualitative cumulative analysis
29	Delta-Mendota Canal Recirculation Feasibility Study	√	---	√	√	√	√	---	---	---	---	---	---	---	Addressed in the qualitative cumulative analysis
30	CVP M&I Water Shortage Policy	---	---	---	---	---	---	---	---	---	---	---	---	---	Not included
31	San Joaquin River Restoration Settlement Act (Friant Settlement Legislation)	√	√	√	√	√	√	---	√	√	√	√	---	---	Addressed in the qualitative cumulative analysis
32	Oroville Facilities FERC Relicensing	√	√	√	√	√	√	√	√		√	√	√	√	Addressed in the qualitative cumulative analysis
33	City of Stockton Delta Water Supply Project	√	√	---	√	√	√	√	√	√	---	√	---	---	Addressed in the qualitative cumulative analysis
34	Monterey Plus EIR	√	---	---	√	√	√	---	---	---	---	---	---	---	Addressed in the qualitative cumulative analysis

Line	Reasonably Foreseeable Programs and Projects	Surface Water Supply and Management	Groundwater Resources	Power Production and Energy Consumption	Flood Control	Surface Water Quality	Fisheries and Aquatic Resources	Terrestrial Resources	Recreation	Visual Resources	Cultural Resources	Air Quality	Land Use	Socioeconomics	Notes
35	Folsom Dam Raise Project	√	---	---	√	√	√	√	√	√	√	---	---	---	Addressed in the qualitative cumulative analysis
36	Folsom Dam Safety and Flood Damage Reduction Project	---	---	---	√	---	---	---	---	---	√	---	---	√	Addressed in the qualitative cumulative analysis
	Water Transfer and Acquisition Programs														
37	Dry Year Water Purchase Program	√	---	√	√	√	√	---	√	√	√	---	---	---	Included in the modeling (quantitative analysis); addressed in the qualitative cumulative analysis
38	CALFED Environmental Water Account	√	√	√	√	√	√	---	√	√	√	---	---	---	Included in the modeling (quantitative analysis)
39	CALFED Environmental Water Program	---	---	---	---	---	---	---	---	---	√	---	---	---	Not included
40	CVPIA Water Acquisition Program	---	---	---	√	√	√	√	√	√	√	---	---	---	Included in the modeling (quantitative analysis)
41	Delta Improvements Package	√	---	√	√	√	√	---	√	√	√	---	---	---	Addressed in the qualitative cumulative analysis
	Groundwater Banking Projects														
42	South-of-Delta Water Banking: Madera Irrigation District Water Banking Project	√	√	---	---	---	---	√	---	---	---	√	---	---	Addressed in the qualitative cumulative analysis
43	South of Delta Water Banking: Semitropic Water Storage District Groundwater Banking Project	√	√	---	---	---	---	√	---	---	---	√	---	---	Addressed in the qualitative cumulative analysis
	Additional Projects														
44	The Governor's Drought Risk Reduction Investment Program	---	---	---	---	---	---	---	---	---	---	---	---	---	Not included
45	Contra Costa Water District Alternative Intake Project	√	---	---	---	√	---	---	---	---	---	---	---	---	Addressed in the qualitative cumulative analysis
46	Contra Costa Canal Encasement Project (CEQA)/ Contra Costa Canal Replacement Project (NEPA)	---	---	---	---	---	---	---	---	---	---	---	---	---	Not included
47	San Joaquin Valley Drainage Project	---	---	---	---	---	---	---	---	---	---	---	---	---	Not included
	Ecosystem Restoration and Fisheries Improvement Projects														
48	Suisun Marsh Levee and Habitat Restoration Program	---	---	---	---	---	---	---	---	---	√	---	---	---	Not included
49	CALFED Ecosystem Restoration Program	---	---	---	---	√	√	√	√	√	√	---	---	---	Addressed in the qualitative cumulative analysis
50	CALFED Levees Program	---	---	---	---	---	---	---	---	---	√	---	---	---	Not included
	Local Projects in the Yuba Region														
51	South Fish Screen	---	---	---	---	---	√	---	---	---	---	---	---	---	Addressed in the qualitative cumulative analysis
52	YCWA Groundwater Management Plan	---	√	---	---	---	---	---	---	---	---	√	---	---	Addressed in the qualitative cumulative analysis
53	Yuba River Development Project FERC Relicensing	√	√	√	√	√	√	√	√	√	---	---	---	---	Addressed in the qualitative cumulative analysis
54f	YCWA Flood Control Operations Obligations	---	---	---	---	---	---	---	---	---	---	---	---	---	Not included
55	YCWA Englebright Reservoir Intake Extension Project	---	---	---	---	---	---	---	---	---	---	---	---	---	Not included
	Local Projects in the Delta Region														
56	State Route 4 Bypass Project	---	---	---	---	---	---	---	---	---	---	---	---	---	Not included
57	Mountain House	---	---	---	---	---	---	---	---	---	---	---	---	---	Not included
58	River Islands	---	---	---	---	---	---	---	---	---	---	---	---	---	Not included
59	East Altamont Energy Center	---	---	---	---	---	---	---	---	---	---	---	---	---	Not included

NOTE: Screening criteria were developed to support the determination of whether a project was considered to be reasonably foreseeable (see Section 21.2.2). Projects that did not meet the three conditions established in the screening criteria were not included in the cumulative impacts analyses conducted for this EIR/EIS.

21.2.3 RELATED AND REASONABLY FORESEEABLE PROGRAMS AND PROJECTS

This section describes reasonably foreseeable, relevant programs, projects, and water management actions considered in the cumulative analysis and their interrelationships with one another. The analysis focuses on those projects that, when combined with the Proposed Project/Action and alternatives, could contribute to cumulative impacts. Scoping for the Proposed Yuba Accord EIR/EIS and other recent documents was used to identify projects considered in the cumulative impacts analysis.

21.2.3.1 CALFED PROGRAMS

The CALFED Bay-Delta Program involves collaboration between state and federal agencies and stakeholders from key interest sectors created to address and resolve resource management issues in the Bay-Delta system. The mission of CALFED is to develop and implement a comprehensive plan that addresses resource problems in the Bay-Delta Estuary related to fish and wildlife, water supply reliability, natural disasters, and water quality. The CALFED ROD was signed in late 2000. The ROD directs that a number of specific studies be implemented to address identified resource management issues. Several of these studies include feasibility studies of major water resources projects and programs that could interact cumulatively with the Proposed Yuba Accord and other cumulative actions assumed and included in the CALSIM II modeling. Studies included in the CALFED ROD regarding these potential projects include:

- Shasta Reservoir Enlargement, a study to explore the expansion of the reservoir to increase yield;
- Sites Reservoir, a study of a major water supply storage reservoir in northern California;
- In-Delta storage options study, which is examining the potential for water storage on islands in the Delta (this project is essentially identical to the Delta Wetlands Project that recently obtained water right permits for storage on Delta islands);
- San Luis Reservoir Low Point Improvement Project, which is exploring alternatives for addressing water quality problems in the reservoir during periods of low storage;
- South Delta Improvements Program, which involves developing a project and alternatives that would allow increased exports from the Delta while minimizing effects on water quality, fisheries, and water levels in the south Delta;
- The CVP/SWP Intertie, which would involve developing a new pipeline connection between DWR's California Aqueduct and the CVP's Delta-Mendota Canal to improve operational flexibility for both the CVP and the SWP;
- Los Vaqueros Reservoir Expansion Project, which is exploring the benefits and opportunities associated with expanding the Los Vaqueros Reservoir;
- Upper San Joaquin River Storage, which is studying the potential to increase storage capacity by raising Friant Dam or implementing a similar storage program;
- The EWA, which is intended to acquire water assets and use them to buffer water supplies, especially in dry years;
- Bay Area Water Quality and Supply Reliability Program, which is intended to develop and coordinate regional blending and exchange concepts that can improve water quality

and water supply reliability for several Bay Area water agencies (including EBMUD); and

- The ERP, which involves extensive habitat restoration throughout the Sacramento and San Joaquin Valleys.

Many of these programs are in the early planning and feasibility stages. They have not been adopted in any planning documents or official plans beyond highly programmatic environmental documents. No firm descriptions of these projects and programs are available, and many do not have schedules for environmental compliance or project implementation. It is highly unlikely that all of these projects will move forward into the implementation stage. In addition, those that are ultimately implemented likely will be staged over a period of several years. It is therefore not possible to include discussions of many of these projects and programs in this analysis. However, because of the inherently interrelated nature of major water resources programs in northern California, they are included in the qualitative analysis.

There are other actions and programs being evaluated and implemented by CALFED and CALFED agencies that could conceivably contribute to cumulative impacts. However, these are also relatively undefined at this time, and it is not possible to include these other programs in this cumulative analysis.

SHASTA RESERVOIR ENLARGEMENT

The CALFED ROD includes enlargement of Shasta Reservoir as an option to increase storage upstream of the Delta. One alternative to expand Shasta Reservoir is to raise the height of the dam by 6.5 feet, which would enlarge the reservoir by 290 TAF, and would inundate a small portion of McCloud River that is protected under the California Wild and Scenic Rivers Act, as well as portions of the Pit River and Upper Sacramento River. Other alternatives include modifications to the dam and reservoir reoperations. This project is currently in the planning stages, with an Initial Alternatives Information Report prepared in 2004.

The Shasta Enlargement Project could contribute to cumulative effects on water supplies and associated resources. The project could increase water supplies available for export in those years when Shasta Reservoir otherwise would have spilled. Additionally, this project could modify the timing and magnitude of upstream reservoir releases in wet years. An environmental document for this project has not been issued yet, but is anticipated to be released in 2008. This project is included in the qualitative cumulative analysis.

UPSTREAM OF DELTA OFF-STREAM STORAGE (SITES RESERVOIR)

The CALFED agencies are currently studying several off-stream storage locations including Sites Reservoir, which would be located 70 miles northwest of Sacramento, as possible options for additional storage. With a potential maximum capacity of 1.8 MAF, Sites Reservoir could increase the reliability of water supplies for a large portion of the Sacramento Valley and could improve fish migration by reducing water diversions on the Sacramento River. If this project were implemented, one of its operational benefits would be its ability to store water from high winter flows and release the stored water during the summer months, which could be used to manage salinity and water quality conditions in the Delta (California State Senate Republican Caucus Website 2007).

The Sites Reservoir Project could contribute to cumulative effects on water supplies and associated resources. The project could increase water supplies available for export in those years when export supplies otherwise would be limited. This project also could modify the timing and magnitude of upstream reservoir releases in wet years. An NOP/NOI for this project was issued in November 2001 and public scoping for the environmental document occurred in January 2002. The environmental document and engineering feasibility study for this project are in progress, and are scheduled for completion near the end of 2008 (DWR Website 2007b). This project is included in the qualitative cumulative analysis.

UPPER SAN JOAQUIN RIVER BASIN STORAGE INVESTIGATION

As part of the Upper San Joaquin River Basin Storage Investigation, Reclamation, DWR and their partners are evaluating the potential for increasing surface water storage in the upper San Joaquin River watershed. Additional storage opportunities ranging from between 250 to 700 TAF could be provided by raising Friant Dam to expand Millerton Lake (DWR Website 2007c), or alternate storage options potentially could serve as an equivalent storage program to Friant Dam Enlargement. Depending on its operation, an expanded facility could provide additional reservoir storage capacity for improved flood control and an additional source of water available to help restore and improve aquatic habitats and water quality in the San Joaquin River (see Section 21.2.7) and the Delta (California State Senate Republican Caucus Website 2007).

The investigation is being undertaken through a two-phased plan of study. Phase 1 is designed to identify water resource opportunities and issues in the Upper San Joaquin River watershed, and includes an appraisal of opportunities to increase surface storage and conjunctive use of groundwater. Phase 2 is designed to provide more detailed analysis and would begin with public meetings to determine the scope of the study. Reclamation and DWR are in the process of preparing a Plan Formulation Report for the Upper San Joaquin River Basin Storage Investigation. Concurrent with this effort, surveys for the environmental document and permit applications also are being performed in the study area. The environmental document and engineering feasibility study for this project are in progress, and are scheduled for completion in 2009 (DWR Website 2007c). This project is included in the qualitative cumulative analysis.

IN-DELTA STORAGE PROGRAM (DELTA WETLANDS PROJECT)

The CALFED Agencies have researched various options for storing water in the Delta. In-Delta storage would increase the reliability, operational flexibility, and water availability for south-of-Delta water users. An in-Delta storage facility could capture peak flows through the Delta during the winter when the CVP and SWP systems do not have the capacity or ability to capture these flows. Water could then be released from the in-Delta reservoirs during periods of export demands, typically during the summer months. Storing additional water in the Delta would provide an opportunity to change the timing of Delta exports and the ability to capture flows during periods when there would be reduced impacts to fish. One option is to lease or purchase the Delta Wetlands Project, a private water development project that would store up to 217 TAF on two islands in the Delta and dedicate two other islands for habitat improvements (Reclamation and DWR 2005). As part of the Delta Wetlands Project, Webb Tract and Bacon Island would be converted to reservoirs, and Bouldin Island and Holland Tract would be used as wetland and wildlife habitat. The Delta Wetlands Project was previously analyzed in environmental documents, and permits were issued for the private project in 2001.

In 2006, DWR released a supplemental report to its 2004 In-Delta Storage Draft State Feasibility Report. The 2006 supplemental report (DWR 2006) identifies other events (e.g., pelagic organism decline, increased focus on seismic instability and global climate change) occurring in the Delta that will affect water project operations. Although the decisions required to implement this type of in-Delta project are not expected to be made until after 2008 (DWR 2006), it is included in the qualitative cumulative analysis.

SAN LUIS RESERVOIR LOW POINT IMPROVEMENT PROJECT

Reclamation and SCVWD are pursuing an evaluation of the San Luis Reservoir Low Point Improvement Project, which would use one, or a combination of alternatives, including treatment options, bypasses, and other storage options to reduce the risk of "low point" water levels (Reclamation 2006). When water levels in San Luis Reservoir are low, high water temperatures combined with wind induced mixing result in algal blooms at the reservoir's water surface (see Section 9.1.4.1). This condition degrades water quality, making it difficult or impractical to treat the water, and can prevent deliveries from San Luis Reservoir. To solve the low point problem, Reclamation and DWR have operated the reservoir to maintain water levels above the critical low elevation, or low point, requiring approximately 200 TAF of water to remain as "carry-over" in the reservoir.

Given likely growth in future water demands, and additional regulatory requirements, it is anticipated that storage in San Luis Reservoir will be more fully exercised and result in more frequent and lower late-summer storage levels in the reservoir (Reclamation 2006). Alternatives being considered to address water quality issues related to the low point problem and to increase the effective storage capacity in the reservoir include but are not limited to: (1) a bypass to the San Felipe Unit around San Luis Reservoir; (2) treatment options such as dissolved air flotation; (3) algae harvesting or application of algaecides; (4) lowering the San Felipe Division intake facilities; and (5) expansion of Pacheco Reservoir.

An NOI/NOP to prepare an EIS/EIR was released in 2002, and an Appraisal Report for the Low Point Improvement Project was issued in 2006. The Appraisal Report recommends that a federal feasibility study be initiated to further study potential measures for resolving these water-related issues and, thus, the project is currently in the planning stages. This project is included in the qualitative cumulative analysis.

DELTA CROSS CHANNEL REOPERATION AND THROUGH-DELTA FACILITY

As part of the CALFED ROD, changes in the operation of the Delta Cross Channel and the potential for a Through-Delta Facility (TDF) are being evaluated. Studies are being conducted to determine how changing the operations of the Delta Cross Canal could benefit fish and water quality. This evaluation will help determine whether a screened through-Delta facility is needed to improve fisheries and avoid water quality disruptions. In conjunction with the Delta Cross Canal operations studies, feasibility studies are being conducted to determine the effectiveness of a TDF. The TDF would include a screened diversion on the Sacramento River of up to 4,000 cfs and conveyance of that water into the Delta.

Both a Delta Cross Canal reoperation and a TDF would change the flow patterns and water quality in the Delta, affecting water quality, fisheries, ecosystems, and water supply reliability. Further consideration of related actions will take place only after completion of several assessments, which are currently in progress. This project is included in the qualitative cumulative analysis.

DELTA-MENDOTA CANAL/CALIFORNIA AQUEDUCT INTERTIE

Reclamation is evaluating the potential for the CVP/SWP Intertie, which would consist of the construction and operation of a pumping plant and pipeline connections between the Delta-Mendota Canal and the California Aqueduct. The CVP/SWP Intertie would be used in a number of ways to achieve multiple benefits, including: (1) meeting current water supply demands; (2) allowing for the maintenance and repair of the CVP Delta export and conveyance facilities; and (3) providing operational flexibility to respond to emergencies related to both the CVP and the SWP.

Currently, the average daily pumping capacity at the Jones Pumping Plant is limited to a maximum of 4,600 cfs, which is the existing capacity of the upper Delta-Mendota Canal and its intake channel. However, because of conveyance limitation in the lower Delta-Mendota Canal and other factors, pumping at the Jones Pumping Plant is almost always less than 4,600 cfs. Delta-Mendota Canal conveyance capacity is affected by: (1) subsidence; (2) canal siltation and deposition; (3) the amount, timing, and location of water deliveries from the Delta-Mendota Canal; (4) facility design; and (5) other factors. By connecting the upper Delta-Mendota Canal with the California Aqueduct, the CVP/SWP Intertie would allow year-round CVP Jones pumping up to 4,600 cfs, subject to all applicable export pumping restrictions for water quality and fisheries protections. CVP Jones capacity would remain limited to its existing authorized pumping capacity of 4,600 cfs. This project was included in Reclamation's OCAP and a Draft EIS is expected to be available in October 2007. This project is included in the quantitative cumulative analysis.

LOS VAQUEROS RESERVOIR EXPANSION PROJECT

Reclamation, DWR and the CCWD are conducting a feasibility study examining alternatives to improve water quality and water supply reliability for Bay Area water users while enhancing the Delta environment, which will include expanding the existing Los Vaqueros Reservoir, as well as a variety of other alternatives. Current work has focused on planning level evaluations of expanding reservoir storage from 100 TAF up to 275 TAF to improve water quality and water supply reliability. An expanded reservoir would require a new or expanded Delta intake, with a capacity of up to about 1,000 cfs for the maximum reservoir size. Locations being considered for the new Delta intake include Old River and adjacent channels. The purposes of the Los Vaqueros Reservoir expansion include increased reliability, water quality, and environmental water supply. A connection to Bethany Reservoir is also currently under study.

The Los Vaqueros Reservoir Expansion Project is in the early planning stage. An Initial Alternatives Information Report was released in 2005 and more recently, a NOI/NOP to prepare an EIS/EIR was released in 2006. This project is included in the qualitative cumulative analysis.

LOWER SAN JOAQUIN RIVER FLOOD IMPROVEMENT PROJECT

The Lower San Joaquin River Flood Improvement Project is a component of the CALFED Conveyance Program, and would be designed to improve flood control capacity on the lower San Joaquin River and enhance ecosystem structure and function in the lower San Joaquin River and the south Delta (DWR and Reclamation 2000). Reclamation and DWR are in the process of completing a program management plan and feasibility cost-share agreement for this project. Activities planned for 2007/2008 to facilitate project development include conducting consensus meetings and the developing a project plan. Subsequent actions will involve work on a San Joaquin River Flood Control Study with the South Delta Water Agency (SDWA), which are anticipated to begin during the 2008/2009 fiscal year (CALFED Bay-Delta Program Website 2007c). The environmental document and engineering feasibility study for this project are in progress, and are scheduled for completion in 2010 (CALFED Bay-Delta Program Website 2007b). This project is included in the qualitative cumulative analysis.

ALTERNATIVE INTAKE PROJECT

The Alternative Intake Project is a drinking water quality improvement project proposed for implementation by the CCWD and Reclamation. For extended periods each year, Delta water quality at CCWD's exiting intakes does not meet CCWD adopted water quality objectives, thus requiring CCWD to use higher quality water stored in Los Vaqueros Reservoir to blend with the diverted Delta water. To ensure that state and federal regulatory requirements for drinking water and the water quality objectives can be met now and in the future, CCWD is proposing to relocate some of its existing diversions to Victoria Canal, a location in the Delta that has higher quality source water than that which is currently available at CCWD's Old River and Rock Slough intakes, to improve the quality of both its source and delivered water (CCWD and Reclamation 2006). Although the new intake would change the location, timing and quality of some of CCWD's diversions, CCWD is not seeking to increase its water rights, CVP contract amounts, or permitted Los Vaqueros Reservoir filling rates (CCWD and Reclamation 2006). A Draft EIR/EIS was released in May 2006; the Final EIR/EIS was released in October 2006. This project is included in the qualitative cumulative analysis.

CALFED ECOSYSTEM RESTORATION PROGRAM

The goals of the CALFED ERP are to:

- Facilitate the recovery of 19 at-risk native species and contribute to the recovery of 25 additional species;
- Rehabilitate natural processes related to hydrology, stream channels, sediment, floodplains and ecosystem water quality;
- Maintain and enhance fish populations critical to commercial, sport and recreational fisheries;
- Protect and restore functional habitats, including aquatic, upland and riparian, to allow species to thrive;
- Reduce the negative impacts of invasive species and prevent additional introductions that compete with and destroy native species; and
- Improve and maintain water and sediment quality to better support ecosystem health and allow species to flourish.

The ERP Plan, which is divided into the Sacramento, San Joaquin, and Delta and Eastside Tributary regions, includes the following kinds of actions:

- Develop and implement habitat management and restoration actions, including restoration of river corridors and floodplains, reconstruction of channel-floodplain interactions, and restoration of Delta aquatic habitats;
- Restore habitat that would specifically benefit one or more at-risk species;
- Implement fish passage programs and conduct passage studies;

- Continue major fish screen projects and conduct studies to improve knowledge of their effects;
- Restore geomorphic processes in stream and riparian corridors;
- Implement actions to improve understanding of at-risk species;
- Develop understanding and technologies to reduce the impacts of irrigation drainage on the San Joaquin River and reduce transport of contaminant (selenium) loads carried by the San Joaquin River to the Delta and the San Francisco Bay; and
- Implement actions to prevent, control, and reduce impacts from nonnative invasive species.

ERP actions will contribute to cumulative benefits on fish and wildlife species, habitats, and ecological processes and are considered in the qualitative analysis of cumulative effects.

SOUTH DELTA IMPROVEMENTS PROGRAM

The CALFED ROD (2000b) identifies the SDIP as an action included in its Programmatic EIS/EIR to address regional and local water supply needs, as well as the needs of the aquatic environment. The SDIP is a project that is proposed by Reclamation and DWR, and includes a series of proposed actions designed to improve water quality and protect salmon in the south Delta while allowing the SWP to operate more effectively. These proposed actions are intended to maximize diversion capability into Clifton Court Forebay, while providing an adequate water supply for the SDWA and reducing the effects of SWP exports on aquatic resources. The SDIP includes physical/structural improvements as well as operational changes that, together, represent a balanced approach to meeting California's water needs (Reclamation and DWR 2005).

The major components of the SDIP include:

- Increasing the maximum allowable diversion capacity at the SWP Clifton Court Forebay;
- Dredging a portion of Old River to improve conveyance capacity;
- Constructing permanent operable barriers to improve water supply reliability and water quality;
- Dredging local channels to reduce the frequency of barrier operations and to accommodate improvements to existing agriculture; and
- Constructing a permanent operable fish control structure at the head of Old River to improve conditions for salmon migrating up and down the San Joaquin River.

CALFED agencies determined that the objectives outlined in the PEIS/EIR could not be met without some of these South Delta improvements (DWR and Reclamation 2002).

Reclamation and DWR currently are pursuing the development of environmental compliance documentation for the SDIP, including a joint EIS/EIR and an ASIP. Following completion of the environmental document and regulatory compliance processes, Reclamation and DWR have identified a two-stage decision-making process for the SDIP project. Stage 1 is designed to address the physical/structural improvements, including the new operable gates, dredging and agricultural modifications. At the end of Stage 1, it is anticipated that a decision document (ROD/NOD) would be issued for the physical/structural component of the project. After the Stage 1 decision, it is anticipated that Stage 2 would address the proposed operational component to increase water deliveries south of the Delta, and most likely would involve preparation of supplemental environmental documentation (Reclamation and DWR 2005). This project is included in the quantitative cumulative analysis.

Banks Pumping Plant Increase to 8,500 cfs

The operational component of the SDIP is designed to optimize the use of the Delta to convey CVP and SWP export water by modifying operations to increase pumping at the SWP Banks Pumping Plant at the head of the California Aqueduct. At this time, authorized pumping is limited to 6,680 cfs. Operational changes proposed by DWR as part of the SDIP would: (1) increase the maximum diversion limit of 6,680 cfs to 8,500 cfs from March 15 to December 15; and (2) modify existing pumping criteria from December 15 to March 15 to allow greater use of SWP export capacity (CALFED 2000b) to provide more water for communities, businesses and agricultural users south of the Delta when it is environmentally sound to do so (Reclamation and DWR 2005).

The proposed increase in export capacity to 8,500 cfs would allow more water to be moved through the Delta by all acquisition programs during the summer months. Because purchases in the CVP/SWP Upstream of the Delta Region are less expensive per acre-foot than purchases in the Export Service Area, water programs could purchase more water with a fixed amount of money in the CVP/SWP Upstream of the Delta Region.

Constructing Permanent Operable Barriers

The SDIP also proposes to dredge and install permanent and operable barriers to ensure adequate quantity and quality to agricultural diverters within the South Delta. The existing temporary barriers have a limited ability to respond to the continually changing hydraulic and environmental conditions in Delta Channels. It is anticipated that if permanent barriers were installed and continuously operated to address Delta concerns, water supply and quality would be improved. If the barriers were in place, water could be transferred, lessening the potential to affect the water quantity, quality, and channel water level needs of water users in the South Delta. Export capacity could not be increased to 8,500 cfs unless the channels in the South Delta are dredged and the permanent operable barriers are installed.

NORTH DELTA FLOOD CONTROL AND ECOSYSTEM RESTORATION PROJECT

The CALFED ROD identifies the North Delta Flood Control and Ecosystem Restoration Project, which is proposed by Reclamation and DWR, as an implementation action that would provide conveyance, flood control and ecosystem benefits through construction of floodway improvements in the North Delta (such as on the lower Mokelumne River and Georgiana Slough). Potential flood control components being considered include bridge replacement, setback levees, dredging, island bypass systems and island detention systems (Reclamation and DWR 2005). DWR and the Corps are conducting a feasibility study to examine potential flood control system improvements that would provide benefits to aquatic and terrestrial habitats and alleviate flood-related problems in the North Delta. In support of the environmental review process, an NOP/NOI was prepared and public scoping was held in 2003. Modeling studies are under preparation, and construction preliminarily scheduled to begin in 2008 (Reclamation and DWR 2005). This project is included in the qualitative cumulative analysis.

ROCK SLOUGH AND OLD RIVER WATER QUALITY IMPROVEMENT PROJECTS

CCWD has completed two important Delta water quality improvement projects that will improve water quality for CCWD's customers and help DWR manage water resources in the Delta. The projects, known as the CALFED Rock Slough and Old River Water Quality Improvement Projects, each improve water quality for CCWD's 500,000 customers by re-locating local sources of agricultural drainage that are near CCWD's water supply intakes. The projects were funded by DWR as part of a series of water quality improvement projects being undertaken in the CALFED Bay-Delta Program.

The project in Rock Slough has relocated an agricultural drainage discharge from Veale Tract that historically drained into Rock Slough, one of CCWD's major sources of water from the Delta. Drainage from Veale Tract is now discharged outside of Rock Slough, where strong currents quickly dilute the drainage without re-directing impacts. Agricultural drainage can contain elevated concentrations of salt and nutrients and is a concern when drains are located near drinking water intakes with little dilution. This project also helps federal and state agencies meet an important water quality standard and allows these agencies to provide better and more efficient operations in the Delta.

A similar project was also completed near the CCWD's Old River Pump Station, CCWD's other major source of supply. This project modified an agricultural drain discharge from Byron Tract by lengthening the outfall into Old River to eliminate possible impacts to the CCWD's source water quality. Previously, the outfall extended only to the immediate bank of the river, where channel velocities are slow and dilution of the discharge was minimal. Now, the discharge extends 150 feet into the middle of Old River, where much higher channel velocities quickly dilute the drainage ensuring no impacts to any other water users or to the Delta ecosystem. Part of the project was completed through a partnership with the Town of Discovery Bay, which also completed a new outfall system for the Town's wastewater discharge. A related but separate phase of this second project, now in the planning stage, will further improve Delta water quality for all Delta users by removing sediments and trace levels of substances such as heavy metals, herbicides, and pesticides from the Kellogg Creek watershed prior to discharge into Old River (CCWD Website 2007). These projects are included in the qualitative cumulative analysis.

BAY AREA WATER QUALITY AND SUPPLY RELIABILITY PROGRAM

The Bay Area Water Quality and Supply Reliability Program would encourage participating Bay Area partners, including Alameda County Water District, Alameda County Flood Control and Wastewater Conservation District, Bay Area Water Users Association, CCWD, EBMUD, the City of San Francisco and SCVWD to develop and coordinate regional exchange projects to improve water quality and supply reliability. This project would include the cooperation of these agencies in operating their water supplies for the benefit of the entire Bay Area, as well as the potential construction of interconnects between existing water supplies (Reclamation and DWR 2005). Phase 1 evaluated overall Bay Area water quality, developed a list of potential projects and provided a qualitative evaluation of the ability of existing infrastructure to provide sufficient high quality water to meet the drinking water objectives in the CALFED ROD (CALFED Bay-Delta Program Website 2007a). Several of these projects are in various stages of development and are proceeding, as described in the Bay Area Integrated Regional Management Plan, which was released in November 2006 (Bay Area IRWMP Website 2006). This program is included in the qualitative cumulative analysis

SAN JOAQUIN VALLEY/SOUTHERN CALIFORNIA WATER EXCHANGE PROGRAM

The San Joaquin River Exchange Contractors Water Authority's 2005 to 2014 Transfer Program consists of the transfer of up to 130 TAF annually of substitute water (maximum of 80 TAF of developed water and a maximum of 50 TAF from land fallowing/crop idling) from the San Joaquin River Exchange Contractors Water Authority (Exchange Contractors) to other CVP contractors. The water would be transferred to Reclamation for delivery to the San Joaquin Valley wetland habitat areas and/or to Reclamation and/or DWR for use by the EWA Program as replacement water for CVP contractors. Reclamation would approve and/or execute short-term and/or long-term temporary water transfers or agreements. Reclamation and the Exchange Contractors issued a Draft EIS/EIR on June 16, 2004, and the Final EIS/EIR was published on December 16, 2004 (Reclamation Website 2004).

The San Joaquin Valley/Southern California Water Exchange Program would facilitate a partnership between MWD and the San Joaquin Valley water agencies to explore water management opportunities to help resolve water supply and water quality management problems. By better managing the water supply, the program would help improve the water quality in Southern California and the water conveyance infrastructure in Northern California. This project is included in the qualitative cumulative analysis.

NORTH BAY AQUEDUCT IMPROVEMENTS

Solano County Water Agency has evaluated the feasibility of relocating the North Bay Aqueduct intake by conducting an engineering, cost, and environmental analysis. In addition, a watershed management evaluation of Barker Slough has been completed. This evaluation incorporates water quality monitoring and developing and implementing pilot BMPs, including fencing the main drainage channel, the Noonan Drain, in the North Bay Aqueduct watershed to prevent livestock from entering the channel. This project is included in the qualitative cumulative analysis.

21.2.3.2 WATER TRANSFER AND ACQUISITION PROGRAMS

ENVIRONMENTAL WATER ACCOUNT

As previously discussed in Chapter 3, the EWA Program is a "*cooperative management program whose purpose is to provide protection to the fish of the Bay-Delta Estuary through environmentally beneficial changes in the operations of the CVP and the SWP, at no uncompensated water cost to the CVP/SWP Projects' water users. The EWA is intended to provide sufficient water, combined with the Ecosystem Restoration Program and the regulatory baseline, to address CALFED's fishery protection, and restoration/recovery needs*." (CALFED 2000a). As reported in the 2005 EWA Acquisition Strategy Report (Reclamation *et al.* 2005), EWA assets also have been used in limited ways to provide fish benefits upstream of the Delta during some years. The EWA Program's approach to fish protection requires the acquisition of alternative sources of CVP/SWP project water supply, called "assets," which are used to augment stream flows and Delta outflows, to modify exports to provide fishery benefits, and to repay the CVP/SWP contractors whose supplies have been interrupted by actions taken to benefit fish (70 FR 8605 (February 22, 2005)). The EWA Program was initially designed as a short-term program, and its continued use as a long-term management tool is being considered by the EWA Agencies.

The existing EWA Program will sunset on December 31, 2007. Currently, DWR and Reclamation plan to temporarily extend the existing EWA Program, and they are in the process of developing supplemental environmental documentation for this extension of the program that is anticipated to be released by the end of the year. While it is uncertain at this time whether a long-term EWA Program or a program equivalent to the EWA will be implemented in the future, or what the elements of such a program will be, the best assumption that can be made at this time is that an equivalent program will continue, with conditions similar to those for the existing EWA Program. For this reason, the analyses in this EIR/EIS that concern future conditions assume that a long-term EWA Program or a program equivalent to the EWA will be implemented, with conditions similar to those for the existing EWA Program. Implementation of a long-term EWA Program or a program equivalent to the EWA is included in the quantitative cumulative analysis (see Appendix D).

CALFED ENVIRONMENTAL WATER PROGRAM

CALFED agencies created the Environmental Water Program (EWP) to carry out flow-related goals of the ERPP. The EWP was developed to be operational through the end of the 30-year CALFED Bay-Delta Program (CALFED Website 2002), and to acquire water from sources throughout the Bay-Delta watershed and provide flows to facilitate:

- Improvement in habitat conditions for fishery protection and recovery;
- Restoration of critical instream and channel-forming flows in Bay-Delta tributaries;
- Improvement in Delta outflow during critical periods; and
- Improvement of salmon spawning and juvenile survival in upstream tributaries as defined by the ERP and ERP Strategic Plan, by purchasing up to 100 TAF of water per year by the end of Stage 1.

The EWP was designed to make long-term surface water purchases, and to focus water acquisitions on Central Valley rivers and streams, with reservoirs upstream of the Delta as priority sources. Water was to remain within the Sacramento and San Joaquin rivers and could not be taken for non-environmental uses. The EWA and EWP programs planned to coordinate efforts to achieve mutual benefits with single acquisitions. Additional strategies for water transfers included groundwater banking and long term purchases.

Although funding for the EWP has been reduced in recent years, ongoing EWP efforts are focused on evaluating the feasibility of augmenting instream flows to promote the recovery of geomorphic process and ecological functions in Clear Creek. These processes are fundamental to re-create and maintain the diverse template of habitats required in the Clear Creek ecosystem to support and to recover aquatic and riparian species, particularly anadromous salmonids and native floodplain vegetation (CALFED Website 2004). However, the last program activity to date occurred in October 2004 (CALFED Website 2004). Because of the narrowed focus of ongoing EWP efforts, this program is not anticipated to involve other actions that may occur on a larger scale, or within the planning horizon for the Proposed Yuba Accord (pers. comm., R. Guinee, USFWS 2007). Thus, the EWP is not included in the cumulative analysis.

CVPIA WATER ACQUISITION PROGRAM

Section 3402 of the CVPIA identifies the purposes of the CVPIA as protection, restoration, and enhancement of fish, wildlife, and associated habitats in the Central Valley. The CVPIA provides for the acquisition of water for protecting, restoring, and enhancing fish and wildlife populations. To meet water acquisition needs under the CVPIA, the Interior has developed a joint Reclamation and USFWS Water Acquisition Program.

The CVPIA requires the provision of firm water supplies to specified National Wildlife Refuges, State Wildlife Areas, and private wetlands in the Grassland Resource Conservation District for the purpose of optimum habitat management on the refuge lands[3]. CVPIA Section 3406(d)(1) requires that the Secretary of the Interior immediately provide specific quantities of water to the refuges and indicates that long-term contractual agreements should be developed for water provided. These are referred to as "Level 2" supplies, for which Reclamation and Interior entered into long-term water supply agreements/contracts with USFWS and CDFG. The CVPIA requires full delivery of this water in all year types except critically dry water years, as determined by Reclamation for allocation of CVP water. In the case of a critically dry water year, the Secretary of the Interior may reduce Level 2 refuge water supplies by up to 25 percent (USFWS 1998).

Section 3406(d)(2) of the CVPIA refers to "Level 4" refuge water supplies, which are the supplies required for optimum habitat management of the existing refuge lands identified in the "1989 Report on Refuge Water Supply Investigations." The CVP must acquire the increment of water between Level 2 and Level 4 supplies from willing sellers. Section 3406(d)(2) requires that, upon enactment of the CVPIA, Level 4 water be provided in 10 percent cumulative increments per year with provision of full Level 4 supplies after 10 years (i.e., 2002). Reclamation has been acquiring Level 4 water on a short-term basis from willing sellers since 1993. Meeting Level 4 requirements requires the annual acquisition of an additional 133,264 AF above Level 2 water supplies.

Refuge water acquisitions are primarily from CVP contractors, and delivery is typically taken at O'Neill Forebay for delivery to the refuges in the San Joaquin Valley. In recent years, acquired water to meet Level 4 needs has averaged between 70 TAF to 80 TAF. Coordination among the CVPIA Water Acquisition Program, the EWP, and EWA requires Reclamation, USFWS, and other CALFED agencies to determine how to address individual program goals while pursuing joint acquisitions. This project is included in the quantitative cumulative analysis.

LONG-TERM CVP AND SWP OCAP

The Long-term OCAP serves as the operational standard by which Reclamation operates the integrated CVP/SWP system. The OCAP describes how Reclamation and DWR operate the CVP and the SWP to divert, store, and convey water consistent with applicable law (Reclamation 2004). Reclamation and DWR completed an update to the OCAP in 2004 to reflect recent operational and environmental changes occurring throughout the CVP/SWP system. Additionally, Reclamation received BOs from the USFWS and NMFS in 2004 and 2005. The terms and conditions specified in the USFWS and NMFS BOs establish the instream habitat conditions and operational requirements that Reclamation and DWR must maintain as part of integrated CVP/SWP operations. For these reasons, the OCAP provides the basis for the hydrologic modeling assumptions and the comparative analytical simulations that were performed as part of the hydrologic assessment of effects on resources in this EIR/EIS. The 2004 OCAP included specific projects such as the CVP/SWP Intertie, the FRWP, and the Trinity River Mainstream Fishery Restoration Program, as described herein.

Due to numerous changed circumstances since the 2004/2005 OCAP consultation, Reclamation has requested re-initiation of Section 7 ESA consultation on OCAP with both NMFS and USFWS. In a letter to NMFS dated April 2006, and clarified in May 2006, Reclamation requested

[3] CVPIA Sections 3406(d)(1) and 3406(d)(2).

initiation of early and formal consultation on the effects of long-term CVP and SWP operations on all federally listed species and critical habitat which may be affected by those operations, to include the newly designated critical habitat for Central Valley steelhead, Central Valley spring-run Chinook salmon, and Central Coast steelhead. Reclamation also requested initiation of conferencing on the effects of the OCAP on the federally threatened southern DPS of North American green sturgeon, which would convert into a formal and early consultation following the effective date of the final rule designating its status (i.e., July 2006). In addition, in a letter dated July 2006, Reclamation also requested re-initiation of formal consultation on the OCAP from the USFWS. The major reason for this re-initiation was changed circumstances regarding delta smelt populations, particularly related to new and constantly emerging information stemming from the POD study effort in the Delta. At this time, a date for the completion of these consultations is unknown.

The 2004 OCAP and the requirements of the 2004 and 2005 BOs are included in the quantitative cumulative analysis. As discussed in Sections 4.1.4 and 10.1.4.1, any conveyance of water provided by the Yuba Accord Alternative through the CVP/SWP system, the Delta and the Export Service Area would be consistent with all of the procedures and operating principles that are established in the new OCAP that Reclamation will adopt after completion of the re-initiated OCAP ESA consultations. Because this new OCAP has not been prepared yet, it was not possible to include its provisions in the cumulative analysis.

CENTRAL VALLEY PROJECT LONG-TERM CONTRACT RENEWALS

There are approximately 250 long-term water service contracts that are dependent upon CVP operations to receive water for agricultural, or M&I uses. Most of these contracts extend for a term of 40 years, and were scheduled to expire in 2004 or subsequent dates prior to 2029. Water needs assessments were performed for each CVP water contractor eligible to participate in the CVP long-term contract renewal process (Reclamation 2003). The water needs assessments confirmed a contractor's past beneficial use and determined future CVP water supplies needed to meet the contractor's anticipated future demands. These assessments were based on a common methodology used to determine the amount of CVP water required to balance a contractor's water demands with available surface and groundwater supplies (Reclamation 2003). In 2005 and 2006, Reclamation issued decisions (ROD and FONSI) for renewing contracts of the Sacramento River Division, the Sacramento River Settlement Contracts, the Delta-Mendota Canal Division, the Friant Division and several individual contracts. Preparation of environmental documents for other divisions and contracts are ongoing, and are expected to be completed following Reclamation's ESA reconsultation on the 2004 OCAP BA.

Water supply findings for the completed contract renewals in the CVP divisions are summarized below. Although not yet completed, available information from the San Luis Unit Draft EIS also is summarized because this area could receive water under the Yuba Accord Alternative. This project is included in the quantitative cumulative analysis.

Sacramento River Division

- In the 2005 FONSI (Reclamation 2005b), Reclamation concluded that the Sacramento River Division Long-term Contract Renewal would not result in significant impacts to the quality of the human environment.
- Key findings presented in Reclamation's 2005 FONSI for the Sacramento River Division Long-term Contract Renewal (Reclamation 2005b):

- **Water Resources.** *"Renewal of long-term contracts will not change contract water quantities from the quantities in existing contracts and, therefore, will not cause any increased use. Therefore, there will be no effect on surface water supplies or quality. For the same reason, renewal of long-term contracts will not result in any growth-inducing impacts that will increase water demand during the time frame of this renewal."*

- **Land Use. "***The renewal of contracts will not provide for additional water supplies that could act as an incentive for conversion of native habitat for increased acreage of agricultural production, M&I development or other activities. The amount and types of crops will vary according to the annual water allocation and farming practices, and a small quantity of irrigation use may be changed to M&I purposes where the existing contract and governing laws and regulations allow. Therefore, there will be no significant effect on land uses."*

Sacramento River Settlement Contractors

- In the 2005 ROD for the Sacramento River Settlement Contractors (SRSC) Long-term Contract Renewal (Reclamation 2005d), Reclamation concluded that "…*the negotiated contract renewals either have no impact or less-than-significant adverse impacts on biological, physical and cultural resources and will provide for stability of operation of the CVP to the benefit of the public and the natural environment*."
- Key findings presented in Reclamation's 2005 ROD:
  - Includes shortage provisions based on Shasta Reservoir inflow deficiencies and the Sacramento River 40-30-30 Index.
  - Through the negotiation process, Reclamation and the SRSC agreed to implement all practicable means to avoid or minimize environmental harm, enhance water conservation and ensure continuity of operations. Implementation of water conservation measures and measures to protect listed species will be the responsibility of the respective contractors.
- Other considerations
  - The EPA raised concerns over differences in the water demand projects used by Reclamation and those presented in DWR's current update to Bulletin 160, and the lack of analysis for the period between 2025, when full use of contract supplies is anticipated, and 2044, the last full year of the renewed contracts. Reclamation's response to this concern states that it is not necessary to speculate on impacts beyond the full use of the water under contract because once the total contract amount is reached, the effects of the contracts remain unchanged although the larger context of water use will be changing in the face of continued population growth and technological change, and in ways that will be addressed as specific changes are proposed (Reclamation 2005d).

Delta-Mendota Canal Unit

- In the 2005 FONSI (Reclamation 2005a), Reclamation concluded that the Delta-Mendota Canal Unit Long-term Contract Renewal would not result in significant impacts to the quality of the human environment.
- Key findings presented in Reclamation's 2005 FONSI for the Delta-Mendota Canal Unit Long-term Contract Renewal (Reclamation 2005a):

- **Water Resources**. *"Renewal of the long-term water service contract will not change contract water quantities from the quantities in existing contracts and will therefore not cause any increased use. Therefore, there will be no effect on surface water supplies or quality. For the same reason, renewal of the water service contract would not result in any growth-inducing impacts that will increase water demand during the contract's time frame."*

- **Land Use**. *"The renewal of contracts will not provide for additional water supplies that could act as an incentive for the conversion of native habitat for increased acreage of agricultural production, M&I development, or other activities. The amount and types of crops will vary, as they have in the past, according to the annual water allocation and farming practices. "*

Friant Division

- In the 2001 FONSI (Reclamation 2001), Reclamation concluded that the Friant Division Long-term Contract Renewal would not significantly affect the quality of the human environment.
- Key findings presented in Reclamation's 2001 FONSI (Reclamation 2001) for the Friant Division Long-term Contract Renewal:
  - **Water Resources**. *"…CVP operations and use amounts would remain the same as the existing conditions…the Friant Division would continue conjunctive use of CVP surface water and groundwater. Thus there would be no effect on surface water resources… The proposed action would not change CVP operations or water service contract amounts. Contractors would continue conjunctive use of available surface water and ground water but with more emphasis on ground water during dry periods when CVP water is limited. The proposed action would have no effect on total water supply."*
  - **Land Use**. *"…would not result in growth-inducing impacts because there would be no changes to CVP operations or contract amounts. Relatively small and insignificant decreases in irrigated acreage (less than two percent) are expected with changing climatic conditions and from wet to dry years. The proposed action would have no effect on land use."*
- Other considerations
  - Following several years of litigation over Friant Dam operations and downstream releases, the involved parties reached a settlement agreement in September 2006 (FWUA Website 2006). As part of the settlement negotiations, the parties have agreed to work together on a series of projects to improve the river channel and instream flow conditions to restore and maintain healthy salmon populations in the San Joaquin River. At the same time, the settlement limits water supply impacts to Friant Division long-term water contractors by providing for new water management measures that are to be undertaken by Reclamation. The settlement agreement also provides that long-term Friant Division water service contracts be amended to conform the contracts to the terms of the settlement (United States District Court Eastern District of California 2006).

San Luis Division

- In the 2005 San Luis Unit Long-term Contract Renewal Draft EIS (Reclamation 2005c), Reclamation concluded that, when evaluated against the No Action Alternative, no potentially significant impacts have been identified that could result from the renewal of San Luis Unit long-term water service and repayment contracts analyzed in the EIS.

- Key findings presented in Reclamation's 2005 Draft EIS (2005c) for the San Luis Unit Long-term Contract Renewal state that:
  - **Water Resources**. *"Contract total, water to be made available, time for delivery, point of diversion, responsibility for water diversion, water measurement, and rates and methods of payment would not differ substantially from* [the] *No Action Alternative."*
  - **Land Use**. *"No direct adverse impacts to land use. Renewed contract water deliveries continue to accommodate a portion of planned growth and support agricultural land uses as under No Action Alternative conditions. "*

Reclamation's analyses of potential impacts to water resources and land use within the CVP service areas supplied with water from these long-term and interim contract allocations indicates that no additional adverse impacts would be expected to occur. The additional quantity of transfer water that the Yuba Accord Alternative would provide to supplement CVP contractor allocations south of the Delta primarily would increase supply reliability during drier conditions and would not result in deliveries that would be greater than existing CVP contract allocations that have been approved through the long-term and interim contract renewal processes. For this reason, potential changes in future Export Service Area conditions associated with water resources and land use would be similar to, and within the range of that which was determined to be less than significant in Reclamation's environmental documentation for the long-term contract renewals. To the extent feasible, approved CVP contractor demands and allocations were included as part of the future conditions characterized in the modeling conducted for this EIR/EIS. Therefore, system-wide operations associated with the CVP long-term contract renewal process are included in the quantitative cumulative analysis.

CVP/SWP Integration Proposition

Reclamation, DWR, and SWP contractors have proposed increasing the integration of CVP and SWP operations by maximizing the existing and proposed SWP conveyance capacity (including the implementation of the SDIP) of both CVP and SWP supplies. Under the proposal, the state would have the primary responsibility for delivering water to federal wildlife refuges, which would allow for increased supply flexibility, particularly south of the Delta. The CVP would be increasingly responsible for maintaining Delta water quality, and CVP facilities would be used to store additional water in Northern California for SWP customers. The proposal is also structured to allow for supporting the continued implementation of the EWA Program or a program equivalent to the EWA. This project is included in the qualitative cumulative analysis.

Delta-Mendota Canal Recirculation Feasibility Study

Reclamation is conducting a feasibility study to evaluate the feasibility, benefits, and impacts of recirculating water from the Delta through the CVP pumping and conveyance facilities to the San Joaquin River. The purpose of the Delta-Mendota Canal Recirculation Study is to meet certain requirements of PL 108-361 and D-1641. The study has been proposed as a way "to provide flow, reduce salinity concentrations into the San Joaquin River, and reduce the reliance on the New Melones Reservoir for meeting water quality and fishery flow objectives through the use of excess capacity in export pumping and conveyance facilities." [PL 108-361, Title 1, Section 103].

The concept of recirculation was developed to facilitate compliance with Delta water quality, salinity, and flow standards in the lower San Joaquin River. Recirculation uses water pumped at the Jones Pumping Plant to augment flow in the San Joaquin River. In principle, water to be recirculated is pumped from the Delta by the Jones Pumping Plant then conveyed in the Delta-Mendota Canal to one or the other (or both) of two existing wasteways (originally designed for emergency uses, such as a downstream canal failure) between the Delta-Mendota Canal and the San Joaquin River, where it is diverted from the canal back into the river. The diverted water then flows to the San Joaquin River either just upstream from the San Joaquin/Tuolumne River confluence (Westley Wasteway path) or near the San Joaquin/Merced River confluence (Newman Wasteway path). Once in the San Joaquin River, the water returns to the Delta, helping to meet the Vernalis flow and water quality standards during the recirculation period. The recirculation concept assumes that the water begins the recirculation process by leaving the Delta with lower salinity, turbidity and TOC levels, and combines with existing San Joaquin River flows of higher salinity, turbidity and TOC to improve the overall quality of the river water before it returns to the Delta. Recirculation will not be implemented when the quality of exported Delta water is worse than the quality of the San Joaquin River water at Vernalis (Reclamation Website 2006a). This project is included in the qualitative cumulative analysis.

DELTA IMPROVEMENTS PACKAGE

The Delta Improvements Package outlines actions related to water project operations in the Delta that would result in increased water supply reliability, improved water quality, environmental protection and ecosystem restoration, protection of the Delta Levee system, and analyses and evaluation to support improved real-time and long-term management (CALFED Website 2001).

The Delta Improvements Package also outlines conditions under which the SWP would be allowed to increase its permitted export pumping capacity from 6,680 cfs to 8,500 cfs. In addition to the commitments in the CALFED ROD to avoid adverse fishery impacts and to protect in-Delta water supply reliability, these conditions include:

- Construction of permanent operable barriers in the South Delta;
- Development of a salinity management plan for the San Joaquin River;
- Improvements to protect water quality near the Contra Costa Canal;
- Environmental protection for important native fish species, including implementation of the Ecosystem Restoration Program; and
- Development of a long-term EWA (or a program equivalent to the EWA).

This project is included in the qualitative cumulative analysis.

ISOLATED DELTA FACILITY

Four broad concepts have been studied to address urban water quality, water supply reliability, and environmental concerns in the Delta, including physical barriers, hydraulic barriers, through-Delta facilities, and isolated facilities. During the last 50 years, a variety of proposals modifying or combining all these concepts have been suggested to improve Delta conditions and to allow for beneficial use of Delta water supplies.

An isolated facility would convey water around the Delta for local supply and export through a hydraulically isolated channel. The previously proposed isolated facility consisted of constructing an isolated canal from near Hood on the Sacramento River to Clifton Court Forebay (with a fish screen near Hood), siphons, and the capability to release water to Delta channels to improve water circulation in Delta channels. This could improve water quality for urban and agricultural water users, and would eliminate reverse flow in the Delta and improve water quality and flow in the Delta by releasing water to South Delta channels. Because the intake gate of this facility would be upstream of much of the Delta along the Sacramento River, it would significantly reduce bromide and agricultural drainage impacts on water delivered to urban water purveyors. Possible collateral measures to improve water quality at the intake gate would be to divert major Sacramento Valley agricultural drainage and Sacramento Regional Water Treatment Plant (WTP) effluent to the Yolo Bypass. This option would also reduce the effects of CVP and SWP export facilities on fish by eliminating predation in Clifton Court Forebay, improving fish migration by closing the Delta cross channel gates, and by eliminating reverse flow. This concept was formulated in a plan proposed by the Interagency Delta Committee in 1965 as the Peripheral Canal. A statute that would have authorized this and many other additions to the SWP was rejected by the voters in 1982. Implementation of this project would result in substantial changes to CVP/SWP system operations (DWR Website 1994). This project is included in the qualitative cumulative analysis.

SOUTH-OF-DELTA WATER BANKING: MADERA IRRIGATION DISTRICT WATER BANKING PROJECT

The Madera Irrigation District (Madera or district) is in the process of developing the Madera Water Supply and Groundwater Enhancement Project in an effort to help reduce drought impacts in the San Joaquin Valley. The district has purchased a 13,648-acre ranch, which would be used for the project. Under this proposed project, pumping facilities would convey district water to the ranch, where the water would be allowed to percolate and form a 'water bank' beneath the ranch. Banked water could be pumped and used locally when supply is low, providing a key regional water supply benefit. The project would help the district in its efforts to conserve and more efficiently use its local and CVP water supplies.

Reclamation published a Draft EA/FONSI for the Pilot Recharge and Recovery Project at Madera Ranch in February 2007. The proposed action consists of the pilot recharge and recovery of up to 11 TAF per year of Madera's Friant Division CVP water between February 2007 and April 2009. The recharged water would eventually be recovered by pumping groundwater using existing wells within district boundaries (Madera Ranch property overlies the recovery area). Approval of these actions would allow Madera to use its 2006-2009 Friant Division allocations to collect data on recharge rates and groundwater hydrology in the area, thereby supplementing evaluations made about the suitability of the area for future recharge and banking operations. This project is included in the qualitative cumulative analysis.

SOUTH–OF-DELTA WATER BANKING: SEMITROPIC WATER STORAGE DISTRICT GROUNDWATER BANKING PROJECT

Semitropic Water Storage District (SWSD) has obtained the necessary permits to initiate construction of a second phase of its groundwater banking program. The new facility, called the Stored Water Recovery Unit, is designed to increase the storage capacity of the groundwater banking project by 650 TAF to a maximum of 1.65 MAF, and will increase recovery capacity by 200 TAF per year, for a total guaranteed or pumpback capacity of 290 TAF per year (SWSD Website 2004). Including its entitlement exchange capability of up to 133 TAF per year, the

SWSD Water Storage Bank will be able to deliver up to 423 TAF per year of dry year yield to the California Aqueduct.

Through a separate action, Reclamation has analyzed and proposes to approve a water transfer, groundwater banking and exchange project that would provide up to 15 TAF of water per year to the SWSD on behalf of Westlands Water District (Westlands) (Reclamation Website 2006b). The exchange could occur in one of three ways: (1) Westlands would exchange the requested amount of banked water for an equal amount of SWSD's allocation of SWP Table A water; (2) Westlands would exchange the requested amount of banked water for an equal amount of CVP water; or (3) SWSD would pump groundwater stored on behalf of Westlands into the California Aqueduct (Reclamation Website 2006b). The return of the water (up to 15 TAF) stored and credited within SWSD bank would be returned to Westlands via exchange within the next 10 years, subject to applicable CVP contractual requirements.

Additional opportunities for new water banking partners to share in the benefits of the Stored Water Recovery Unit are available. Future partners could include existing banking partners, public agencies, and the EWA Program. This project is included in the qualitative cumulative analysis.

SACRAMENTO RIVER WATER RELIABILITY STUDY

The purpose of the SRWRS is to develop a water supply plan that is consistent with the Water Forum objectives of pursuing a Sacramento River diversion to meet the water supply needs of the Placer-Sacramento region and to promote ecosystem preservation along the lower American River. Reclamation is preparing the SRWRS with the cost-sharing partners: Placer County Water Agency (PCWA), City of Sacramento, City of Roseville, and Sacramento Suburban Water District (SSWD). The NOI and NOP for preparation of a joint EIS/EIR were issued in July and August 2003, respectively. Reclamation is the lead agency under NEPA, and PCWA is the lead agency under CEQA.

To meet the water supply needs of the cost-sharing partners, the SRWRS will identify a package of water supply infrastructure components, including new or expanded diversion(s) from the Sacramento, Feather, or American Rivers, and new or expanded water treatment and pumping facilities, storage tanks, and major transmission and distribution pipelines. The additional water supplies considered in the SRWRS for each cost-sharing partner include: (1) additional water supply of up to 35 TAF for PCWA's M&I demand with a treatment capacity of 65 million gallons per day (mgd), (2) additional water supply of up to 29 TAF in Water Forum average, drier, and driest years for SSWD's M&I demand and groundwater stabilization program with a treatment capacity of 15 mgd, (3) additional water supply of up to 7,100 AF for the City of Roseville's M&I demand with a treatment capacity of 10 mgd, and (4) additional water supply of up to 58 TAF (see note below) with a water treatment capacity of 165 mgd for the City of Sacramento's M&I demand (Reclamation Website 2007b). This project is included in the qualitative cumulative analysis.

MONTEREY PLUS EIR

The Monterey Plus EIR addresses the Monterey Amendment to the SWP long-term water supply agreements as part of a settlement agreement in *Planning and Conservation League v. Department of Water Resources* (83 Cal. App. 4th 892 (2000) (PCL v. DWR).

In 1994, DWR and certain representatives of the SWP contractors agreed to a set of principles, known as the Monterey Agreement, to settle long-term water allocation disputes, and to establish a new water management strategy for the SWP. The disputes focused on the phrasing of Article 18 of the SWP contracts, which addresses the allocation of shortages in water supply, and particularly under what circumstances the initial reductions to agricultural use should be imposed prior to reducing allocations to urban contractors. The Monterey Agreement Statement of Principles, executed on December 1, 1994, resolved the allocation controversy by proposing contract revisions to eliminate initial agricultural use cutbacks and specifying that all project water would be allocated in proportion to contract amounts.

In May 1995, a Draft EIR for the Monterey Agreement was prepared by the Central Coast Water Authority (CCWA) and the Final EIR was completed in October 1995. CCWA certified the Final EIR in November 1995 and issued findings and mitigation measures. Subsequently, DWR relied on the EIR as a responsible agency and drafted a contract amendment. Twenty seven of the 29 SWP contractors (all except Plumas County and Empire West Side Irrigation District) executed the Monterey Agreement amendments.

DWR has been operating the SWP consistent with the provisions of the Monterey Agreement since 1996. On December 27, 1995, the Planning and Conservation League (PCL) filed a lawsuit against DWR and CCWA challenging the adequacy of the 1995 Monterey Agreement EIR. The Citizens Planning Association of Santa Barbara and Plumas County Flood Control and Water Conservation District joined the lawsuit. Ultimately, on September 15, 2000, the Third District Court of Appeal ruled that DWR had the statutory duty to serve as lead agency in assessing environmental consequences of the Monterey Agreement. The Appellate Court further held that the 1995 Monterey Agreement EIR failed to adequately analyze the impacts of deleting Article 18(b) (the provision for reallocation of water among contractors in the event of a defined permanent water shortage) and directed that a new EIR be prepared.

The Monterey Plus EIR evaluates the potential environmental impacts of changes to SWP operations that are a consequence of the Monterey Amendment, as well as the additional actions set forth in an agreement to settle litigation regarding the 1995 Monterey Amendment EIR. The settlement agreement addresses preparation of an EIR evaluating the allocation of SWP water supplies, transfer of Table A[4] amounts and land, water management provisions, financial restructuring, and other contract elements.

The NOP for the Monterey Plus EIR was issued on February 27, 2003. The Monterey Plus EIR will analyze resources that could be affected by the project, including but not limited to aesthetics, agricultural resources, air quality, biological resources, cultural resources, cumulative impacts, geology and soils, growth inducement, hazards and hazardous materials, hydrology and water quality, land use and planning, mineral resources, noise, population and housing, public services, recreation, transportation and traffic, utilities and service systems (DWR Website 2007a). This project is included in the qualitative cumulative analysis.

21.2.3.3 DRY YEAR WATER PURCHASE PROGRAM

In mid-January 2001, several CVP and SWP contractors requested that Reclamation and DWR initiate planning for a dry year water acquisition program, based on the dry year hydrology to date. DWR announced the 2001 Dry Year Water Purchase Program (Dry Year Program) in March 2001. This program was the first dry year acquisition program by DWR since the 1991, 1992, and 1994 Drought Bank programs. The Dry Year Program was implemented again in

[4] Table A lists the amounts of SWP water made available each year. Under certain conditions, the contractor may receive a lesser amount.

2002 through 2004, and may be activated in the future to help public agencies throughout California supplement their water supplies in dry years.

The program intends to reduce the possibility of any hardship associated with water shortages through the facilitation of water transfers, and it is open to CVP contractors, SWP contractors, and third party users. In 2001, DWR provided 138.8 TAF of water from willing sellers in Northern California to eight SWP contractors (DWR Website 2002). In 2002, DWR secured 22 TAF of water from willing sellers in Northern California and provided it to four water agencies throughout the state. In 2003 and 2004, DWR purchased very little water under the program.

Transfers negotiated between CVP and SWP contractors and other water users, such as the 2001 CVP Forbearance Agreement with Westlands and the 2003 crop idling acquisition by MWD from water agencies upstream of the Delta as part of its Colorado River Contingency Plan, are parts of the Dry Year Program. The mandatory reduction in California's use of Colorado River[5] water could increase demand for water upstream of the Delta, and increase acquisitions under the Dry Year Program. This project is included in both the qualitative and quantitative cumulative analyses.

21.2.3.4 THE GOVERNOR'S DROUGHT RISK REDUCTION INVESTMENT PROGRAM

As part of the implementation of the CALFED Bay-Delta Program, the Governor convened a panel to develop plans for California to respond to future droughts. This plan was referred to as the Drought Risk Reduction Investment Program (DRRIP). Other environmental documents (e.g., existing EWA EIS/EIR) identified the DRIPP as a water acquisition project that was included in the cumulative condition. However, because of California's budget crisis, the program lost funding and was discontinued in 2003. Therefore, the DRIPP is not included in the cumulative analysis for this EIR/EIS.

21.2.3.5 DELTA WATER SUPPLY PROJECT

The Delta Water Supply Project (DWSP) would involve development of a new supplemental water supply for the City of Stockton by diverting water from the San Joaquin River, treating the Delta water at a new WTP, and distributing the treated water for M&U uses. The DWSP would consist of a surface water diversion/intake facility, a new raw water conveyance pipeline, a new water treatment facility, and treated water transmission pipelines to deliver water to the city's existing water distribution system. The project also would include a groundwater recharge component. Treated surface water would be injected into the groundwater aquifer for storage until it is needed, and then would be pumped or "recovered" from the groundwater aquifer for use (City of Stockton 2003).

The Final EIR was completed in 2005. Construction is anticipated to begin in 2008, and the first phase (including the WTP) of the project is scheduled for completion by 2010 (City of Stockton Website 2006). This project is included in the qualitative cumulative analysis.

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[5] Through the negotiation and settlement process leading up to the Colorado River Water Delivery Agreement, signed in 2003, the State of California has agreed to take specific, incremental steps that will reduce its diversions of Colorado River water in the next 14 years, allowing the state to live within its authorized annual share of 4.4 MAF (USDOI 2003).

21.2.3.6 *San Joaquin River Restoration Settlement Act*

The agreement to restore water flows for salmon in the San Joaquin River below Friant Dam (i.e., the "Settlement") was announced September 13, 2006 by the Natural Resources Defense Council, Friant Water Users Authority (FWUA) and the U.S. Departments of Interior and Commerce. It provides for river channel improvements and sufficient water to sustain a salmon fishery upstream of the confluence of the Merced River tributary, while maintaining water supply reliability to Reclamation's Friant Division water contractors.

The Settlement is based on two goals and objectives:

(1) A restored river with continuous flows to the Delta and naturally reproducing populations of Chinook salmon. The focus is the 153-mile stretch of the river between Friant Dam and the Merced River.

(2) A water management program to minimize water supply impacts to San Joaquin River water users. The San Joaquin River currently provides supplies to approximately 15,000 small farms.

Restoring continuous flows to the approximately 60 miles of dry river will be undertaken in a phased manner. Flows will be gradually increased over the next several years, with salmon being re-introduced by December 31, 2012. The Settlement continues in effect until 2026. After 2026, the U.S. District Court, in conjunction with the SWRCB, will consider any requests by the parties for changes in the restoration program.

The Settlement requires specific releases of water from Friant Dam to the confluence of the Merced River, designed to support the various life stages of spring-run and fall-run Chinook salmon. The release schedule assumes continuation of the current average Friant Dam release of 116,741 AF, with additional flow requirements depending on the water year type. These additional flow requirements vary from 247 TAF in most dry years, to 555 TAF in wet years. The projected impact on Friant Division long-term water contractor deliveries is a reduction of 170 TAF per year (about 15 percent of the 1,150,000 AF of current average deliveries). Through water management strategies, Friant has agreed to reduce or avoid these water supply impacts via strategies including using surplus water to enhance groundwater programs, and developing programs to return water to Friant water users through recapture, recirculation, transfers, and exchanges.

Exhibit B of the Settlement specifies the seasonal flow releases from Friant Dam for specified water year types. These flows may be augmented by buffer flows of up to 10 percent, and further augmented by acquisition of water from willing sellers. Interim flows for experimental purposes may be initiated in 2009. Full implementation of the flows will require prior improvement to channel capacities. Full restoration flows are to begin on January 1, 2014. Interim flows are expected to begin in fall 2009.

The full restoration releases are as follows:

- Wet years (defined as the wettest 20 percent of years) - 555,568 AF
- Normal wet years (next 30 percent of years) - 356, 281 AF
- Normal dry years (next 30 percent of years) - 247,876 AF
- Dry years (next 15 percent of years) - 184,021 AF
- Critical years (remaining 5 percent of years) - 0 to 70,795 AF (depending on San Joaquin River runoff)

The Settlement agreement contains no definition of how restoration water released from Friant Dam would be recaptured and recirculated. Potentially any increase in flows on the San Joaquin River at Vernalis, derived from the above restoration releases, could be offset by a reduction in releases from New Melones Reservoir. Reclamation is required to operate New Melones Reservoir to meet water quality standards at Vernalis. There is no certainty that the Settlement would result in increased Delta inflow. Any increased flows into the Delta could potentially be recaptured by the CVP and SWP at Jones and Banks pumping plants. While this type of recapture and recirculation has been discussed, no details or analysis is presented in the public Settlement documents. Friant Dam restoration releases in the July to September period vary from 230 cfs in critical years to 350 cfs in wet years. The Settlement targets primarily the March-April period for restoration releases, and the March-June period for restoration releases in wet years. This project is included in the qualitative cumulative analysis.

21.2.3.7 OROVILLE FACILITIES FERC RELICENSING

DWR developed the Oroville Facilities as part of the SWP, and manages them for the primary purpose of water supply. However, the facilities also are managed for other purposes, including flood management, power generation, recreation, fish and wildlife enhancement, and salinity control in the Delta. Because the existing FERC license for the Oroville Facilities expired on January 31, 2007, DWR filed a license application with FERC in 2005 and is seeking a new license to continue to own, operate, and maintain the Oroville Facilities (FERC Project No. 2100) according to the requirements of the FPA and FERC regulations (DWR 2001). DWR's goal in the relicensing process is to obtain a new license that provides for the above purposes while also addressing stakeholder needs identified through the relicensing process.

In 2007, FERC issued a Final EIS (FERC 2007) that analyzed the environmental impacts associated with the issuance of a new license for the existing hydropower project and recommended conditions for inclusion in any license issued. In addition to the power and development purposes for which licenses are issued, FERC is required to give equal consideration to energy conservation and the protection and enhancement of fish and wildlife, aesthetics, cultural resources, and recreational opportunities. Overall, the measures proposed by DWR, along with additional recommended and revised measures provided by FERC staff, would protect and enhance existing water use, water quality, fish and wildlife, land use, aesthetics, recreational, and cultural resources. In addition, the project would continue to provide a large portion of the electricity needed to pump water through the SWP at a lower cost than potential replacement power sources. Based on FERC's analysis of the Oroville Facilities Project in the Draft EIS, the agency has concluded that issuing a new license for the project as proposed by DWR, along with staff's modification and additions to those proposals, would be best adapted to a comprehensive plan for the proper use, conservation, and development of the Feather River (FERC 2006).

21.2.3.8 FREEPORT REGIONAL WATER PROJECT

EBMUD has entered into a partnership with the SCWA to design and build a regional water supply project that will assure water for East Bay customers in dry years and needed water for the Sacramento region. EBMUD's Mokelumne River water supply is adequate to meet the water supply needs of the district's 1.3 million customers in normal and wet years, but in prolonged droughts, customers face severe rationing. Through the FRWP, EBMUD customers' drought year cutbacks will be reduced.

In 2002, EBMUD and the County of Sacramento (in association with the City of Sacramento and with support from Reclamation) formed the FRWA, which is responsible for the joint effort to draw water from the Sacramento River near the town of Freeport. The Draft EIR was published in 2003 and the Final EIR was published and certified in 2004. Reclamation issued the ROD in January 2005.

The following elements were approved under the 2004 EIR and subsequently refined through supplemental CEQA documents in 2006:

- A new 185 mgd water intake structure and pump station on the Sacramento River near Freeport;
- A new large diameter pipeline to transport water eastward to the new SCWA WTP and the existing Folsom South Canal to supply EBMUD customers;
- A new WTP in central Sacramento County, owned and operated by SCWA, which will provide treated surface water supplies to the Sacramento area; and
- A new pumping facility and large diameter pipeline will treat and transport water from the southern end of the Folsom South Canal to EBMUD's Mokelumne Aqueduct for use by EBMUD customers.

This program is included in the 2004 OCAP consultation and, thus, in the hydrologic modeling used to conduct the quantitative analyses.

21.2.3.9 Trinity River Mainstream Fishery Restoration Program

The purpose of this program is to alleviate impacts to fish due to deliveries of CVP water from the Trinity River. The Draft EIS for the Trinity River Mainstream Fishery Restoration Program was issued in October 1999, the Final EIS was issued in November 2000, and the ROD was signed in December 2000. Westlands filed suit against the Interior to enjoin it from implementing the ROD, which would increase the flow of water to the Trinity River, resulting in less water being imported from the Trinity River at Lewiston Dam to the Central Valley. Under the ROD, Interior would boost water flows on the lower Trinity to an average of 595 TAF annually, compared to the roughly 340 TAF previously retained in the river. Implementation of ROD was delayed due to litigation and completion of a Supplemental EIS (SEIS). A Draft SEIS was published in April 2004, however work on the SEIS was suspended pending resolution of court proceedings. In November 2004, the U.S. Court of Appeals denied the petitions for rehearing filed by Westlands and the Northern California Power Agency. The SEIS will not be completed and the ROD is now being implemented. This program is included in the 2004 OCAP consultation and, thus, in the hydrologic modeling used to conduct the quantitative analyses.

21.2.3.10 Sacramento Valley Water Management Program

The short-term phase of the SVWMP resolves water quality and water rights issues arising from the need to meet the flow-related water quality objectives of the 1995 Bay-Delta WQCP and the SWRCB’s Phase 8 Water Rights Hearing process. In addition, the Short-Term Program would promote better water management in the Sacramento Valley and develop additional water supplies through a cooperative water management partnership. Program participants include Reclamation, DWR, Northern California Water Association, San Luis & Delta-Mendota Water Authority, some Sacramento Valley water users, and CVP and SWP contractors. Short-Term Program actions would be locally proposed projects and actions that include the development of groundwater to substitute for surface water supplies, conjunctive use of groundwater and surface water, refurbishing existing groundwater extraction wells, installing groundwater monitoring stations, installing new groundwater extraction wells, reservoir reoperation, system improvements such as canal lining, tailwater recovery, and improved operations, and surface and groundwater planning studies. These short-term projects and actions would be implemented for a period of 10 years in areas of Shasta, Butte, Sutter, Glenn, Tehama, Colusa, Sacramento, Placer, and Yolo counties. The NOI/NOP was published on August 5, 2003. This program is included in the hydrologic modeling used to conduct the quantitative analyses.

21.2.3.11 Folsom Dam Safety and Flood Damage Reduction Project

The Folsom Dam Safety and Flood Damage Reduction Project would improve public safety downstream of Folsom Dam by modifying the dam and its appurtenant structures. To mitigate potential safety concerns identified in previous and ongoing corrective action studies, potential modification alternatives address a combination of hydrologic, seismic, and static issues of the Folsom Dam complex, which includes the Main Folsom Dam, Mormon Island Auxiliary Dam, the two wing dams and eight dikes. Potential modification alternatives include, but are not limited to, construction of an auxiliary spillway, dam, and embankment raises, seismic retrofitting of structures, and dam and embankment static options. A major component of the project includes location and extractions of adequate borrow materials for embankment modifications. The Draft EIS/EIR was published in November 2006, and the Final EIS/EIR was released in March 2007 (Reclamation Website 2007a).

The Corps intends to adopt the Final EIS/EIR to satisfy the requirements of NEPA for flood damage reduction features of the proposed action to be accomplished under the Corps' Folsom Dam Modifications and Folsom Dam Raise Projects. This project is included in the qualitative cumulative analysis[6].

21.2.3.12 Folsom Dam Raise Project

In February 2002, the Corps issued the Supplemental Plan Formulation Report/EIS/EIR for the American River Watershed, California, Long Term Study, which describes, analyzes, and reports impacts of flood damage reduction and ecosystem restoration along the American River, and includes the Corps' proposal to raise Folsom Dam seven feet to reduce the Sacramento area's flood risks. Study of the American River Watershed was initially authorized in the Flood Control Act of 1962 (PL 87-874) with direction from Congress given to the Corps to survey for flood control and allied purposes (Corps Website 2007).

The feasibility study was conducted in coordination with the Reclamation Board and SAFCA as the non-federal sponsors. This study supplements the 1996 Supplemental Information Report and the 1991 Feasibility Report for the American River Watershed Investigation. This document and its technical appendices support decision-making by the Corps and the non-federal sponsors, which include the Reclamation Board and SAFCA. In May 2006, the Corps issued the Public Draft SEIS/EIR and the Post Authorization Decision Document for the Folsom Dam Raise, Folsom Bridge portion of the American River Project (Corps Website 2007).

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[6] Although conditions in the lower American River are not specifically analyzed in the individual resource chapters of this EIR/EIS (see Chapter 4), the Folsom Dam Modifications Project and the Folsom Dam Raise Project are considered in the qualitative cumulative analysis for completeness, and because these projects have the potential to result in considerable changes to CVP/SWP system-wide operations in the future.

Construction of Folsom Bridge is expected to begin in the fall of 2007. This project is included in the qualitative cumulative analysis.

21.2.3.13 *LOCAL PROJECTS*

YCWA GROUNDWATER MANAGEMENT PLAN

Over the past decade, YCWA and its Member Units have taken an active and progressive role in managing the groundwater resources of the North Yuba and South Yuba groundwater subbasins. In addition to the surface water delivered by the YCWA, the Member Units have existing capacity to pump groundwater to meet parts of their demands. The five municipal purveyors (California Water Service, Linda County Water District, the City of Wheatland, Olivehurst Public Utility District (OPUD)[7], and Beale AFB) located over these groundwater subbasins rely exclusively on groundwater to meet their needs. Other water purveyors in Yuba County use combinations of groundwater and surface water supplies to meet demands.

To better manage groundwater resources in Yuba County, YCWA prepared a Groundwater Management Plan consistent with the provisions of Water Code § 10750 *et seq.*[8] as amended January 1, 2003. The YCWA Groundwater Management Plan was developed to build on and formalize the historically successful management of Yuba County's groundwater resources, and to develop a framework for implementation of future activities. In addition to several other districts in Yuba County that have adopted groundwater management plans, YCWA adopted the Groundwater Management Plan in February 2005.

As part of basin management, YCWA, DWR, and the Member Units have instituted a monitoring plan to record in detail the water levels and water quality of the groundwater subbasins. The monitoring plan will be included as part of the Proposed Project/Action and alternatives for this EIR/EIS.

The groundwater management approach for groundwater substitution transfers in Yuba County is embodied in three principles:

- Closely monitor conditions to watch for any potential significant impacts and to gain a better understanding of the groundwater resource;
- Immediately respond to any significant impacts that occur and mitigate those impacts with appropriate measures; and
- Utilize the transfer and associated activities to further the goal of effective management of the water resources of Yuba County through conjunctive use of groundwater and surface water.

YCWA's and DWR's coordinated implementation of the Groundwater Program for the Yuba Basin will protect Yuba County's groundwater resources. YCWA also works with DWR in monitoring the basin and has been instrumental in extending the monitoring network of wells in the basin. YCWA and the districts participating in water transfers also meet regularly to discuss the management of the groundwater subbasins. This project is included in the qualitative cumulative analysis.

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[7] The OPUD is currently scheduled to provide water to the Plumas Lake Specific Plan Area, at which time the area will be annexed into OPUD's service area.

[8] The authority to manage groundwater resources in Yuba County is provided through the Yuba County Water Agency Act and Water Code Division 6, Part 2.75 (Water Code Sections 10750 *et seq.*).

SOUTH FISH SCREEN

As an outgrowth of the collaborative discussions regarding the Proposed Yuba Accord, YCWA recently executed a letter of agreement with CDFG to resolve issues associated with the water diversion and fish screen located on the south bank of the Yuba River immediately upstream from Daguerre Point Dam. The parties who developed the Proposed Yuba Accord's Fisheries Agreement recognize that addressing these issues is an important step in the ultimate improvement of habitat for the lower Yuba River's salmon and steelhead populations. Under this letter agreement, CDFG and YCWA, in coordination with environmental and fisheries interests and the local irrigation districts and mutual water companies that receive their water supplies through the South Canal, will collaborate on development and implementation of a plan to construct a new fish screen at the head of this canal so that South Canal diversions will comply with applicable federal and state fish screen criteria. Improved protections for the Yuba River fisheries and continued irrigation supplies to farmers in the southern portion of Yuba County are co-equal objectives of this collaborative effort. The overall plan will include a feasibility study phase, a design study phase, and a construction phase. The letter agreement between YCWA and CDFG specifies timelines for these elements. This project is included in the qualitative cumulative analysis.

FEDERAL ENERGY REGULATORY COMMISSION YUBA RIVER DEVELOPMENT PROJECT RELICENSING

YCWA's Yuba Project (FERC No. 2246) was completed in 1970. Major Yuba Project facilities include New Bullards Bar Dam and Reservoir on the North Yuba River, New Colgate Powerhouse on the North Yuba River, Our House Dam on the Middle Yuba River, Log Cabin Dam on Oregon Creek, and the Narrows II Powerhouse on the lower Yuba River. The Yuba Project's operations are coordinated with the Corps and PG&E operation of Englebright Dam and Reservoir and the operation of Narrows I Powerhouse on the lower Yuba River, just below Englebright Dam. The FERC license for the Yuba Project will expire in 2016.

Prior to the expiration of the Yuba Project license, YCWA must undergo a relicensing process that allows FERC, state and federal resource agencies (CDFG, SWRCB, USFWS, NMFS, etc.), conservation groups, and the general public to reconsider appropriate operations and land management for the project in consideration of current social and scientific knowledge. A provision of the FPA (FERC's operating law) known as the Equal Consideration Standard states:

> *In deciding whether to issue a license, the Commission must give equal consideration to developmental and environmental values, including: hydroelectric development; fish and wildlife resources, including their spawning grounds and habitat; visual resources; cultural resources; recreational opportunities and other aspects of environmental quality; irrigation; flood control; and water supply.*

In the relicensing process, FERC will be obligated to prepare an EA or EIS, which will assess the environmental consequences of the proposed future operation of the Yuba Project and compare the potential impacts of proposed alternatives. Along with the EA or EIS, proposed license terms and conditions, and PM&Es will be considered. FERC likely will issue a Final EA or EIS and a decision on the license renewal, which is anticipated to include terms and conditions for operating the hydropower project. Because this renewal has a different timeframe than the Yuba Accord, it is not considered in the quantitative cumulative analysis. This project is included in the qualitative cumulative analysis.

YCWA FLOOD OPERATIONS OBLIGATIONS

Flood control is one of the purposes of the YCWA, as defined and authorized in the legislative authorization for the agency. During the past 10 years, YCWA has worked on behalf of various flood control efforts within Yuba County by soliciting grant, state and federal funding for various flood control projects, supporting and coordinating the activities of landowners and local agencies within Yuba County in support of flood control projects, and occasionally providing funding for various elements of flood control studies. In general, YCWA's activities in flood control involve funding, administration, management, and planning types of activities.

YCWA will continue to work on various elements of flood control in Yuba County, with the ultimate goal of achieving a satisfactory level of flood protection for Yuba County's citizens. However, the specific projects that will be undertaken or support activities in which YCWA will engage are not fully known at this time. Frequently, YCWA supports initiatives of other agencies (such as DWR or the Corps) or acts as a partner in those projects, providing local partner coordination for larger regional projects. As a result, YCWA does not necessarily select priorities for flood control.

At this time, although it is certain that YCWA will be involved in various flood control activities and projects in the future, the specific projects and YCWA's specific role and participation are not known. As a result, the cumulative impacts of yet-unspecified flood control projects will not be assessed further in this EIR/EIS.

YCWA ENGLEBRIGHT RESERVOIR INTAKE EXTENSION PROJECT

The Narrows II Powerhouse Intake Extension Project is a conceptual-level project that would lower the intake for the Narrows II Powerhouse to provide cooler water temperatures for releases through the Narrows II Powerhouse to the lower Yuba River. YCWA is charged with diligently pursuing the development of the Narrows II Powerhouse Intake Extension Project pursuant to RD-1644, including submittal of proposals for project funding and preparation of permitting and CEQA documentation.

At this time, the project has only a conceptual-level design, and no current source of funding for continued design work, permitting or construction. As a result, the cumulative impacts of this project will not be assessed further in this chapter.

21.3 SUMMARY OF CUMULATIVE IMPACTS

Resource specific cumulative impacts are analyzed and presented in each of the individual resource chapters included in this EIR/EIS. The discussion of cumulative water supply changes that could be expected under future with-project conditions, relative to future without-project conditions, provides quantified hydrological information that is used to evaluate cumulative impacts on specific resources. While significant conclusions are not discussed for cumulative water supply changes, they are discussed for resource-specific impacts that may be affected by water supply changes. **Table 21-2** summarizes the findings of the resource specific cumulative analyses, which are fully described in the EIR/EIS chapters.

Table 21-2. Summary of Cumulative Impacts for the Proposed Lower Yuba River Accord

Potential Cumulative Impacts for the Resources Addressed in the EIR/EIS	Yuba Accord Alternative Cumulative Condition vs. Existing Condition	Modified Flow Alternative Cumulative Condition vs. Existing Condition
Surface Water Supply and Management (Chapter 5)		
Potential for cumulative surface water supply and management impacts within the Yuba Region	PSU	PSU
Potential for cumulative surface water supply and management impacts within the Delta Region	PSU	PSU
Potential for cumulative surface water supply and management impacts within the Export Service Area	PSU	PSU
Groundwater Resources (Chapter 6)		
Potential for cumulative groundwater resources impacts within the Yuba Region	LTS	LTS
Power Production and Energy Consumption (Chapter 7)		
Potential for cumulative hydropower impacts within the Yuba Region	PSU	PSU
Potential for cumulative hydropower impacts within the CVP/SWP Upstream of the Delta Region	PSU	PSU
Potential for cumulative hydropower impacts within the Delta Region	PSU	PSU
Potential for cumulative hydropower impacts within the Export Service Area	PSU	PSU
Flood Control (Chapter 8)		
Potential for cumulative flood control impacts within the Yuba Region	LTS	LTS
Potential for cumulative flood control impacts within the CVP/SWP Upstream of the Delta Region	LTS	LTS
Potential for cumulative flood control impacts within the Delta Region	LTS	LTS
Potential for cumulative flood control impacts within the Export Service Area	LTS	LTS
Surface Water Quality (Chapter 9)		
Potential for cumulative water quality impacts within the Yuba Region	LTS	LTS
Potential for cumulative water quality impacts within the CVP/SWP Upstream of the Delta Region	PSU	PSU
Potential for cumulative water quality impacts within the Delta Region	PSU	PSU
Potential for cumulative water quality impacts within the Export Service Area	LTS	LTS
Fisheries and Aquatic Resources (Chapter 10)		
Potential for cumulative fisheries and aquatic resources impacts within the Yuba Region	B	B
Potential for cumulative fisheries and aquatic resources impacts within the CVP/SWP Upstream of the Delta Region	PSU	PSU
Potential for cumulative fisheries and aquatic resources impacts within the Delta Region	PSU	PSU
Potential for cumulative fisheries and aquatic resources impacts within the Export Service Area	LTS	LTS

Potential Cumulative Impacts for the Resources Addressed in the EIR/EIS	Yuba Accord Alternative Cumulative Condition vs. Existing Condition	Modified Flow Alternative Cumulative Condition vs. Existing Condition
Terrestrial Resources (Chapter 11)		
Potential for cumulative terrestrial resources impacts within the Yuba Region	LTS	LTS
Potential for cumulative terrestrial resources impacts within the CVP/SWP Upstream of the Delta Region	PSU	PSU
Potential for cumulative terrestrial resources impacts within the Export Service Area	LTS	LTS
Recreation (Chapter 12)		
Potential for cumulative recreation impacts within the Yuba Region	LTS	LTS
Potential for cumulative recreation impacts within the CVP/SWP Upstream of the Delta Region	PSU	PSU
Potential for cumulative recreation impacts within the Delta Region	PSU	PSU
Potential for cumulative recreation impacts within the Export Service Area	LTS	LTS
Visual Resources (Chapter 13)		
Potential for cumulative visual resources impacts within the Yuba Region	LTS	LTS
Potential for cumulative visual resources impacts within the CVP/SWP Upstream of the Delta Region	LTS	LTS
Potential for cumulative visual resources impacts within the Delta Region	LTS	LTS
Potential for cumulative visual resources impacts within the Export Service Area	LTS	LTS
Cultural Resources (Chapter 14)		
Potential for cumulative cultural resources impacts within the Yuba Region	LTS	LTS
Potential for cumulative cultural resources impacts within the CVP/SWP Upstream of the Delta Region	LTS	LTS
Potential for cumulative cultural resources impacts within the Delta Region	LTS	LTS
Potential for cumulative cultural resources impacts within the Export Service Area	LTS	LTS
Air Quality (Chapter 15)		
Potential for cumulative air quality impacts within the Yuba Region	LSM	LSM
Land Use (Chapter 16)		
Potential for cumulative land use impacts within the Yuba Region	LTS	LTS
Socioeconomics (Chapter 17)		
Potential for cumulative socioeconomic impacts within the Yuba Region	NI	NI
Growth Inducement (Chapter 18)		
Potential for cumulative growth inducing impacts within the Yuba Region	NA	NA

Potential Cumulative Impacts for the Resources Addressed in the EIR/EIS	Yuba Accord Alternative Cumulative Condition vs. Existing Condition	Modified Flow Alternative Cumulative Condition vs. Existing Condition
Environmental Justice (Chapter 19)		
Potential for cumulative environmental justice impacts within the Yuba Region	NI	NI
Indian Trust Assets (Chapter 20)		
Potential for cumulative ITA impacts within the Yuba Region	NI	NI
Potential for cumulative ITA impacts within the CVP/SWP Upstream of the Delta Region	NI	NI
Potential for cumulative ITA impacts within the Delta Region	NI	NI

Level of Significance (CEQA/NEPA)
B = Beneficial
NI = No Impact
LTS = Less Than Significant Cumulative Impact
PSU = Potentially Significant Unavoidable Cumulative Impact
LSM = Less Than Significant Cumulative Impact with Mitigation Measures Incorporated
NA = Not Applicable

CHAPTER 22
CLIMATE CHANGE CONSIDERATIONS

22.1 INTRODUCTION

Global climate change is playing an increasingly important role in scientific and policy debates related to effective water management. The most considerable impacts of climate change on water resources in the United States are believed to occur in the mid-latitudes of the West, where the runoff cycle is largely determined by snow accumulation and subsequent melt patterns. It is well documented that the effects of warmer climates on the timing of runoff in these regions likely will shift a portion of spring and summer runoff to periods earlier in the year (Vanrheenen *et al.* 2001). Despite the high degree of regulation in many water supply systems throughout the western United States, the resultant effects of these shifts on runoff seasonality generally are considered to be undesirable, because the amount of water stored in snowpack can be substantial and, under normal (i.e., historical) conditions, this stored water is relied upon to augment low stream flows during the relatively dry summers (Vanrheenen *et al*. 2001).

In the past, efforts to address climate change issues typically have focused on complex details and analytical limitations of atmospheric science and modeling. More recently, however, increasing attention is being given to understanding possible consequences to society and the types of appropriate responses given many remaining uncertainties (Gleick 1997). This is particularly true in the area of water resources, where many decisions depend explicitly on the assumptions about future climatic conditions. Long-term water planning choices, the design and construction of new water supply infrastructure, agricultural planting patterns, urban water allocations and rate structures, and reservoir operating rules all depend on climatic conditions. Thus, it is vitally important that those responsible for water planning and management, policymakers, and especially the public, begin to think about the implications of climatic change for our water systems (Gleick 1997).

Evidence is continuing to accumulate to indicate global climate change is to have a marked effect on water resources in California. More than 150 peer-reviewed scientific articles on climate and water issues in California have been published to date, with many more in preparation, addressing a range of considerations from proposed improvements in the downscaling of general circulation models to understanding how reservoir operations might be adapted to new conditions (Kiparsky and Gleick 2003). Rising temperatures and sea levels, and changes in hydrological systems are recognized as potential threats to California's economy, public health and environment (California Energy Commission 2003). In addition to the need for better understanding of the potential implications associated with these changes, it also is recognized that more research is necessary to identify which systems are most vulnerable (U.S. Climate Change Science Program Website 2005).

Because the Proposed Project/Action or an alternative would have a duration of approximately eight years, it would not be in place for a sufficient amount of time to contribute to climate change impacts, or to be potentially influenced by CVP/SWP system operations resulting from future climate change impacts. However, because of the importance of this issue with respect to California water planning and management efforts in general, it does require consideration and, thus, the following discussion is provided.

22.2 REGULATORY SETTING

While there are numerous regulations related to air quality and emission in California standards, two recent state regulations specifically address issues surrounding global climate change. A description of these regulations can be found below.

22.2.1 EXECUTIVE ORDER S-3-05

The Governor of California signed Executive Order S-3-05 on June 1, 2005. The Order recognizes California's vulnerability to climate change, noting that increasing temperatures could potentially reduce snowpack in the Sierra Nevada Mountains, which serve as one of the state's primary sources of water. Additionally, according to the Order, climate change could influence human health, coastal habitats, microclimates, and agricultural yield. To address these potential impacts, the Order mandates greenhouse gas emission reduction targets. More specifically, by 2010, greenhouse gas emissions are expected to be reduced to 2000 levels; by 2020, emissions are expected to reach 1990 levels; and by 2050, emissions are expected to be 80 percent below 1990 levels. The Secretary of the California EPA will oversee the reduction program targets and coordinate efforts to meet these provisions with numerous state agencies, such as the Resources Agency, which includes DWR. The Secretary will also provide biannual reports to the Governor and the State Legislature regarding: (1) progress toward meeting the greenhouse gas emissions targets; (2) the ongoing impacts of global warming in the state, including impacts to water supply and the environment; and (3) potential mitigation and adaptation plans to combat these impacts. In order to achieve the climate change emission targets, in June 2005, the Secretary formed the Climate Action Team, which is comprised of administrators from numerous state agencies.

22.2.2 ASSEMBLY BILL 32 – CALIFORNIA GLOBAL WARMING SOLUTIONS ACT

The California Global Warming Solutions Act of 2006 (AB 32) was signed into law on September 27, 2006. With the Governor's signing of AB 32, the Health and Safety Code (Section 38501, Subdivision (a)) now states the following:

> "*Global warming poses a serious threat to the economic well-being, public health, natural resources, and the environment of California. The potential adverse impacts of global warming include the exacerbation of air quality problems, a reduction in the quality and supply of water to the state from the Sierra snowpack, a rise in sea levels resulting in the displacement of thousands of coastal businesses and residences, damage to marine ecosystems and the natural environment, and an increase in the incidences of infectious diseases, asthma, and other human health-related problems*."

The bill will require the CARB, in coordination with state agencies as well as members of the private and academic communities, to adopt regulations to require the reporting and verification of statewide greenhouse gas emissions and to monitor and enforce compliance with this program. Similar to Executive Order S-3-05, under the provisions of the bill, by 2020, statewide greenhouse gas emissions will be limited to the equivalent emission levels in 1990. By January 2008, the CARB will determine the statewide greenhouse gas emission level in 1990 through review of the best available scientific, technological, and economic information, as well as provide opportunities for public review and comment. To achieve the 2020 reduction goal, by January 2011, the CARB shall adopt emission limits and reduction measures, which may include a system of market-based declining annual aggregate emission limits for sources or categories of sources that emit greenhouse gases. It is anticipated that limits and emission standards adopted by the CARB will become operative beginning January 2012. In addition, the Climate Action Team established by the Governor to coordinate the efforts set forth under Executive Order S-3-05 is expected to continue its role coordinating overall climate policy.

22.3 TYPES OF POTENTIAL IMPACTS TO ENVIRONMENTAL RESOURCES IN CALIFORNIA RESULTING FROM GLOBAL CLIMATE CHANGE

Global climate change has the potential to impact numerous environmental resources in California through potential, though uncertain, impacts related to future air temperatures and precipitation patterns, and the resulting implications to stream runoff rate and timing, water temperatures, reservoir operations, and sea levels. Although current models are broadly consistent in predicting increases in probable global air temperatures and increasing levels of greenhouse gasses resulting from human activities, there are considerable uncertainties about precipitation estimates. For example, many regional modeling analyses conducted for the western United States indicate that overall precipitation will increase, but uncertainties remain due to differences among larger-scale General Circulation Models (GCMs)(Kiparsky and Gleick 2003). Some researchers believe that climate warming might push the storm track on the West Coast further north, which would result in drier conditions in California. At the same time, relatively newer GCMs, including those used in the National Water Assessment, predict increases in California precipitation (DWR 2005). Similarly, two popular climate models, including HadCM2 developed by the U.K. Hadley Center and PCM developed by the U.S. National Center for Atmospheric Research, also predict very different future scenarios. The HadCM2 predicts wetter conditions while the PCM predicts drier conditions (Brekke *et al.* 2004).

While much variation exists in projections related to future precipitation patterns, all available climate models predict a warming trend resulting from the influence of rising levels of greenhouse gasses in the atmosphere (Barnett *et al.* 2005). The potential effects of a warmer climate on the seasonality of runoff from snowmelt in California's Central Valley have been well-studied and results suggest that melt runoff would likely shift from spring and summer to earlier periods in the water year (Vanrheenen *et al*. 2001). Currently, snow accumulation in the Sierra Nevada acts as a natural reservoir for California by delaying runoff from winter months when precipitation is high (Kiparsky and Gleick 2003). Despite the uncertainties about future changes in precipitation rates, it is generally believed that higher temperatures will lead to changes in snowfall and snowmelt dynamics. Higher atmospheric temperatures will likely increase the ratio of rain to snow, shorten and delay the onset of the snowfall season, and accelerate the rate of spring snowmelt, which would lead to more rapid and earlier seasonal runoff relative to current conditions (Kiparsky and Gleick 2003). Studies suggest that the spring stream flow maximum could occur about one month earlier by 2050 (Barnett *et al*. 2005).

Based on consideration of future air temperature and precipitation changes and the results of recent local and regional climate change studies (see Section 22.4), the types of potential climate change effects that could be expected to occur on various resources within the Central Valley of California may include:

- ***Water Supply.*** The impacts of climate change on water supply and availability could have direct and indirect effects on a wide range of institutional, economic and social factors (Gleick 1997). Still, considerable uncertainty exists on the overall impact to future water supplies. For example, Brekke (2004) suggest two equally probable projections based on the type of model used for analyses. Based on HadCM2 projections, there would be increased reservoir inflows, increased storage limited only by current capacity, and increased river flows, relative to current conditions. In contrast, PCM models suggest decreased reservoir inflows, decreased storage and decreased river flows. Nevertheless, changes in water supply are expected and small changes in inflows could result in large changes in the reliability of water yields from reservoirs (Kiparsky and Gleick 2003). Further exacerbating potential climate change impacts, future water systems will likely already be increasingly stressed by other factors, including population growth, competition for financial resources from other sectors, and disputes over water allocations and priorities.

- ***Sea Levels.*** Existing global climate changes may already be contributing to a rise in sea level. For example, sea levels recorded at the Golden Gate Bridge in San Francisco have risen 0.2 m (0.7 feet) in the last century, and are expected to rise another 0.5 m (1.6 feet) by 2100 (DWR 2005). Impacts associated with a rise in sea level would likely be most significant in the Delta, where a rise in sea level would increase pressure on levees currently protecting low-lying lands, much of which is already below sea level. DWR (2005) reports that a one-foot rise in sea level would increase the frequency of the 100-year peak high tide to a 10-year event. Additionally, a rise in sea level would cause increased salinity intrusion from the ocean, which could degrade freshwater supplies pumped from the Delta, and necessitate increased reservoir releases upstream to dilute intruding sea water. Sea level rise could also threaten coastal aquifers (DWR 2005).

- ***Hydropower Generation***. Hydropower production is generally a function of reservoir storage. Climate changes that decrease the quantity or alter the timing of available water (i.e., reservoir inflows), as predicted by the PCM models for example, have the potential to adversely impact the productivity of hydroelectric facilities. Alternatively, reliable increases in average flows would increase hydropower production (Kiparsky and Gleick 2003). One study (Vanrheenen *et al.* 2004) based on the PCM model, suggests potential decreases in hydropower production at Shasta Reservoir ranging from 4 to 11 percent over various time periods during the next hundred years, while total Central Valley hydropower production could decrease by 6 to 12 percent.

- ***Surface Water Quality***. Water quality depends on several variables including water temperature, flow, runoff rate and timing, and the physical characteristics of the watershed. Climate change has the potential to alter all of these variables. Depending on basin hydrology, higher winter flows could dilute pollutants, or conversely, increase erosion, sedimentation, and chemical and nutrient loads in rivers (Kiparsky and Gleick 2003). In addition, non-point source pollutants could increase due to increased urban runoff. Still, much work remains to determine the potential global climate change impacts to water quality.

- ***Groundwater***. Reduced Sierra Nevada snowpack, earlier runoff, and reductions in spring and summer stream flows would likely affect surface water supplies and may place a heavier reliance on groundwater resources, which are already depleted in many of California's agricultural areas (Hayhoe *et al.* 2004). While warmer, wetter winters could increase the amount of water available for groundwater recharge, the additional winter runoff may occur when some basins are either being recharged at there maximum capacity or are already full (Kiparsky and Gleick 2003). In contrast, reductions in spring runoff and higher evapotranspiration resulting from higher temperatures could reduce the amount of water available for recharge (Kiparsky and

Gleick 2003). Unless precipitation increases, the higher levels of evaporation accompanying warmer air temperatures could also reduce groundwater supplies in the spring (California Energy Commission 2003).

- ***Fisheries and Aquatic Resources***. If air temperatures in California rise significantly, it will become increasingly difficult to maintain appropriate water temperatures in order to manage coldwater fisheries, including anadromous salmonids. A reduction in snowmelt and increased evaporation could lead to decreases in reservoir levels and, perhaps more importantly, coldwater pool reserves (California Energy Commission 2003). As a result, water temperatures in rivers supporting anadromous salmonids could potentially rise and no longer be able to support over-summering life stages (i.e., adult and juvenile spring-run Chinook salmon, juvenile steelhead). In fact, DWR (2006) suggests that under a warmer climate scenario, water temperature standards in the upper Sacramento River likely could not be maintained.

- ***Flood Control***. Flooding depends not only on precipitation, but also on the timing and intensity of that precipitation, two characteristics that are not well-modeled at the present time (Kiparsky and Gleick 2003). Still, under most climate change scenarios, reservoir inflow is expected to increase during the winter and decrease during the spring and summer, and given existing reservoir capacities, this runoff pattern could potentially result in increased flooding (California Energy Commission 2003). Moreover, if the increased inflow during the wet season cannot be managed effectively, then dry season water supply could decrease considerably even if overall annual water quantity increases, as projected by the HadCM2 models (Zhu *et al.* 2003).

- ***Air Quality***. Air quality indices consider several constituent parameters, and these concentrations are difficult to model, particularly considering the uncertainty regarding global climate change projections. However, a study conducted by the California Energy Commission (2003) reports that in the Bay Area and the Central Valley, given no other changes in weather or emissions, a 7.2°F warming would increase ozone concentrations by 20 percent and nearly double the size of the area out of compliance with national health standards for air quality.

- ***Socioeconomics***. Because of conflicts between flood control operations and hydropower objectives, climate change in California may require the release of more water in the early spring to reduce flood potential. This change could result in a reduction in hydropower generation and its economic value. Concurrently, production of power by fossil fuels may increase to meet energy demands at a cost of hundreds of millions of dollars and result in increased greenhouse gas emissions (Kiparsky and Gleick 2003). Additionally, higher energy and water costs would likely hit low-income households the hardest because these costs makeup a larger proportion of their expenditures, relative to higher income families (California Energy Commission 2003).

22.4 CLIMATE CHANGE CASE STUDIES IN THE CALIFORNIA CENTRAL VALLEY

Projecting the regional impacts of climatic change and variability relies first on GCMs, which develop large-scale scenarios of changing climate parameters, usually by comparing scenarios with different concentrations of greenhouse gases in the atmosphere (Kiparsky and Gleick 2003). In general, conclusions drawn from the GCM results suggest that a global warming trend in California would likely lead to more severe winter storms, earlier runoff from the Sierra Nevada snowpack, and reduced summer flows in tributary streams (Quinn *et al.* 2003). However, information provided by the GCMs is typically too coarse of a scale to make accurate regional assessments (Kiparsky and Gleick 2003). Consequently, recent efforts have resulted in reducing the scale and increasing the resolution of climate models by downscaling or integrating regional models into the global models.

Both GCMs and hydrologic models (i.e., CALSIM) have been utilized in a number of California climate change studies. Many of these studies focus on stream flow response to shifts in the timing and form of precipitation, and do not address inter-annual variability or scaling issues inherent in mapping GCM model output to more detailed watershed hydrologic models (Quinn *et al*. 2003). As a result, such studies do little more than make qualitative statements about the implications of these changes to environmental impacts (e.g., water quality, agriculture, fisheries) (Quinn *et al*. 2003). However, as will be seen in the following case studies, other investigations at least attempt to quantify impacts to environmental resources, particularly water supply.

Such efforts have focused attention on the issues of water management in California associated with potential hydrologic changes that may occur as a result of climate change. More recently, there has been progress in modeling climate change and its effects on a regional basis. Although there are still differences in some model projections (e.g., amount and timing of annual precipitation), projections on other variables are becoming more consistent (e.g., reduced snowpack, shift of snowmelt timing to an earlier time period, rises in sea level, and warmer weather patterns). Though differences in the hydrological response to climate change exist among model projections, these differences can be used to bracket the magnitude of anticipated changes allowing managers to develop different response scenarios. Some of the key findings of recent research efforts in the Central Valley of California are described below.

22.4.1 2005 Update to the DWR California Water Plan

The 2005 update to the California Water Plan (DWR 2005) contains an analysis of future water demands resulting from population growth, and additionally attempts to address potential impacts resulting from global climate change, as discussed below.

DWR has developed preliminary estimates of water demands that could reasonably be expected to occur by 2030. These preliminary estimates represent the expected water demands under three different future scenarios. The three future scenarios are defined as follows:

Scenario 1 – Current Trends: Recent trends for population growth and development patterns, agricultural and industrial production, environmental water dedication, and naturally occurring conservation measures (e.g., plumbing code changes, natural replacement, actions water users take on their own, etc.).

Scenario 2 – Less Resource Intensive: Recent trends for population growth, higher agricultural and industrial production, more environmental water dedication, and higher naturally occurring conservation.

Scenario 3 – More Resource Intensive: Higher population growth rate, higher agricultural and industrial production, no additional environmental water dedication, and lower naturally occurring conservation.

The greater urban water demand projected under all three scenarios presents significant challenges to water managers. Under the Current Trends scenario, DWR estimates an additional 3.6 MAF of urban and environmental water demand per year. Though there may be commensurate reductions in agricultural demand, this demand reduction would occur in the Central Valley, while much of the additional urban demand would occur in the southern part of the state, and the ability to transfer additional water there is constrained by conveyance facilities, area-of-origin issues, environmental impacts, and other third party effects. Although these projections describe additional water demands in California by 2030, they do not consider the capability of the water management system to meet those demands under different hydrologic conditions as those predicted by climate change models.

DWR (2005) also attempts to address concerns related to climate change. More specifically, DWR recognizes the potential for significant impacts associated with climate change, and these impacts warrant an examination regarding the ability of existing water supply infrastructure and natural systems to accommodate or adapt to climatic change. DWR (2005) identifies the following needs:

- The major tool for evaluating the impact on major water project systems is CALSIM, a model developed jointly by Reclamation and DWR. CALSIM currently relies on historic monthly hydrological data to assess project impacts. The development of modified input to CALSIM from the climate models is a major task and will require help from the research community. Enabling CALSIM to utilize data from climate models will allow for more proactive planning and development of strategies and options for improving water supply and quality.
- The linking of climate and hydrologic models is a major task but will provide a tool for evaluating multipurpose reservoir flood control aspects. The screening of climate models by experts in the field will be required to select those that provide the most plausible future scenarios. Because there will be competition between flood control and other purposes at the large multipurpose reservoirs due to earlier peak snowmelt runoff, an examination of space criteria allocated for flood control in the spring is required.
- Because of a general warming in California's climate, it is anticipated that increases in water requirements for crops, wildlands and landscaping will likely occur. In order to properly measure these changes, the monitoring of evapotranspiration rates will be required. The goal is to develop likely changes in evapotranspiration rates for the 2050 and 2100 scenarios. Projections of future weather including precipitation during the growing season are required to provide projected increases in plant water requirements.
- Existing models for water temperature on the major rivers in the Sacramento River Basin will likely require improvement as the job of maintaining suitable downstream temperatures for anadromous salmonids becomes more difficult.
- Monitoring the effects of climate change on regions near California is also important. The Colorado River region is important to California and may have potential impacts on both water supply and hydropower. The Columbia River Basin is an important source of hydropower for California. Monitoring the results of research and studies in these areas is important for future planning studies.

Because only limited data and tools exist to provide answers to important questions for decision makers, water managers and resource planners, DWR is working in conjunction with others to develop a new analytical approach for the preparation of California Water

Plan Update 2010. DWR has determined that designing this quantitative approach will best be achieved through a consortium of public and private entities, with state leadership and input from stakeholders. The purpose of the consortium is to prepare a long-term plan to review data and analytical tools, as well as to develop decision-support systems to make complex technical information more accessible to decision makers and resource managers. Because time is needed to develop this new approach, most of the quantitative work will be presented in Update 2010.

22.4.2 PRELIMINARY CLIMATE CHANGE IMPACTS ASSESSMENT FOR CVP/SWP OPERATIONS AND THE DELTA

In responding to Executive Order S-3-05, and as a first step in addressing the limitations presented above, DWR (2006) describes the Department's progress toward incorporating climate change modeling into existing water resources planning and management tools and methodologies. While the report describes numerous efforts, Chapters 4 and 5 present the potential impacts of climate change scenarios on CVP/SWP operations and deliveries, and Delta water quality and water levels using the hydrologic models CALSIM II and DSM2, respectively. Each impact analysis considers four scenarios predicted by pairings of two global climate models (i.e., PCM and GFDL) and two carbon dioxide emissions rates (A2 and B1), and illustrate projected hydrologic conditions centered around 2050 (i.e., 2035 through 2064). All four climate change scenarios predict a general warming trend for California; however, three of the four scenarios predict modestly drier climates, while one (i.e., PCM-B1) predicts a weak precipitation increase. Monthly river inflow data for use as CALSIM II input is generated by downscaling and adapting global climate model results, using a regional hydrologic model, derivation of climate change runoff perturbation ratios, and application of these perturbations ratios to CALSIM II historic reservoir inflows. The hydrologic estimates associated with each climate change scenario are then compared to a base scenario, which is designated as the 2020 level of development outlined in Reclamation's OCAP (Reclamation 2004).

The results of the analysis for CVP/SWP operations and deliveries indicate several potential impacts related to global climate change. For example, during the three drier year climate scenarios, there are a significant number of months in which Shasta and Folsom reservoirs fall to dead storage, with these occurrences concentrated during critical and drought year conditions. During these months, stream flow requirements in the Sacramento and American rivers could not be met, and the CVP was unable to meet its share of water for the Coordinated Operations Agreement. In contrast, the base scenario had only one month which resulted in attainment of dead storage in these locations. These reservoir shortages influence the remaining analyses within the model, and hence, CVP/SWP system deliveries also are influenced by global climate change. Relative to the base scenario, changes in annual average south-of-Delta SWP Table A and CVP deliveries ranged from a slight increases associated with the wetter-climate scenario up to about 10 percent reductions for drier year scenarios. In addition, carry-over storage for both the CVP and SWP reservoirs is negatively impacted under the drier climate scenarios and mildly increased under the wetter climate scenario. Additional reservoir operations impacts are evident by a reduction in the CVP/SWP power generation capacity during summer months and warming of water temperatures in rivers downstream of project reservoirs under the drier climate scenarios.

Using the same methodology and reservoir operation output described above, DWR (2006) also describes potential impacts of climate change on Delta water quality and water levels. The CALSIM II output reflecting adjustments in reservoir operation and Delta exports due to shifting precipitation and runoff patterns are utilized in the DSM2 model for each of the four scenarios. Because one of the key assumptions in the CALSIM II model prioritizes Delta water quality standards, the impact assessment for the Delta inherently mitigates for climate change by modifying upstream system operations to maintain Delta water quality standards. Hence, Delta water quality effects for all four climate change scenarios are relatively minor. When considering a one-foot rise in sea level, either alone or combined with the effects of climate change, Delta water quality standards are met about 90 percent of the time, particularly during dry and critical years. In real-time, operational adjustments would be required and translate into impacts to the CVP and SWP, although these impacts cannot yet be quantified. Finally, DWR (2006) predicts that levee overtopping could be an issue during a one-foot sea level rise scenario, although no overtopping events are predicted for the current sea level condition.

As noted in DWR (2006), the purpose of this study is to demonstrate how various analysis tools currently used by management agencies could be used to address issues related to climate change. All of the results are preliminary and do not reflect the likelihood of occurrence for potential impacts, and as such, are not sufficient by themselves to make policy decisions. In addition, the study contains several key assumptions that may not reflect operational realities. For instance, the study assumes that no changes will be made to system structures or facilities, reservoir operating rules, stream flow requirements, water quality standards, or operations to account for sea level rise or salt water encroachment. Future work will focus on further elucidating not only the magnitude, but also probability, of potential impacts, as well as investigating possible changes in system operations to avoid these impacts.

22.4.3 WEIGHTED ESTIMATION OF CLIMATE PROJECTION DISTRIBUTIONS OVER CALIFORNIA

Reclamation has also initiated studies regarding the potential impacts of climate change on water management in California. The Reclamation studies attempt to expand previous studies that identify and enumerate potential impacts, by assigning a relative probability to each potential impact, thereby creating risk-based planning principles. To achieve this objective, Brekke (2006) utilizes an ensemble analysis of 18 different model projections for three future climatologic periods, including 2011 through 2040, 2041 through 2070, and 2071 through 2100. Precipitation, temperature, and joint precipitation-temperature distribution functions are developed using ensemble member weighting factors that indicate each model's performance during model-to-reference comparisons (i.e., pre-climate change model results compared to 20th century observations). The project distributions are expected to illustrate projection-specific likelihoods relative to the consensus. Further results related to this risk-based analysis are forthcoming, as it is anticipated that Reclamation will issue a report by late-2007.

22.4.4 CLIMATE WARMING AND WATER SUPPLY MANAGEMENT IN CALIFORNIA

Tanaka *et al.* (2006) focuses on the likely effects of a range of climate warming estimates on the long-term performance and management of California's water system. The study incorporates a wide range of hydrologic effects and resources, and includes the inter-tied water supply system such as groundwater and surface water, agricultural and urban water supply users, environmental flows, hydropower, and potential for changing infrastructure and management. In addition, Tanaka *et al.* (2006) employs the California Value Integrated Network (CALVIN), a large-scale economic-engineering optimization model for California's water supply, to examine the ability of the complex water supply system to adapt to significant changes in climate and population.

Generally confirming earlier studies, Tanaka *et al.* (2006) illustrates that a wide range of climate warming scenarios could significantly increase wet season flows and significantly decrease spring snowmelt. The magnitude of the climate warming effects is comparable to population-driven water demand growth in the coming century. Agricultural water users in the Central Valley are the most vulnerable to climate warming, with the driest climate scenarios predicting delivery reductions of up to one-third, with much of the agricultural water being diverted for urban uses. While the study suggests California's water systems can adapt to meet the predicted future requirements, the costs could be substantial, and could have major effects on the agricultural and environmental sectors.

22.4.5 HYDROLOGIC FORECASTING AND WATER RESOURCES MANAGEMENT FOR FOLSOM LAKE WATERSHED IN CALIFORNIA

Reclamation and the Scripps Institute of Oceanography have provided funding to demonstrate the utility of modern hydrologic forecasting and water resource management concepts and ideas combined with climate information to provide improved management of the Folsom Lake waters (Hydrologic Resource Center Website 2005). The work is a joint effort among the Hydrologic Research Center at Scripps, the Scripps Institute of Oceanography, and the Georgia Water Resources Institute. Throughout the study, the development team will be working in collaboration with Reclamation's Central Valley Operations and NMFS' Regional River Forecast Center in Sacramento, California.

By investigating different long-term weather forecasting scenarios, initial findings indicate that Folsom operations would benefit significantly from long-lead seasonal forecasts. The project team is currently developing methodologies for incorporating climate forecasts into models to develop hydrologic forecasts. Currently, within the study area, there are significant differences in the climate model forecasts from node to node which result in significant hydrologic forecast differences. The research and development work includes the following activities:

- Hydrologic modeling of the watershed;
- Modeling of reservoir operations in Folsom Lake;
- Development of models for hydrologic forecast uncertainty;
- Development of methods for downscaling global climate model information; and
- Development of retrospective studies to demonstrate feasibility and utility.

22.4.6 SIMULATED HYDROLOGIC RESPONSES TO CLIMATE VARIATIONS AND CHANGES IN THE MERCED, CARSON, AND AMERICAN RIVER BASINS, SIERRA NEVADA, CALIFORNIA (1900 – 2099)

Hydrologic responses of daily stream flow to simulated climatic variations over a 200-year period for the Merced, Carson and American River basins are described by Dettinger *et al.* (2004) in a study funded by the U.S. Department of Energy, NMFS, Scripps Institution of Oceanography and the USGS. Dettinger *et al.* (2004) utilizes a PCM model to simulate future hydrologic conditions under three different scenarios. The first scenario is a historical simulation based on the climate during the 1870 to 1999 period. The second simulation is for the 1995 to 2048 period with greenhouse gasses fixed at 1995 levels and is referred to as the 'future control" simulation. The final simulation is for the 1995 to 2099 period with increasing greenhouse gas concentrations and is referred to as the "business as usual" simulation.

Over northern California, simulated temperatures have risen in the last part of the 20th century. Mean precipitation rates remain fairly constant under all three simulations. In contrast to the "future control" scenario, the "business as usual" future climate conditions continue the trend of the late 20th century, with additional warming of about 2.4°C and a five percent increase in precipitation by 2100. Simulations show that "business as usual" trends become significantly different by 2025. Simulated hydrologic responses to the PCM simulated climates include small increases in total stream flow and evapotranspiration and a large, clear trend toward earlier snowmelt and reduced summertime flows and soil moisture. Dettinger *et al* (2004) concludes that

> *"…even the relatively modest changes in climate predicted by the PCM model would be sufficient to induce significant and disruptive changes in the hydrology and ecosystems for these three representative Sierra Nevada river basins. The PCM climate change projections are actually near the lower edge of the available climate change simulations in terms of warming (ranging from 2°C to 5°C) and yield only modest changes in overall precipitation. If even these modest climate change projections are sufficient to cause the important hydrological changes in the Sierra Nevada simulated here, then prospects for climate change impacts in California can rightly be taken quite seriously, despite large remaining climate change uncertainties. "*

22.4.7 POTENTIAL IMPLICATIONS OF PCM CLIMATE CHANGE SCENARIOS FOR SACRAMENTO-SAN JOAQUIN RIVER BASIN HYDROLOGY AND WATER RESOURCES

In a study similar to Dettinger *et al.* (2004), VanRheenen *et al.* (2004) employs five different PCM scenarios to simulate potential hydrological changes associated with climate change. The first three scenarios are runs from 1995 through 2099 using "business as usual" global emissions simulations, each with a different initialization. The fourth scenario is a control climate scenario with greenhouse gas emissions set at 1995 levels, and the fifth scenario uses an evolving greenhouse gas concentration based on 1870 to 2000 data. For purposes of this study, a simulation model of the system, named CVMod (Central Valley Model), was developed. CVMod simulates the movement and storage of water within the Sacramento-San Joaquin River Basin, given current operational procedures. The model operates on a monthly timestep of stream flows, which come from either observed historic stream flows (for studies representing past climate) or from predicted stream flows under future climate scenarios.

VanRheenen *et al.* (2004) concludes that both demand modification and infrastructure improvements will be required to account for volumetric and temporal shifts predicted to occur with future climates in the Sacramento-San Joaquin River Basin.

22.4.8 TRENDS IN SNOWFALL VERSUS RAINFALL IN THE WESTERN UNITED STATES

Knowles *et al.* (2006) addresses the well-documented shift in runoff patterns in recent decades, particularly the part of this trend attributed to more precipitation falling as rain instead of snow. The study documents a regional trend in the western United States toward smaller ratios of total winter snowfall water equivalents (i.e., the water content within snowfall) to total winter precipitation during the 1949 through 2004 period. This trend appears to be a response to warming across the region, with the most significant shift in precipitation patterns occurring in locations where wet-day minimum temperatures averaged over the study period are warmer than -5°C. Greater warming has occurred mainly at sites where the mean temperatures are cold enough that precipitation form is less susceptible to warming trends. Trends toward smaller snowfall to precipitation ratios are most pronounced in January for lower elevations throughout much of the West Coast region. The authors suggest that if these trends continue, much of the West's freshwater storage capacity from snowpack will be diminished and the risks of winter and spring flooding could increase. The combination of reduced natural storage capacity and greater flood risks threatens to augment the tension between flood control and storage priorities at major reservoirs.

22.4.9 Accelerated Climate Prediction Initiative

The University of Washington Water Resources Management and Drought Planning Group designed the Accelerated Climate Prediction Initiative (ACPI) to answer questions on how future climate variability may affect the water resource industries (particularly hydropower) along the West Coast (University of Washington, The Alpheus Group TAG Website 2005). Through the ACPI, the CVMod has been developed for use in conducting an independent evaluation of climate changes predicted to occur, as well as the potential for such changes to influence water systems in California, including the Central Valley. CVMod charts the major operations of the Trinity, Sacramento, and San Joaquin River basins by Reclamation and DWR. CVMod represents fifteen structures in all including: eleven dams, two pumping stations, and two diversion canals. The model also captures a complex and divergent set of demands and legal policies that affect allocations within the Central Valley and the Delta.

22.5 Areas of Further Research and Ongoing Activities

One of the most important areas of research associated with the potential impacts of climate change on California's water resources is the further development of tools to predict changes in the timing or amount of future water availability. Currently, CALSIM serves as the primary operations and planning model for CVP and SWP operations. The model simulates CVP and SWP operations on a monthly time-step to predict the hydrologic effects of those operations within the geographical area affected by CVP and SWP facilities, including the Delta. CALSIM routes water in the system on a monthly basis using operational decisions, which minimize a priority-based penalty function of delivery and storage targets. The weights of these penalty functions train the model to adhere to operating rules and constraints such as instream flow requirements, downstream water quality objectives and contract deliveries to agricultural and urban water districts. The end-of-period storages from each optimization step are used as initial conditions for the following month's optimization. Model outputs include monthly reservoir releases, river flows, reservoir stored water volumes, Delta export activities, and indicators of Delta water quality (California Energy Commission 2003). A baseline version of the model is set up to perform monthly operations decisions for a 73-year simulation period based on the 1922 to 1994 hydrologic years experienced in the Central Valley. Water demands and system infrastructure are modified to represent 2001 and 2020 levels of development.

Another simulation model that has been used for studies in the Central Valley is CVMod. CVMod was developed by the University of Washington and operates similarly to CALSIM. The primary input to CVMod is monthly stream flow which comes from either observed historic stream flows or from Variable Infiltration Capacity (VIC) simulations of potential future stream flows; VIC is a regional hydrologic model implemented for the Sacramento-San Joaquin River Basin (Vanrheenen *et al*. 2004). In a comparison of CALSIM with CVMod, it was shown that CALSIM was better able to predict end-of-month storage volumes in the major Central Valley Reservoirs. The period of analysis for the comparison was October of 1979 through June of 1994 (California Energy Commission 2003).

A third model used in some Central Valley studies is CALVIN. CALVIN was developed at University of California Davis and is a prescriptive optimization model that operates surface and groundwater resources and allocates water over the historical hydrologic record (California Energy Commission 2003). CALVIN maximizes the economic values of agricultural and urban water use statewide, within physical, environmental and policy constraints. Besides the Central Valley, CALVIN incorporates parameters from southern California SWP contractors, California users of the Colorado River, the Owens Valley and Mono Basin and also groundwater sources, making it the model with the broadest coverage of water users in California. Monthly operations and allocation decisions are made based on the 1922 to 1993 hydrologic period assuming perfect foresight of future inflows.

To effectively assess the potential impacts of climate change on California's water system, a model is needed that represents the operation of the system and has the ability to accept input from climate change impact studies related to the Central Valley. The model requires a descriptive, rather than prescriptive approach (California Energy Commission 2003). Of the three models described above, CALSIM provides the most robust representation of the current system in terms of coverage, spatial representation and operational rules. CALSIM's major fault is its inability to utilize hydrologic data not related to the 73 years of historical data for which the model has been validated. CVMod has the ability to accept any hydrologic inputs, however, its weakness is that some of the operations rules, and hence, the results from the model, are potentially much different from how the system is actually run. The CALVIN model is prescriptive rather than descriptive.

Projecting regional impacts of climate change is a multi-step process. First, GCMs are used to develop large-scale scenarios of changing climate parameters. Because this information is at too coarse a scale to make regional assessments, efforts are currently being made to reduce the scale and increase the resolution of GCMs by downscaling or integrating regional models into the GCMs. Quinn *et al.* (2003) was able to downscale output from both HadCM2 and PCM models to simulate hydrologic conditions in the San Joaquin River basin from 2010 to 2100. Simulations of water deliveries were made using output from the downscaled HadCM2 and PCM models as input to CALSIM. Although Quinn *et al.* (2003) results differed significantly, depending on which downscaled GCM was used to develop CALSIM input, they do show the feasibility of linking GCMs with hydrologic models for simulating different climate change scenarios. VanRheenen *et al.* (2004) were able to incorporate output data from PCM models into CVMod to examine the Central Valley water resources, under five different PCM scenarios, by developing a technique to downscale PCM model output to a scale suitable for CVMod input. Dettinger *et al.* (2004) was able to utilize a downscaled PCM model output to simulate stream flow and water balances in the American River Basin by use of the Precipitation-Runoff Modeling System (PRMS), a model that predicts changes to runoff based on land use and climate changes. Zhu *et al.* (2003) utilized CALVIN to process 12 climate change scenarios developed by the Lawrence Berkeley National Laboratory (LBNL). In this study, LBNL data was used to alter the CALVIN base hydrology, consisting of monthly time series of rim inflows, reservoir evaporation rates local accretions and groundwater inflows, to simulate predicted hydrology under different climate change scenarios.

Although significant differences among GCMs currently exist in predicted future climate scenarios, the research described above indicates that substantial progress has been made in developing methodologies to integrate hydrologic models with climate models. Ideally, the ability to integrate GCM output with CALSIM will provide a tool to allow the proactive planning and development of options to improve water supply and quality under different climate change scenarios. Integration of the GCMs with CALSIM will likely require several intermediate steps that will include downscaling of the GCMs and may include features from CALVIN, CVMod and PRMS. DWR (2006) has made significant strides in integrating GCMs into CALSIM, although several limitations remain.

Both government agencies and the private sector have recognized the potentially adverse impacts associated with climate change. Businesses in the private sector are voluntarily cutting their greenhouse gas emissions while state and local governments are responding with efforts to cut emissions within their jurisdictions (California Energy Commission 2003). Additionally, the federal government has set a goal of reducing greenhouse gas intensity by 18 percent over the next decade. Greenhouse gas intensity is a measure of green house gas emissions per defined unit. For example, greenhouse gas intensity could be reported as tons of greenhouse gas emissions per capita or per million dollars of gross domestic product.

Within California, the Climate Action Team established by Executive Order S-3-05, coordinates all state-level actions relating to climate change. Under the umbrella of the Climate Action Team, the different state resource agencies are actively engaged in various activities specifically related to climate change. For example, DWR is helping the state prepare for climate change through its water resource planning and forecasting activities; CDFG is addressing the issue of adaptation to climate change with regional conservation planning, watershed planning, fisheries management and restoration, and biological assessment; and the California Energy Commission's Public Interest Energy Research Program is addressing climate change by leading the development of a long term climate change research program for California and is seeking to improve understanding of the implications of climate change by supporting research on potential impacts and possible adaptation and mitigation measures (State of California Website 2005). Additionally, several campuses of the University of California are actively engaged in climate change research.

Through development of a functional water management tool capable of incorporating climate change data, reductions in greenhouse gas emissions, and proper resource planning, California will continue preparing for climate change impacts.

22.6 CONCLUSIONS

According to a recently published California Energy Commission report titled, "*Climate Change and California Water Resources: A Survey and Summary of the Literature*" (Kiparsky and Gleick 2003):

> "*Managing water resources to address climate change impacts could prove to be different than managing for historical climate variability for several reasons, including: (1) climate changes could produce hydrologic conditions and extremes of a different nature than current systems were designed to manage; (2) they may produce similar kinds of variability, but that are outside of the range for which current infrastructure was designed; (3) traditional water resource management assumes that sufficient time and information will be available before the onset of large or irreversible climate impacts to*

permit managers to respond appropriately; and (4) traditional management assumes that no special efforts or plans are required to protect against surprises or uncertainties."

Although considerable uncertainties regarding the exact impacts of climate change on California hydrology and water resources will remain until there is more accurate and consistent information about how precipitation patterns, timing, and intensity will change, considerable progress is being made to develop methodologies and tools to incorporate future climate change scenarios into current hydrologic models. Additionally, one of the most important results for water managers also has been the one most consistently predicted to occur. It is quite likely that there will be increases in winter runoff, decreases in spring and summer flows and higher peak flows. Therefore, managing water resources with a changing climate will likely prove different than managing for historic variability. Climate changes could produce hydrologic conditions and extremes of a different nature than current systems were designed to manage.

CHAPTER 23
CONSULTATION AND COORDINATION

Federal, state, local agencies and other interested parties have participated in the CEQA and NEPA process leading to the development of the Proposed Yuba Accord presented in this Draft EIR/EIS. During preparation of this Draft EIR/EIS, YCWA and Reclamation consulted with resource specialists, agencies with specific expertise in key resource issues, and members of the public. These consultations assisted YCWA and Reclamation in determining the scope of the Draft EIR/EIS, identifying the range of alternatives and environmental protection and mitigation measures, and defining impact significance. Consultation included public meetings, informal agency communications, and formal interagency meetings. YCWA and Reclamation will continue to solicit public and agency input on the project by encouraging review of this Draft EIR/EIS. This chapter summarizes public involvement efforts and agency consultation conducted during the project planning and environmental review process. Signatories and participants in development of the Proposed Yuba Accord include:

- Yuba County Water Agency
- Bureau of Reclamation
- California Department of Water Resources
- California Department of Fish and Game
- National Marine Fisheries Service
- U.S. Fish and Wildlife Service
- South Yuba River Citizens League
- Browns Valley Irrigation District
- Dry Creek Mutual Water Company
- Friends of the River
- The Bay Institute
- Trout Unlimited
- Brophy Water District
- Ramirez Water District
- South Yuba Water District
- Wheatland Water District
- Hallwood Irrigation Company

23.1 PUBLIC INVOLVEMENT

Scoping is used under both CEQA and NEPA to determine the focus and content of an EIR or EIS. Scoping is required by NEPA regulations (40 CFR 1501.7), and is described as "*an early and open process for determining the scope of issues to be addressed and for identifying significant issues related to the proposed action.*" Under CEQA, scoping is optional and may be conducted as part of early public consultation for a project, although scoping is required when a CEQA lead agency prepares a joint EIR/EIS with a federal agency.

The main objective of the scoping process is to provide the public and potentially affected resource agencies with information on the proposed project and to solicit public input regarding the issues and concerns to be evaluated in the environmental documentation. The scoping process is intended to provide the lead agencies with information regarding the range of actions, alternatives, resource issues, and mitigation measures that are to be analyzed in depth in the EIR/EIS, and to eliminate from detailed study those issues found not to be significant.

The following is a summary of the public involvement activities, including public informational and environmental process scoping meetings, for the project that have occurred to date. These activities are discussed in greater detail in the Proposed Lower Yuba River Accord Public Scoping Summary Report, which may be obtained from YCWA and Reclamation.

23.1.1 ENVIRONMENTAL IMPACT REPORT/ENVIRONMENTAL IMPACT STATEMENT SCOPING

The formal scoping process for the Proposed Yuba Accord began on June 20, 2005 with publication of the NOI in the Federal Register (pursuant to NEPA), distribution of a press release by Reclamation, and publication of announcements in the Appeal Democrat, Marysville Herald, and The Sacramento Bee.

Also on June 20, 2005, an NOP for the Proposed Yuba Accord was filed with the State Clearinghouse (pursuant to CEQA) and YCWA posted its own version of the Reclamation press release on its website. An announcement was published in the legal notices section of the Appeal-Democrat on June 21, 2005. The NOI and NOP were mailed to more than 900 individuals, interest groups, and other organizations. Comments were received and recorded during the 30-day scoping period, which extended through July 20, 2005. Two public meetings were held during the scoping period, as further described below.

23.1.2 SCOPING MEETINGS AND COMMENTS

YCWA and Reclamation held four public scoping meetings during the scoping period; two sessions were held in Sacramento, California on July 19, 2005 and two sessions were held in Marysville, California on July 20, 2005. Attendees at the meetings included various federal, state, and local agency representatives, NGO representatives, and local residents. An agenda and other meeting material hand-outs were provided, including technical briefs on each of the three proposed Yuba Accord agreements (the Fisheries Agreement, the Water Purchase Agreement, and the Conjunctive Use Agreements), comment submittal contact information, and pre-addressed comment cards. The first portion of each meeting was an informal discussion and display session related to the three agreements comprising the Proposed Yuba Accord and explaining the EIR/EIS process. Lead agency representatives and consultant team members answered questions related to the Proposed Yuba Accord and EIR/EIS process, and collected public comments. A brief presentation of the history and overview of the Proposed Yuba Accord was made. At the conclusion of the presentation, meeting attendees were given the opportunity to make verbal comments. The meetings concluded with additional time for meeting attendees to view, ask questions, and comment upon the information display stations and meeting materials. Questions and comments were taken throughout each meeting and attendees were encouraged to provide their comments to the lead agencies in writing.

Key issues that were raised by agency representatives and members of the public at the public scoping meetings and in response to the NOI and NOP include:

- ❑ *Alternatives Considerations*
  - Alternatives under consideration
  - YCWA point of diversion
- ❑ *Groundwater Resources*
  - Potential impacts on private well owners
  - Potential impacts on fish and wildlife habitat
  - Potential impacts associated with the Conjunctive Use Program
  - Pumping control and monitoring
  - Potential impacts to non-signatories of the Conjunctive Use Agreement

- ***Fisheries Resources***
  - Water release temperatures, quantities, and timing
  - Lower Yuba River flows and water temperature
  - Reservoir water temperature
  - Flow fluctuation
  - Proposed operational and surface water elevation changes in New Bullards Bar Reservoir
  - Feather River flows and water temperature
  - Potential impacts to Delta fisheries
  - Potential impacts associated with the Conference Year Program
  - Fish screening
  - Potential impacts associated with adding Delta pumping facilities as points of rediversion
  - Reduced flows to the Delta
- ***Terrestrial Resources***
  - Impacts on wildlife habitat associated with reduced groundwater levels
- ***Recreation***
  - Potential impacts to angling and other recreational uses
- ***Land Use and Growth Inducement***
- ***Water Quality***
  - Compliance with federal and state regulations
  - Potential impacts at Delta intakes and compliance locations
  - Potential impacts on Bay-Delta fisheries and Delta ecosystem
- ***Water Supply and Management***
  - Changes in CVP and SWP operations
  - Potential impacts to legal water users associated with adding Clifton Court Forebay and Jones Pumping Plant as points of rediversion
  - CVP water supply reliability
  - Reduced flows to the Delta
- ***Power Production and Energy Consumption***
  - Potential impacts and changes to hydroelectric power production
- ***Socioeconomics***
  - Potential impacts on rice production and the local agricultural economy

23.2 RESOURCE AGENCY CONSULTATION AND COORDINATION

In compliance with the federal and state consultation requirements outlined below, YCWA and Reclamation have been involved in coordination and informal consultation activities with various resource agencies since 2005. This section summarizes agency consultation and coordination requirements, activities to date, and ongoing consultation efforts.

23.2.1 FEDERAL ENDANGERED SPECIES ACT

Section 7 of the ESA requires all federal agencies to ensure that any action they authorize, fund, or carry-out is not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of designated critical habitat. To ensure that the Proposed Project/Action avoids jeopardy, YCWA and Reclamation must consult with the USFWS and NMFS, if the federal agency determines that its action might impact a listed species. NMFS jurisdiction under the ESA is limited to the protection of marine mammals and fish and anadromous fish; all other species are within USFWS jurisdiction.

YCWA and Reclamation have had numerous meetings with NMFS and the USFWS (see Section 23.2.7), where discussions focused on determining the scope of work, identifying listed and proposed species potentially affected by the Proposed Project/Action and alternative ?, as well as developing a suitable approach for assessing the potential effects of the federal action (i.e., the Proposed Action) on listed and proposed species and their habitat, as part of the Section 7 consultations required by the federal ESA. NMFS and USFWS representatives assisted in defining the scope of analysis for the Biological Evaluation, which defines and evaluates the potential effects of the Proposed Lower Yuba River Accord on fish, wildlife, and plant species that are either listed under the federal ESA or proposed for such listing, and where applicable, their designated or proposed critical habitats.

23.2.2 MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT

The MSA establishes a management system for national marine and estuarine fishery resources. Section 305(b)(2) of the 1996 reauthorization of the MSA added a provision for federal agencies to consult with NMFS on impacts to EFH. EFH only applies to commercial fisheries; therefore, the requirements of the MSA applies to all Chinook salmon habitat but not steelhead habitat. EFH includes specifically identified waters and substrate necessary for fish spawning, breeding, feeding, or growing to maturity. Consultation with NMFS for the ESA simultaneously addresses consultation requirements under the MSA. YCWA and Reclamation's ongoing coordination efforts with NMFS satisfy the analytical requirements for EFH for species managed under the MSA.

23.2.3 CALIFORNIA ENDANGERED SPECIES ACT

The CESA (CDFG Code Section 2050 et. seq.) establishes state policy to conserve, protect, restore, and enhance threatened or endangered species and their habitats. The CESA mandates that state agencies should not approve projects that jeopardize the continued existence of threatened or endangered species if reasonable and prudent alternatives are available that would avoid jeopardy. Unlike the federal ESA, under CESA there are no mandated state agency consultation procedures. For projects that would affect a species that is federally and state-listed, compliance with ESA satisfies CESA if CDFG determines that the federal incidental take authorization is consistent with CESA (CDFG Section 2080.1). For projects that would result in take of a state-listed species, the project proponent must apply for a take permit under CDFG Section 2081(b).

YCWA and Reclamation have had numerous meetings with CDFG (see Section 23.2.7,), where discussions focused on determining the scope of work, identifying listed and proposed species potentially affected by the Proposed Project/Action, as well as developing a suitable approach for assessing the potential effects of the action on listed and proposed species and their habitat. Upon review of the Proposed Project/Action and associated mitigation measures (where applicable), CDFG will issue a written finding based upon it's determination of whether the Proposed Project/Action would jeopardize the continued existence of any listed species or result in the destruction or adverse modification of habitat essential to the continued existence of the species. The written finding will also include CDFG's determination of whether the Proposed Project/Action would result in any taking of an endangered or threatened species incidental to the Proposed Project/Action (Fish and Game Code Section 2081).

23.2.4 FISH AND WILDLIFE COORDINATION ACT

The FWCA (PL 85-624; 16 USC 661-667d) requires that all federal agencies consult with USFWS, NMFS, and the states' wildlife agencies for activities that affect, control, or modify waters of any stream or other bodies of water (Cylinder *et al.* 1995). Under the authority of the FWCA, resource trustees review water development projects and wildlife is given equal consideration and coordination with other features of the project.

While preparing this Draft EIR/EIS, YCWA and Reclamation have been in contact and closely coordinated with NMFS and the USFWS regarding the scope and content of this Draft EIR/EIS. These activities and continuing coordination meets applicable consultation/coordination requirements of the FWCA.

23.2.5 INDIAN TRUST ASSETS AND NATIVE AMERICAN CONSULTATION

YCWA and Reclamation are responsible for evaluating potential impacts to ITAs. Potential effects on ITAs stem from actions or activities that would affect Indian Trust lands, and federally reserved hunting, fishing, gathering, water, or other rights. During preparation of this Draft EIR/EIS, Bureau of Indian Affairs (BIA) representatives were contacted to discuss and confirm the likely locations of ITAs within the project area. There are no ITAs on project area reservoirs or in the Delta region. Potential impacts to ITAs and the health of Tribes in the Yuba Region resulting from the Proposed Project/Action have been evaluated and no significant adverse impacts have been identified. In the event an impact is identified, consultation with affected recognized tribal governments would proceed through the proponent agencies, the BIA, the Office of the Solicitor, and the Office of American Indian Trust. Government-to-government consultation would take place to determine interests, concerns, impacts, applicable tribal regulations, and appropriate avoidance measures. Ongoing consultation would involve YCWA, Reclamation, BIA, and the Regional Solicitor's Office.

23.2.6 NATIONAL HISTORIC PRESERVATION ACT/STATE HISTORIC PRESERVATION OFFICER CONSULTATION

The NHPA requires federal agencies to consult with the ACHP concerning potential effects of federal actions on historic properties listed or eligible for listing on the NRHP. The evaluations of cultural resources as part of this Draft EIR/EIS comply with the NHPA as it applies to the Proposed Project/Action and alternatives. In addition, notices of public meetings for this project have been sent to the SHPO, which acts as an intermediary for the ACHP.

A copy of this Draft EIR/EIS has been sent to the SHPO, as a unit of the CDPR, requesting review and soliciting input on the project. Reclamation will continue to coordinate with the ACHP and SHPO as necessary, consistent with Section 106 of the NHPA.

23.2.7 AGENCY INVOLVEMENT AND COORDINATION

Key meetings, deliverables, decisions, and other activities related to the evaluation of the Proposed Project/Action effects are summarized as follows:

- *May 11, 2005*. YCWA, Reclamation, DWR, NMFS, USFWS, CDFG and the Yuba Accord Project Team met to discuss ESA compliance and coordination, including the Accord Environmental Compliance Process Timeline, identification of ESA and CESA compliance topics, opportunities to tier from recent environmental compliance documentation, and the proposed 2006 Water Transfer and Yuba Accord Fisheries Agreement Pilot Program.
- *May 17, 2005 and June 16, 2005*. YCWA, Reclamation, DWR, SWRCB, CDFG, USFWS, NMFS, NGOs, Member Units and the Yuba Accord Project Team participated in Project Kick-off Meetings to discuss the project objectives, purpose and need for the project, action items, environmental compliance timeline, the CEQA/NEPA Compliance Plan, and the key steps and participants in the environmental compliance process.
- *June 22, 2005*. YCWA, Reclamation, DWR, NMFS and the Yuba Accord Project Team participated in a technical assistance meeting to discuss the Draft NMFS ESA Compliance Strategy Plan, the ESA compliance process and documentation requirements, the Draft Environmental Compliance Timeline, and the relationship of the ESA process to the CEQA/NEPA process.
- *June 23, 2005*. YCWA, Reclamation, DWR, USFWS and the Yuba Accord Project Team participated in a technical assistance meeting to discuss the draft USFWS ESA Compliance Strategy Plan, the ESA compliance process and documentation requirements, the Draft Environmental Compliance Timeline, and the relationship of the ESA process to the CEQA/NEPA process.
- *August 31, 2005*. YCWA and Reclamation met to discuss the relationship of Proposed Yuba Accord ESA compliance and OCAP.
- *September 7, 2005.* YCWA, Reclamation, DWR, CDFG and the Yuba Accord Project Team participated in a technical assistance meeting to discuss the Draft CDFG CESA Compliance Strategy Plan, the CESA compliance process and documentation requirements, the Draft Environmental Compliance Timeline, and the relationship of the CESA process to the CEQA/NEPA process.
- *September 20, 2005.* YCWA, Reclamation, DWR, USFWS, NMFS, CDFG and the Yuba Accord Project Team participated in a technical assistance meeting to discuss the Proposed Action description, the definition of the Action Area, confirmation of the special-status species lists for Terrestrial and Fisheries Resources, and development of the Terrestrial and Fisheries Resources Assessment Methodologies.
- *November 22, 2005.* YCWA and Reclamation met to discuss the relationship of Yuba Accord ESA compliance and OCAP.
- *December 6, 2005.* YCWA and Reclamation met to discuss the ESA analysis of the Yuba Accord as an OCAP-related project.
- *December 22, 2005.* YCWA and Reclamation met to discuss ESA modeling assumptions.
- *December 28, 2005.* YCWA and Reclamation met to discuss proposed project and cumulative effect scenarios.

- *January 18, 2006.* YCWA and Reclamation met to discuss ESA and OCAP modeling assumptions.
- *February 9, 2006.* YCWA, Reclamation and DWR met to discuss ESA compliance issues related to OCAP.
- *February 14, 2006.* YCWA and Reclamation met to discuss the approach to ESA consultation for the Proposed Yuba Accord.
- *February 27, 2006.* YCWA, Reclamation and DWR met to discuss ESA compliance issues related to OCAP.
- *March 17, 2006.* YCWA, Reclamation, DWR, USFWS, NMFS, CDFG, Member Unit representatives, and the Yuba Accord Project Team participated in a TRT meeting to discuss finalization of the CEQA, NEPA, and ESA modeling approach for the Proposed Yuba Accord. Also, comments regarding the Modeling Technical Memorandum were provided and discussed at the meeting.
- *March 27, 2006.* Reclamation/USFWS policy meeting regarding consultation approach.
- *April 11, 2006.* YCWA, Reclamation, DWR, USFWS, NMFS, CDFG, Member Unit representatives, CVP/SWP contractor representatives and the Yuba Accord Project Team participated in a TRT workshop to discuss the effects assessment methodologies for various resource topics to be included in the Yuba Accord environmental documentation.
- *April 21, 2006.* YCWA requested an official species list, by USGS 7½ minute quadrangles, from USFWS for the Yuba Accord local study area (Yuba Region).
- *April 24, 2006.* YCWA, Reclamation, USFWS, NMFS and the Yuba Accord Project Team participated in a technical assistance meeting to review draft Biological Evaluation (BE) (?) outlines, and to discuss preliminary modeling and salvage results for the Proposed Project/Action.
- *April 27, 2006.* YCWA, Reclamation, DWR, USFWS, CDFG, Member Unit representatives, CVP/SWP contractor representatives, and the Yuba Accord Project Team participated in a TRT meeting to discuss questions and comments related to the Proposed Yuba Accord analytical approaches presented at the April 11, 2006 TRT workshop.
- *May 4 and 5, 2006.* YCWA and DWR met to discuss Yuba Accord ESA and CESA compliance.
- *May 9, 2006.* YCWA, Reclamation, NMFS and the Yuba Accord Project Team participated in a technical assistance conference call to review preliminary modeling and salvage results for the Proposed Action.
- *May 10, 2006.* YCWA, NMFS and USFWS met to discuss ESA compliance issues related to OCAP.
- *May 17, 2006.* YCWA, Reclamation, DWR, USFWS, CDFG, NGOs, Member Unit representatives, CVP/SWP contractor representatives and the Yuba Accord Project Team participated in a TRT meeting to finalize the Proposed Yuba Accord analytical approach for various resource categories to be evaluated in the environmental documentation.
- *May 31, 2006.* YCWA, Reclamation and DWR met to discuss Yuba Accord ESA compliance issues.

- *June 29, 2006 and July 7, 2006.* YCWA, Reclamation, DWR, USFWS, CDFG, NGOs, Member Unit representatives, CVP/SWP contractor representatives, and the Yuba Accord Project Team participated in a TRT meeting to discuss comments regarding the Modeling Technical Memorandum and review the analytical format and preliminary modeling results for the Proposed Project/Action.
- *August 1, 2006.* YCWA submitted letter to Reclamation requesting applicant status for the Yuba Accord ESA consultation.
- *August 15, 2006.* YCWA, Reclamation and USFWS met to discuss effects of reinitiation of OCAP consultation on Yuba Accord ESA compliance.
- *August 25, 2006.* YCWA and Reclamation met to discuss effects of reinitiation of OCAP consultation on Yuba Accord ESA compliance.
- *August 31, 2006.* YCWA and Reclamation met to discuss effects of reinitiation of OCAP consultation on Yuba Accord ESA compliance.
- *September 15, 2006.* YCWA sent Reclamation a letter describing its proposed approach to ESA compliance for the Yuba Accord.
- *September 19, 2006.* YCWA sent NMFS a letter requesting species list confirmation for ESA compliance.
- *September 29, 2006.* YCWA, Reclamation and DWR met to discuss ESA compliance process for Yuba Accord.
- *October 20, 2006.* YCWA, Reclamation, DWR, and the Yuba Accord Project Team met to discuss the BE and ESA modeling assumptions.
- *October 23, 2006.* Reclamation submitted a letter informing YCWA, USFWS, and NMFS that YCWA will be considered an applicant for the Section 7 ESA consultation process.
- *November 1, 2006.* YCWA, Reclamation, DWR, MWH, and the Yuba Accord Project Team met to discuss ESA modeling assumptions.
- *November 15, 2006.* YCWA, Reclamation, DWR, USFWS, NMFS, and the Yuba Accord Project Team met to discuss ESA modeling assumptions.
- *February 1, 2007.* YCWA, Reclamation, and DWR met to discuss CEQA/NEPA cumulative considerations.

23.3 PUBLIC REVIEW OF THE DRAFT EIR/EIS

The Public Draft EIR/EIS is available for review and comment for 60 days following filing of the Notice of Completion of the EIR with the California State Clearinghouse and the Notice of Availability (NOA) of the EIS with the EPA. In addition to filing with the EPA, the NOA also has been published in the Federal Register.

The purpose for public review of the Draft EIR/EIS is to receive comments from interested parties on its completeness and adequacy in disclosing potential environmental impacts of the Proposed Project/Action. After the close of the public comment period for the Draft EIR/EIS, a Final EIR/EIS, including responses to public and agency comments on the Draft EIR/EIS, will be prepared. YCWA is responsible for certifying the EIR as adequate by issuing an NOD in compliance with CEQA. Reclamation is responsible for adopting the EIS by issuing an ROD in compliance with NEPA. After adoption and certification, the agencies will use the EIR/EIS to make their determination whether or not to approve the Proposed Project/Action.

23.3.1 EIR/EIS DISTRIBUTION LIST

The Draft EIR/EIS is available for public review at YCWA, Reclamation and DWR offices, as well as at several libraries, which are listed in **Table 23-1**. Additionally, the NOA or copies of the Draft EIR/EIS have been distributed to federal and state government officials and resource agencies; regional and local government offices; water districts, agencies, and utilities; other interest groups and organizations; and individuals as identified in **Table 23-2**.

Table 23-1. Locations Where the Draft EIR/EIS is Available for Public Review

Agency Locations	Library Locations
Yuba County Water Agency 1402 D Street Marysville, CA 95901	Yuba County Library 303 2nd Street Marysville, CA 95901
Department of Water Resources 1416 Ninth Street Sacramento, CA 95814	Sacramento Public Library 828 I Street Sacramento, CA 95814
Bureau of Reclamation 2800 Cottage Way Sacramento, CA 95825	

Table 23-2. Agencies, Organizations, and Individuals Receiving the Notice of Availability or Copies of the Draft EIR/EIS

U.S. Government Officials
Barbara Boxer, United States Senate
Dianne Feinstein, United States Senate
Dennis Cardoza, United States House of Representatives, District 18
John Doolittle, United States House of Representatives, District 4
Wally Herger, United States House of Representatives, District 2
Barbara Lee, United States House of Representatives, District 9
Dan Lungren, United States House of Representatives, District 3
Doris Matsui, United States House of Representatives, District 5
George Miller, United States House of Representatives, District 7
Jerry McNerney, United States House of Representatives, District 11
George Radanovich, United States House of Representatives, District 19
Ellen Tauscher, United States House of Representatives, District 10
Federal Government Agencies
Department of the Interior, Bureau of Reclamation
National Marine Fisheries Service
Native American Heritage Commission
U.S. Army Corps of Engineers
U.S. Bureau of Indian Affairs
U.S. Bureau of Land Management
U.S. Coast Guard Marine Safety Office
U.S. Department of the Interior
U.S. Environmental Protection Agency
U.S. Fish and Wildlife Service
U.S. Geological Survey, Water Resources Division

Table 23-2 (continued)

State Government Officials
Arnold Schwarzenegger, Governor
Sam Aanestad, California State Senate, District 4
Dave Cogdill, California State Senate, District 14
Dave Cox, California State Senate, District 1
Jeff Denham, California State Senate, District 12
Michael Machado, California State Senate, District 5
Don Perata, California State Senate, District 9
Darrell Steinberg, California State Senate, District 6
Tom Torlakson, California State Senate, District 7
Greg Aghazarian, California State Assembly, District 26
Mark DeSaulnier, California State Assembly, District 11
Doug La Malfa, California State Assembly, District 2
Dave Jones, California State Assembly, District 9
Alan Nakanishi, California State Assembly, District 10
Roger Niello, California State Assembly, District 5
Lois Wolk, California State Assembly, District 8
State Government Agencies
California Air Resources Board
California Bay-Delta Authority
California Department of Boating and Waterways
California Department of Conservation
California Department of Fish and Game
California Department of Food and Agriculture
California Department of Forestry
California Department of Health Services
California Department of Parks and Recreation
California Department of Water Resources
California Environmental Protection Agency
California Farm Bureau Federation
California Office of Historic Preservation
California State Attorney General's Office
California State Clearinghouse
California State Lands Commission
California State Reclamation Board
California State Water Resources Control Board
California Water Quality Control Board, Central Valley Region
Regional and Local Government Agencies
Alameda County
Alpine County
Amador County
Butte County
Calaveras County
City of Marysville
City of Sacramento
Colusa County
Contra Costa County
El Dorado County
Glenn County
Lassen County
Madera County
Mariposa County
Merced County
Modoc County
Nevada County

Table 23-2 (continued)

Regional and Local Government Agencies
Placer County
Plumas County
Sacramento County
San Joaquin County
Shasta County
Sierra County
Siskiyou County
Solano County
Stanislaus County
Sutter County
Tehama County
Trinity County
Tuolumne County
Yolo County
Yuba County
Yuba County Office of Emergency Services
Water Districts, Agencies and Utilities
Alameda County Water District
Association of California Water Agencies
Brophy Water District
Browns Valley Water District
California Urban Water Agencies
Central Valley Project Water Association
City/County Office of Metropolitan Water Planning
Contra Costa Water District
Cordua Irrigation District
Dry Creek Mutual Water Company
East Bay Municipal Utility District
Hallwood Irrigation Company
Pacific Gas and Electric Company
Ramirez Water District
Reclamation District 784
Sacramento Municipal Utility District
South Yuba Water District
Wheatland Water District
Environmental Organizations
California Sportfishing Protection Alliance
California Striped Bass Association
California Waterfowl Association
California Trout, Inc.
Environmental Defense Fund
Federation of Fly Fishers
Friends of the River
South Yuba River Citizens League
The Bay Institute
Trout Unlimited
Individuals and Other Interests
Rick Anderson
Candyce Baker
James Baker
Dan Boom
James Butler
Sue Cunningham
Russell King
Steve Kraces
Vernon Kuska

Table 23-2 (continued)

Individuals and Other Interests (continued)
Ted Lowe
Mimi Mathews
Rickey Matos
James and Patricia Myers
Darrell Ommen
Clifford Pound
Bill Shearer
William Short
Roscoe Smith

CHAPTER 24
LIST OF PREPARERS

Table 24-1 provides a list of persons who contributed to the preparation of this Draft EIR/EIS. This list is consistent with the requirements set forth in CEQA and NEPA (Section 15129 of the State CEQA Guidelines and 40 CFR 1502.17). Additionally, **Table 24-2** provides the names, qualifications, and area of participation for persons who were primarily responsible for preparing the Draft EIR/EIS.

Table 24-1. List of Agency Representatives Who Contributed to the Preparation of the Draft EIR/EIS

Yuba County Water Agency	
Curt Aikens	General Manager
Eric Miller	Assistant Manager, Project Development
Thomas Johnson	Independent Consultant Representing YCWA
Bureau of Reclamation	
Mike Heaton	Deputy, Regional Resources Manager
Tim Rust	Program Manager
Tammy LaFramboise	Environmental Specialist
Ann Lubas-Williams	Special Assistant, Central Valley Operations Office
Shane Hunt	Environmental Specialist
Bob Eckhart	Supervisory Environmental Specialist
Lee Mao	Chief, Decision Analysis Branch, Regional Water Quality Coordinator
Patricia Rivera	Native Affairs Program Manager
Adam Nickels	Archaeologist
Stanley E. (Chip) Parrott	Geologist
Department of Water Resources	
Teresa Geimer	Chief of Water Supply and Transfers Branch
Curtis Spencer	Principal Engineer
Delores Brown	Environmental Specialist
John Leahigh	State Water Project Operations Control
Bob Aldridge	State Water Project Analysis Office
Katherine Wadsworth	Environmental Scientist
Kuen Tsay	Senior Engineer, State Water Project Analysis Office

Table 24-2. List of Persons Primarily Responsible for the Preparation of the Draft EIR/EIS

Name	Qualifications	Participation
HDR|Surface Water Resources, Inc.		
Paul Bratovich	24 years fishery consulting experience	Vice President/Principal Fisheries Biologist/Project Manager – Fisheries resources, ESA consultation, guidance and document review
George "Buzz" Link	31 years consulting experience in water resources, modeling, and power operations	Vice President/Principal Engineer – CALSIM post-processing, modeling, document review
Bill Smith	28 years experience in California water resource planning	Principal Engineer – CALSIM post-processing, modeling
Dave Schuster	40 years experience in water resources policy and environmental consulting	Principal Engineer – Guidance and document review

Table 24-2 (Continued)

Name	Qualifications	Participation
HDR|Surface Water Resources, Inc. (Continued)		
Dianne Simodynes	13 years experience in environmental consulting and watershed analysis	Senior Environmental Scientist/Project Manager – CEQA, NEPA and ESA compliance, project management, cumulative impacts, document preparation and review
Patti Idlof	18 years experience in environmental consulting	Senior Environmental Planner – Document review, cumulative impacts
Jose Perez-Comas	28 years experience in fisheries biology research and consulting	Senior Environmental Scientist – Fisheries biology and aquatic habitat, quantitative fisheries impact assessment
Janice Piñero	8 years experience in environmental consulting	Senior Environmental Scientist – Quantitative fisheries impact assessment
Amanda O'Connell	4 years experience in environmental consulting	Associate Environmental Planner – CEQA, NEPA and ESA compliance
Adrian Pitts	8 years experience in environmental consulting	Associate Environmental Scientist – Terrestrial resources
Brian Ellrott	3 years experience in environmental consulting	Associate Environmental Scientist – Fisheries and aquatic resources
John Cornell	11 years experience in environmental consulting	Associate Environmental Scientist – Reservoir fisheries resources, flood control
Samantha Hadden	6 years experience in environmental consulting	Environmental Scientist – Recreation, cultural resources, visual resources, water quality
Carolyn Bragg	6 months experience in environmental consulting	Environmental Planner – Document preparation and production
Heather Bowen	3 months experience in environmental consulting	Environmental Scientist – General assistance related to document preparation
Kelli Angell	1 month experience in environmental consulting	Environmental Scientist – General assistance related to document preparation
Padma Paan	1 year experience in environmental consulting	Engineer – Modeling
Brandon Lee	1 year experience in environmental consulting	GIS Analyst – Graphics, map preparation
Carol Brown	24 years experience in environmental consulting as an administrative assistant	Senior Administrative Assistant – Administrative support and document management
Debra Hoek	30 years experience as an administrative assistant	Administrative Assistant – Administrative support and document management
Linda Standlee	20 years experience as an administrative assistant	Administrative Assistant – Administrative support
MWH Americas, Inc.		
Steve Grinnell	25 years experience in environmental consulting, 10 years experience in Yuba County water resources planning	Water Resources Engineer – Hydrologic modeling, guidance and document review
Andy Draper	27 years experience in environmental consulting, 11 years experience in California water resources planning	Water Resources Engineer – Surface water supply and management, modeling technical memorandum, guidance and document review
Jeffrey Weaver	9 years experience in environmental consulting	Water Resources Engineer – Hydrologic modeling, surface water supply and management, hydropower, modeling technical memorandum
Sevim Onsoy	2 years experience in environmental consulting	Hydrogeologist – Groundwater resources
Susan Burke	10 years experience as a water resources planner and economist	Natural Resource Economist - Socioeconomics, land use and air quality
Ibrahim Khadam	3 years experience in environmental consulting	Water Resources Engineer – Modeling technical memorandum, Attachment B – Lower Yuba River water temperature evaluation
Stephanie Murphy	8 years experience in wildlife biology and consulting	Wildlife Biologist – Terrestrial resources

Table 24-2 (Continued)

Bartkiewicz, Kronick and Shanahan Law Offices	
Alan Lilly	Legal Counsel
Paul Bartkiewicz	Legal Counsel
Richard Shanahan	Legal Counsel
Ryan Bezerra	Legal Counsel
Nuffer, Smith, and Tucker	
Sharon McNerney	Public Facilitator
MBK Engineers	
Rich Reinhardt	Flood Control
PacificComm	
Rich Golb	Public Information

CHAPTER 25
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GLOSSARY

Term	Definition
accretion	The act of adding material, such as from the deposition and accumulation of waterborne particles (e.g., the process of adding water to an aquifer from all sources).
acre-foot	The volume of water that would cover 1 acre to a depth of 1 foot; equal to 43,560 cubic feet or 325,851 gallons of water.
anadromous fish	Fish that spend a part of their life cycle in the sea and return to freshwater streams to spawn.
Anadromous Fish Restoration Program (AFRP)	The AFRP is tasked by the Central Valley Project Improvement Act to make "all reasonable efforts to at least double natural production of anadromous fish in California's Central Valley streams on a long-term, sustainable basis". The AFRP identified instream and Delta flows needed for recovery of anadromous fish.
appropriative water rights	Right to use a given quantity of water for reasonable and beneficial use in a prescribed place in order of priority based on the time water is first put to use. Since December 19, 1914, the exclusive method for establishing an appropriative water right is through the permit system administered by the State Water Resources Control Board.
aquifer	Underground layer of porous rock, sand, etc. that is sufficiently porous and permeable to store, transmit and yield a sufficient quantity of groundwater to wells and springs.
Article 21 water	Article 21 water is surplus SWP water that is available to SWP contractors, as determined by DWR. Article 21 water is allocated to the SWP contractors when (1) the San Luis Reservoir is full, (2) the contractor's Table A allocations are otherwise being met, and (3) sufficient water exists to meet state water quality standards.
Basin Plan	Basin Plans (also called Water Quality Control Plans) provide the basis for protecting water quality in California. Basin Plans are mandated by both the federal Clean Water Act and the state Porter-Cologne Water Quality Act. Basin Plans are designed to preserve and enhance water quality and protect the beneficial uses of all regional waters. Basin Plans typically: (1) designate beneficial uses for surface and ground waters; (2) establish narrative and numerical objectives that must be attained or maintained to protect the designated beneficial uses and conform to the state's antidegradation policy; (3) describe implementation programs to protect the beneficial uses of all waters in the Region; and (4) describe surveillance and monitoring activities to evaluate the effectiveness of the Basin Plan.
Bay-Delta	The entire estuary system of the San Francisco Bay, Sacramento-San Joaquin Rivers, and Delta.

Term	Definition
1995 Bay/Delta Water Quality Control Plan and Decision 1641 (D-1641)	The purpose of this plan is to establish water quality control measures which contribute to the protection of beneficial uses in the Bay-Delta Estuary. Like all water quality control plans, this plan consists of: (1) beneficial uses to be protected; (2) water quality objectives for the reasonable protection of beneficial uses; and (3) a program of implementation for achieving the water quality objectives. Together, the beneficial uses and the water quality objectives established to protect them are called water quality standards under the terminology of the federal Clean Water Act. On December 29, 1999, the State Water Resources Control Board (State Water Board) adopted Water Right Decision 1641 (D-1641), which among other matters amended DWR, Reclamation and other parties permits and licenses to implement certain flow-related water quality objectives adopted by the State Water Board for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary. On March 15, 2000, in response to petitions for reconsideration, the State Water Board revised D-1641 in accordance with Order WR 2002-02.
beneficial use	Actual or reasonable potential use that may be made of waters of the state, including but not limited to domestic, municipal, agricultural, and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and propagation and enhancement of fish, wildlife, and other aquatic resources.
biological opinion	Document issued under the authority of the federal Endangered Species Act stating the findings of the USFWS and/or the NMFS as to whether or not a federal action is likely to jeopardize the continued existence of a listed species or result in the destruction or adverse modification of critical habitat. See 16 USCA 1536(b).
Bulletin 160-05	Bulletin 160-05 is the latest in a series of California Water Plan updates. The Bulletin 160 series evaluates water supplies and assesses agricultural, urban, and environmental water uses to quantify the gap between water supplies and uses. The main focus of Bulletin 160-05 is to evaluate options for meeting the state's future water needs.
C.W. Jones Pumping Plant	The CVP export pumping plant in the south Delta (formerly known as Tracy Pumping Plant).
CALFED Bay-Delta Program	A consortium of 15 State and Federal agencies with management or regulatory responsibilities in the Bay-Delta.
California Endangered Species Act (CESA)	California legislation that prohibits the "take" of plant and animal species designated by the CDFG as either endangered or threatened. Take includes hunting, pursuing, catching, capturing, killing, or attempting such activity. CESA provides CDFG with administrative responsibilities over the plant and wildlife species listed under the State act as threatened or endangered. CESA also provides CDFG with the authority to permit the take of State-listed species under certain circumstances. See Fish and Game Code Section 2050-2116.

Term	Definition
California Environmental Quality Act (CEQA)	Act requiring California public agency decision-makers to document and consider the environmental impacts of their actions. Also requires and agency to identify ways to avoid or reduce environmental damage and to implement those measures where feasible. Provides means to encourage public participation in the decision-making process. See Public Res. Code Sections 21001.1, 21002, 21080; Guidelines 15002(c).
CALSIM model	CALSIM is a planning model designed to simulate the operations of the CVP and SWP reservoir and water delivery system under current and future conditions. CALSIM predicts how reservoir storage and river flows would be affected based on changes in system operations. CALSIM output is typically used to help assess impacts on water supply, water quality, aquatic resources, and recreation.
CALSIM II model	CALSIM II is the agreed upon CVP-SWP implementation of the CALSIM model code.
candidate species	Any species being considered by the U.S. Secretary of the Interior or Secretary of Commerce for listing as an endangered or a threatened species, but not yet the subject of a proposed rule (see 50 CFR 424.02), or any species accepted as a candidate species by the California Department of Fish and Game pursuant to Fish and Game Code Section 2074.2.
carriage water	Additional flows released during export periods to ensure maintenance of water quality standards and assist with maintaining natural outflow patterns in Delta channels. For instance, a portion of transfer water released from upstream of the Delta intended for export from south Delta would be used for Delta outflow.
carry-over storage	The amount of water stored in reservoirs carried over from one year to another.
Central Valley Project (CVP)	Multiple-purpose federal water project operated by the Bureau of Reclamation in California that provides water to agricultural, urban, and industrial users in California. The CVP was originally authorized by legislation in 1937.
Central Valley Project contractors	Agencies that have long-term contracts for water entitlements from the Central Valley Project.
Central Valley Project Improvement Act (CVPIA)	This federal legislation, signed into law on October 30, 1992, mandates major changes in the management of the federal Central Valley Project. The CVPIA puts fish and wildlife on an equal footing with agricultural, municipal, industrial, and hydropower users.

Term	Definition
CVPIA Water Acquisition Program for Refuge Level 4 Supplies	The purpose of this program is to acquire water supplies to meet the habitat restoration and enhancement goals of the CVPIA and to improve the Department of the Interior's (Interior) ability to meet regulatory water quality requirements. Section 3406(d) of the CVPIA refers to "Level 4" refuge water supplies, which is the amount of water required for optimum habitat management of the existing refuge lands identified in the 1989 Report on Refuge Water Supply Investigations. Section 3406(d) of the CVPIA requires Interior to acquire water supplies, known as incremental Level 4, to meet optimal waterfowl habitat management needs at identified wildlife areas in the California Central Valley. Incremental Level 4 is defined as the difference between historic annual average water deliveries (Level 2) and water supplies needed to achieve optimal waterfowl habitat management (Level 4).
CVP Operations Criteria and Plan (OCAP)	Document that identifies the factors influencing the physical and institutional conditions and decision-making process under which the CVP operates.
CEQA Responsible Agency	Under CEQA, a Responsible Agency is a public agency which proposes to carry out or approve a project, for which a Lead Agency is preparing or has prepared an EIR or Negative Declaration and includes all public agencies other than the Lead Agency which have discretionary approval power over the project.
CEQA Trustee Agency	Under CEQA, a Trustee Agency is a state agency having jurisdiction by law over natural resources affected by a project which are held in trust for the people of the State of California.
Clean Air Act (CAA)	The United States Congress passes the Clean Air Act in 1963, the Air Quality Act in 1967, the Clean Air Act Extension of 1970, and Clean Air Act Amendments in 1977 and 1990. The Clean Air Act (1990) proposed emissions trading, added provisions for addressing acid rain, ozone depletion and toxic air pollution, and established a national permits program.
Clean Water Act (CWA)	Growing public awareness and concern for controlling water pollution led to enactment of the Federal Water Pollution Control Act Amendments of 1972. As amended in 1977, this law became commonly known as the Clean Water Act. The Act established the basic structure for regulating discharges of pollutants into the waters of the United States. It gave EPA the authority to implement pollution control programs such as setting wastewater standards for industry. The Clean Water Act also continued requirements to set water quality standards for all contaminants in surface waters. The Act made it unlawful for any person to discharge any pollutant from a point source into navigable waters, unless a permit was obtained under its provisions. It also funded the construction of sewage treatment plants under the construction grants program and recognized the need for planning to address the critical problems posed by nonpoint source pollution.
Clifton Court Forebay (CCF)	The in-Delta storage facility used to regulate flows to the SWP Harvey O. Banks Pumping Plant.

Term	Definition
Component 1 Water	The Water Purchase Agreement in the Yuba Accord identifies four water supply components that would be provided based on certain water availability conditions and subject to various pricing structures. Portions of the water used to implement Schedules 1 through 6 of the Fisheries Agreement would be delivered as Component 1, 2, 3, or 4 water. From 2008 through 2015, the Water Purchase Agreement would require YCWA to provide 60 TAF of water annually to the EWA Program or an equivalent program. Reclamation and DWR plan to use these supplies exclusively for the EWA Program. In certain years, operational limitations of the Yuba Project, the CVP or the SWP may cause the quantity of water provided by YCWA to be less than 60 TAF. In this event, YCWA would provide "makeup" water quantities in a later water year of the same classification, ensuring that over the course of the agreement, the EWA Program, or a program equivalent to the EWA, would receive its full entitlement of Component 1 water.
Component 2 Water	The Water Purchase Agreement would enable provision of Component 2 water in drier years for use in the CVP and SWP, including for fish and wildlife purposes. YCWA would provide Reclamation and DWR 15 TAF of Component 2 water in any dry year, and 30 TAF in any critical year.
Component 3 Water	The Water Purchase Agreement states that, under certain CVP and SWP delivery allocation scenarios, Reclamation and DWR could request up to 40 TAF of Component 3 water from YCWA.
Component 4 Water	Under the Water Purchase Agreement, Component 4 water could be delivered in all water year types. YCWA would inform Reclamation and DWR of the quantity of any additional water available from surface and groundwater supplies. Reclamation and DWR then would notify YCWA if they opted to take delivery of any or all of this Component 4 water.
Conference Years	Conference Years are defined as water years for which the North Yuba Index is less than 500 TAF.
cone of depression	A cone of depression occurs in an aquifer when ground water is pumped from a well. In an unconfined (water table) aquifer, this is an actual depression of the water levels. When a well is pumped, the water level in the well is lowered. By lowering this water level, a gradient occurs between the water in the surrounding aquifer and the water in the well. Because water flows from high to low water levels or pressure, this gradient produces a flow from the surrounding aquifer into the well.
conjunctive use	Application of surface and groundwater to meet the demand for beneficial use. Coordinated and planned management of both surface water and groundwater resources to maximize the efficient use of the resource. Typically, groundwater is used in place of or to supplement surface supplies during drier years when surface water supplies may be diminished.
Conjunctive Use Agreement	An agreement between YCWA and its Member Units (including water districts and water companies within Yuba County) for implementation of a comprehensive program of conjunctive use and water use efficiency.

Term	Definition
contaminant	Any substance or property preventing the use or reducing the usability of water for ordinary purposes such as drinking, bathing, recreation and cooling. Any solute or cause of change in physical properties that renders water unfit for a given use. (Generally considered synonymous with pollutant.)
Contra Costa Canal	Part of the Central Valley Project, the Contra Costa Canal is the principal element of the Contra Costa Water District, delivering water from the Delta to the District's treatment facilities and raw-water customers. The canal is a 48-mile-long facility that starts at Rock Slough in East Contra Costa County and ends at the Terminal Reservoir in Martinez.
conveyance	A pipeline, canal, natural channel, or other similar facility that transports water from one location to another.
Coordinated Operations Agreement (COA)	A 1986 agreement between USBR Reclamation and DWR to coordinate the operation of the CVP and SWP.
Cooperating Agency	Any federal agency other than the lead agency that has jurisdiction by law or special expertise with respect to the environmental impacts expected to result from a proposed project.
critical habitat	An area designated as critical habitat listed in 50 CFR Parts 17 or 226 (50 CFR §402.02). Critical habitat areas are specific geographic areas, whether occupied by special-status species or not, that are determined to be essential for the conservation and management of special-status species, and that have been formally described in the Federal Register.
cross Delta water transfers	These transfers typically involve moving water from areas transfers north of the Delta to areas south or west of the Delta.
cubic feet per second (cfs)	Cubic feet per second (cfs, ft 3/s) is the rate of flow representing a volume of 1 cubic foot passing a given point in 1 second. It is equivalent to approximately 7.48 gallons per second, 448.8 gallons per minute, or 0.02832 cubic meters per second.
cultural resource	An aspect of a cultural system that is valued by or significantly representative of a culture or that contains significant information about a culture. Properties such as landscapes, districts, sites, buildings, structures, objects or cultural practices that are usually greater than 50 years of age and possess architectural, historic, scientific or other technical value.
cumulative impact	For CEQA purposes, defined as the change in the environment that results from the incremental impact of the project when added to other, closely related past, present and reasonably foreseeable future projects. Under NEPA, defined by the CEQ regulations as the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonable foreseeable future actions regardless of the source (federal or non-federal) of these other actions.

Term	Definition
Darcy's equation	Based on the analytical approach, the rate of water movement over time (Q) between surface and groundwater systems can be quantified using Darcy's equation: $$Q = K \cdot A \cdot \frac{dh}{dl}$$ Where K is the hydraulic conductivity (or ability of porous media to transmit water) of the streambed, *dh* is the hydraulic head difference between head above and below the streambed, and *dl* is the streambed thickness, and Q is the total flux over the area A which is the streambed through which surface water percolates. The direction of water movement between the surface water and groundwater system may change over time or over the extent of the surface water body depending on the sign of *dh/dl*.
Delta balanced conditions	During balanced conditions, Delta inflow and exports are controlled by Reclamation and DWR to meet SWRCB environmental and water quality standards, the needs of in-Delta diverters and CVP/SWP exports from the Delta. Balanced conditions can occur at any time of the year, but generally occur during late spring, summer and fall, or during drier years.
Delta Cross Channel	Existing gated structure and channel connecting the Sacramento River at Walnut Grove to Snodgrass Slough and thence to the North Fork of the Mokelumne River. The facility was constructed as part of the Central Valley Project to control movement of Sacramento River water into the central Delta and to the south-Delta export pumps. Operating criteria currently require the gates to be closed for specific periods to keep downstream-migrating fish in the Sacramento River and to prevent flooding of the central Delta.
Delta excess conditions	During excess conditions, Delta flow requirements for water quality have been met and excess water is available for Delta users.
Delta facilities	CVP and SWP facilities in the Delta that collect and convey water through the Delta.
Delta Simulation Model (DSM2)	The Delta hydrodynamic and salinity model developed by DWR to simulate hydrodynamic and mixing processes in the Delta, using upstream river flows and salinities, downstream tidal stage and salinity, diversion rates, agricultural return flow and seepage rates, and salinities as boundary conditions.
Delta inflow	The combined water flow entering the Delta at a given time from the Sacramento River, San Joaquin River, and other Central Valley tributaries.
Delta-Mendota Canal	The Delta-Mendota Canal conveys water in a southeasterly direction from the CVP Jones Pumping Plant along the west side of the San Joaquin Valley for irrigation supply, for use in the San Luis Unit of the CVP, and to replace San Joaquin River water stored at Friant Dam and used in the Friant-Kern and Madera systems.

Term	Definition
Delta outflow	The net amount of water (not including tidal flows) at a given time flowing out of the Delta towards the San Francisco Bay. The Delta outflow equals Delta inflow minus the water used within the Delta and exported from the Delta.
depletion	Depletion refers to the loss of water from surface water reservoirs or groundwater aquifers at a rate greater than that of recharge.
direct mortality	The direct loss of fish associated with facilities (forebay, fish screens, and salvage facilities) for the south Delta export pumps. This direct mortality is a portion of the total fish mortality resulting from operation of the export pumps (see indirect mortality).
dissolved organic carbon (DOC)	DOC is used to describe the thousands of dissolved compounds found in water that derive from organic materials (such as decomposed plant matter). DOC is organic material from plants and animals broken down into such a small size that it is "dissolved" into water.
ecosystem	A recognizable, relatively homogeneous unit that includes organisms, their environment, and all the interactions among them.
electrical conductivity (EC)	The measure of the ability of water to conduct an electrical current, the magnitude of which depends on the dissolved mineral content of the water. Electrical conductivity estimates the amount of total dissolved salts (TDS), or the total amount of dissolved ions in the water (also see salinity).
emergent vegetation	A plant rooted in shallow water that has most of its vegetative growth above water.
endemic species	A species native and confined to a certain region; having comparatively restricted distribution.
entrainment	The incidental trapping of fish and other aquatic organisms in water diverted from streams, rivers, and reservoirs. The process of drawing fish into diversions, along with water, resulting in the loss of such fish.
Environmental Impact Report (EIR)	A detailed statement (i.e., report) prepared under CEQA by a state or local agency describing and analyzing the significant environmental effects of a project and discussing ways to mitigate or avoid the effects.
Environmental Impact Statement (EIS)	An environmental impact document required of federal agencies under NEPA for major projects or legislative proposals that would significantly affect the environment. Analyzes and describes the environmental impacts of a proposed action, adverse effects that cannot be avoided, alternative courses of action, and documents the information required to evaluate the environmental impacts of a proposed action.
environmental justice	Defined by the U.S. Environmental Protection Agency Office of Environmental Justice as "the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies."

Term	Definition
Environmental Water Account (EWA)	The Environmental Water Account (EWA) Program is a cooperative management program designed to provide protection to the at-risk native fish species of the Bay-Delta estuary through environmentally beneficial changes in the operations of the CVP and SWP, at no uncompensated water cost to CVP and SWP water users. The EWA Program obtains its water by acquisition from willing sellers (fixed assets), through operational flexibility of Delta facilities (variable assets), and through other water management tools and agreements.
estuarine fish	Fish that spend a part of their life cycle in an estuary.
estuary	A semi-enclosed body of water with an open connection to the sea. Estuaries are regions of interaction between rivers and near-shore ocean waters where river flow and tidal action mix fresh and salt water, and the influx of nutrients from both sources results in high productivity. Thus, water in estuaries tends to be at an intermediate and variable salinity and temperature.
essentially equivalent	The degree of change between variables is determined to have a negligible difference, and thus the variables are considered to be nearly the same. The degree of change between variables as "essentially equivalent" indicates that strong similarities, or weak differences, have been found between these variables. To illustrate, for impact assessment purposes, essentially equivalent is defined as water temperature changes (increases or decreases) that are less than or equal to 0.3ºF (i.e., represent no measurable change) between modeled simulations. The difference in simulated average monthly reservoir volume (TAF) is considered to be negligible (i.e., essentially equivalent) if the calculated relative percent difference between alternatives is less than one percent (i.e., 0 percent). Salinity changes are defined as essentially equivalent if there is as a less than 1.0 percent change. DOC concentrations are considered essentially equivalent if there is a less than 0.1 mg/L change.
Evolutionarily Significant Unit (ESU)	A population or group of populations inhabiting a defined geographical area that comprises a unique segment of the species; a distinct population, reproductively isolated from other conspecific populations and is an important evolutionary legacy of the species.
export	Water diversion from the Delta used for purposes outside the Delta.
Export to Inflow Ratio (E/I ratio)	This requirement of the SWRCB Water Rights Order D-1641 presently limits Delta exports by the CVP and SWP to a percentage of Delta inflow. During July through January, 65% of inflow can be exported. During February through June, months most critical to fisheries, the allowable E/I ratio is reduced to 35% to help diminish reverse flows and the resulting entrainment of fish caused by south Delta export operations.
export pumps	CVP and SWP pumping plants in the southern portion of Delta - the Jones Pumping Plant and the Banks Pumping Plant, respectively. These large pumps export water to urban and agricultural water users in the Export Service Area.
Export Service Area	Lands that receive, store and use CVP and SWP water pumped from the Delta.

Term	Definition
Federal Endangered Species Act (ESA)	Federal legislation that requires Federal agencies, in consultation with the USFWS and NMFS, to ensure that their actions do not jeopardize the continued existence of endangered or threatened species or result in the destruction or adverse modification of the critical habitat of these species.
Federal Energy Regulatory Commission (FERC)	The federal agency within the Department of Energy that regulates the price, terms and conditions of energy sold through interstate commerce and all transmission services, including electricity sales, wholesale electric rates, hydroelectric licensing, natural gas pricing, oil pipeline rates and gas pipeline certification.
Fisheries Agreement	The Fisheries Agreement under the Yuba Accord Alternative contains proposed new instream flow requirements for the lower Yuba River that are intended to provide protection for the river's fisheries resources equivalent to or greater than the protection provided by the instream flow requirements in RD-1644. Key elements of the Fisheries Agreement include: (1) changes to lower Yuba River instream flow requirements; and (2) formation of a RMT (a collaborative decision-making body made up of the signatories to the "Statement of Support for Proposed Lower Yuba River Fisheries Agreement" and River Management Fund (RMF).
fish salvage	The process of screening fish at the south Delta export facilities and physically transporting them by truck to release in other parts of the Delta. This generally results in higher fish mortality than a more conventional fish screen where screened fish simply return to the river and continue downstream. Fish salvage is required at the existing export facilities since there is no flow continuing downstream to carry the fish away.
fish screen	Barrier on the front face of a water intake facility to prevent fish and debris from being drawn into the intake.
flow dependent habitat availability	For the adult spawning life stage of anadromous salmonids, flow dependent habitat availability refers to the amount of appropriate spawning habitat, including the suitable water depths, velocities and substrate, for successful spawning that is, in part, contingent on stream flow.
fry	Salmon that have emerged from gravel, completed yolk absorption, remained in freshwater streams, and are less than a few months old.
groundwater	Water that occurs beneath the land surface and is naturally stored underground in aquifers, or flows through or fills the pore spaces of the alluvium, soil or rock formation in which it is situated.
groundwater basin	An alluvial aquifer or a stacked series of alluvial aquifers with reasonably well defined boundaries in a lateral direction and having a definable bottom.
Groundwater Management Plan	A comprehensive written document developed for the purpose of groundwater management and adopted by an agency having appropriate legal or regulatory authority.

Term	Definition
groundwater overdraft	The condition of a groundwater basin in which the amount of water withdrawn by pumping exceeds the amount of water that recharges the basin over a period of years during which water supply conditions approximate average.
groundwater recharge	The natural and intentional infiltration of surface water into the zones of saturation.
groundwater subbasin	A subdivision of the groundwater basin created by dividing the basin using geologic and hydrologic conditions or institutional boundaries.
groundwater substitution transfer	Additional pumping of groundwater with a one-for-one reduction in surface water diversions that would have occurred absent the additional groundwater pumping. The amount of reduced surface water diversions is then transferred to other water users.
hardness	A physical-chemical characteristic of water created by the amount of dissolved minerals, such as calcium, magnesium, and iron present in the water. The degree of hardness is expressed as the equivalent concentration of calcium carbonate ($CaCO_3$).
Harvey O. Banks Pumping Plant (Banks Pumping Plant)	The State Water Project (SWP) export pumping plant in the south Delta. The plant is located downstream of Clifton Court Forebay.
hydraulic conductivity	Hydraulic conductivity, symbolically represented as K, is a property of vascular plants, soil or rock that describes the ease with which water can move through pore spaces or fractures. It depends on the intrinsic permeability of the material and on the degree of saturation.
hydrograph	A graph that shows some property of groundwater or surface waters as a function of time at some given point.
impingement	Contact or collision with a diversion structure (used to describe deleterious effects of some diversion facilities on aquatic species).
Indian Trust Assets (ITAs)	Indian trust assets are legal interests in property held in trust by the federal government for federally recognized Indian tribes or individual Indians. "Assets" are anything owned that has monetary value. Indian trust assets can be real property, physical assets or intangible property rights, such as a lease, or a right to use something. Examples of items that can be Indian trust assets are land, minerals, hunting and fishing rights, water rights, and instream flows.
instream flows	The amount of flow required to sustain stream values, including fish, wildlife, and recreation. May refer either to specific instream water needs as determined by scientific studies or a protected flow level set by regulation.
invertebrate	An animal that lacks a backbone or spinal column.
Joint Point of Diversion (JPOD)	SWRCB Water Rights Decision 1641 refers to the ability of the SWP and CVP to utilize each other's point of diversion. Allows the SWP and CVP to pump water for each other during times of restriction for one set of pumps.

Term	Definition
kriging technique	A method of spatial interpolation based upon geostatistics. By "spatial interpolation", this means estimating the value of a variable at an unsampled location based upon measured values of the same value at known locations.
land fallowing	Allowing previously irrigated agricultural land to temporarily lie idle (fallowing) or purchasing such land and allowing it to remain out of production.
land subsidence	The lowering of the natural land surface due to groundwater extraction. There are two distinct types of land subsidence that occur when a well in a confined aquifer is pumped: elastic subsidence that is temporary and which reverses itself as water levels recover; and inelastic subsidence, which results in permanent lowering of the land surface even after pumping stops.
Lead Agency (CEQA)	Under CEQA, the "lead agency" is the local or state governmental agency that has the principal responsibility for carrying out or approving the activity. All other local or state agencies with discretionary approval authority are responsible agencies. The lead agency must determine first whether the activity is exempt from CEQA. If the activity is not exempt, the lead agency must prepare an environmental impact report.
Lead Agency (NEPA)	The role of a federal agency in the NEPA process depends on the agency's expertise and relationship to the proposed undertaking. The agency carrying out the federal action is responsible for complying with the requirements of NEPA. In some cases, there may be more than one federal agency involved in an undertaking. In this situation, a lead agency is designated to supervise preparation of the environmental analysis, or environmental impact report if one is required. Federal agencies, together with state, tribal or local agencies, may act as joint lead agencies.
level of development	Criteria used in predicting the amount of water supply needed to meet existing or future demands and the capacity of water supply facilities to meet that demand.
low flow conditions	Defined as the lowest 25 percent of the monthly cumulative probability distribution in the model output that is used for analytical purposes in this EIR/EIS (see Chapters 9 and 10).
Magnuson-Stevens Fishery Conservation and Management Act (MSA)	Statute enacted in 1976, primarily to establish an Exclusive Economic Zone in which foreign fishing could be controlled, and to set up a conservation and management structure for United States fisheries.
maximum contaminant level (MCL)	The highest drinking water contaminant concentration allowed under federal and state Safe Drinking Water Act regulations.
Member Units	Any municipality, town or district wholly or partially within or contiguous to YCWA that is empowered to appropriate and deliver water and which contracts with the agency for payment of construction costs or for delivery of water, as defined in Section 2(g) of the Yuba County Water Agency Act.
mitigation	Measures taken to minimize or avoid adverse environmental impacts.

Term	Definition
Modified Flow Alternative	The Modified Flow Alternative is proposed as an action alternative to the Proposed Project/Action (i.e., Yuba Accord Alternative), and is evaluated in the individual resource chapters in this EIR/EIS (see Chapters 5 through 20).
Monterey Agreement	Amendment made to contracts for State water as a result of the Monterey principles. This amendment established a number of water management tools including: (1) the turnback pool; (2) transfer of water amounts in Table A; (3) storage of water outside of the Export Service Area; and (4) flexible management of SWP terminal reservoirs.
Monterey Amendment	The amendments to the long term water supply contracts for the State Water Project entered into by the California Department of Water Resources and most of the State Water contractors in 1995 and 1996 for purposes of implementing the Monterey Agreement.
multilevel piezometer	Generally, a small-diameter, nonpumping well used to measure the elevation of the water table or potentiometric surface. The water table is an imaginary surface that represents the static head of groundwater and is defined by the level to which water will rise.
National Environmental Policy Act (NEPA)	In 1969, the National Environmental Policy Act was enacted establishing a national environmental policy and the Council on Environmental Quality (CEQ) to advise the president on environmental issues. NEPA requires the preparation of environmental impact statements (EIS) for all major federal actions which would have a significant effect on the environment. NEPA served as a model for the California Environmental Quality Act (CEQA) enacted in 1970.
Net Delta Outflow Index (NDOI)	A measure of the net freshwater flow of water from the Delta into the San Francisco Bay, which is derived from a water balance that considers river inflows, precipitation, agricultural consumptive demand, and project exports.
No Action Alternative (NEPA)	The NEPA basis of comparison for impact evaluation purposes.
No Project Alternative (CEQA)	The CEQA basis of comparison for impact evaluation purposes.
Non-Governmental Organization (NGO)	The term non-governmental organization (NGO) is used in a variety of ways all over the world and, depending on the context in which it is used, can refer to many different types of organizations. In its broadest sense, a non-governmental organization is one that is not directly part of the structure of government.
non-native species	Also called introduced or exotic species; refers to plants or animals that originate elsewhere and are brought into a new area, where they may dominate the local species or in some way negatively impact the environment for native species.

Term	Definition
North Yuba Index (NYI)	The North Yuba Index was developed in conjunction with the Proposed Yuba Accord, and provides a measure of available water in the North Yuba River that can be used to meet instream flow requirements and delivery requirements to Member Units on the lower Yuba River. The North Yuba Index is comprised of two components: (1) active storage in New Bullards Bar Reservoir at the start of the current water year (October 1), and (2) total actual and forecasted inflow into New Bullards Bar Reservoir for the current water year, including diversions from the Middle Yuba River and Oregon Creek to New Bullards Bar Reservoir.
North Yuba Subbasin	One of two aquifers in Yuba River Basin. The North Yuba subbasin is bounded on the north by Honcut Creek, the Feather River on the west, on the south by the Yuba River, and on the east by the Sierra Nevada. It is believed that the Yuba and Feather rivers create a groundwater divide, which act as flow barriers in the shallow subsurface, creating two distinct Yuba groundwater subbasins (i.e., North Yuba subbasin and South Yuba subbasin).
Notice of Intent (NOI)	The notice issued by a federal agency to publicly announce its intention to prepare an environmental impact statement, pursuant to NEPA.
Notice of Preparation (NOP)	The notice issued by a state or local agency to publicly announce its intention to prepare an environmental impact report, pursuant to CEQA.
Old River	A natural channel in the southern Delta. The channel merges with many other channels in the south Delta, passes by the south Delta export facilities and connects with the San Joaquin River at its upstream end. Much of the water approaching the export facilities flows up Old River from the central Delta.
pelagic fish	Fish that spend most of their life swimming in the water column with little contact with or dependency on the bottom. Adult spawning usually occurs in open water, often near the surface.
pelagic organism decline (POD)	While the pelagic fish community of the upper San Francisco estuary historically has showed substantial variability, a recent collapse in the abundance of delta smelt, longfin smelt, striped bass, and threadfin shad has captured the attention of resource managers, scientists, politicians, and the general public. The consequences of the decline are most serious for delta smelt, a threatened species whose relatively narrow range overlaps with large water diversions that supply water to over 22 million people. The pelagic organism decline occurred despite moderate hydrology in recent years, which typically results in at least modest fish recruitment, and recent investments in habitat restoration and environmental water to support native fishes.

Term	Definition
Porter-Cologne Water Quality Control Act	Also referred to as the 'Porter-Cologne Act', it is contained in the California Water Code, Division 7, §13000 et seq. It is the principle law governing water quality regulation in California. It is the policy of the state, as set forth in Porter-Cologne, that the quality of all the waters of the state shall be protected, that all activities and factors affecting the quality of water shall be regulated to attain the highest water quality within reason, and that the state must be prepared to exercise its full power and jurisdiction to protect the quality of water in the state from degradation. Porter-Cologne directs the SWRCB to formulate and adopt state policies for controlling water quality and designates the State Board as the state water pollution control agency for all purposes stated in the Clean Water Act. Porter-Cologne establishes the policies that are to be implemented and authorities that are to be used in achieving the goals of the Clean Water Act.
1966 Power Purchase Contract	YCWA executed a Power Purchase Contract with PG&E on May 13, 1966. The Power Purchase Contract specifies conditions of PG&E's power purchase from YCWA and PG&E's rights to require releases of water from New Bullards Bar Reservoir for power production.
ramping criteria	The timing, magnitude and frequency of flow reduction and fluctuation events have the potential to influence the condition and production of salmonids. Ramping criteria are operating rules intended to minimize or avoid in-river flow fluctuations. Flow reduction and fluctuation criteria for the lower Yuba River were established in the 2005 FERC Order Modifying and Approving Amendment of License for the Yuba River Development Project (FERC No. 2246).
raptor	A bird species in the order *Falconiformes* such as hawks, eagles, kites, and falcons, and in the order *Strigiformes* (owls).
real-time monitoring and operations	Continuous observation in multiple locations of biological conditions on site in order to improve management to protect fish species and allow optimal operation of the water supply system.
recharge zone	A land area into which water can infiltrate into an aquifer relatively easily, replenishing the aquifer.
Record of Decision (ROD)	Concise, public, legal document that identifies and officially discloses the federal lead agency's decision following the completion of an environmental impact statement.
redd dewatering	A redd is a nest of fish eggs consisting of gravel, typically formed by digging motion performed by an adult female salmon. Redd dewatering occurs when water levels fall below the level of egg deposition, which potentially could result in egg and alevin mortality.
Revised Water Rights Decision 1644 (RD-1644)	The State Water Resources Control Board adopted Revised Water Right Decision 1644 (RD-1644) in 2003, which specifies both long-term and interim instream flow requirements for the lower Yuba River.

Term	Definition
riparian area	The land adjacent to a natural watercourse such as a river or stream. Riparian areas support vegetation that provides important wildlife habitat, as well as important fish habitat when sufficient to overhang the bank or fall into the water.
river stage	A site-specific measurement of river-level referenced as the height in feet above a designated zero reference point at the site. The zero reference point is usually chosen as the elevation of the river bottom. Since each gage is established independently at each location, the stage reading is good for that location only and cannot be compared to other locations.
riverine habitat	The aquatic habitat within streams and rivers.
Sacramento Valley 40-30-30 Index	The Sacramento Valley 40-30-30 Index is implemented for water year types and is characterized as: (1) wet; (2) above normal; (3) below normal; (4) dry; and (5) critical. It is used to determine year types for Delta outflow criteria and Sacramento system requirements. Year types are set by first of month forecasts beginning in February. Final determination is based on the May 1st 50 percent exceedance forecast.
Sacramento-San Joaquin Delta (Delta)	The legal Delta, as described in the California Water Code Section 12220, generally extends from Sacramento to the north, Tracy to the south, Interstate 5 to the east, and Collinsville to the west. The Delta covers approximately 738,000 acres.
salinity	Generally, the concentration of mineral salts dissolved in water. Salinity may be expressed in terms of a concentration or as electrical conductivity. When describing salinity influenced by seawater, salinity often refers to the concentration of chlorides in the water.
seasonal high flow period	For impact analysis purposes in this EIR/EIS, the seasonal high flow period in the lower Yuba River is assumed to generally occur from December through June (see Chapter 9).
seasonal low flow period	For impact analysis purposes in this EIR/EIS, the seasonal low flow period in the lower Yuba River is assumed to generally occur from August through November (see Chapter 9).
Section 106 of the National Historic Preservation Act	A Section 106 Review under the U.S. National Historic Preservation Act of 1966 (NHPA), as amended and associated, 36 CFR Part 800, must be undertaken for projects that involve a direct, indirect, or an adverse impact on a site or sites that are on or are eligible for inclusion in the National Register of Historic Places. The responsibility of initiating and completing the Section 106 Review lies with the head of any federal agency having direct or indirect jurisdiction over a proposed federal or federally assisted undertaking in any state and the head of any federal department or independent agency having authority to license any undertaking.
smolt	A juvenile salmonid migrating to the ocean and undergoing physiological changes (called smoltification) to adapt from a freshwater to a saltwater environment.

Term	Definition
South Yuba Subbasin	One of two aquifers in Yuba River Basin. The South Yuba subbasin is bounded on the north by the Yuba River, on the west by the Feather River, on the south by the Bear River, and on the east by the Sierra Nevada and encompasses nearly 107,000 acres. Groundwater elevations range from about 150 feet in the northwest region of the South Yuba subbasin to about 30 feet in the southwest corner near the confluence of the Feather and Bear rivers.
special-status species	Species that are in at least one of the following categories: listed as threatened or endangered under the Federal ESA; proposed for Federal listing under the ESA; Federal candidates under ESA; listed as threatened or endangered under the CESA; candidates under CESA; plants listed as rare under the California Native Plant Protection Act; California fully protected species or specified birds under various sections of the California Fish and Game Codes; California species of special concern; or California Native Plant Society List 1A, lB, 2, or 3 species.
State Water Project (SWP)	The water storage and conveyance system that is operated and maintained by the California Department of Water Resources.
State Water Project contractors	Agencies that have long-term contracts for water entitlements from the State Water Project.
State Water Resources Control Board Decision 1641 (D-1641)	State Water Resources Control Board Decision 1641 (March 2000) implemented the 1995 Water Quality Control Plan; D-1641 included new provisions for X2, export/import ratios, and implemented the Vernalis Adaptive Management Program.
Table A	A tool for apportioning available water supply and cost obligations under the SWP contract. When the SWP was being planned, the amount of water projected to be available for delivery to the contractors was 4.2 million acre-feet (MAF) per year. Table A lists by year and acre-feet the portion of the 4.2 MAF deliverable to each contractor. The Table A amounts are not an indication of the SWP water delivery reliability, nor should these amounts be used to support an expectation that a certain amount of water will be delivered to a contractor in any particular time span.
terrestrial species	Types of species of animals and plants that live on or grow from the land.
transmissivity	The rate of flow of water through a cross-sectional area of an aquifer which is one unit wide and which extends the full saturated depth of the aquifer.
trihalomethane (THM)	Organic compounds which may be harmful to health at certain levels in drinking water. Trihalomethanes are formed as a byproduct when chlorine or bromine are used to disinfect water for drinking. They result from the reaction of chlorine and/or bromine with organic matter in the water being treated. The THMs produced may have adverse health effects at high concentrations, and many governments set limits on the amount permissible in drinking water.

Term	Definition
turbidity	In water bodies, the condition of having suspended particles that reduce the ability of light to penetrate beneath the surface. Some rivers and streams are naturally more turbid than others; soil erosion and runoff into streams can increase turbidity.
unimpaired run-off	Unimpaired runoff represents the natural water production of a river basin, unaltered by upstream diversions, storage, or by export or import of water to or from other watersheds.
Vernalis Adaptive Management Program (VAMP)	Science based management plan designed to determine and protect the survival and transport of salmon smolts through the Delta in relation to the flow of the San Joaquin River, SWP/CVP exports, and the operation of a fish barrier at the head of the Old River.
vernal pool	Seasonally ponded landscape depressions in which water accumulates because of limitations to subsurface drainage and that support a distinct association of plants and animals.
Water Purchase Agreement	Under the Water Purchase Agreement, Reclamation and DWR would enter into a long-term agreement to purchase water from YCWA to improve reliability for the CVP and SWP, including for fish and wildlife purposes, and to contribute to the EWP Program or an equivalent program.
water purveyor	Anyone who sells drinking water to the public, usually the owner of a public water supply system.
water transfers	A temporary or long-term change in the point of diversion, place of use, or purpose of use due to a transfer of or exchange of water or water rights. A more general definition is that water transfers are a voluntary change in the way water is usually distributed among water users in response to water scarcity.
water year	A continuous 12-month period for which hydrologic records are compiled and summarized. Different agencies may use different calendar periods for their water years.
water year type	See Sacramento Valley 40-30-30 Index and Yuba River Index.
watershed	The land area that drains water to a particular stream, river, or lake.
Weighted Usable Area (WUA)	The relationship between instream flow and the quantity and quality of instream habitat expressed in terms of weighted usable area (WUA) produced by a particular flow level.

Term	Definition
X2	The location (measured in river kilometers upstream from the Golden Gate Bridge) of 2 parts per thousand total dissolved solids. The length of time X2 must be positioned at set locations in the estuary in each month and is determined by a formula that considers the previous month's inflow to the Delta and a "Level of Development" factor, denoted by a particular year. X2 is currently used as the primary indicator in managing Delta outflows. The X2 indicator is also used to reflect a variety of biological consequences related to the magnitude of fresh water flowing downstream through the estuary and the upstream flow of salt water in the lower portion of the estuary. The outflow that determines the location of X2 also affects both the downstream transport of some organisms and the upstream movement of others and affects the overall water operations of the CVP and SWP.
Yuba Accord Alternative	The Proposed Project/Action.
Yuba Project Model	In this Draft EIR/EIS, the spreadsheet-based model is referred to as the Yuba Project Model (YPM), and is described in detail in Attachment A of Appendix D.
Yuba River Index	The Yuba River Index was developed in 2000 for the SWRCB Lower Yuba River Hearings to describe the hydrology of the lower Yuba River. This index is a measure of the unimpaired river flows at Smartville. The Yuba River Index is used to determine the water year types and the corresponding instream flow requirements under RD-1644.

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