Chapter 16

Cumulative Impact Summary, Growth-Inducing Effects, and Irreversible Commitment of Resources

16.1 Introduction

This chapter provides an overview of the cumulative impacts of the alternatives in combination with other projects. As required under State California Environmental Quality Act (CEQA) Guidelines (14 Cal. Code Regs., § 15130), the cumulative impacts are determined by evaluating a cumulative projects list and summary of the cumulative effects of the alternatives taken together with other past, present, and reasonably foreseeable future projects is presented in this chapter.

This chapter also fulfills the CEQA requirement to determine whether and how a proposed project, if implemented, may induce growth and the impacts of that induced growth. This discussion covers the methodology used to evaluate growth-inducing effects and an analysis of the growth-inducing effects that could result from the Lower San Joaquin River (LSJR) and southern Delta water quality (SDWQ) alternatives.

Finally, the chapter discloses, per CEQA requirements, any irreversible commitment of resources—the permanent loss of resources for future or alternative purposes—that could result from implementation of the alternatives.

16.2 Cumulative List and Impact Summary

Cumulative impacts are defined in the State CEQA Guidelines (Cal. Code of Regs., tit. 14, § 15355) as "two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts." A cumulative impact occurs from "the change in the environment which results from the incremental impact of the project when added to other closely related past, present, and reasonable foreseeable probable future projects. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time" (Cal. Code Regs., tit. 14, § 15355(b)).

In general, the LSJR or SDWQ alternatives would primarily affect the following resources: water supply, surface hydrology, and water quality; aquatic resources, terrestrial biological resources, groundwater resources, recreational resources, agricultural resources, service providers, and energy resources and climate change. Accordingly, cumulative impacts are those impacts created as a result of the LSJR or SDWQ alternatives in combination with other projects causing related impacts. (Cal. Code Regs., tit. 14,15130, subd. (a)(1)). These projects and the cumulative effects are summarized below in Table 16-1 and Table 16-2. The cumulative effects summarized in this chapter are analyzed in detail of each relevant resource chapter and Chapter 15, *LSJR Alternative 1 and SDWQ Alternative 1 (No Project Alternative)* . In addition, the geographic scope of the area affected by the cumulative effect is generally described below as it relates to the cumulative project list and described more specifically in each resource chapter as it relates to a specific resource.

16.2.1 Cumulative Project List of Past, Present and Reasonably Foreseeable Future Projects

This cumulative impact evaluation considers present (current) projects and reasonably foreseeable future projects with related effects in the San Joaquin River (SJR) Basin (including the three eastside tributary watersheds—the Stanislaus, Tuolumne, and Merced Rivers), the southern Delta, and Delta. The existing environment described in resource chapters 5–14 includes the effects of past projects, thus provides a context in the geographic area for environmental effects that are necessarily included in the cumulative impacts analysis. The cumulative projects are listed in Table 16-1.

Table 16-1 Cumulative Project List

Project Name	Status	Location	Description
Agricultural Drainage Selenium Management Program	Planned	SJR and southern Delta	Reduce agricultural drainage containing elevated levels of selenium (through land and irrigation management practices) and limit where and when drainage water can be discharged. Impairment of water quality in the SJR, Delta, and San Francisco Bay has resulted in the completion of a total maximum daily load (TMDL) for selenium in the LSJR, listing of the western Delta as having impaired water quality for selenium, and initiation of a TMDL study for selenium in North San Francisco Bay.
Almond 2 Power Plant	Construction	Stanislaus County	Construct the state-of-the-art, natural-gas fired, simple-cycle peaking power generation facility, located next to the existing Turlock Irrigation District (TID) Almond Power Plant in Ceres, California. Uses treated effluent (i.e., recycled water) from the City of Ceres' wastewater treatment plant for the project's process water needs.
Anadromous Fish Screen Program	Ongoing	SJR and tributaries	Protect juvenile Chinook salmon (all runs), steelhead, green and white sturgeon, striped bass, and American shad from entrainment at priority diversions throughout the Central Valley.
Bay Area Water Quality and Supply Reliability Program*	Planned/Construction	Bay Area/ southern Delta	Cooperate with Bay Area water agencies in operating their water supplies for benefit of entire Bay Area and potentially constructing interconnects between existing water supplies
Bay–Delta Conservation Plan and Alternative Delta Conveyance Facilities*	Planned	Delta	Provide the basis for permits under federal and state endangered species laws for activities covered by the plan, a comprehensive restoration program for the Delta, and a more reliable water supply by modifying conveyance facilities to create a more natural flow pattern.
National Marine Fisheries Service (NMFS) Biological Opinion and Conference Opinion on the Long-Term Operations of the CVP and SWP	Ongoing	SJR, tributaries, southern Delta, Delta	In its 2009 biological opinion, NMFS concluded that continued operations of the CVP and SWP would likely jeopardize several listed species, including Sacramento River winter-run Chinook salmon, Central Valley spring-run Chinook salmon, Central Valley steelhead, Southern distinct population segment of North American green sturgeon, and southern resident killer whales. The opinion identifies actions to be taken by the U.S. Bureau of Reclamation (USBR) and/or California Department of Water Resources (DWR), including the following. • Limit the strength of reverse flows in Old and New Rivers to reduce entrainment of juvenile fish into state and federal export facilities in the southern Delta.

Project Name	Status	Location	Description
			• Implement facility improvements at state and federal export facilities to increase fish survival. • Implement measures, including a fish study using acoustic tags, to increase survival of juvenile steelhead migrating from the SJR Basin. • Implement a year-round minimum flow regime that improves conditions for steelhead in the Stanislaus River. • Biological opinion effective through December 31, 2030. • Alternative (RPA) that, if implemented, is believed to avoid the likelihood of jeopardizing the continued existence of these listed species.
U.S. Fish and Wildlife Service (USFWS) Biological Opinion on the Long-Term Operations of CVP and SWP (delta smelt)	Ongoing	SJR, tributaries, southern Delta, Delta	USFWS opinion issued on December 15, 2008, to USBR on the effects of the continued operation of the federal CVP and the California SWP on the delta smelt and its designated critical habitat. Identified an RPA intended to protect each life-stage and the critical habitat of the federally protected delta smelt and its designated critical habitat that includes flow components.
Calaveras County General Plan Update	Planned	Calaveras County	Update the general plan land use designation map.
CALFED Ecosystem Restoration Program	Planned/Construction/Ongoing	Delta, Suisun Bay, and San Francisco Bay watershed	Improve the ecological health of the Delta, Suisun Bay, and San Francisco Bay watershed by restoring and protecting habitats, ecosystem functions, and native species.
California Water Plan	Ongoing	California	Provide framework for water managers, legislators, and the public to consider options and make decisions regarding California's water future . Plan is updated every five years and presents basic data and information.
Central Regional Water Quality Control Board's (Central Valley Water Board's) Salt and Boron TMDL (at Vernalis)	Completed	SJR	Amended the Sacramento River and San Joaquin River Basin Plan to implement a salt and boron TMDL to reduce salt loading and achieve water quality objectives required in revisions of the 1995 Bay-Delta Plan.
Central Valley Project Improvement Act	Ongoing	Central Valley	Mandates fish and wildlife protection, restoration, and enhancement equally with irrigation and domestic water supply uses, and mandates fish and wildlife enhancement equally with power generation. Includes measures that are likely to reduce the amount of water available for irrigation and municipal use.

Project Name	Status	Location	Description
Central Valley Vision	Planned	SJR	Provide a 20-year strategic plan for State Parks expansion in the Central Valley, focused on increasing service to residents and visitors. Run by California State Parks since 2003.
City of Stockton DWSP to reduce salinity in the southern Delta	Construction	San Joaquin County	Pumps water from the Delta through miles of underground pipeline along Eight Mile Road to a surface water treatment plant, to provide a new supplemental water supply for Stockton.
City of Tracy Connection to the South San Joaquin Irrigation District (SSJID)	Completed	Stanislaus River	Allows the city to receive additional water after the city completed a second connection to the SSJID water line in 2009.
City of Tracy Desalination and Green Energy Project	Planned/Ongoing	Contra Costa County	Construct and operate a 1.2 million-gallon-per-day desalination plant to remove salts from the wastewater stream produced by the existing wastewater treatment plant. Also operate a biomass cogeneration plant.
Comprehensive Conservation Management Plans for National Wildlife Refuges	Planned/Ongoing	southern Delta	Develop comprehensive conservation management plans to guide management and resource use for each refuge of USFWS's National Wildlife Refuge System.
Conditional Waiver of Waste Discharge Requirements for Irrigated Lands	Ongoing	Central Valley	Use conditional waivers to develop new and additional information to provide a more reasonable basis for adoption of individual or general waste discharge requirements, where necessary, in the future. A conditional waiver is a regulatory process under California's nonpoint-source program plan designed to meet requirements of the California Water Code.
Contra Costa Alternative Intake Project	Completed	southern Delta	Install a new drinking water, screened intake at Victoria Canal, about 2.5 miles east of Contra Costa Water District's (CCWD) existing intake on the Old River, which would allow CCWD to divert higher quality water when available. Includes a 2.5-mile pipeline extension and a new pumping plant that would tie into CCWD's existing conveyance system.
Contra Costa Canal Fish Screen Project	Planned	southern Delta	Install fish screens at Rock Slough diversion to minimize entrainment losses of sensitive fish species. Includes flow control and transition structures necessary to reduce tidal influences and maintain flow rates.
Conveyance of Refuge Water Supply and Mendota Wildlife Area	Planned	Fresno County	Construct new dam approximately 400 feet downstream from existing dam (locally preferred alternative).

Project Name	Status	Location	Description
Delta–Bay Enhanced Enforcement Program	Ongoing	SJR and tributaries	Provide increased enforcement to reduce illegal harvest of species in San Francisco Bay and Delta, and upstream into Sacramento River and SJR Basins. Initiated in 1991 through the Four Pumps Agreement between the DFG and DWR (funded by SWP Contractors).
Delta Fish Agreement (Four Pumps Project)	Ongoing	Delta	Provide a mechanism for offsetting adverse fishery impacts caused by diversion of water at Harvey O. Banks Delta Pumping Plant, a part of the SWP located at the head of the California Aqueduct. Agreement between DWR and DFG.
Delta–Mendota Canal Recirculation Project*	Planned	southern Delta, SJR	Recirculate water from Delta through CVP pumping and conveyance facilities to SJR where it enters Delta, which provides flows to reduce salinity concentrations in SJR.
Delta Risk Management Strategy	Completed	Delta	Evaluate the sustainability of the Delta and assess major risks to the Delta resources from floods, seepage, subsidence, and earthquakes. Evaluate the consequences, and develop recommendations to manage the risk.
Dos Rios Ranch	Ongoing	Stanislaus County, Tuolumne River	Restore land to provide wildlife habitat and flood control in Central Valley on 1,600 acres of biologically rich floodplain, including three miles of riverfront on the SJR and three miles on the Tuolumne River.
Eastern San Joaquin Integrated Conjunctive Use Program	Ongoing	Central Valley	Develop approximately 140,000–160,000 acre-feet (AF) per year of new surface water supply for the basin to directly and indirectly support conjunctive use by the Northeastern San Joaquin County Groundwater Banking Authority (GBA) member agencies. This amount of water would support groundwater recharge consistent with the GBA's objectives for conjunctive use and the underlying groundwater basin.
Farmington Groundwater Recharge Project	Ongoing	San Joaquin County	Begin replenishment of groundwater basin in critical overdraft in eastern part of county. Launched by Stockton East Water District (SEWD), U.S. Army Corps of Engineers, and other local water agencies to partner with local landowners, businesses, growers, and ranchers to save the region's water supply by recharging an average of 35,000 AF of water annually into the eastern SJR Basin.
Federal Energy Regulatory Commission (FERC) Relicensing of the Don Pedro Project (FERC Project No. 2299)	Planned	Tuolumne County, Tuolumne River	Relicense New Don Pedro Dam so it can continue to operate.

Project Name	Status	Location	Description
FERC Relicensing of the Merced River Hydroelectric Project (FERC Project No. 2179)	Planned	Mariposa County, Merced River	Relicense New Exchequer Dam so it can continue to operate.
Fish Screen and Passage Program	Ongoing	Waterways	Conduct inventories of all screened and unscreened diversions and fish passage problems via site visits, and gather information on size and number of diversions at each site and presence of existing fish protective facilities. A DFG program.
Fish Screen Project at Sherman and Twitchell Islands	Planned	Delta	Install fish screens on up to 10 currently unscreened agricultural intakes used to irrigate state-owned lands on Sherman and Twitchell Islands in the Delta. Contribute to protection of delta smelt and other sensitive aquatic species and the restoration of habitat in the Delta.
FloodSAFE California	Planned	Central Valley	Improve integrated flood management statewide, with substantial emphasis on Central Valley and Delta.
Franks Tract Project*	Planned	Sacramento and San Joaquin Counties	Install operable gates to control flow of water at one of two locations on either Threemile Slough or West False River.
Fremont Landing Conservation Bank	Planned	Delta	Restore, enhance, and preserve 100 acres of habitat for federally and state listed Chinook salmon and Central Valley steelhead at Fremont Landing Conservation Bank.
Grasslands Bypass Project (USBR and San Luis Delta Mendota Water Authority discharges of salt, selenium, and boron)	Completed	Merced and Fresno Counties	Prevent discharge of subsurface agricultural drainage water into wildlife refuges and wetlands in central California. Convey drainage water instead through a segment of the San Luis Drain to Mud Slough, a tributary of the SJR.
Gravel Mining Reach Floodway Restoration	Unknown	Stanislaus County, Tuolumne River	Restore seven miles on Tuolumne River actively gravel mined area to increase floodway capacity to convey 15,000 cubic feet per second (cfs), increase salmon spawning and rearing habitat, protect dikes and offchannel pits from future flood damage, and restore riparian forests on floodplains.
Grayson River Ranch Conservation Easement	Completed	Stanislaus County, Tuolumne River	Established easement to allow for five miles of river subject to frequent flooding.
Habitat Management Preservation and Restoration Plan for Suisun Marsh	Planned	Solano County	Develop a regional plan for Suisun Marsh to protect and enhance the Pacific Flyway and existing wildlife values, endangered species, and water quality.

Project Name	Status	Location	Description
Habitat Restoration Plan for the Lower Tuolumne River Corridor	Completed	Stanislaus County, Tuolumne River	Provide integrated and long-term restoration strategy for lower Tuolumne River to maximize anadromous fish habitat improvements, minimize channel restoration project costs, and streamline project evaluation and monitoring. Produce five products as part of this process: (1) propose general types of inventoried preservation and restoration sites, (2) evaluate fluvial geomorphic processes, (3) evaluate geomorphic-salmonid relationships and develop restoration strategy, (4) finalize restoration site list and designs, and (5) integrate into a comprehensive river corridor habitat restoration plan.
Hatchery and Stocking and Hatchery and Stocking Program Proposed Changes	Ongoing	waterways	Rear and release millions of trout, salmon, and steelhead of various age and size classes into state waters. A statewide system of fish hatchery facilities run by DFG.
In-Delta Storage Program (Delta Wetlands Project)*	Planned	San Joaquin County	Development of two storage islands (Webb Tract and Bacon Island), two habitat islands (Holland Tract and Bouldin Island), embankment design, consolidated inlet and outlet structures, project operations, and habitat management plans.
Jensen River Ranch Habitat Enhancement and Public Access Project	Planned	Fresno County	Connect Jensen River Ranch site with Woodward Regional Park via paved and natural public trails by modifying an urban stormwater drainage channel to create oxbows for wetland wildlife habitat, grading to create changes in site hydrology and to widen the riparian terrace, installing hiking and equestrian trails, constructing a public use area with access via a paved main trail, and restoring and enhancing oak woodlands and wetland and riparian habitat.
Knights Ferry Floodplain and Side-channel restoration	Planned	Stanislaus County, Merced River	Restore existing side-channel and floodplain habitat.
Knights Ferry Gravel Replenishment Project, Phase 2	Completed	Stanislaus County, Merced River	Continue to investigate how source and size of restoration gravel affect fall-run Chinook salmon redd densities.
Levee Repair–Levee Evaluation Program	Ongoing	Delta, southern Delta, and SJR and tributaries	Complete most urgent levee repairs and those of lower priority, throughout the Central Valley. Continue to identify, plan, and prioritize. Needed to maintain functionality of flood control systems that have deteriorated over time and/or do not meet current design standards.
Los Vaqueros Reservoir Expansion Project*	Planned/Construction	San Joaquin County	Expand Los Vaqueros reservoir storage from 100 thousand acre-feet (TAF) up to 275 TAF and require a new or expanded Delta intake with capacity of up to about 1,000 cfs. Considering Old River and adjacent channels for the new Delta intake location.

Project Name	Status	Location	Description
Lower San Joaquin Flood Improvement Project*	Planned	Southern Delta, SJR	Improve flood control capacity on LSJR and enhance ecosystem structure and function in LSJR and southern Delta.
Lower Sherman Island Wildlife Area (LSIWA) Land Management Plan (LMP)	Ongoing	Delta	Provide extensive, diverse, and valuable wildlife habitats and related recreational opportunities integral to the functioning and human use of the Delta. Occupies roughly 3,100 acres, primarily marsh and open water, at confluence of Sacramento River and SJR in the western Delta.
Lower Tuolumne River Big Bend Project	Ongoing	Stanislaus County, Tuolumne River	Improve forest, river, and wildlife habitat along the Tuolumne River. When completed, over 25,000 native trees and shrubs will be planted and over 150 acres of native grasses and forbs will be seeded in a 240-acre project.
Merced County General Plan Update	Planned	Merced County	Update the general plan, which is the overarching policy document that guides land use, housing, transportation, infrastructure, community design, and other policy decisions. The general plan expresses the county's vision for the future and incorporates public policy relative to future public and private land uses.
Merced River Ranch Floodplain Restoration	Construction	Merced County, Merced River	Restore (i.e., rehabilitate and enhance) channel, floodplain, and riparian ecosystem processes and critical habitats for juvenile and adult salmonids.
Millerton Lake Resources Management Plan/General Plan	Completed	Merced and Fresno Counties, Upper SJR	Provide analysis and recommendations related to recreation resources, needs, allowable use levels, and operations by State Parks and private entities.
Modesto Regional Water Treatment Plant (MRWTP) Phase Two	Construction	Stanislaus County	Expand the MRWTP and the terminal reservoir/pump station by Modesto Irrigation District, and construct downstream facilities in the city, including water tanks, pump stations, pipelines and control valves.
New Exchequer Spillway Modification	Planned	Merced River	Increase the height of the existing spillway gates and un-gated spillway 8–10 feet to increase capacity of Lake McClure.
Non Structural Alternative at San Joaquin River National Wildlife Refuge: Refinement of Habitat Enhancement	Planned	Stanislaus County	Provide floodplain inundation behind project levees of up to 3,100 acres of refuge land in some years.
North Delta Flood Control and Ecosystem Restoration Project*	Planned	northern Delta	Implement flood control improvements to benefit aquatic and terrestrial habitats, species, and ecological processes.

Project Name	Status	Location	Description
National Pollutant Discharge Elimination System (NPDES) permit amendments for City of Manteca	Planned	San Joaquin County	Amend the city's wastewater treatment plant NPDES permit for discharging treated wastewater effluent into the southern Delta, based on water quality objectives established by the State Water Resources Control Board (State Water Board) and the Central Valley Water Board.
NPDES permit amendments for City of Stockton	Planned	San Joaquin County	Amend the city's wastewater treatment plant NPDES permit for discharging treated wastewater effluent into the southern Delta, based on water quality objectives established by the State Water Board and the Central Valley Water Board.
NPDES permit renewal for the City of Tracy	Planned	Contra Costa County	Renew and possibly amend the city's Wastewater Treatment Plan NPDES permit for discharging treated wastewater effluent into the southern Delta, based on water quality objectives established by the State Water Board and the Central Valley Water Board.
NPDES permit renewal for the Mountain House Community Services District	Planned	Contra Costa County	Renew and possibly amend the Mountain House Community Services District wastewater treatment plant NPDES permit for discharging treated wastewater effluent into the southern Delta, based on water quality objectives established by the State Water Board and the Central Valley Water Board.
Regional Surface Water Supply Project	Planning	Stanislaus County	Construct a new water treatment plant in Stanislaus County, near Hughson, as described in TID's environmental impact report. Locate the new plant near the intersection of Geer and Hatch Roads and treat water drawn from the Tuolumne River near the Geer Road Bridge.
Restoration of the Ruddy Mining Reach	Ongoing	Stanislaus County, Tuolumne River	Restore along Tuolumne River in Ruddy Mining area.
San Joaquin Basin Action Plan	Ongoing	Upper SJR	Meet Kesterson Reservoir mitigation needs and acquire water supply for Level 4 under Central Valley Improvement Act (CVPIA) Section 3406(d)(5). Plan created in 1989. A cooperative agreement between USBR, USFWS, and DFG to jointly develop a habitat acquisition and wetland enhancement project on approximately 23,500 acres of lands within the northern SJR Basin.
San Joaquin County General Plan Update	In Progress	San Joaquin County	Recommended staff alternative June 14, 2012.

Project Name	Status	Location	Description
San Joaquin County Multi-Species Habitat Conservation and Open Space Plan	Ongoing	San Joaquin County	Provide a strategy to balance open space and non-open space uses while protecting the region's agricultural economy; preserving landowner property rights; providing for long-term management of plant, fish and wildlife species, especially those currently listed or may be listed under the federal Endangered Species Act or the California Endangered Species Act; providing and maintaining multiple-use open spaces that contribute to quality of life of residents of San Joaquin County; and accommodating a growing population while minimizing costs to project proponents and society. Run by San Joaquin Council of Governments.
San Joaquin River Flow Modifications	Ongoing	SJR watershed	Provide two years of continued implementation of a Water Right Decision 1641 (D-1641) spring pulse flow target for SJR at Vernalis.
San Joaquin River Parkway Plan	Planned/Construction	Fresno and Madera Counties	Preserve, enhance, and provide for enjoyment of natural landscape of SJR corridor. A long-range planning document.
San Joaquin River Partnership's San Joaquin River Blueway	Planned/ Construction	SJR	Provides the public opportunities to explore and enjoy the SJR from its headwaters to the Delta via a network of parks, wildlife refuges, and other publicly accessible places.
San Joaquin River Salinity Management Plan	Completed	Southern Delta	Manage water quality to improve salt, boron, and other constituent conditions in the LSJR.
San Joaquin Water Quality Project Selenium TMDL	Completed	LSJR	Amended water quality objectives identified in the Central Valley Water Board's 1996 Basin Plan for selenium. Implement TMDL through: (1) prohibitions of discharge of agricultural subsurface drainage water adopted in a Basin Plan Amendment for the Control of Subsurface Drainage Discharges, and (2) load allocations in waste discharge requirements.
San Luis Reservoir Low Point Improvement Project[a]	Planned	Merced County	Reduce risk of "low point" water levels at San Luis Reservoir with one alternative or a combination of alternatives, including treatment options, bypasses, and other storage options.
Semitropic Groundwater Banking Program	Ongoing	Multiple counties in Central Valley	Implement groundwater banking to support municipalities and water districts.
SEWD Dr. Joe Waidhofer Water Treatment Plant Expansion	Planned	San Joaquin County	Expand the existing water reservoir by 10 million gallons and provide power, monitoring, and lighting for the reservoir by (1) modifying the existing piping, the reservoir inlet structure, and the electrical and control system, (2) installing new piping, new chemical feed vaults, and (3) conducting new water quality sampling. Run by SEWD.

Project Name	Status	Location	Description
South County Water Supply Project	Ongoing	San Joaquin and Stanislaus Counties	Meet present and future water demands in Central Valley cities of Manteca, Escalon, Lathrop, and Tracy, as well as provide irrigation water for local agriculture. Run by SSJID in a series of phased projects.
South Delta Flood Bypass	Planned	southern Delta	Provide a natural buffer against effects of sea level rise and increased flooding related to climate change. Initial modeling Impact Statement/Report suggests the proposed bypass could reduce flood stage along urbanized areas of LSJR by nearly 2 feet.
South Delta Improvements Program*	Planned	southern Delta	Install and operate permanent operable gates for local water levels, water quality, and Chinook salmon protection.
South Delta Temporary Barriers Project	Ongoing	southern Delta	Increase water levels, improve water circulation patterns and water quality in southern Delta for local agricultural diversions, and improve operational flexibility of the SWP to help reduce fishery impacts and improve fishery conditions. Consists of four rock barriers across southern Delta channels.
Spawning Gravel Supplementation	Ongoing	Stanislaus County, Tuolumne River	Mechanically place large volume of gravel followed by period augmentation and maintenance of gravel supply, as needed.
Special Run Pools 9 and 10 Reconstruction	Completed	Stanislaus County, Tuolumne River	Reduce salmonid predator habitat, restore and increase salmonid habitat, reconstruct a natural river channel geometry scaled to current channel forming flows, and restore native riparian plant communities within their predicted hydrological regime.
SSJID and SEWD water transfer agreement	Ongoing	San Joaquin County	Contract for 10 years with a possible 10-year renewal pending further studies, starting in 2011, regarding a district water transfer agreement with SSJID for 8,000–30,000 AF per year allocation based on New Melones Reservoir storage and inflow as of April 1 of each year.
SSJID Division 9 Irrigation Enhancement Project	Planned	San Joaquin County	Design, construct, and operate a pressurized irrigation water system serving farmland within a portion of Division 9 of the SSJID.
SSJID increased surface water agreements/sales to municipalities and associated infrastructure	Planned	Merced County and Stanislaus County	Purchase future surface water from SSJID by the cities of Ripon and Escalon, and purchase future surface water from Merced ID by the City of Merced, as an increased use of surface water by municipalities through agreements with irrigation districts was indicated in SSJID's Urban Water Management Plans.

Project Name	Status	Location	Description
SSJID On-Farm Water Conservation Program	Ongoing	San Joaquin County	Promote and incentivize on-farm physical improvements, and irrigation management practices and water measurement (together referred to as conservation measures) that promote water conservation. Defines water conservation as using less water to accomplish the same purpose by encouraging efficient use of district surface water to meet crop water requirements.
Stanislaus County General Plan Update	Complete	Stanislaus County	Revised Agricultural Buffers December 20, 2011, and Housing Element Update adopted April 2, 2010.
State Plan of Flood Control	Ongoing	LSJR, Delta, and lower Stanislaus River	Complete in 2012 the floodplain evaluation activities for the State Plan of Flood Control initiated in January 2008. Develop and use critical and essential datasets and models to plan, design, improve, retrofit, construct, and repair new and existing capital assets and infrastructure.
Stockton Deep Water Ship Channel Demonstration Dissolved Oxygen Project	Ongoing	Delta	Study effectiveness of elevating dissolved oxygen concentrations in the channel. A multiple-year study.
Tracy Fish Collection Facility and Tracy Fish Facility Improvement Program	Planning/Construction/Ongoing	Southern Delta	Identify and implement physical improvements and operational changes, assess fisheries conditions, and monitor fish salvage operations per agreements signed with DFG in 1992 and in accordance with legal requirements under 1992 CVPIA.
Tuolumne County General Plan Update	Complete	Tuolumne County	Updated the safety element (in 2009) and the Mountain Springs Community Plan (in 2008).
Tuolumne River Regional Park	Construction	Stanislaus County, Tuolumne River	Provides over 500 acres of parkland that runs along seven river miles of the Tuolumne River from the Mitchell Street Bridge east to the Carpenter Road Bridge in Stanislaus County. Five major areas: Legion Park/Airport Area, Gateway Parcel, Mancini Park, Dryden Park Golf Course Area, and Carpenter Road Area.
Tuolumne River Restoration Projects including Warner Deardorff Segment – Mining Reach Project No. 3	Planned/Construction	Stanislaus County, Tuolumne River	Return this reach of the river to a more natural, dynamic channel morphology that will improve, restore, and protect instream and riparian habitat for fall-run Chinook salmon survival, including restoring hydrological and geomorphic processes.
Two Gates Fish Protection Demonstration Project*	Planned	San Joaquin County	Install and operate removable gate structures at Old River between Bacon Island and Holland Tract, and Connection Slough between Mandeville and Bacon Islands.

Project Name	Status	Location	Description
Upper San Joaquin River Restoration Program	Planned/ Ongoing	Fresno and Madera Counties, Upper SJR	A comprehensive, long-term effort to restore flows to the SJR from Friant Dam to the confluence of Merced River and restore a self-sustaining Chinook salmon fishery in the river while reducing or avoiding adverse water supply impacts from restoration flows. It is a direct result of a Settlement reached in 2006 to provide sufficient fish habitat in the SJR below Friant Dam near Fresno, California, by the U.S. Departments of the Interior and Commerce, Natural Resources Defense Council, and Friant Water Users Authority. Implement provisions of the Stipulation of Settlement related to the interim flows and restoration flows under this program. Implement the full restoration flow schedule no later than January 2014. USBR is temporarily changing Friant Dam operations in water year 2010 to release the interim flows.
Update to Bay-Delta Water Quality Control Plan: Phase II	Planned	Delta	A comprehensive update to the 2006 Bay-Delta Plan by the State Water Board that will include evaluating and potentially amending existing water quality objectives that protect beneficial uses and the program of implementation to achieve those objectives. Water quality objectives that could be amended include Delta outflow criteria.
USBR and DWR compliance with the modified Cease and Desist Order in the Board's Water Rights Order 2010-0002	Ongoing	Southern Delta	Continue to implement and improve the temporary barriers program, in consultation with South Delta Water Agency and with any necessary assistance from USBR. Study effectiveness and feasibility of alternative salinity control measures, and implement any additional measures.
USBR's New Melones Lake Area Final Resource Management Plan	Completed	Calaveras County and Tuolumne County	Develop framework for management guidance for resources and recreation needs for New Melones Lake Area, while ensuring the Eastside Division of the CVP continues to meet authorized purposes of flood control, water supply, power recreation, water quality, and fish and wildlife enhancement.
Vernalis Adaptive Management Program (VAMP)	Completed	San Joaquin County	Maintain fish population by flow release on the Stanislaus River and other tributaries to be met at Vernalis, under D-1641.

*CALFED Listed Water Resource Projects

16.2.2 Cumulative Impact Summary

The cumulative effects analysis applies to all alternatives. Analysis of the cumulative effects with respect to each resource can be found at the end of each resource chapter 5–14. Table 16-2 presents a summary of the impacts analysis for each resource area.

16.3 Growth-Inducing Effects

CEQA requires a discussion of "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" (State CEQA Guidelines § 15126.2[d]). Growth-inducing projects are those that have the potential to remove obstacles that inhibit population growth, or encourage and facilitate other activities that can stimulate growth in the future. This chapter discusses the effects of the LSJR and SDWQ alternatives (including LSJR Alternative 1 and SDWQ Alternative 1 [No Project]) and the potential effects on growth.

16.3.1 Methodology for Growth-Inducing Effects

The evaluation of potential growth-inducing impacts is qualitative and discusses the possible direct and indirect ways the LSJR and SDWQ alternatives could have growth-inducting effects. It primarily discusses the potential changes in inflow, outflow, and exports and then addresses whether the changes would directly or indirectly do the following: foster economic, population, or housing growth; remove obstacles to growth; tax community service facilities; or, encourage or result in growth and related environmental effects (State CEQA Guidelines § 15126.2[d]).

It should be noted that growth-inducing impacts are not to be construed as necessarily beneficial, detrimental, or of little significance to the environment. Growth-inducing impacts are analyzed to help assess if the alternatives could contribute to significant environmental changes beyond the direct consequences of those alternatives evaluated in the resource chapters and appendices of this Substitute Environmental Document (SED). The analysis focuses on whether the alternatives would directly or indirectly stimulate growth.

16.3.2 Analysis of Growth-Inducing Effects

The SDWQ alternatives are limited to protecting the beneficial use of agriculture and would maintain the historical range of salinity in the southern Delta. Because the SDWQ alternatives would maintain the historical range of salinity and not change the baseline, they would not induce growth. The LSJR alternatives are limited to addressing river flow requirements the SJR and the three eastside tributaries. None of the alternatives directly involve the construction of any new facilities or significant changes in water operations that would lead to inducing growth in any area as discussed below.

- Changes in river flows in the affected rivers would generally result in more water remaining in the rivers rather than being used for consumptive purposes. These changes in river flows would not directly or indirectly induce growth.

Table 16-2. Summary of Cumulative Impacts

Resource	LSJR Alternative 1 and SDWQ Alternative 1	LSJR Alternative 2	LSJR Alternative 3	LSJR Alternative 4	SDWQ Alternative 2	SDWQ Alternative 3
Water Supply, Surface Hydrology, and Water Quality	X	X	X	X	O	O
Flooding, Sediment and Erosion	O	O	O	O	O	O
Aquatic Resources	X	X	O	O	O	O
Terrestrial Biological Resources	X	X	O	O	O	O
Groundwater Resources	X	O	X	X	O	O
Recreational Resources and Visual Quality	O	O	X	X	O	O
Agricultural Resources	X	O	X	X	O	O
Cultural Resources	O	O	O	O	O	O
Service Providers	X	O	X	X	X	O
Energy Resources and Climate Change	X	O	X	X	O	O

Notes:

X indicates cumulatively considerable increment and cumulatively significant impact

O indicates no cumulatively considerable increment and no cumulative impact

- Changes in flows in the affected rivers would also result in an increase in Delta inflow because additional flows would be required to remain in the rivers and ultimately discharged into the southern Delta from the LSJR. In areas where water availability is constrained, increased inflow can allow for an increase in consumptive use, including new urban or population growth. Within the legal Delta, however, the availability and quality of water is not a limiting factor, and numerous unrelated constraints (e.g., flooding risk and protections of agricultural lands) limit growth potential under existing conditions.
- Under the LSJR alternatives, Delta outflow would generally increase. An increase in outflow would not result in growth-inducing effects because use of outflow for consumptive purposes is restricted based on salinity. Therefore, an increase in outflow would not increase the reliable water supply and is not considered growth inducing.
- Modeling predicts a potential for minor increases in exports (1 percent and 4 percent) under LSJR Alternatives 3 and 4, respectively, on an average annual basis. Based on the modeling, LSJR Alternative 1 and SDWQ Alternative 1 (No Project) would result in a change similar to that of LSJR Alternative 4 based on the modeling. LSJR Alternative 2, resulting in no change to or a reduction in exports, would not induce growth. Minor increases in exports under the LSJR Alternatives 3 and 4 are not considered to be growth inducing for the following reasons.
    - Increases of 1 percent to 4 percent in modeled exports are extremely minor because Delta exports make up less than half of the water supplies available to and used in California south of the Delta and in the Central Valley Project (CVP) and State Water Project (SWP) export service areas.
    - Although modeling predicts minor increases in exports on an average annual basis, the annual variability of exports is high and actual exports are controlled by a variety of factors, including weather patterns, annual agricultural practices, economic conditions, and availability of water from other sources (e.g., groundwater, local water sources, recycled water, Colorado River supplies) south of the Delta and in the CVP and SWP export service areas. Additionally, exports are controlled by many other laws, regulations, permits, and water rights that address the timing and amount of permissible exports, only some of which are related to the availability of water in the Delta for export, and these requirements vary from year to year.
    - The minor modeled increases in exports are well within both the range of normal variation experienced from year to year and the likely accuracy of modeling results at this scale of predictability.
- Although the LSJR and SDWQ alternatives may result in different methods of compliance implemented by the regulated community, such as the need for certain facilities (e.g., wastewater treatment plants) to implement improvements to meet discharge effluent limitations, the building of any particular facility is speculative. If new facilities are built, the alternatives would not cause these facilities to increase capacity; therefore, the alternatives would not have the potential to spur growth where available facilities constrain growth.

The LSJR and SDWQ alternatives do not involve the construction or operation of direct growth-inducing uses, such as housing. Since it is anticipated that the alternatives would not induce growth, as discussed above, they would not foster economic, population, or housing growth; remove obstacles to growth; tax community service facilities; or encourage or facilitate other activities that would encourage or result in growth and related environmental effects.

16.4 Significant Irreversible Commitment of Resources

Section 15126 (c) of the State CEQA Guidelines requires a discussion of the significant irreversible environmental changes that would be caused by a proposed project, should it be implemented. Section 15127 of the State CEQA Guidelines requires information about irreversible changes needs to be included in connection with the adoption, amendment, or enactment of a plan of a public agency, such as the amendment of the 2006 Bay-Delta Plan by the State Water Board. An irreversible commitment of resources is the permanent loss of resources for future or alternative purposes. Irreversible resources are those that cannot be recovered or recycled, or those that are consumed or reduced to unrecoverable forms. Irreversible impacts are those which cause, either directly or indirectly, the use of natural resources so that they cannot be restored or returned to their original condition.

LSJR Alternative 1 and SDWQ Alternative 1 (No Project) and LSJR Alternatives 3 and 4 have potential irreversible impacts associated with consumption of groundwater, agricultural resources, and energy. These resources were determined to be affected by these alternatives such that a permanent loss of these resources for future or alternative purposes might occur under the LSJR alternatives and could not be recovered or recycled.Under these alternatives, surface water diversions could be reduced, which would result in a shortfall of surface water supplies; this could result in additional groundwater pumping and the possibility of overdraft. Use of groundwater may be mitigated, depending on the extent to which controls can be implemented to reduce or manage pumping in groundwater basins. Changes in agricultural production can involve the potential loss of agricultural land under these alternatives. These alternatives may also result in changes in the consumption of energy resources, either through a reduction in energy production (hydropower) and/or through additional energy consumption to pump groundwater (directly or indirectly).