

3.10 HYDROLOGY AND WATER QUALITY

This section of the Program Environmental Impact Report (PEIR) describes the existing hydrology and water quality conditions within the SCAG region, identifies the regulatory framework with respect to laws and regulations that affect hydrology and water quality, and analyzes the potential impacts of the Connect SoCal Plan (Connect SoCal”; “Plan”) to affect water quality, result in substantial siltation or erosion or flooding due to the alteration of drainage patterns, and deplete groundwater supplies or interfere with groundwater recharge. In addition, this PEIR provides regional-scale mitigation measures, as well as project-level mitigation measures for subsequent, site-specific environmental review to reduce identified impacts as appropriate and feasible.

3.10.1 ENVIRONMENTAL SETTING

3.10.1.1 Definitions

Definitions of terms used in the regulatory framework, characterization of baseline conditions, and impact analysis for hydrology and water quality are provided.

Best Management Practices (BMPs): For purposes of this PEIR, A BMP is any program, technology, process, siting criteria, operating method, measure, or device that controls, prevents, removes, or reduces storm water pollution. Generally, BMPs focus on water quality problems caused by increased impervious surfaces from land development. BMPs are designed to reduce stormwater volume, peak flows, and/or nonpoint source pollution through evapotranspiration, infiltration, detention, and filtration or biological and chemical actions.

Ephemeral Drainages: An ephemeral stream or drainage has flowing water only during, and for a short duration after, precipitation events in a typical year. Ephemeral stream beds are located above the water table year-round. Groundwater is not a source of water for the stream. Runoff from rainfall is the primary source of water for stream flow.

Hydrologic Unit Code (HUC): The United States is divided and sub-divided into successively smaller hydrologic units which are classified into four levels: regions, sub-regions, accounting units, and cataloging units. The hydrologic units are arranged or nested within each other, from the largest geographic area (regions) to the smallest geographic area (cataloging units). Each hydrologic unit is identified by a unique hydrologic unit code (HUC) consisting of two to eight digits based on the four levels of classification in the hydrologic unit system.

1. The first level of classification divides the United States into 21 major geographic areas, or regions. These geographic areas contain either the drainage area of a major river, such as the Missouri region, or the combined drainage areas of a series of rivers, such as the California region.
2. The second level of classification divides the 21 regions into 221 subregions. A subregion includes the area drained by a river system, a reach of a river and its tributaries in that reach, a closed basin(s), or a group of streams forming a coastal drainage area.
3. The third level of classification subdivides many of the subregions into accounting units. These 378 hydrologic accounting units are nested within, or can be equivalent to the subregions.
4. The fourth level of classification is the cataloging unit, the smallest element in the hierarchy of hydrologic units. A cataloging unit is a geographic area representing part or all of a surface drainage basin, a combination of drainage basins, or a distinct hydrologic feature. There are 2,264 Cataloging Units in the country.

Impaired Waters: Under section 303(d) of the Clean Water Act, states, territories, and authorized tribes are required to develop lists of impaired waters. These are waters that are too polluted or otherwise degraded to meet the water quality standards of the jurisdiction. The law requires that these jurisdictions establish priority rankings for waters on the lists and develop Total Maximum Daily Loads (TMDLs) for these waters.

Mudflow: Mudflows result from the downslope movement of soil and/or rock under the influence of gravity.

National Flood Insurance Program (NFIP): The National Flood Insurance Program aims to reduce the impact of flooding on private and public structures. It does so by providing affordable insurance to property owners, renters and businesses and by encouraging communities to adopt and enforce floodplain management regulations.

Non-Point Source Runoff: Runoff that occurs on surfaces before reaching a channel is also called a nonpoint source. If a nonpoint source contains man-made contaminants, the runoff is called nonpoint source pollution. A land area which produces runoff that drains to a common point is called a drainage basin. When runoff flows along the ground, it can pick up soil contaminants including, but not limited to, petroleum, pesticides, or fertilizers that become discharge or nonpoint source pollution.

Perennial Stream: A perennial stream has flowing water year-round during a typical year. The water table is located above the stream bed for most of the year. Groundwater is the primary source of water for stream flow. Runoff from rainfall is a supplemental source of water for stream flow.

Runoff: Runoff is the water flow that occurs when the soil is infiltrated to full capacity and excess water from rain, meltwater, or other sources flows over the land. This is a major component of the water cycle, and the primary agent in water erosion. In addition to causing water erosion and pollution, surface runoff in urban areas is a primary cause of urban flooding, which can result in property damage, damp and mold in basements, and street flooding.

Regional Water Quality Control Board: As a result of the Porter-Cologne Act, nine RWQCBs were established that exercise rulemaking and regulatory activities by basin. Each RWQCB conducts a broad range of activities to protect ground and surface water resources within their respective jurisdictions. Six of the nine RWQCBs (either wholly or in part) have jurisdiction that includes portions of the SCAG region as shown in **Figure 3.10-1, Regional Water Quality Control Boards:**

- *Region 3—Central Coast RWQCB.* The Central Coast RWQCB jurisdiction includes Santa Clara (south of Morgan Hill), San Mateo (southern portion), Santa Cruz, San Benito, Monterey, Kern (small portions), San Luis Obispo, Santa Barbara, Ventura (northern portion) counties.
- *Region 4—Los Angeles RWQCB.* The Los Angeles RWQCB jurisdiction includes the coastal watersheds of Los Angeles and Ventura Counties, along with very small portions of Kern and Santa Barbara Counties.
- *Region 6—Lahontan RWQCB.* The jurisdiction of the Lahontan RWQCB extends from the Oregon border to the northern Mojave Desert and includes all of California east of the Sierra Nevada crest, including San Bernardino County and northeastern Los Angeles County.
- *Region 7—Colorado River RWQCB.* The Colorado River RWQCB jurisdiction includes Imperial, San Bernardino, Riverside, and San Diego counties.
- *Region 8—Santa Ana RWQCB.* The Santa Ana RWQCB jurisdiction includes Orange, Riverside, and San Bernardino counties.
- *Region 9—San Diego RWQCB.* The San Diego RWQCB includes San Diego, Imperial, and Riverside counties.

Seiche: A seiche is an oscillation of a body of water in an enclosed or semi-enclosed basin, such as a reservoir, harbor, lake, or storage tank.

Storm Water Pollution Prevention Plan (SWPPP): A plan created by constructors to show their plans for sediment and erosion control. Typically, these plans are part of an overall design that details procedures to be followed during various phases of construction. This is required by a federal regulation governing stormwater runoff from active construction sites that are more than one acre in area.

Total Maximum Daily Loads (TMDL): A TMDL is a calculation of the maximum amount of a pollutant that a water body can receive and still safely meet water quality standards.

Tsunami: A tsunami is a great sea wave produced by a significant undersea disturbance.

Waters of the United States: the definition of “waters of the United States” are regulatory definitions of “waters of the United States” are those portions of 33 CFR part 328 and 40 CFR parts 110, 112, 116, 117, 122, 230, 232, 300, 302, and 401 as they existed immediately prior to the 2015 Rule's amendments (see discussion below in Regulatory Background). For example, pursuant to 40 CFR 230.3(s), the term “waters of the United States” means:

1. All waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;
2. All interstate waters including interstate wetlands;
3. All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation or destruction of which could affect interstate or foreign commerce including any such waters:
 - a. Which are or could be used by interstate or foreign travelers for recreational or other purposes; or
 - b. From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or
 - c. Which are used or could be used for industrial purposes by industries in interstate commerce;
4. All impoundments of waters otherwise defined as waters of the United States under this definition;
5. Tributaries of waters identified in paragraphs (s)(1) through (4) of this section;
6. The territorial sea;

7. Wetlands adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (s)(1) through (6) of this section; waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of CWA (other than cooling ponds as defined in 40 CFR 423.11(m) which also meet the criteria of this definition) are not waters of the United States.

3.10.1.2 Hydrologic Regions

The Department of Water Resources (DWR) has divided the state into ten hydrologic regions, corresponding to the state's major water drainage basins. The SCAG region is divided into four hydrologic regions: Central Coast, Colorado River, South Coast, and South Lahotan. The hydrologic regions are described below.¹

Central Coast

The Central Coast Hydrologic Region runs along California's central coast, stretching from Santa Cruz County down to Santa Barbara County and the northwest corner of Ventura County. Due to the thriving agriculture and viticulture business in the area, the region is the most groundwater-dependent hydrologic region in California. Approximately 80 percent of water demands in the region are met via groundwater extraction. Additional water is supplemented from the State Water Project (SWP) and the Central Valley Project. Due to the extent of groundwater extraction, the Central Coast faces challenges such as groundwater basin overdraft, seawater intrusion, and water quality degradation.²

Colorado River

The Colorado River Hydrologic Region covers approximately 13 million acres of southeast California. Imperial County, and large parts of Riverside and San Bernardino counties are within this hydrologic region. It is the most arid hydrologic region in California, with less than an average of six inches of precipitation falling annually. Groundwater aquifers are a vital water resource for communities in the area, as is the Colorado River, which serves as the main tributary of the region. Overdraft and leaking underground storage tanks pose legitimate issues to water availability and quality in the region.³

¹ Public Policy Institute of California. *California Hydrologic Regions and Counties*. Available online at: <https://www.ppic.org/map/california-hydrologic-regions-and-counties/>, accessed August 27, 2019.

² Department of Water Resources. *California Water Update 2018: Central Coast Hydrologic Region Report*. October. Available online at: cwpc@water.ca.gov, accessed August 27, 2019.

³ Ibid

South Coast

The South Coast Hydrologic Region is comprised of approximately 6.8 million acres in the southwestern portion of the state. The region is bounded to the south by Mexico and the Pacific Ocean to the west. Most of the region falls within SCAG's jurisdiction, including parts of Ventura, Orange, Los Angeles, Riverside, and San Bernardino counties. Approximately 50 percent of the population of California lives within this region and as such, it maintains the highest population density of any hydrologic region. Groundwater provides about 25 percent of water demand in the region, which contains 56 delineated groundwater basins.⁴

South Lahontan

The South Lahontan Hydrologic Region covers over 21 million acres of eastern California. The region contains the highest (Mount Whitney) and lowest (Death Valley) surface elevations of the state and the contiguous U.S. Annual precipitation is approximately eight inches and a significant amount of water rights in the region belong to the Los Angeles Department of Water and Power (LADWP). SCAG counties within the South Lahontan Hydrologic Region include San Bernardino and Los Angeles. The 223-mile long Los Angeles Aqueduct is the region's major water development feature. The aqueduct system provides large quantities of power and water to the region, though 41 percent of water supply is provided by groundwater.⁵

3.10.1.3 Regional Water Quality Control Boards

The four hydrologic regions in the SCAG region are managed by six Regional Water Quality Control Boards (RWQCBs): The Central Coast, Los Angeles, Lahontan, Colorado River, Santa Ana and the San Diego RWQCB. The purpose of the RWQCBs is to manage and improve water supplies within the region, by addressing groundwater pumping, water quality protection and restoration, and sharing information between water boards across the state. Each board has seven part-time board members, appointed by the Governor, who make critical decisions including setting water quality standards, issuing permits, and determining and enforcing compliance. Furthermore, each RWQCB completes, reviews, and updates a Basin Plan, designed specifically to each region's climate and topography. Basin Plans are designed to preserve and enhance water quality, as well as protect the beneficial uses of all regional waters. Each Basin Plan designates beneficial uses, sets protection goals to comply with the state's anti-degradation policy, and describes protection programs. By incorporating all applicable water rules and regulations, the Basin Plans serve as a resource for agencies involved with water, wastewater, discharge,

⁴ Ibid

⁵ Ibid

environmental permitting, and resource management, as well as the public interested in local water quality issues.

3.10.1.4 Surface Hydrology

Surface water hydrology refers to surface water systems, including watersheds, floodplains, rivers, streams, lakes, and reservoirs.

Watersheds

Watersheds refer to areas of land, or a basin, in which all waterways drain to one specific outlet, or body of water, such as a river, lake, ocean, or wetland. Watersheds have topographical divisions such as ridges, hills, or mountains. All precipitation that falls within a given watershed, or basin, eventually drains into the same body of water. As shown in **Figure 3.10-2, Watersheds in the SCAG Region**, there are 19 watersheds in the SCAG region: the Aliso-San Onofre Watershed, Antelope-Fremont Valleys Watershed, Ballona Creek Watershed, Calleguas Creek Watershed, Imperial Reservoir Watershed, Los Angeles River Watershed, Lower Colorado Watershed, Malibu Creek Watershed, Mojave Watershed, Newport Bay Watershed, Salton Sea Watershed, Santa Ana River Watershed, Santa Clara River Watershed, San Gabriel River Watershed, San Jacinto Watershed, Santa Monica Bay Watershed, Seal Beach-Westminster Watershed, Southern Mojave Watershed, Ventura River Watershed.⁶

Watersheds are an essential part of the landscape, ecological composition, economy, and life, especially in Southern California and the SCAG region where arid conditions place great emphasis on the necessity of water. Unfortunately, water resources in the SCAG region have been degraded by a multitude of factors. Agricultural run-off, mining operations, loss of habitat, illegal dumping, and eutrophication are just some of the causes of impaired water quality. As climate change affects precipitation patterns and drought conditions become more severe, water resources must be carefully managed to ensure their protection. In particular, groundwater pumping must be performed with caution so as to prevent saltwater intrusion or permanent aquifer subsidence.

Drainages

Despite its primarily arid climate, the SCAG region has a variety of surface water resources, such as creeks, rivers, lakes, and reservoirs. Due to the dry climate of the region, many rivers and creeks are intermittent or ephemeral, drying up in the summer or flowing only in reaction to precipitation. Annual

⁶ USGS. 2018. *Watershed Boundary Dataset*. Available online at: https://www.usgs.gov/core-science-systems/ngp/national-hydrography/watershed-boundary-dataset?qt-science_support_page_related_con=4#qt-science_support_page_related_con, accessed January 10, 2019.

rainfall amounts vary depending on elevation and proximity to the coast. Some waterways in the region, like the Los Angeles River, maintain a perennial flow due to agricultural irrigation and urban landscape watering.

Most waterways in California have been diverted for agricultural and economic purposes. Within the SCAG region, surface waters such as Los Angeles River, San Gabriel River, and the San Jacinto River have been dammed, redirected, and paved for human uses and as flood control measures. The Salton Sea is a man-made inland sea that resulted from the diversion of the Colorado River around 1905. The drainage reservoir serves Imperial County and would dry up without agricultural runoff flows.⁷ Other major natural surface waters like the Ventura River, Santa Clara River, Santa Ana River, and portions of the Santa Margarita River maintain more natural conditions and flows and support aquatic species and natural habitats. All surface water drainages suffer from water quality impacts such as overuse, erosion, and illegal dumping.

Lakes and Reservoirs

Most lakes in southern California have been generated by humans, through manual digging and/or the damming of rivers across the state. Lakes and reservoirs serve as important habitat as well as recreational purposes; however, the most vital uses include agricultural irrigation, flood control, and drinking water, all of which are imperative to life in the semi-arid climate. Major lakes in the SCAG region include Big Bear Lake, Lake Arrowhead, Lake Casitas, Diamond Valley Lake, and the Salton Sea.

Big Bear Lake and Lake Arrowhead are located in San Bernardino County and were created via the damming of rivers. Big Bear Lake was created in 1884 and has no tributary inflow, replenishing itself solely by snowmelt. The dam at Lake Arrowhead was completed in 1922 and the lake is still used for recreation and potable water. Damming also created Lake Casitas in Ventura County⁸ and the Salton Sea, which is one of the saltiest bodies of water on earth due to evaporation and agricultural runoff.⁹ Diamond Valley Lake is the newest and largest reservoir in Southern California, holding 800,000 acre-feet (af) of water. While the lake is situated in Riverside County, it is connected to the State Water Project

⁷ The Salton Sea Authority. *Timeline of Salton Sea*. Available online at: <http://saltonseaauthority.org/get-informed/history/>, accessed August 27, 2019.

⁸ U.S. Bureau of Reclamation. *Casitas Dam*. Available online at: <https://www.usbr.gov/projects/index.php?id=276>, accessed August 27, 2019.

⁹ The Salton Sea Authority. *Timeline of Salton Sea*. Available online at: <http://saltonseaauthority.org/get-informed/history/>, accessed August 27, 2019.

(SWP) and serves as an important resource for potable water and hydroelectric power throughout the SCAG region.¹⁰

Coastal Waters

Three counties in the SCAG region border the Pacific Ocean and contain coastal waters such as bays, estuaries, beaches, and open ocean. Santa Monica Bay comprises a large portion of the region's open coastal waters and important harbors include the Los Angeles/Long Beach Harbor complex and Port Hueneme. Important estuaries, providing unique and critical habitat for wildlife, include coastal lagoons and wetlands. Unfortunately, coastal wetlands are negatively impacted by run-off, discharges, oil spills, dredging, illegal dumping, and natural oil seeps.¹¹

Federally Protected Wetlands and Waterways

Under Section 404 of the Clean Water Act (CWA)¹² and Section 10 of the Rivers and Harbors Act,¹³ some wetlands and waterways are federally protected by the U.S. Army Corps of Engineers (USACE). Parties must obtain special permits for discharging dredged or fill materials or pollutants into designated waters, intensifying protections for such wetlands and waterways. Designated wetlands and waterways in the SCAG region are identified in **Table 3.10-1, Federally Protected Wetlands and Waterways within the SCAG Region**, below.

¹⁰ Diamond Valley Lake. *How Deep is the Lake*. Available online at: http://www.dvlake.com/general_info02.html, accessed August 27, 2019.

¹¹ State Water Resources Control Board. 2014. *Basin Plan for the Coastal Watersheds of Los Angeles and Ventura Counties Chapter 1: Introduction*. Available at: https://www.waterboards.ca.gov/losangeles/water_issues/programs/basin_plan/electronics_documents/FinalRevisedChapter1Text.pdf, accessed September 10, 2019.

¹² U.S. Environmental Protection Agency. *Overview of Clean Water Act Section 404*. Available online at: <https://www.epa.gov/cwa-404/overview-clean-water-act-section-404>, accessed August 27, 2019.

¹³ U.S. Environmental Protection Agency. *Section 10 of the Rivers and Harbors Appropriation Act of 1899*. Available online at: <https://www.epa.gov/cwa-404/section-10-rivers-and-harbors-appropriation-act-1899>, accessed September 3, 2019.

**Table 3.10-1
Federally Protected Wetlands and Waterways within the SCAG Region**

Major River or Lake	Acres	Linear Miles
Imperial County		
Salton Sea	190,391.60	—
Los Angeles County		
Castaic Lake	2,230.82	—
Morris Reservoir	283.42	—
Puddingstone Reservoir	243.77	—
Pyramid Lake	1,177.31	—
San Gabriel Reservoir	524.85	—
Los Angeles River	—	50.73
San Gabriel River	—	59.19
Santa Clara River	—	43.86
Orange County		
Irvine Lake	445.54	—
San Gabriel River	—	0.35
Santa Ana River	—	27.18
Riverside County		
Diamond Valley Lake	4,057.69	—
Lake Elsinore	3,308.69	—
Lake Matthews	2,666.79	—
Perris Reservoir	1,920.63	—
Salton Sea	42,537.27	—
Skinner Reservoir	790.46	—
Vail Lake	257.23	—
Santa Ana River	—	24.43
Santa Margarita River	—	5.14
San Bernardino County		
Big Bear Lake	2,692.69	—
Lake Arrowhead	735.62	—
Silverwood Lake	905.09	—
Santa Ana River	—	43.86
Ventura County		
Lake Casitas	2,446.81	—
Lake Piru	1,220.91	—
Santa Clara River	—	39.27
TOTAL	258,837.19	294.00

Source:

U.S. Geological Survey (USGS). 2018. National Hydrology Dataset. Available online at: <http://nhd.usgs.gov/data.html>, accessed January 10, 2019.

3.10.1.5 Groundwater Hydrology

Groundwater accounts for most of the local fresh water within the SCAG region. The Central Coast and South Lahontan watersheds most heavily rely on groundwater for urban and agricultural use, although all four watersheds are dependent upon it. Drought conditions in recent years have led to groundwater overdraft and associated subsidence, in which the groundwater basin collapses with dirt and renders it unusable. Improved groundwater management and water reduction measures, as well as wet weather conditions, have assisted in lessening groundwater overdraft, however, it is still a major concern within the SCAG region and across the state, as climate change leads to more severe and volatile weather patterns and the population of the area continues to expand.¹⁴

3.10.1.6 Water Quality

Point and non-point source pollution are different forms of pollution which can damage surface water and are regulated at the federal and local level. Point source pollution refers to contaminants that enter a watershed, usually through a specific location such as a pipe. The source must be documented and the flow from the source is subject to a discharge permits issued by a Regional Water Quality Control Board. Examples of point source pollution are discharges from sewage treatment plants and industrial facilities. Because point sources are much easier to regulate than non-point sources, they were the initial focus of the 1972 CWA. Regulation of point sources since then has dramatically improved the water quality of rivers and streams throughout the country.

In contrast to point source pollution, non-point source pollution, also known as “pollution runoff,” is diffuse. Non-point pollution comes from areas (such as contaminated runoff from urban areas) and is significantly influenced by land uses. A driveway or the road in front of a house may be a source of pollution if spilled oil, leaves, pet waste, or other contaminants are washed into a storm drain. Non-point source pollution is now considered a major water quality problem in the United States.

The problem of non-point source pollution, specifically runoff pollution is especially acute in urbanized areas where a combination of impermeable surfaces, landscape irrigation, highway runoff, and illicit dumping increase the pollutant loads in stormwater. The California State Water Quality Control Board (SWQCB) has identified the following pollutants found in urban runoff as being of concern:

- **Sediment.** Excessive sediment loads in streams can interfere with photosynthesis, aquatic life respiration, growth, and reproduction.

¹⁴ United States Geological Survey. (USGS). 2018. California Water Data. Available online at: <https://ca.water.usgs.gov/data/>, accessed January 8, 2019.

- **Nutrients.** Nitrogen and phosphorus can result in eutrophication of receiving waters (excessive or accelerated growth of vegetation or algae), reducing oxygen levels available for other species.
- **Bacteria and viruses.** Pathogens introduced to receiving waters from animal excrement in the watershed and by septic systems can restrict water contact activities.
- **Oxygen demanding substances.** Substances such as lawn clippings, animal excrement, and litter can reduce dissolved oxygen levels as they decompose.
- **Oil and grease.** Hydrocarbons from automobiles are toxic to some aquatic life.
- **Metals.** Lead, zinc, cadmium, and copper are heavy metals commonly found in stormwater. Other metals introduced by automobiles include chromium, iron, nickel, and manganese. These metals can enter waterways through storm drains along with sediment, or as atmospheric deposition.
- **Toxic pollutants.** Pesticides, phenols, and polynuclear aromatic hydrocarbons (PAHs) are toxic organic chemicals found in stormwater.
- **Floatables.** Trash in waterways increases metals and toxic pollutant loads in addition to undesirable aesthetic impacts.

EPA lists impaired and threatened waters under CWA Section 303(d).¹⁵ The state then identifies the pollutant causing the impairment and develops rules and guidelines towards its improvement. There are more than 200 impacted waterways and water bodies within the SCAG region (**Table 3.10-2, Impaired Surface Water Bodies in the SCAG Region**).¹⁶ Poor water management and overuse in Southern California has led to problems with salinity, Polychlorinated biphenyls (PCBs), pathogens and bacteria, overwhelming nutrients, lead, sulfates, uranium, and disinfection byproducts (DBPs).

¹⁵ U.S. Environmental Protection Agency. 2018. *Clean Water Act Section 303(d): Impaired Waters and Total Maximum Daily Loads (TMDLs)*. Available online at: <https://www.epa.gov/tmdl>, accessed August 27, 2019.

¹⁶ U.S. Environmental Protection Agency (EPA). 2016. *California Water Quality Assessment Reports*. Available online at: https://ofmpub.epa.gov/waters10/attains_state.control?p_state=CA, accessed January 8, 2019.

**Table 3.10-2
Impaired Surface Water Bodies in the SCAG Region**

Pollutant	Impaired Water Body
Central Coast	
Boron	Cuyama River (above Twitchell Reservoir)
	Rincon Creek
Colorado River Basin	
Chlordane	Alamo River
	Imperial Valley Drains
DDT (Dichlorodiphenyltrichloroethane)	Coachella Valley Storm Water Channel
	Palo Verde Outfall Drain and Lagoon
Selenium	Colorado River (Imperial Reservoir to California-Mexico Border)
Toxaphene	New River (Imperial County)
Lahontan	
Arsenic	Amargosa River (Upper Canyon to Willow Creek confluence)
Fluoride	Mojave River (Mojave Forks Reservoir outlet to Upper Narrows)
	Mojave River (Upper Narrows to Lower Narrows)
Nitrate	Sheep Creek
Total Dissolved Solids	Crab Creek
	Holcomb Creek
Los Angeles	
Algae	Lindero Creek Reach 1
	Lindero Creek Reach 2 (Above Lake)
	Medea Creek Reach 1 (Lake to Confl. with Lindero)
	Medea Creek Reach 2 (Abv Confl. with Lindero)
	Ventura River Estuary
	Ventura River Reach 1 and 2 (Estuary to Weldon Canyon)
Ammonia	Calleguas Creek Reach 2 (estuary to Potrero Rd- was Calleguas Creek Reaches 1 and 2 on 1998 303d list)
	Calleguas Creek Reach 3 (Potrero Road upstream to confluence with Conejo Creek on 1998 303d list)
	Calleguas Creek Reach 6 (was Arroyo Las Posas Reaches 1 and 2 on 1998 303d list)
	Calleguas Creek Reach 7 (was Arroyo Simi Reaches 1 and 2 on 1998 303d list)
	Calleguas Creek Reach 9B (was part of Conejo Creek Reaches 1 and 2 on 1998 303d list)
	Calleguas Creek Reach 10 (Conejo Creek (Hill Canyon)-was part of Conejo Crk Reaches 2 & 3, and lower Conejo Crk/Arroyo Conejo N Fk on 1998 303d list)
	Calleguas Creek Reach 11 (Arroyo Santa Rosa, was part of Conejo Creek Reach 3 on 1998 303d list)
	Calleguas Creek Reach 12 (was Conejo Creek/Arroyo Conejo North Fork on 1998 303d list)
	Calleguas Creek Reach 13 (Conejo Creek South Fork, was Conejo Cr Reach 4 and part of Reach 3 on 1998 303d list)
	Coyote Creek
	Dominguez Channel (lined portion above Vermont Ave)

Pollutant	Impaired Water Body
	Los Angeles River Reach 1 (Estuary to Carson Street) Los Angeles River Reach 2 (Carson to Figueroa Street) Los Angeles River Reach 3 (Figueroa St. to Riverside Dr.) Los Angeles River Reach 4 (Sepulveda Dr. to Sepulveda Dam) Los Angeles River Reach 5 (within Sepulveda Basin) San Jose Creek Reach 1 (SG Confluence to Temple St.) Santa Clara River Reach 3 (Freeman Diversion to A Street) Sepulveda Canyon Tujunga Wash (LA River to Hansen Dam)
Beach Closures	Robert H. Meyer Memorial Beach
Benthic-Macroinvertebrate Bioassessments	Arroyo Seco Reach 1 (LA River to West Holly Ave.) Compton Creek Las Virgenes Creek Malibu Creek Triunfo Canyon Creek Reach 2 Walnut Creek Wash (Drains from Puddingstone Res)
Bis(2ethylhexyl)phthalate (DEHP)	Sawpit Creek
Boron	Calleguas Creek Reach 8 (was Tapo Canyon Reach 1) Fox Barranca (tributary to Calleguas Creek Reach 6) Santa Clara River Reach 11 (Piru Creek, from confluence with Santa Clara River Reach 4 to gaging station below Santa Felicia Dam)
Cadmium	Ballona Creek Estuary
Cadmium (sediment)	Ballona Creek
ChemA (tissue)	Calleguas Creek Reach 5 (was Beardsley Channel on 1998 303d list) Calleguas Creek Reach 9A (was lower part of Conejo Creek Reach 1 on 1998 303d list) Duck Pond Agricultural Drains/Mugu Drain/Oxnard Drain No 2 Rio De Santa Clara/Oxnard Drain No. 3
Chloride	Piru Creek (from gaging station below Santa Felicia Dam to headwaters) Santa Clara River Reach 5 (Blue Cut gaging station to West Pier Hwy 99 Bridge) (was named Santa Clara River Reach 7 on 2002 303(d) list) Santa Clara River Reach 6 (W Pier Hwy 99 to Bouquet Cyn Rd) (was named Santa Clara River Reach 8 on 2002 303(d) list) Sespe Creek (from 500 ft below confluence with Little Sespe Cr to headwaters)
Chlorpyrifos (tissue)	Calleguas Creek Reach 4 (was Revolon Slough Main Branch: Mugu Lagoon to Central Avenue on 1998 303d list)
Coliform Bacteria	Arroyo Seco Reach 2 (West Holly Ave to Devils Gate Dam) Bell Creek Big Rock Beach Dan Blocker Memorial (Coral) Beach Las Flores Beach Leo Carillo Beach (South of County Line) Long Point Beach Los Angeles River Reach 6 (Above Sepulveda Flood Control Basin) Malibu Lagoon Beach (Surfrider) Palo Comado Creek

Pollutant	Impaired Water Body
	Redondo Beach Rio Hondo Reach 1 (Confl. LA River to Snt Ana Fwy) Rio Hondo Reach 2 (At Spreading Grounds) San Gabriel River Reach 1 (Estuary to Firestone) San Gabriel River Reach 2 (Firestone to Whittier Narrows Dam) San Jose Creek Reach 2 (Temple to I-10 at White Ave.) Santa Clara River Reach 7 (Bouquet Canyon Rd to above Lang Gaging Station) (was named Santa Clara River Reach 9 on 2002 303(d) list) Stokes Creek Topanga Beach Torrance Beach Torrance Carson Channel Verdugo Wash Reach 1 (LA River to Verdugo Rd.) Wilmington Drain
Copper	Aliso Canyon Wash Burbank Western Channel San Gabriel River Estuary
DDT (Dichlorodiphenyltrichloroethane)	Amarillo Beach Bluff Cove Beach Cabrillo Beach (Outer) Carbon Beach Castlerock Beach Escondido Beach Flat Rock Point Beach Area Inspiration Point Beach La Costa Beach Las Tunas Beach Malaga Cove Beach Malibu Beach Nicholas Canyon Beach Paradise Cove Beach Point Dume Beach Point Fermin Park Beach Portuguese Bend Beach Puerco Beach Royal Palms Beach Sea Level Beach Trancas Beach (Broad Beach) Ventura Marina Jetties Whites Point Beach Zuma Beach (Westward Beach)
DDT (sediment)	Abalone Cove Beach
Fecal Coliform	Canada Larga (Ventura River Watershed) Dry Canyon Creek

Pollutant	Impaired Water Body
	McCoy Canyon Creek
Fish Barriers (Fish Passage)	Matilija Creek Reach 1 (Jct. With N. Fork to Reservoir)
	Matilija Creek Reach 2 (Above Reservoir)
Indicator Bacteria	Artesia-Norwalk Drain
	Avalon Beach
	Bull Creek
	Channel Islands Harbor Beach
	Coyote Creek, North Fork
	Dockweiler Beach
	Hermosa Beach
	Hobie Beach (Channel Islands Harbor)
	Long Beach City Beach
	Lunada Bay Beach
	Manhattan Beach
	Marina del Rey Harbor Beach
	Ormond Beach
	Peninsula Beach
	Point Vicente Beach
	Promenade Park Beach
	Puente Creek
	Resort Point Beach
	Rincon Beach
	San Antonio Creek (Tributary to Ventura River Reach 4)
	San Buenaventura Beach
	San Gabriel River Reach 3 (Whittier Narrows to Ramona)
	Santa Monica Beach
	Santa Monica Canyon
	Surfers Point at Seaside
	Venice Beach
	Ventura River Reach 3 (Weldon Canyon to Confl. w/ Coyote Cr)
	Will Rogers Beach
Invasive Species	Solstice Canyon Creek
Lead	Monrovia Canyon Creek
	Topanga Canyon Creek
	Triunfo Canyon Creek Reach 1
Nitrate and Nitrite	Brown Barranca/Long Canyon
	Mint Canyon Creek Reach 1 (Confl to Rowler Cyn)
	Torrey Canyon Creek
	Wheeler Canyon/Todd Barranca
Pathogens	Palo Verde Shoreline Park Beach
Pumping	Ventura River Reach 4 (Coyote Creek to Camino Cielo Rd)
Sulfates	Hopper Creek
	Pole Creek (trib to Santa Clara River Reach 3)

Pollutant	Impaired Water Body
Toxicity	Santa Clara River Reach 1 (Estuary to Hwy 101 Bridge)
Trash	San Gabriel River, East Fork
	Verdugo Wash Reach 2 (Above Verdugo Road)
San Diego	
Benzo[b]fluoranthene	English Canyon
Cadmium	Prima Deshecha Creek
Chloride	Oso Creek (at Mission Viejo Golf Course)
Chlorpyrifos	Long Canyon Creek (tributary to Murrieta Creek)
	Murrieta Creek
	Redhawk Channel
	Santa Gertrudis Creek
	Temecula Creek
	Warm Springs Creek (Riverside County)
	Long Canyon Creek (tributary to Murrieta Creek)
DDE (Dichlorodiphenyldichloroethylene)	Murrieta Creek
Diazinon	San Juan Creek
Enterococcus	Arroyo Trabuco Creek
	Pacific Ocean Shoreline, Aliso HSA, at Aliso Beach - middle
	Pacific Ocean Shoreline, Aliso HSA, at Aliso Creek mouth
	Pacific Ocean Shoreline, Lower San Juan HSA, at North Beach Creek
	Pacific Ocean Shoreline, Lower San Juan HSA, at South Doheny State Park Campground
	Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Pier
Indicator Bacteria	Pacific Ocean Shoreline, San Clemente HA, at South Capistrano County Beach
	Aliso Creek
Iron	Pacific Ocean Shoreline, Dana Point HSA, at Aliso Beach at West Street
	De Luz Creek
Phosphorus	Santa Margarita River (Upper)
	Segunda Deshecha Creek
Sediment Toxicity	Laguna Canyon Channel
Selenium	Moro Canyon Creek
	Oso Creek (lower)
Total Coliform	Pacific Ocean Shoreline, Dana Point HSA, at Salt Creek outlet at Monarch Beach
	Pacific Ocean Shoreline, Laguna Beach HSA, at Main Beach
Santa Ana	
Ammonia (Unionized)	Bolsa Chica Channel
	Borrego Creek (from Irvine Blvd to San Diego Creek Reach 2)
	East Garden Grove Wintersburg Channel
	Serrano Creek
Cadmium	Cucamonga Creek Reach 1 (Valley Reach)
	Rathbone (Rathbun) Creek
	Santa Ana River Reach 6
Chemical oxygen demand (COD)	Chino Creek Reach 1B (Mill Creek confl to start of concrete lined channel)
Coliform Bacteria	Chino Creek Reach 2 (Beginning of concrete channel to confl w San Antonio Creek)

Pollutant	Impaired Water Body
Copper	Bolsa Chica State Beach
	Santa Ana River, Reach 3
DDT (Dichlorodiphenyltrichloroethane)	Balboa Beach
	Peters Canyon Channel
Enterococcus	Newport Slough
	Seal Beach
Fecal Coliform	Buck Gully Creek
	Los Trancos Creek (Crystal Cove Creek)
	San Diego Creek Reach 1
Indicator Bacteria	Goldenstar Creek
	Morning Canyon Creek
	San Diego Creek Reach 2
	Santa Ana Delhi Channel
	Santa Ana River, Reach 2
	Temescal Creek, Reach 6 (Elsinore Groundwater sub basin boundary to Lake Elsinore Outlet)
Nutrients	Chino Creek Reach 1A (Santa Ana River R5 confl to just downstream of confl with Mill Creek)
	Grout Creek
	Mill Creek (Prado Area)
	Summit Creek
Pathogens	Knickerbocker Creek
	Lytle Creek
	Mill Creek Reach 1
	Mill Creek Reach 2
	Mountain Home Creek
	Mountain Home Creek, East Fork
	Santa Ana River, Reach 4
	Silverado Creek
PCBs (Polychlorinated biphenyls)	Huntington Beach State Park
pH	Cucamonga Creek Reach 2 (Mountain Reach)
	San Antonio Creek
	Temescal Creek, Reach 1
Salinity/TDS/Chlorides	Santiago Creek, Reach 4

Source: State Water Resources Control Board. 2016. 2016 303(d) List of Impaired Waterbodies. Available at: http://www.waterboards.ca.gov/water_issues/programs/tmdl/integrated2010.shtml, accessed September 3, 2019.

Land Use and Water Quality

Buildings, roads, sidewalks, parking lots, and other impervious surfaces define the urban landscape. Impervious surfaces also alter the natural hydrology and prevent the infiltration of water into the ground. Impervious surfaces change the flow of stormwater over the landscape. In underdeveloped

areas, vegetation holds down soil, slows the flow of stormwater over land, and filters out some pollutants by both slowing the flow of the water and trapping some pollutants in the root system. Additionally, some stormwater filters through the soil, replenishing underground aquifers. As land is converted to other uses such as commercial or residential development, many of these natural processes are eliminated as vegetation is cleared and soil is paved over. As more impervious surface coverage is added to the landscape, more stormwater flows faster off the land. The greater volume of stormwater increases the possibility of flooding, and the high flow rates of stormwater do not allow for pollutants to settle out, meaning that more pollution gets concentrated in the stormwater runoff. Research on urban stream protection has found that stream degradation occurs when a watershed reaches relatively low levels of imperviousness—in the range of 10 to 20 percent. Water quality degradation can occur when impervious surface coverage in a watershed surpasses 10 percent.¹⁷ Fish habitat, spawning, and diversity suffer when imperviousness is greater than 10 to 12 percent. Wetland plants and amphibian populations diminish when impervious surfaces are greater than 10 percent. Generally, the higher the percentage of impervious surface, the greater the degradation in stream water quality.¹⁸ Based on this research, streams can be considered stressed in watersheds when the impervious coverage exceeds 10 to 15 percent. The link between impervious surfaces and degraded water quality points to the need for careful comparisons between dispersed and compact development strategies. On a regional or watershed level, greater overall water quality protection is achieved through more concentrated or clustered development. Concentrated development protects the watershed by leaving a larger percentage of it in its natural condition.

Waste Discharge Requirements

If the operation or discharges from a property or business affects California's surface, coastal, or groundwater, it would normally be required to obtain a permit to discharge waste from the appropriate RWQCB. Discharges of pollutants into surface waters require a federal NPDES permit application with the appropriate RWQCB.¹⁹ For other types of discharges, such as those affecting groundwater or in a diffused manner (e.g., erosion from soil disturbance or waste discharges to land) a report of waste

¹⁷ Hakkam, Kim, et al. The Impact of Impervious Surface on Water Quality and Its Threshold in Korea. *Water*. 2016. Available online at: <https://pdfs.semanticscholar.org/5c51/42d64aabcd1fbedf3c73313836dad5aead48.pdf>, accessed August 27, 2019.

¹⁸ Brabec, Elizabeth, et al. 2002. Imperious Surfaces and Water Quality: A Review of Current Literature and Its Implications on Watershed Planning. *Journal of Planning Literature*. Available online at: <https://pdfs.semanticscholar.org/e62b/8c92c2547bab312fa7ed173ce12ce31d5724.pdf?ga=2.79098964.1532995814.1568152933-155264741.1568152933>, accessed September 10, 2019.

¹⁹ U.S. Environmental Protection Act. *NPDES Permit Basics*. Available online at: <https://www.epa.gov/npdes/npdes-permit-basics>, accessed August 27, 2019.

discharge must be filed with the appropriate RWQCB in order to obtain Waste Discharge Requirements (WDRs).

For specific situations, the RWQCB may waive the requirement to obtain a WDR for discharges to land or may determine that a proposed discharge can be permitted more effectively through enrollment in a general NPDES permit or general WDR.

RWQCBs in the SCAG region have identified a typical list of activities that affect water, but the list is by no means inclusive of all situations:

- Discharge of process wastewater not discharging to a sewer (factories, cooling water, etc.)
- Confined Animal facilities (dairies, feedlots, etc.)
- Waste containments (landfills, waste ponds, etc.)
- Construction sites
- Boatyards and shipyards
- Discharges of pumped groundwater and cleanups (underground tank cleanups, dewatering, spills)
- Material handling areas draining to storm drains
- Sewage treatment facilities
- Filling of wetlands
- Dredging, filling, and disposal of dredge wastes
- Commercial activities not discharging to a sewer (e.g., factory wastewater, storm drain)
- Waste discharges to land

3.10.1.7 Hazards

Floodplains and Flooding

Flooding generally occurs when soil and vegetation cannot absorb excess rainwater or snowmelt, and water runs off the land in quantities that cannot be carried in stream channels or kept in natural ponds or man-made reservoirs. Periodic floods occur naturally on many rivers, forming areas known as floodplains. These river floods usually result from heavy rain, sometimes combined with melting snow, which causes the rivers to overflow their banks. A flood that rises and falls rapidly with little or no

advance warning is called a flash flood. Flash floods usually result from intense rainfall over a relatively small area.

Flooding occurs occasionally on streets and roads in urbanized areas where storm waters are diverted into manmade or artificial drainage systems. In urbanized areas with significant area of impervious surfaces, storm water is not able to permeate and percolate into the soil, and is diverted into a storm drainage system. In some areas, these drainage systems are occasionally overloaded with storm water drainage, or the drains become clogged with leaves and other debris, thereby impeding storm water drainage onto transportation facilities (i.e., roadways). The ability of the storm drainage system to accommodate water flows is also largely based on ground permeability and infrastructure capacity. In metropolitan areas, agencies responsible for maintaining and upgrading drainage facilities to accommodate volume are local cities and the counties.

Principal impacts of flooding include damage to permanent structures, relocation of non-stationary objects, loss of human life, and damage to infrastructure and soil conditions. After the initial damage from floodwaters, standing water often creates a secondary level of destruction, by ruining crops, further undermining and damaging infrastructure, and contaminating water wells. Debris flows are another hazard associated with flooding, when heavy soils and rocks slide down into a valley, threatening the infrastructure below.

100-Year Floodplain

The 100-Year floodplain denotes an area that has a one percent chance of being inundated during any particular 12-month period. The risk of this area being flooded in any century is one percent but statistically the risk is almost 40 percent in any 50-year period. Floodplain zones are determined FEMA and used to create Flood Insurance Rate Maps (FIRMs).²⁰ These tools assist communities in mitigating flood hazards through land use planning. FEMA also outlines specific regulations for any construction located within a 100-year floodplain, whether residential, commercial, or industrial. Each watershed in the SCAG region has associated 100-year flood plain, with Imperial County containing the most land designated as being in the floodplain.

Seiche

A seiche is an oscillation of a body of water in an enclosed or semi enclosed basin, such as a reservoir, harbor, lake, or storage tank. Many examples of seiches can be found in Southern California, where water

²⁰ FEMA. *Flood Insurance Rate Map (FIRM)*. Available online at: <https://www.fema.gov/flood-insurance-rate-map-firm>, accessed August 27, 2019.

reservoirs have been constructed or developed by damming rivers. The seiches serve as a means of flood control and a holding tank for drinking and agricultural water. Examples of enclosed water bodies in the SCAG region include Big Bear Lake, Pyramid Lake, and the Salton Sea.

Tsunami

Tsunamis are massive waves triggered by large earthquakes along fault lines near the ocean. Tsunamis have potential to crash and flood areas much further inland than regular ocean waves. Such inundation can cause severe damage to local infrastructure and even loss of life. The three coastal counties of Los Angeles, Orange, and Ventura contain more than 25,000 acres that are susceptible to tsunamis within the SCAG region.²¹

Mudflow

Mudflows and landslides are also generated by ground-shaking seismic events. In areas with steep slopes or hillsides, mud and other debris can be triggered by an earthquake miles away and cause significant damage to infrastructure and life below. Many areas of the SCAG region are susceptible to landslides and mudflows due to the abundance of active faults and existing mudflow hazards. Landslides are discussed in further detail in **Section 3.7, Geology and Soils**.

Coastal Flooding and Sea Level Rise

During the winter months (generally November to February), offshore storms occurring over the Pacific Ocean, combined with high tides and strong winds, have the potential to result in wave run-up. In addition, as discussed above, seismically-induced waves (i.e. as the result of a tsunami event) may occur on occasion, having the potential to cause coastal flooding. Further, a short- or long-duration increase in sea level during a period of extreme precipitation and runoff may result in the potential for coastal flooding. Wave run-up along the coastal areas may also contribute to coastal flooding and erosion.

Rising sea levels will increase the potential for coastal flooding, and the issue of sea-level rise is important in land use planning and hazard analysis in coastal areas. California Executive Order S-13-08, signed by the governor on November 14, 2008, specifies that all state agencies planning construction projects in areas that are vulnerable to future sea-level rise must consider a range of scenarios for 2050 and 2100 to assess project vulnerability, and, to the extent feasible, must reduce expected risks and increase resiliency with respect to sea-level rise. Before 2050, differences in sea-level rise projections under different emissions scenarios are minor but they diverge significantly past midcentury. After 2050, sea-level rise

²¹ California Department of Conservation (DOC). 2018. *California Official Tsunami Inundation Maps*. Available online at: <https://www.conservation.ca.gov/cgs/geohazards/tsunami/maps#County>, accessed January 8, 2019.

projections increasingly depend on the trajectory of greenhouse gas emissions. For example, under certain scenarios, rapid ice sheet loss on Antarctica could drive rates of sea-level rise in California above 50 mm/year (2 inches/year) by the end of the century, leading to potential sea-level rise exceeding 10 feet. This rate of sea-level rise would be about 30-40 times faster than the sea-level rise experienced over the last century.²²

The Intergovernmental Panel on Climate Change (IPCC) has indicated that globally, sea level rose at an average annual rate of approximately 1.5 millimeters from 1901 to 1990 and at an average annual rate of approximately 3.2 millimeters from 1993 to 2010 (IPCC 2013). By year 2100, sea levels may rise up to 55 inches (1.4-meter), causing a 45 percent increase in land in Los Angeles County to become more vulnerable to the 100-year flood event. Based on mapping completed by the Pacific Institute, much of the Pacific Coast could be subject to flooding associated with a 100-year flood event with a sea-level rise of 55 inches.

3.10.2 REGULATORY FRAMEWORK

3.10.2.1 Federal Regulations

Rivers and Harbors Appropriation Act of 1899, Section 10

Authorization from the USACOE must be obtained for construction of a structure in or over any navigable water of the U.S., pursuant to Section 10 of the Rivers and Harbors Appropriation Act of 1899 (33 U.S. Code [USC] 403). Authorization is also needed for structures built near navigable water if they would affect the course, location, condition, or capacity of the water body, as through re-channelization, disposal of fill, and so forth.²³

Wild and Scenic Rivers Act of 1968 (WSRA)

The objective of the WSRA (Public Law 90-542), dated October 2, 1968, is the preservation of certain rivers with outstanding natural, cultural, and recreational values in a free-flowing condition. The WSRA provides permanent protection for some of the country's most outstanding free flowing rivers and

²² California Ocean Protection Council. 2017. *Rising Seas in California: An Update of Sea-Level Rise Science*. Available at: <http://www.opc.ca.gov/webmaster/ftp/pdf/docs/rising-seas-in-california-an-update-on-sea-level-rise-science.pdf>, accessed October 30, 2019.

²³ U.S. Environmental Protection Agency. 2019. *Section 10 of the Rivers and Harbors Appropriation Act of 1899*. Available online at: <https://www.epa.gov/cwa-404/section-10-rivers-and-harbors-appropriation-act-1899>, accessed August 27, 2019.

prohibits federal support for actions such as the construction of dams or other harmful instream activities.²⁴

Clean Water Act of 1972, as amended (CWA)

Congress enacted the Clean Water Act (CWA), originally enacted as the Federal Water Pollution Control Act (FWPCA; Public Law 92–500) in 1948, but took on its modern form when completely rewritten in 1972 in an act entitled the Federal Water Pollution Control Act Amendments of 1972, now commonly known as the Clean Water Act.²⁵ Major changes have subsequently been introduced via amendatory legislation including the Clean Water Act of 1977 and the Water Quality Act of 1987.

The CWA is the primary federal law governing water pollution. Its objective is to restore and maintain the chemical, physical, and biological integrity of the nation's waters by preventing point and nonpoint pollution sources, providing assistance to publicly owned treatment works for the improvement of wastewater treatment, and maintaining the integrity of wetlands. It is one of the first and most influential modern environmental laws in the U.S. As with many other major federal environmental statutes, it is administered by EPA, in coordination with state governments. Its implementing regulations are codified at 40 C.F.R. Subchapters D, N, and O (Parts 100-140, 401-471, and 501-503).

Section 303(d)

Section 303(d) of the Federal CWA requires the SWRCB to list impaired water bodies and determine TMDLs of pollutants, sediments, or other stressors that are contributing excessively to these impaired waters.²⁶

Section 401 – Water Quality Certification

Section 401 establishes the basic structure for regulating discharges of pollutants into the waters of the U.S. and regulating quality standards for surface waters. Under the CWA, EPA has implemented pollution control programs such as setting wastewater standards for industries and surface waters.²⁷

²⁴ National Park Service. 2000. *Wild and Scenic Rivers Act, 1968*. Available online at: https://www.nps.gov/parkhistory/online_books/anps/anps_6f.htm, accessed August 27, 2019.

²⁵ U.S. Environmental Protection Agency. *Summary of the Clean Water Act*. Available online at: <https://www.epa.gov/laws-regulations/summary-clean-water-act>, accessed August 27, 2019.

²⁶ U.S. Environmental Protection Agency. *Clean Water Act Section 303(d): Impaired Water and Total Maximum Daily Loads (TMDLs)*. Available online at: <https://www.epa.gov/tmdl>, accessed August 27, 2019.

²⁷ U.S. Environmental Protection Agency. *Clean Water Act Section 401: State Certification of Water Quality*. Available online at: <https://www.epa.gov/cwa-401/clean-water-act-section-401-state-certification-water-quality>, accessed August 27, 2019.

Section 402

Section 402 establishes the National Pollutant Discharge Elimination System (NPDES) permit process. In California, NPDES permitting authority is delegated to, and administered by the nine RWQCBs. Pursuant to Section 402, a discharge of any pollutant from a point source into navigable waters, are prohibited unless an NPDES permit is obtained. Point sources are discrete conveyances such as pipes or manmade ditches. Individual homes that are connected to a municipal system, use a septic system, or do not have a surface discharge do not need an NPDES permit; however, industrial, municipal, and other facilities must obtain permits if their discharges go directly to surface waters.²⁸

Section 402(p) establishes that, stormwater permits are required for stormwater discharges from a municipal separate storm sewer system (MS4) serving a population of 100,000 or more. Municipal separate storm sewer means a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutter, ditch, man-made channels or storm drain) owned or operated by a state, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to state law) having jurisdiction over disposal of sewage, industrial wastes, stormwater, or other wastes, including special districts under state law such as a sewer district, flood control district or drainage district, or similar entity, or a tribe or an authorized tribal organization, or a designated and approved management agency under section 208 of the CWA that discharges to waters of the United States (40 CFR 122.26(b)(8)).

Section 404 – Discharge of Dredge or Fill Material

Section 404 of the federal CWA is administered and enforced by the U.S. Army Corps of Engineers (USACE). Section 404 of the CWA established a program to regulate the discharge of dredged and fill material into waters of the United States, including wetlands. USACE administers the day-to-day program, including the determination of eligibility of projects for use of Categorical Exclusions and Nationwide Permits, and review and consideration of individual permit decisions and jurisdictional determinations. USACE also develops policy and guidance; and enforces Section 404 provisions.²⁹

²⁸ U.S. Environmental Protection Agency. *Clean Water Act, Section 402: National Pollutant Discharge Elimination System*. Available online at: <https://www.epa.gov/cwa-404/clean-water-act-section-402-national-pollutant-discharge-elimination-system>, accessed August 27, 2019.

²⁹ U.S. Environmental Protection Agency. *Overview of Clean Water Act Section 404*. Available online at: <https://www.epa.gov/cwa-404/overview-clean-water-act-section-404>, accessed August 27, 2019.

Executive Order 11990 - Protection of Wetlands

This executive order is an overall wetlands policy for all agencies managing federal lands, sponsoring federal projects, or providing federal funds to state or local projects. This executive order requires that when a construction project involves wetlands, a finding must be made by the federal agency that there is no practicable alternative to such construction, and that the proposed action includes all practicable measures to minimize impacts to wetlands resulting from such use.³⁰

Pollution Prevention Act of 1990

The Pollution Prevention Act (42 USC §13101 et seq.) focused on reducing the amount of pollution through cost-effective changes in production, operation, and raw materials. The Act focuses on source reduction which reduces the release of hazardous substances through practices that increase efficiency in energy, water, or other natural resources.³¹

Antidegradation Policy

The Antidegradation Policy under U.S. EPA's Water Quality Standards Regulations (48 F.R. 51400, 40 CFR 131.12, November 8, 1983), requires states and tribes to establish a three-tiered antidegradation program to prevent a decrease in water quality standards.

- Tier 1—Maintains and protects existing uses and water quality conditions that support such uses. Tier 1 is applicable to all surface waters.
- Tier 2—Maintains and protects “high quality” waters where existing conditions are better than necessary to support “fishable/swimmable” waters. Water quality can be lowered in such waters but not to the point at which it would interfere with existing or designed uses.
- Tier 3—Maintains and protects water quality in outstanding national resource waters (ONRWs). Water quality cannot be lowered in such waters except for certain temporary changes.

³⁰ U.S. Environmental Protection Agency. 2019. *Protection of Wetlands (Executive Order 11990)*. Available online at: <https://www.epa.gov/cwa-404/protection-wetlands-executive-order-11990>, accessed August 27, 2019.

³¹ U.S. Environmental Protection Agency. 2017. *Pollution Prevention Act of 1990*. Available online at: <https://www.epa.gov/p2/pollution-prevention-act-1990>, accessed August 27, 2019.

Antidegradation was explicitly incorporated into the federal CWA through 1987 amendments, codified in section 303(d)(4)(B), requiring satisfaction of antidegradation requirements before making certain changes in NPDES permits.³²

Definition of Waters of the United States (WOTUS)

On June 29, 2015, EPA and USACOE jointly published a final WOTUS Rule (40 CFR Parts 110, 112, 116, et al. and 33 CFR Part 328) for determining the extent to which wetlands and other water features are protected under the CWA.

Following publication of the 2015 WOTUS Rule, 31 states, and 53 non-state parties, including environmental groups and groups representing farming, recreational, forestry, and other interests, filed complaints and petitions for review in multiple federal district and appellate courts challenging the 2015 Rule. On February 28, 2017, the President of the United States issued Executive Order 13778 directing EPA and the Department of the Army to review and rescind or revise the 2015 Clean Water Rule. On October 22, 2019, EPA and the Department of the Army published a final rule to repeal the 2015 Rule and recodify the regulation that was in place prior to issuance of the 2015 Rule. This final rule will become effective on December 23, 2019.³³

National Flood Insurance Act

The U.S. Congress passed the National Flood Insurance Act in 1968 and the Flood Disaster Protection Act in 1973 to restrict certain types of development on floodplains and to provide for a NFIP. The purpose of these acts is to reduce the need for large, publicly funded flood control structures and disaster relief. The NFIP is a federal program administered by the Flood Insurance Administration of FEMA. It enables individuals who have property (a building or its contents) within the 100-year floodplain to purchase insurance against flood losses. FEMA works with the states and local communities to identify flood hazard areas and publishes a flood hazard boundary map of those areas. Floodplain mapping is an ongoing process and flood maps must be regularly updated for both major rivers and tributaries as land uses and development patterns change.³⁴

³² U.S. Environmental Protection Agency. 2012. *Water Quality Standards Handbook, Chapter 4: Antidegradation*. Available online at: <https://www.epa.gov/sites/production/files/2014-10/documents/handbook-chapter4.pdf>, accessed August 27, 2019.

³³ U.S. Environmental Protection Agency. 2019. *Waters of the United States (WOTUS) Rulemaking*. Available at: <https://www.epa.gov/wotus-rule/rulemaking-process>, accessed October 30, 2019; see also 84 Fed. Reg. 56626 (October 22, 2019)..

³⁴ FEMA. *National Flood Insurance Act of 1968 and Flood Disaster Protection Act of 1973*. Available online at: <https://www.fema.gov/media-library/assets/documents/7277>, accessed August 27, 2019.

Executive Order 11988, Flood Plain Management

The objective of Presidential Executive Order 11988, dated May 24, 1977, is the avoidance of, to the extent possible, long- and short-term adverse impacts associated with the occupancy and modification of the base floodplain (100-year floodplain) and the avoidance of direct and indirect support of development in the base floodplain wherever there is a practicable alternative. Under the Executive Order, the USACOE must provide leadership and take action to:³⁵

- Avoid development in the base floodplain unless it is the only practicable alternative
- Reduce the hazard and risk associated with floods
- Minimize the impact of floods to human safety, health, and welfare
- Restore and preserve the natural and beneficial values of the base floodplain

California Toxics Rule

On May 18, 2000, USEPA promulgated numeric water quality criteria for priority toxic pollutants and other provisions for water quality standards to be applied to waters within California. USEPA promulgated this rule based on the USEPA Administrator's determination that the numeric criteria are necessary in California to protect human health and the environment. The rule fills a gap in California water quality standards that was created in 1994 when a state court overturned the state's water quality control plans containing water quality criteria for priority toxic pollutants. Thus, the state of California has been without numeric water quality criteria (which is required by the CWA) for many priority toxic pollutants, necessitating this action by USEPA. These federal criteria are legally applicable in the state of California for inland surface waters, enclosed bays, and estuaries for all purposes and programs under the CWA. USEPA and the SWRCB have the authority to enforce these standards, which are incorporated into the NPDES permits that regulate existing discharges in California.

3.10.2.2 State

Porter Cologne Water Quality Control Act

The Porter-Cologne Act is the principal law governing water quality regulation in California. It establishes a comprehensive program to protect water quality and the beneficial uses of water. The Porter-Cologne Act applies to surface waters, wetlands, and ground water and to both point and

³⁵ U.S. Fish and Wildlife Service. *Executive Order 11988 Flood plain Management*. Available online at: https://www.fws.gov/r9esnepa/NEPA_Handbook/EO_11988.pdf, accessed August 27, 2019.

nonpoint sources of pollution. Pursuant to the Porter-Cologne Act (California Water Code section 13000 et seq.), the policy of the State is as follows:

- 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.

The Porter-Cologne Act established nine Regional Water Boards (based on hydrogeologic barriers) and the State Water Board, which are charged with implementing its provisions and which have primary responsibility for protecting water quality in California. The State Water Board provides program guidance and oversight, allocates funds, and reviews Regional Water Boards decisions. In addition, the State Water Board allocates rights to the use of surface water. The Regional Water Boards have primary responsibility for individual permitting, inspection, and enforcement actions within each of nine hydrologic regions. The State Water Board and Regional Water Boards have numerous NPS-related responsibilities, including monitoring and assessment, planning, financial assistance, and management.

The Regional Water Boards regulate discharges under the Porter-Cologne Act primarily through issuance of NPDES permits and waste discharge requirements (WDRs for point and nonpoint source discharges. Anyone discharging or proposing to discharge materials that could affect water quality (other than to a community sanitary sewer system regulated by an NPDES permit) must file a report of waste discharge.

The Porter-Cologne Act also implements many provisions of the Clean Water Act, such as NPDES permitting program. Section 401 of the Clean Water Act gives the State Water Board the authority to review any proposed federally permitted or federally licensed activity that may impact water quality and to certify, condition, or deny the activity if it does not comply with State water quality standards.

The Porter-Cologne Act also requires adoption of water quality control plans (Basin plans) that contain the guiding policies of water pollution management in California. A number of statewide water quality control plans have been adopted by the State Water Board. In addition, regional water quality control plans (basin plans) have been adopted by each of the Regional Water Boards and get updated as necessary and practical. These plans identify the existing and potential beneficial uses of waters of the State and establish water quality objectives to protect these uses. The basin plans also contain implementation, surveillance, and monitoring plans. Statewide and regional water quality control plans include enforceable prohibitions against certain types of discharges, including those that may pertain to nonpoint sources. Portions of water quality control plans, the water quality objectives and beneficial use

designations, are subject to review by U.S.EPA, when approved they become water quality standards under the Clean Water Act.

Sustainable Groundwater Management Act (SGMA)

On September 16, 2014 Governor Edmund G. Brown Jr. signed a three-bill package known as the Sustainable Groundwater Management Act. The legislation allows local agencies to customize groundwater sustainability plans to their regional economic and environmental needs. SGMA creates a framework for sustainable, local groundwater management for the first time in California history.

The three bills that make up SGMA are Assembly Bill (AB) 1739 by Assembly Member Roger Dickinson, Senate Bill (SB) 1319, and SB 1168 by Senator Fran Pavley.³⁶

In September 2015, Governor Brown signed SB 13, by Senator Fran Pavley. The Bill makes various technical, clarifying changes to SGMA including requirements for groundwater sustainability agency formation, the process for State Water Board intervention if no responsible agency is specified for a basin, guidelines for high- and medium-priority basins, and participation of mutual water companies in a groundwater sustainability agency.³⁷

Cobey-Alquist Floodplain Management Act

The Cobey-Alquist Floodplain Management Act (California Water Code 8400-8415) and Executive Order B-39-77 support the NFIP. The Act encourages local governments to plan, adopt, and enforce land use regulations for floodplain management, to protect people and property from flooding hazards. The Act also identifies requirements that jurisdictions must meet to receive State financial assistance for flood control.³⁸ Executive Order B-39-77 requires state agency compliance with good floodplain management practices.³⁹

California Coastal Act

The California Coastal Act (Public Resources Code § 30000 et seq.), dealing with coastal development and its impacts to public access, is the primary law that governs decisions of the California Coastal

³⁶ California Department of Water Resources. 2019. *SGMA Groundwater Management*. Available online at: <https://water.ca.gov/Programs/Groundwater-Management/SGMA-Groundwater-Management>, accessed August 27, 2019.

³⁷ California Legislative Information. 2015. *Senate Bill No. 35*.

³⁸ California Legislative Information. *Chapter 4. Cobey-Alquist Flood Management Program 8400-8415*.

³⁹ California Department of Water Resources. *Flood Map Modernization State Business Plan*. Available online at: https://www.floods.org/PDF/SBP_CA_04.pdf, accessed August 27, 2019.

Commission (CCC). Chapter 3 of the California Coastal Act contains Coastal Resources Planning and Management Policies. Policies include protection of certain water oriented recreational activities (Section 30220); minimizing the adverse effects of wastewater discharge, controlling runoff and preventing depletion of ground water supplies (Section 30231); and water supply and flood control through channelization, dams, or other substantial alternations (Section 30236).⁴⁰

State Water Resources Control Board Water Rights (SWRCB) Program

The SWRCB is responsible for administering water rights in California. It has several water rights programs including a compliance monitoring program, drought year information resources, water availability analysis, water use reports program and water quality certification. The water availability analysis program is required by the California Water Code which requires sufficient information for applications submitted to the SWRCB to demonstrate a reasonable likelihood that appropriated water is available for appropriation. The water use reports program is responsible for water use reports for water right holders and sets measurement methods for the reports.⁴¹

Lake or Streambed Alteration Program

The California Department of Fish and Wildlife (CDFW) is responsible for conserving, protecting, and managing California's fish, wildlife, and native plant resources. To meet this responsibility, Section 1600 of the California Fish and Game Code requires an entity to notify CDFW of any proposed activity that may substantially modify a river, stream, or lake. Notification is required by any person, business, state, or local government agency or public utility that proposes an activity that will:⁴²

- Substantially divert or obstruct the natural flow of any river, stream or lake;
- Substantially change or use any material from the bed, channel, or bank of, any river, stream, or lake;
or
- Deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake.

The notification requirement applies to any work undertaken in or near a river, stream, or lake that flows at least intermittently through a bed or channel. This includes ephemeral streams, desert washes, and

⁴⁰ California Coastal Act. *Laws and Regulations. The Coastal Act.* Available online at <https://www.coastal.ca.gov/laws/>. Accessed September 3, 2019

⁴¹ California Water Boards. 2019. *Programs* Available online at: https://www.waterboards.ca.gov/water_issues/programs accessed August 27, 2019.

⁴² California Legislative Information. *Chapter 6. Fish and Wildlife Protection and Conservation [1600-1617]*.

watercourses with a subsurface flow. It may also apply to work undertaken within the flood plain of a body of water. If CDFW determines that the activity may substantially adversely affect fish and wildlife resources, a Lake or Streambed Alteration Agreement will be prepared. In August 2005, the California Fish and Game Commission policy regarding wetlands resources stated that “it is the policy of the Fish and Game Commission to seek to provide for the protection, preservation, restoration, enhancement and expansion of wetland habitat in California” and to “strongly discourage development in or conversion of wetlands.”⁴³ As a result, although the Commission has no independent statutory permitting authority related to wetlands, the policy underscores that the Commission does not support wetland development proposals unless “project mitigation assures there will be ‘no net loss’ of either wetland habitat values or acreage” and “prefers mitigation which would achieve expansion of wetland acreage and enhancement of wetland habitat values.” The Agreement includes reasonable conditions necessary to protect those resources and must comply with CEQA.

Statement of Policy with Respect to Maintaining High Quality Waters in California

California’s antidegradation policy, formally known as the Statement of Policy with Respect to Maintaining High Quality Waters in California (SWRCB Resolution No. 68-16), restricts degradation of surface and ground waters. It protects waters where existing quality is higher than necessary for the protection of beneficial uses. Any actions with the potential to adversely affect water quality must 1) be consistent with maximum benefit to the people of the state, 2) not unreasonably affect present and anticipated beneficial use of the water, and 3) not result in water quality less than that prescribed in water quality plans and policies.⁴⁴ Any actions that can adversely affect surface waters are also subject to the federal antidegradation policy (40 CFR Section 131.12) developed under the CWA.

NPDES General Permits

Construction General Permit

The California Construction Stormwater Permit (Construction General Permit) 1 (also, known as Industrial General Permit), adopted by the SWRCB, regulates construction activities that include clearing, grading, and excavation resulting in soil disturbance of at least one acre of total land area. The Construction General Permit authorizes the discharge of stormwater to surface waters from construction activities. It prohibits the discharge of materials other than stormwater and authorized non-stormwater

⁴³ California Fish and Game Commission. *Miscellaneous Policies: Wetlands Resources*.

⁴⁴ State Water Resources Control Board. *Resolution No. 68-16 Statement of Policy with Respect to Maintaining High Quality of Waters in California*. Available online at: https://www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/1968/rs68_016.pdf, accessed August 27, 2019.

discharges and all discharges that contain a hazardous substance in excess of reportable quantities established in Title 40, Sections 117.3 or 302.4 of the CFR, unless a separate NPDES permit has been issued to regulate those discharges. The Construction General Permit requires that all developers of land where construction activities will occur over more than 1 acre do the following:

- Complete a risk assessment to determine pollution prevention requirements pursuant to the three risk levels established in the General Permit;
- Eliminate or reduce non-stormwater discharges to storm sewer systems and other waters of the US;
- Develop and implement a SWPPP, which specifies BMPs that will reduce pollution in stormwater discharges to the Best Available Technology Economically Achievable/ Best Conventional Pollutant Control Technology standards; and
- Perform inspections and maintenance of all BMPs.

To obtain coverage under the NPDES Construction General Permit, the Legally Responsible Person must electronically file all permit registration documents with the SWRCB before the start of construction. Permit registration documents must include:

- Notice of Intent,
- Risk Assessment,
- Site Map,
- SWPPP,
- Annual Fee, and
- Signed Certification Statement.

Typical BMPs contained in SWPPPs are designed to minimize erosion during construction, stabilize construction areas, control sediment, control pollutants from construction materials, and address post construction runoff quantity (volume) and quality (treatment). The SWPPP must also include a discussion of the program to inspect and maintain all BMPs.⁴⁵

⁴⁵ State Water Resources Control Board. *Construction General Permit Fact Sheet*. Available online at: https://www.waterboards.ca.gov/water_issues/programs/stormwater/docs/constpermits/wqo_2009_0009_complete.pdf, accessed August 27, 2019.

Industrial General Permit

The Statewide General Permit for Storm Water Discharges Associated with Industrial Activities, Order 2014-0057-DWQ (Industrial General Permit or IGP) implements the federally required storm water regulations in California for storm water associated with industrial activities discharging to waters of the United States.⁴⁶

Municipal Stormwater Program

The Municipal Storm Water Program regulates storm water discharges from municipal separate storm sewer systems (MS4s) throughout California. Pursuant to the Federal Water Pollution Control Act (Clean Water Act) section 402(p), storm water permits are required for discharges from an MS4 serving a population of 100,000 or more. The Municipal Storm Water Program manages the Phase I Permit Program (serving municipalities over 100,000 people), the Phase II Permit Program (for municipalities less than 100,000), and the Statewide Storm Water Permit for the State of California Department of Transportation (Caltrans).⁴⁷

Caltrans is responsible for the design, construction, management, and maintenance of the State highway system, including freeways, bridges, tunnels, Caltrans' facilities, and related properties, and is subject to the permitting requirements of CWA Section 402(p). Caltrans' discharges consist of storm water and non-storm water discharges from state-owned rights-of-way.

Before July 1999, discharges from Caltrans' MS4 were regulated by individual NPDES permits issued by the RWQCBs. On July 15, 1999, the SWRCB issued a statewide permit (Order No. 99-06-DWQ) that regulated all discharges from Caltrans MS4s, maintenance facilities, and construction activities.⁴⁸ On September 19, 2012, Caltrans' permit was reissued (Order No. 2012-0011-DWQ), and it became effective on July 1, 2013.⁴⁹

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- ⁴⁶ State Water Resources Control Board. *Industrial Stormwater Program*. See https://www.waterboards.ca.gov/water_issues/programs/stormwater/industrial.html, accessed August 27, 2019.
- ⁴⁷ State Water Resources Control Board. *Municipal Stormwater Program*. Available at: https://www.waterboards.ca.gov/water_issues/programs/stormwater/municipal.html, accessed October 31, 2019.
- ⁴⁸ Caltrans. *Stormwater & Water Pollution Control*. Available online at: <https://dot.ca.gov/programs/traffic-operations/ep/stormwater>, accessed August 27, 2019.
- ⁴⁹ California State Water Resources Control Board. *Order No. 2012-0011-DWQ NPDES No. CAS000003 National Pollutant Discharge Elimination System (NPDES) Statewide Storm Water Permit Waste Discharge Requirements (WDRS) for State of California Department of Transportation*. Available online at: https://www.waterboards.ca.gov/board_decisions/adopted_orders/water_quality/2012/wqo2012_0011_dwq.pdf, accessed August 27, 2019.

The Caltrans permit requires development of a program for communication with local agencies, and coordination with other MS4 programs where those programs overlap geographically with Caltrans facilities. As part of the permit, Caltrans is required to create and annually update a Stormwater Management Plan (SWMP) that is used to outline the regulation of pollutant discharge caused by current and future construction and maintenance activities. SWMP requirements apply to discharges from Caltrans stormwater conveyances, including catch basins and drain inlets, curbs, gutters, ditches, channels, and storm drains. The SWMP applies to discharges consisting of stormwater and non-stormwater resulting from the following:

- maintenance and operation of state-owned highways, freeways, and roads;
- maintenance facilities;
- other facilities with activities that have the potential for discharging pollutants;
- permanent discharges from subsurface dewatering;
- temporary dewatering; and
- construction activities.

Caltrans' Storm Water Management Plan (SWMP) describes the procedures and practices used to reduce or eliminate the discharge of pollutants to storm drainage systems and receiving waters. The SWMP was most recently updated in July of 2016.⁵⁰

California Green Building Standards Code

Chapters 4 and 5 of the California Green Building Standards Code (CalGreen) include mandatory measures for residential and nonresidential development, respectively. Section 4.106.2 requires residential projects that disturb less than 1 acre and are not part of a larger common plan of development, manage stormwater drainage during construction through use of on-site retention basins, filtration systems where stormwater is conveyed to a public drainage system, and/or compliance with a stormwater management ordinance. Section 5.106.1 requires newly constructed nonresidential projects and additions of less than one acre to prevent the pollution of stormwater runoff because of construction

⁵⁰ Caltrans. 2016. *Statewide Stormwater Management Plan*. Available online at: https://www.waterboards.ca.gov/water_issues/programs/stormwater/docs/caltrans/swmp/swmp_approved.pdf, accessed August 27, 2019.

through compliance with a local ordinance or implementing BMPs that address soil loss and good housekeeping to manage equipment, materials, and wastes.⁵¹

California Fish and Game Code

The California Department of Fish and Wildlife (CDFW) is responsible for conserving, protecting, and managing California's fish, wildlife, and native plant resources. To meet this responsibility, the Fish and Game Code (Section 1602) requires an entity to notify CDFW of any proposed activity that may substantially modify a river, stream, or lake. Notification is required by any person, business, state or local government agency, or public utility that proposes an activity that will:

- substantially divert or obstruct the natural flow of any river, stream or lake;
- substantially change or use any material from the bed, channel, or bank of, any river, stream, or lake;
or
- deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake.

The notification requirement applies to any work undertaken in or near a river, stream, or lake that flows at least intermittently through a bed or channel. This includes ephemeral streams, desert washes, and watercourses with a subsurface flow. It may also apply to work undertaken within the flood plain of a body of water.⁵²

California Ocean Plan

The California Ocean Plan establishes water quality objectives for California's ocean waters and provides the basis for regulation of wastes discharged into the state's coastal waters. The plan applies to point and nonpoint source discharges. Both the SWRCB and the six coastal RWQCBs implement and interpret the California Ocean Plan. The California Ocean Plan identifies the applicable beneficial uses of marine waters. These beneficial uses include preservation and enhancement of designated Areas of Special Biological Significance (ASBS), rare and endangered species, marine habitat, fish migration, fish spawning, shellfish harvesting, recreation, commercial and sport fishing, mariculture, industrial water supply, aesthetic enjoyment, and navigation.

⁵¹ California Building Standards Commission. 2017. *2016 California Green Building Standards Code*. Available online at: https://ladbs.org/docs/default-source/publications/code-amendments/2016-calgreen_complete.pdf?sfvrsn=6, accessed August 27, 2019.

⁵² California Legislative Information. *Chapter 6. Fish and Wildlife Protection and Conservation [1600-1617], Section 1602*.

The California Ocean Plan establishes a set of narrative and numerical water quality objectives to protect beneficial uses. These objectives are based on bacterial, physical, chemical, and biological characteristics as well as radioactivity. The water quality objectives in Table 1 (formerly Table B) of the California Ocean Plan apply to all receiving waters under the jurisdiction of the plan and are established for the protection of aquatic life and for the protection of human health from both carcinogens and noncarcinogens. Within Table 1 there are 21 objectives for protecting aquatic life, 20 for protecting human health from noncarcinogens, and 42 for protecting human health from exposure to carcinogens. The Ocean Plan also includes an implementation program for achieving water quality objectives. Effluent limitations are established for the protection of marine waters.⁵³

Urban Water Management Planning Act

In 1983, the California Legislature enacted the Urban Water Management Planning Act (Water Code, Section 10610 et seq.), which requires urban water suppliers to develop water management plans to actively pursue the efficient use of available supplies. Every five years, water suppliers are required to develop Urban Water Management Plans (UWMPs) to identify short-term and long term water demand management measures to meet growing water demands.⁵⁴

Conservation Requirements

Executive Order B-37-16 established a new water use efficiency framework for California. The order bolstered the state's drought resilience and preparedness by establishing longer-term water conservation measures that include permanent monthly water use reporting, new urban water use targets, reducing system leaks and eliminating clearly wasteful practices, strengthening urban drought contingency plans and improving agricultural water management and drought plans. Based on monthly water use reporting, most urban water suppliers reported sufficient supplies to meet demand in three additional dry years and are not subject to state conservation mandates. On February 8, 2017, SWRCB adopted an emergency water conservation regulation to amend and extend the May 2016 regulation. The amended regulation allows certain suppliers the opportunity to submit or resubmit their water supply reliability assessments.⁵⁵

⁵³ California Water Boards. 2015. *California Ocean Plan*. Available online at: https://www.waterboards.ca.gov/water_issues/programs/ocean/docs/cop2015.pdf, accessed August 27, 2019.

⁵⁴ California Water Code Division 6.

⁵⁵ California Water Boards. 2019. *Governor's Conservation Executive Orders and Proclamations* Available online at: https://www.waterboards.ca.gov/water_issues/programs/conservation_portal/executive_orders.html Accessed September 3, 2019.

California State Lands Commission

The California State Lands Commission (SLC) provides stewardship of California's public trust lands, waterways, and resources through economic development, protection, preservation, and restoration. The SLC is tasked with public land management and resource protection to ensure the future quality of the environment and balanced use of the lands and resources entrusted to its care. The State's public trust lands include tidelands, navigable waterways, and submerged coastal lands extending to a distance of three nautical miles, as well as the waters and underlying beds of more than 120 rivers, lakes, streams, and sloughs.

The California SLC regulates the use of tidelands and submerged lands under its jurisdiction to ensure that proposed uses of these lands are consistent with the Public Trust Doctrine principle that certain resources are preserved for public use. Generally, the SLC has jurisdiction over land below mean high tide (MHT). Public and private entities may apply to the SLC for land leases or permits on State lands for many purposes including dredging among others. CGC Section 65940 describes the degree of specificity and contents required for a surface land lease application.

California Geological Survey Tsunami Inundation Maps

The California Geological Survey provides geologic and seismic expertise to the public, other State government offices, and local government agencies (cities and counties). The California Geological Survey is working closely with the California Emergency Management Agency (Cal EMA) and the University of Southern California Tsunami Research Center to produce statewide tsunami inundation maps for California. These maps are used by coastal communities to produce emergency evacuation plans. The Cal EMA provides generalized maps for projected tsunami inundation to coastal government agencies for emergency planning purposes. These maps are used as a basic guideline for what areas are prone to tsunami inundation.

California Coastal Commission Sea-Level Rise Policy Guidance

The CCC has developed Sea-Level Rise Policy Guidance intended to help local governments, permit applicants, and other interested parties address the challenges presented by sea-level rise in California's coastal zone. The CCC's adopted Sea-Level Rise Policy Guidance outlines the types of information, analysis, and design considerations that the agency's staff requires to determine whether shoreline projects conform to the above-listed Coastal Act policies. Specifically, the Sea-Level Rise Policy Guidance provides step-by-step guidance on how to address sea-level rise in new and updated Local Coastal Programs (LCPs) and Coastal Development Permits (CDPs) according to the policies of the California Coastal Act. LCPs and the CDP processes are the fundamental land use planning and regulatory

governing mechanisms in the coastal zone. While it is advisory, the data requirements, resource considerations, projections for sea-level rise, alternatives analyses, and monitoring requirements outlined in detail in the CCC's Sea-Level Rise Policy Guidance represent information that would likely be required to produce as part of the CCC's evaluation of coastal projects in conformance with Sections 30235 and 30253 of the Coastal Act. Specifically, the Sea-Level Rise Policy Guidance outlines that projects will need to be planned, located, designed, and engineered for the changing water levels and associated impacts that might occur over the life of the development. In addition, project planning should anticipate the migration and natural adaptation of coastal resources (beaches, access, etc.) due to future sea-level rise conditions in order to avoid future impacts to those resources from the new development.

The most recent update in 2018 of the Sea-Level Rise Guidance document aims to respond to the needs for guidance that can help cities, counties and the State prepare for, and adapt to, sea-level rise. The 2018 update provides a science-based methodology for state and local governments to analyze and assess the risks associated with sea-level rise, and to incorporate sea-level rise into their planning, permitting, and investment decisions. The Guidance expands the preferred coastal adaptation planning approaches, incorporating existing law, expressed policy preferences by the Governor and Legislature, and the goal of fostering consistency across coastal and ocean government agencies. Some recommendations include protection of coastal habitats and public access, adaptation strategies that prioritize protection of vulnerable communities, and adaptive capacity should be built in to design and planning.⁵⁶

California Stormwater Quality Association BMP Handbooks

The California Stormwater Quality Association (CASQA) is a professional member association dedicated to the advancement of stormwater quality management through collaboration, education, implementation guidance, regulatory review, and scientific assessment. CASQA's membership is comprised of a diverse range of stormwater quality management organizations and individuals, including cities, counties, special districts, industries, and consulting firms throughout the state. CASQA develops and publishes four BMP Handbooks. The New Development and Redevelopment Handbook provides guidance on developing project specific SWMPs, including selection and implementation of BMPs, for a particular development or redevelopment project.⁵⁷

⁵⁶ California Natural Resources Agency. 2018. State of California Sea-Level Rise Guidance. Available at: http://www.opc.ca.gov/webmaster/ftp/pdf/agenda_items/20180314/Item3_Exhibit-A OPC SLR Guidance-rd3.pdf, accessed September 17, 2019.

⁵⁷ CASQA. *New Development & Redevelopment BMP Handbook*. Available online at: <https://www.casqa.org/resources/bmp-handbooks/new-development-redevelopment-bmp-handbook>, accessed August 27, 2019.

3.10.2.3 Regional

Water Quality Control Plan for the Central Coastal Basin

The Water Quality Control Plan for the Central Coastal Basin, or basin plan, identifies how the quality of the surface and ground waters in the Central Coast Region should be managed to provide the highest water quality reasonably possible. This basin plan lists the various water uses. Second, it describes the water quality which must be maintained to allow those uses. It then describes the programs, projects, and other actions which are necessary to achieve the standards established in this plan. It summarizes SWRCB and RWQCB plans and policies to protect water quality, and describes statewide surveillance and monitoring programs as well as regional surveillance and monitoring programs. The Regional Board implements the basin plan by issuing and enforcing waste discharge requirements to individuals, communities, or businesses whose waste discharges can affect water quality. These requirements can be either state waste discharge requirements for discharges to land, or federally delegated NPDES permits for discharges to surface water. Methods of treatment are not specified. When such discharges are managed so that: (1) they meet these requirements, (2) water quality objectives are met, and (3) beneficial uses are protected and water quality is controlled. The basin plan is also implemented by encouraging water users to improve the quality of their water supplies, particularly where the wastewater they discharge is likely to be reused. Public works or other projects which can affect water quality are reviewed and their impacts identified. Proposals which implement or help achieve the goals of the basin plan are supported; the Regional Board makes water quality control recommendations for other projects.⁵⁸

Water Quality Control Plan for the Los Angeles Region

The RWQCB has prepared a Water Quality Control Plan for the Los Angeles Region. This basin plan encompasses all coastal drainages flowing to the Pacific Ocean between Rincon Point (on the coast of western Ventura County) and the eastern Los Angeles County line, as well as the drainages of five coastal islands (Anacapa, San Nicolas, Santa Barbara, Santa Catalina, and San Clemente). In addition, the Los Angeles region includes all coastal waters within three miles of the continental and island coastlines. As the eastern boundary, formed by the Los Angeles County line, departs somewhat from the hydrologic divide, the Los Angeles and Santa Ana regions share jurisdiction over watersheds along their common border.

⁵⁸ California Water Boards. 2019. *Water Quality Control Plan for the Central Coastal Basin*. Available online at: https://www.waterboards.ca.gov/centralcoast/publications_forms/publications/basin_plan/docs/2019_basin_plan_r3_complete.pdf, accessed August 27, 2019.

This basin plan assigned beneficial uses to surface and groundwater such as municipal water supply and water-contact recreation to all waters in the basin. It also set water quality objectives, subject to approval by the EPA, intended to protect designated beneficial uses. These objectives apply to specific parameters (numeric objectives) and general characteristics of the water body (narrative objectives). An example of a narrative objective is the requirement that all waters must remain free of toxic substances in concentrations producing detrimental effects upon aquatic organisms. Numeric objectives specify concentrations of pollutants that are not to be exceeded in ambient waters of the basin. The Los Angeles RWQCB is involved in the regulation of several activities that are relevant to the consideration of the basin plan:

- Prepares, monitors compliance with, and enforces Waste Discharge Requirements, including NPDES permits;
- Implements and enforces local stormwater control efforts;
- Enforces water quality laws, regulations, and waste discharge requirements; and
- General Construction Activity Stormwater Discharges

Stormwater discharges that are composed entirely of runoff from qualifying construction activities may require regulation under the General Construction Activity Storm Water Permit issued by the SWRCB. Construction activities that qualify include clearing, grading, excavation, reconstruction, and dredge-and-fill activities that result in the disturbance of at least one acre and less than five acres of total land area. The evaluation of the plan does not generate the need for compliance with the Construction General Permit. The development of single-family residences would require permit coverage if the development disturbs greater than one acre of land. Additionally, the plan would require the consideration of a Standard Urban Stormwater Management Plan (SUSMP) as part of compliance with the NPDES General Construction Activity Storm Water Permit to reduce water quality impacts to the maximum extent practicable. A SUSMP is a report that includes one or more site maps, an identification of construction activities that could cause pollutants to enter the stormwater, and a description of measures or BMPs to control these pollutants to the maximum extent practicable.⁵⁹

⁵⁹ California Water Boards. 2019. *Basin Plan for the Coastal Watersheds of Los Angeles and Ventura Counties*. Available online at: https://www.waterboards.ca.gov/losangeles/water_issues/programs/basin_plan/basin_plan_documentation.html, accessed August 27, 2019.

Water Control Plan for the Lahontan Region

This basin plan for the Lahontan Region sets forth water quality standards for the surface and ground waters which include both designated beneficial uses of water and the narrative and numerical objectives which must be maintained or attained to protect those uses. It identifies general types of water quality problems, which can threaten beneficial uses. It then identifies required or recommended control measures for these problems. The plan also summarizes past and present water quality monitoring programs, and identifies monitoring activities, which should be carried out to provide the basis for future basin plan updates and for waste discharge requirements or conditional waivers.

Additionally, the Lahontan basin plan implements a number of state and federal laws, the most important of which are the federal CWA and the State Porter-Cologne Water Quality Control Act. Other pertinent federal laws include the Safe Drinking Water Act, Toxic Substances Control Act, Resource Conservation and Recovery Act, and Endangered Species Act, and the Comprehensive Response, Compensation, and Liability Act (CERCLA or “Superfund”) and Superfund Amendment and Reauthorization Act (SARA). Other applicable California laws include the Health and Safety, Fish and Game, and Food and Agriculture Codes.⁶⁰

Water Control Plan for the Colorado River Basin

The intent of this basin plan is to provide definitive guidelines and give direction to the full scope of activities that serve to optimize the beneficial uses of the state waters within the Colorado River Basin by preserving and protecting the quality of these waters. Water uses and water benefits vary. Water quality is an important factor in determining use and benefit. For example, drinking water must be of higher quality than the water used to irrigate pastures. Both are beneficial water uses, but the quality requirements for irrigation water are different from those for drinking water. The basin plan recognizes the variations of water quality and water uses. The basin plan lists and defines the various beneficial water uses (Chapter 2). It describes the water quality which must be maintained to support such uses (Water Quality Objectives, Chapter 3). The section on implementation (Chapter 4) describes the programs, projects and other actions that are necessary to achieve the standards established in this basin plan. Plans, Policies and Issues (Chapter 5), summarize the various plans and policies which protect water quality. This chapter also describes water quality issues which require special attention.

⁶⁰ California Environmental Protection Agency. *Water Quality Control Plan for the Lahontan Region (Basin Plan)*. Available online at: https://www.waterboards.ca.gov/lahontan/water_issues/programs/basin_plan/references.shtml, accessed August 27, 2019.

Surveillance and Monitoring (Chapter 6), describes activities within the Colorado River Basin Region related to surveillance, monitoring, assessment, lab support, and quality assurance and quality control.⁶¹

Water Quality Control Plan for the Santa Ana River Basin

This basin plan establishes water quality standards for the ground and surface waters of the region. The term “water quality standards,” as used in the federal CWA, includes both the beneficial uses of specific waterbodies and the levels of quality that must be met and maintained to protect those uses. The plan describes actions by the Regional Board and others that are necessary to achieve and maintain water quality standards. The Regional Board regulates waste discharges to minimize and control their effect on the quality of the region’s ground and surface water. Permits are issued under several programs and authorities. The terms and conditions of these discharge permits are enforced through a variety of technical, administrative, and legal means. Water quality problems in the region are listed in the plan, along with the causes, where they are known. For waterbodies with quality below the levels necessary to allow all the beneficial uses of the water to be met, plans for improving water quality are included.⁶²

Water Quality Control Plan for the San Diego Basin

The San Diego Regional Board's basin plan is designed to preserve and enhance water quality and protect the beneficial uses of all regional waters. Specifically, the plan: (1) designates beneficial uses for surface and ground waters, (2) sets 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) describes implementation programs to protect the beneficial uses of all waters in the region, and (4) describes surveillance and monitoring activities to evaluate the effectiveness of the plan (California Water Code sections 13240–13244, section 13050(j)). Additionally, the plan incorporates by reference all applicable state and regional board plans and policies.⁶³

⁶¹ California Water Boards. 2019. *Water Quality Control Plan for the Colorado River Basin Region*. Available online at: https://www.waterboards.ca.gov/coloradoriver/water_issues/programs/basin_planning/docs/bp032014/r7_bp2019fullbp.pdf, accessed August 27, 2019.

⁶² California Water Boards. 2019. *Santa Ana Region Basin Plan*. Available online at: https://www.waterboards.ca.gov/santaana/water_issues/programs/basin_plan/, accessed August 27, 2019.

⁶³ California Water Boards. 2019. *San Diego Region – The Basin Plan*. Available online at: https://www.waterboards.ca.gov/sandiego/water_issues/programs/basin_plan/, accessed August 27, 2019.

3.10.2.4 Local

County of Los Angeles General Plan

As part of the Conservation and Natural Resources Element of the 2040 General Plan Update, the Board of Supervisors of the County of Los Angeles has adopted three goals for water quality initiatives related to hydrology and water quality and two goals related to watershed and river master plans:⁶⁴

Water Quality Initiatives

- Support multi-benefit outcomes, such as water quality benefits arising from ecosystem restoration efforts, and identify, attract, and create funds and resources to implement this initiative.
- Participate in enhanced watershed management programs and watershed management programs in coordination with other agencies throughout Los Angeles County.
- Participate in coordinated integrated watershed monitoring plans in coordination with other agencies throughout Los Angeles County.

Watershed and Rivers Master Plans

- Participate with stakeholders in the preparation of watershed management plans in response to the NPDES MS4 Permit by promoting multi-benefit outcomes, including, but not limited to new public access to natural resources, new recreational opportunities, enhanced aquatic habitats, and restored natural features, where appropriate, while maintaining necessary levels of flood protection.
- Identify, attract, and create funds and resources to implement these plans.

County of Riverside General Plan

The County of Riverside General Plan specifically addresses hydrology and water quality in four categories: water resources, water quality (including groundwater quality), floodplain management, and wetlands.⁶⁵

⁶⁴ Los Angeles Department of Regional Planning. *General Plan, Chapter 9: Conservation and Natural Resources Element*. Available online at: <http://planning.lacounty.gov/generalplan/generalplan>, accessed August 27, 2019.

⁶⁵ Riverside County Planning Department. 2015. *General Plan Multipurpose Open Space Element*. Available online at: [https://planning.rctlma.org/Portals/14/genplan/general Plan 2017/elements/OCT17/Ch05 MOSE 120815.pdf?ver=2017-10-11-102103-833](https://planning.rctlma.org/Portals/14/genplan/general%20Plan%202017/elements/OCT17/Ch05%20MOSE%20120815.pdf?ver=2017-10-11-102103-833), accessed August 27, 2019.

Water Resources

The General Plan acknowledges that contamination from natural or manufactured sources has reduced groundwater quality such that its use requires treatment. Management of the amount of water available (local and imported) and its quality, is identified as an important response to the gap between supply and demand in Riverside County. The General Plan provides policies that seek to protect and enhance the water resources in the county. These policies address broad water planning issues, and the relationship of land use decisions to water issues.

Water Quality

The General Plan recognizes BMPs established by the three applicable RWQCBs, Regions 7, 8, and 9 to provide state-level water quality policy and NPDES as effective means of managing water quality problems that have occurred in Riverside County. Such problems are related to inadequate subsurface sewage disposal, waste disposal management of the Santa Ana River, agriculturally related problems such as citricultural runoff in the western county and increasing salinity of the desert groundwater basins, sediment buildup of water bodies from construction-related erosion, lake water quality problems, and pollution due to urban stormwater system runoff.

Floodplain and Riparian Area Management

The intent of the county is to sustain living riparian habitats to the maximum extent possible, recognizing that flooding is part of the dynamic nature of healthy rivers and ecosystems. High flows and flood waters are needed to cleanse the channels of accumulated debris, build stream banks, import gravels for aquatic life, thin riparian forests and create riparian habitat. The open space of floodplains adjacent to rivers and streams helps store and slowly release floodwaters, thus reducing flood flow and peaks and their subsequent impacts during small and frequent flood events. Further, riparian habitat within floodplains is of great value to resident and migratory animal species, as it provides corridors and linkages to and from the biotic regions of the county. The numerous essential habitat elements provided by the remaining riparian corridors of Riverside County make them a significant contributor to wildlife habitat throughout the county.

Wetlands

The General Plan provides specific policies for the protection of wetlands including the requirement to ensure compliance with the Section 404 of the federal CWA in terms of wetlands mitigation policies and policies concerning fill material in jurisdictional wetlands during development review and approval process; preservation of buffer zones around wetlands where feasible and biologically appropriate; and

consideration of wetlands for use as natural water treatment areas that will result in improvement of water quality.

San Bernardino County General Plan

San Bernardino County has established goal and policies to ensure coordination and cooperation with governmental agencies at all levels to ensure safe, reliable, and high-quality water supply for all residents and ensure prevention of surface and ground water pollution. The County General Plan provides specific policies for adherence to federal and state water quality standards for surface and groundwater and wastewater discharge requirements in the review of development proposals that relate to type, location and size of the project to safeguard public health. Similarly, the County General Plan specifies the need to work with the RWQCBs to establish uniform criteria for appropriate sewerage options for new development. The County General Plan further directs cooperation with state, regional, and responsible authorities to expand water sampling programs to determine ambient groundwater quality conditions affecting public, agricultural, and private wells. Identify the sources, extent, and types of organic and inorganic groundwater contaminants, and evaluation of their impacts on groundwater resources. The County General Plan calls for the prevention of surface and groundwater pollution through continued cleanup of contaminated waters and watersheds.⁶⁶

Imperial County General Plan

The Imperial County General Plan provides specific goals and policies related to maintaining the viability of the Salton Sea and other surface water resources in the county.⁶⁷

- **Goal 2:** Long-term viability of the Salton Sea, Colorado River, and other surface waters in the County will be protected for sustaining wildlife and a broad range of ecological communities.
 - **Objective 2.1:** The continued viability of the agricultural sector as an important source of surface water for the maintenance of valuable wildlife and recreational resources in the County.
 - **Objective 2.2:** A balanced ecology associated with the riparian and ruderal biological communities important as breeding and foraging habitats for native and migratory birds and animals occurring within the County.

⁶⁶ San Bernardino County Land Use Services. 2007. *County of San Bernardino 2007 General Plan*. Available online at: <http://www.sbcounty.gov/Uploads/lus/GeneralPlan/FINALGP.pdf>, accessed August 27, 2019.

⁶⁷ Imperial County Planning/Building Department. 1997. *Imperial County General Plan Water Element*. Available online at: <http://www.icpds.com/CMS/Media/Water-Element.pdf>, accessed August 27, 2019.

- **Objective 2.3:** Preservation of riparian and ruderal habitats as important biological filters as breeding and foraging habitats for native and migratory birds and animals.

Orange County General Plan

In the Orange County region, the protection of water quality is a major concern. The need to maintain safe water quality may constrain the development of energy resources, from methane (landfills) and geothermal sources. At a minimum, water quality concerns will need to be considered during the process of developing these resources and water intensive resources such as agriculture.

Development of land and the increase in population density has also created new sources of non-stormwater discharges and pollutants in stormwater discharges. The San Diego and Santa Ana RWQCBs require that water quality and watershed protection principles are considered as part of land use planning and development review.

Drainage Area Management Plan (DAMP)

The specific water pollutant control elements of the Orange County Stormwater Program are documented in the 2003 Drainage Area Management Plan (DAMP) which is the County of Orange, incorporated cities of Orange County, and Orange County Flood Control District's (collectively referred to as Permittees) primary policy, planning and implementation document for municipal NPDES Stormwater Permit compliance. The DAMP was prepared and is periodically updated using a consensus building process that involving public and private sector input and public review through the CEQA process.⁶⁸

The DAMP describes the agreements, structures and programs that:

- Provide the framework for the program management activities and plan development (DAMP Section 2.0 and Section 3.0);
- Provide the legal authority for prohibiting unpermitted discharges into the storm drain system and for requiring BMPs in new development and significant redevelopment (DAMP Section 4.0);
- Improve existing municipal pollution prevention and removal best management practices (BMPs) to further reduce the amount of pollutants entering the storm drain system (DAMP Section 5.0);

⁶⁸ Orange County Public Works. 2003 *Drainage Area Management Plan (DAMP)*. Available online at: <https://cms.ocgov.com/gov/pw/watersheds/documents/damp/mapplan.asp>, accessed August 27, 2019.

- Educate the public about the issue of urban stormwater and non-stormwater pollution and obtain their support in implementing pollution prevention BMPs (DAMP Section 6.0);
- Ensure that all new development and significant redevelopment incorporates appropriate Site Design, Source Control and Treatment Control BMPs to address specific water quality issues (DAMP Section 7.0);
- Ensure that construction sites implement control practices that address control of construction related pollutants discharges including erosion and sediment control and on-site hazardous materials and waste management (DAMP Section 8.0);
- Ensure that existing development will address discharges from industrial facilities, selected commercial businesses, residential development and common interest areas/homeowner associations (Note: The San Diego permit explicitly outlines a residential component, but the Santa Ana permit is more general about residential requirements) (DAMP Section 9.0);
- Detect and eliminate illegal discharges/illicit connections to the municipal storm drain system (DAMP Section 10.0);
- Identify impacted receiving waters and produce environmental quality information to direct management activities, including prioritization of pollutants to support the development of specific controls to address these problems (DAMP Section 11.0); and
- Assess watersheds and manage urban runoff on a watershed basis (DAMP Section 12.0).

One of the major challenges for the Permittees in updating the programs was the reconciliation between the two Regional Board permits and the resulting program requirements that have significant differences for the first time. As a result of this separation, the 2003 DAMP now includes Local Implementation Plans (LIPs – also termed Jurisdictional Urban Runoff Management Programs – JURMP – in the San Diego Regional Board Third Term Permit). The LIPs were created to assist each Permittee in implementing an increasingly complex program within its jurisdiction while maintaining a single policy document that addresses two sets of permit requirements.⁶⁹ The LIPs were completed by the San Diego Permittees in February 2003 and by the Santa Ana Permittees in June 2003.

⁶⁹ Orange County Public Works. *Drainage Area Management Plan (DAMP), Appendix A – Stormwater Program Local Implementation Plan (LIP)*. Available online at: <https://media.ocgov.com/gov/pw/watersheds/documents/damp/lip.asp>, accessed August 27, 2019.

The requirement to overlay separate, but nonetheless, highly interrelated water quality protection and planning processes based on hydrologic rather than political boundaries was addressed through the creation of Watershed Action Plans (WAP). A WAP (see DAMP Appendix D) was created for each of the six watersheds under the jurisdiction of the San Diego Regional Board in August 2003. A model WAP was created for the Newport Bay watershed during 2005-06 and draft WAPs are being prepared for the other watersheds in the area of Orange County under the jurisdiction of the Santa Ana Regional Board.⁷⁰

Ventura County General Plan

The Ventura County General Plan provides specific goals and policies related to the inventory and monitoring of water quantity and quality to facilitate effective management of the resources. The Ventura County General Plan has identified ten specific programs to support achievement of the goals and policies. The programs include:

- Support of the Seawater Intrusion Abatement Project;
- Enforcement of Chapter 70 (Excavation and Grading) of the Uniform Building Code, as incorporated by reference in and amended by the Ventura County Building Code, to ensure that any proposed grading in a waterway or wetland is adequately investigated and that any development incorporates appropriate design provisions to protect waterways or wetlands;
- Support the Fox Canyon Groundwater Management Agency Plan for both the Upper and Lower Aquifer Systems;
- Continued coordination with water districts and other appropriate agencies to establish a data base on actual available supply, projected use factors for types of land use and development, and threshold limits for development within available water resources;
- Planning Division will continue to promote of the efficient use of water through the Landscape Design Criteria Program;
- Cooperation between the Public Works Agency and the Environmental Health Division, to pursue the use of reclaimed water for agricultural irrigation;
- Continued monitoring, inspection and regulation of underground storage tanks;

⁷⁰ Orange County Public Works. *Drainage Area Management Plan (DAMP)*. Available online at: <https://cms.ocgov.com/gov/pw/watersheds/documents/damp/default.asp>, accessed August 27, 2019.

- Identification of waste disposal sites and seek to mitigate impacts to water resources; and consideration of the Board of Supervisors of a Countywide water conservation retrofit program to fund the installation of water conservation fixtures) for businesses and residents located within Ventura County.⁷¹

City General Plan and Ordinances

In accordance with Sections 65560(g) of the California Government Code, all cities are required to have a conservation element as part of their General Plans.⁷² The conservation element provides goals and policies related to conservation, development, and utilization of natural resources including water and its hydraulic force, forests, soils, rivers and other waters, harbors, fisheries, wildlife, minerals, and other natural resources. One of the six required aspects of the open space element is for planning, conservation and management of open space for the preservation of natural resources, including habitat for fish and wildlife species; areas required for ecologic and other scientific study purposes; rivers, streams, bays and estuaries; and coastal beaches, lakeshores, banks of rivers and streams, and watershed lands. In addition, many cities have ordinances related to protection, conservation and management of natural water resources consistent with the applicable beneficial uses stipulated in the applicable RWQCB basin plan.

Furthermore, some local jurisdictions have started to address climate change impacts such as sea level rise in policy documents. For example, the City of Long Beach developed a draft of its Climate Action and Adaptation Plan (CAAP) to help reduce greenhouse gas (GHG) emissions, prepare the community for the impacts of climate change, improve the quality of life, and enhance economic vitality. The CAAP provides a framework for creating or updating policies, programs, practices, and incentives to reduce the City's GHG footprint, and ensure the community and physical assets are better protected from the impacts of climate change.⁷³

3.10.3 ENVIRONMENTAL IMPACTS

3.10.3.1 Thresholds of Significance

For the purposes of this PEIR, SCAG has determined that adoption and/or implementation of the Plan could result in significant adverse impacts to hydrology and water resources, if the Plan would result in any of the following:

⁷¹ City of Ventura. *Ventura General Plan*. Available online at: <https://docs.vcrma.org/images/pdf/planning/plans/Goals-Policies-and-Programs.pdf>, accessed August 27, 2019.

⁷² California Legislative Information. *Article 10.5. Open-Space Lands [65560-65570], Section 65560*.

⁷³ City of Long Beach Development Services. *Climate Action and Adaptation Plan*. Available online at: <http://www.longbeach.gov/lbds/planning/caap/>, accessed September 17, 2019.

- Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality;
- Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin;
- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:
 - Result in substantial erosion or siltation on- or off-site;
 - Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site;
 - Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or
- In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation; or
- Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan.

3.10.3.2 Methodology

The analysis of water quality impacts identifies the types of pollutants potentially associated with future development as a result of implementation of the Plan and considers their effects on water quality. Consideration is given to BMPs, which would serve to minimize pollutants in stormwater runoff. Further, the Plan's consistency with relevant regulatory permits/requirements is evaluated to demonstrate how compliance would protect water quality.

As summarized in Regulatory Framework, independent of the CEQA process, there is a comprehensive set of regulations implemented at the State and jurisdictional level to impacts related to storm drainage, urban pollutants, and flood hazards. As such, the analysis presented herein assumes future projects would comply with these regulations.

This discussion of hydrology and water quality addresses impacts within the entire SCAG region. The impact analysis was based on several factors, including the policies and land uses of the Plan, the degree

to which existing land uses in the region would change, and the thresholds of significance for hydrology and water quality.

The mitigation measures in the PEIR are divided into two categories: SCAG mitigation and project-level mitigation measures. SCAG mitigation measures shall be implemented by SCAG over the lifetime of the Plan. For projects proposing to streamline environmental review pursuant to SB 375, SB 743 or SB 226 (as described in Section 1.0 Introduction), or for projects otherwise tiering off this PEIR, the project-level mitigation measures described below (or comparable measures) can and should be considered and implemented by Lead Agencies and Project Sponsors during the subsequent, project- or site-specific environmental reviews for transportation and development projects as applicable and feasible. However, SCAG cannot require implementing agencies to adopt mitigation, and it is ultimately the responsibility of the implementing agency to determine and adopt project-specific mitigation.

3.10.3.3 Impacts and Mitigation Measures

Impact HYD-1 Potential to violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality.

Significant and Unavoidable Impact - Mitigation Required.

Hydrology and water quality resources of concern within the SCAG region are subject to extensive regulatory controls at the federal, state, and local level. Grading, excavation, and other construction activities associated with implementation of transportation projects and development projects anticipated to occur under the Plan, could impact water quality due to erosion resulting from exposed soils that may be transported in stormwater runoff. In addition, construction activities have the potential to generate short-term water pollutants, including sediment, trash, construction materials, and equipment fluids. However, all construction activities are subject to NPDES GCASP permit requirements in addition to any applicable local requirements. As shown in **Table 3.10-3, Pollutants Associated with Transportation**, there are several pollutants specific to transportation that could also impact water quality. Many urban runoff pollutants are attributable to landscape irrigation, highway runoff, and illicit dumping that flows into nearby water bodies during storm events. These pollutants could include, but are not limited to, oil, grease, auto emissions, and pesticides, urban runoff debris, and air pollution residue. Highway runoff is a component of urban runoff contributing oil and grease, sediment, nutrients, heavy metals, and toxic substances. If such contaminated runoff remains largely untreated, long-term degradation of water quality could occur.

The SWRCB has developed trash, metal, and bacteria TMDLs for many watersheds in the region, including Dominguez Channel, Santa Monica Bay, Los Angeles River, Santa Clara River, Ventura River, Malibu Creek, Calleguas Creek, and Ballona Creek. The TMDLs provide a numerical threshold for each pollutant within each watershed to be used for regulating both point and non-point source discharges and is implemented through the NPDES permit process. An NPDES storm water permit is required for any construction activity that would disturb greater than one acre. Acquisition of the General Construction permit is dependent on the preparation of a SWPPP that should contain specific BMPs to control the discharge of pollutants, including sediment, into the local surface water drainages. In addition, all state projects for which Caltrans is the sponsor agency would comply with the Caltrans Statewide NPDES permit that regulates all storm-water discharges from Caltrans owned conveyances, maintained facilities and construction activities. The inclusion of runoff control measures in the design of future roadway projects should improve water quality and result in fewer impacts to the environment.

**Table 3.10-3
Pollutants Associated with Transportation**

Pollutant	Source
Asbestos	Clutch plates, brake linings
Cadmium	Tire wear and insecticides
Copper	Thrust-bearing, bushing, brake linings, and fungicides and insecticides
Chromium	Pavement materials, metal plating, rocker arms, crankshafts, rings, and brake linings
Cyanide	Anti-caking compound in de-icing salt
Lead	Leaded gasoline, motor oil, transmission babbitt metal bearings, tire wear
Iron	Auto-body rust, steel highway structures, moving engine parts
Manganese	Moving engine parts
Nickel	Diesel fuel and gasoline, pavement material, lubricating oil, metal plating, bushing wear, and brake linings
Nitrogen and Phosphorus	Motor oil additives, fertilizers
Sulphates	Roadway beds, fuel, and de-icing salt
Zinc	Motor oil and tires
Grease and Hydrocarbons	Spills and leaks of oil and n-paraffin lubricants, antifreeze, hydraulic fluids
Rubber	Tire wear
Sediment	Pavement wear, construction and maintenance activities

Source:

U.S. Environmental Protection Agency, Office of Water. 1995. *Controlling Nonpoint Source Runoff Pollution from Roads, Highways, and Bridges*. EPA-841-F-95-008a.

Construction of transportation projects and development projects anticipated to occur under the Plan would increase impervious surfaces throughout the SCAG region. The growth projections reflected in the

Plan would substantially increase the amount of urbanized land or densify existing urbanized areas in the SCAG region. Connect SoCal envisions more compact, infill development patterns which may result in higher levels of paved surfaces and pollution associated with water run-off from paved surfaces into urban waterways.

Increased impervious surfaces could add to storm water runoff volumes and peak flow rates which could result in increased pollutants loads. Future projects could also result in increased stormwater runoff, and thus increased pollutant loading, being captured in existing storm drain systems and conveyed to local or regional wastewater treatment facilities. The land use patterns included in the Plan would generate new sources of sanitary sewage, which would also be conveyed to wastewater treatment facilities in the region for secondary or tertiary treatment. Suspended sediments, oxygen demanding substances, and oil and grease would constitute a substantial part of these pollutant loads. Total nitrogen and total phosphorous would increase less than these other pollutants, but would have the potential for influencing algal growth, reducing dissolved oxygen, and affecting aquatic species abundance and composition. Contaminated urban runoff, if left untreated, would result in incremental degradation of water quality. This is of particular concern where projects are located on previously contaminated sites. Without effective erosion and storm water control, contaminated soils exposed during construction activities may result in surface water contamination.

Transportation and land use strategies in the Plan anticipate increased urbanization in high-quality transit areas (HQTAs). Additional impervious surfaces in these already developed areas could increase the potential for pollutants to enter impaired receiving waters. Project grading and construction of impervious surfaces for the Plan's transportation projects and anticipated development projects have the potential to alter existing drainage patterns by altering slope and reducing infiltration. Many jurisdictions in the region, such as the County and City of Los Angeles, have strict guidelines requiring no net increase in runoff during construction and operation. These low impact development standards help to reduce the potential for contaminated runoff.

For development projects where construction activities would disturb more than one acre of land, construction activities are also subject to NPDES GCASP requirements, which require the preparation and implementation of a SWPPP. However, since implementation of the Plan would add an additional 6,346 lane miles to the region and 41,546 acres of greenfield land is anticipated to become developed, there is potential for water quality standards and waste discharge requirements to be exceeded due to an expected increase in impervious surfaces. As such, implementation of the Plan may result in significant, unavoidable impacts to surface and groundwater quality requiring the consideration of mitigation measures.

Mitigation Measures

SCAG Mitigation Measure

SMM HYD-1: SCAG shall continue to work with local jurisdictions and water quality agencies to encourage regional-scale planning for improved water quality management and pollution prevention. Future impacts to water quality shall be avoided to the extent practical and feasible through cooperative planning, information sharing, and comprehensive pollution control measure development within the SCAG region. This cooperative planning shall occur as part of current and existing coordination, an integral part of SCAG's ongoing regional planning efforts.

Project Level Mitigation Measure

PMM HYD-1: In accordance with provisions of sections 15091(a)(2) and 15126.4(a)(1)(B) of the *State CEQA Guidelines*, a Lead Agency for a project can and should consider mitigation measures to reduce substantial adverse effects from violation of any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality, as applicable and feasible. Such measures may include the following or other comparable measures identified by the Lead Agency:

- a) Complete, and have approved, a Stormwater Pollution Prevention Plan (SWPPP) prior to initiation of construction.
- b) Implement Best Management Practices to reduce the peak stormwater runoff from the project site to the maximum extent practicable.
- c) Comply with the Caltrans storm water discharge permit as applicable; and identify and implement Best Management Practices to manage site erosion, wash water runoff, and spill control.
- d) Complete, and have approved, a Standard Urban Stormwater Management Plan, prior to occupancy of residential or commercial structures.
- e) Ensure adequate capacity of the surrounding stormwater system to support stormwater runoff from new or rehabilitated structures or buildings.

- f) Prior to construction within an area subject to Section 404 of the Clean Water Act, obtain all required permit approvals and certifications for construction within the vicinity of a watercourse:
- g) Where feasible, restore or expand riparian areas such that there is no net loss of impervious surface as a result of the project.
- h) Install structural water quality control features, such as drainage channels, detention basins, oil and grease traps, filter systems, and vegetated buffers to prevent pollution of adjacent water resources by polluted runoff where required by applicable urban storm water runoff discharge permits, on new facilities.
- i) Provide operational best management practices for street cleaning, litter control, and catch basin cleaning are implemented to prevent water quality degradation in compliance with applicable storm water runoff discharge permits; and ensure treatment controls are in place as early as possible, such as during the acquisition process for rights-of-way, not just later during the facilities design and construction phase.
- j) Comply with applicable municipal separate storm sewer system discharge permits as well as Caltrans' storm water discharge permit including long-term sediment control and drainage of roadway runoff.
- k) Incorporate as appropriate treatment and control features such as detention basins, infiltration strips, and porous paving, other features to control surface runoff and facilitate groundwater recharge into the design of new transportation projects early on in the process to ensure that adequate acreage and elevation contours are provided during the right-of-way acquisition process.
- l) Upgrade stormwater drainage facilities to accommodate any increased runoff volumes. These upgrades may include the construction of detention basins or structures that will delay peak flows and reduce flow velocities, including expansion and restoration of wetlands and riparian buffer areas. System designs shall be completed to eliminate increases in peak flow rates from current levels.
- m) Encourage Low Impact Development (LID) and incorporation of natural spaces that reduce, treat, infiltrate and manage stormwater runoff flows in all new developments, where practical and feasible.

Level of Significance after Mitigation

As previously discussed, regulations and policies would reduce impacts but given the regional scale of the analysis in this PEIR, it is not possible to determine if all impacts would be fully mitigated by existing regulations and policies. Therefore, this PEIR identifies project-level mitigation measures consistent with applicable regulations and policies designed to reduce impacts. Lead Agencies may choose to include project-level mitigation measures in environmental documents as they determine to be appropriate and feasible. However, because of the regional nature of the analysis and the lack of project specific-detail, including project components and locations, and SCAG's lack of authority to impose project-level mitigation measures, this PEIR finds impacts related to water quality standards and waste discharge requirements could be significant and unavoidable even with implementation of mitigation.

Impact HYD-2 Potential to substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin.

Significant and Unavoidable Impact - Mitigation Required.

Given that most of the groundwater basins in the Plan area are already in a state of overdraft, future development may result in a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of preexisting nearby wells would drop to a level that would not support existing land uses or planned uses for which permits have been granted). Population growth of 3.2 million people by 2045 would increase regional water demand and could substantially deplete groundwater supplies. Additionally, urbanization to accommodate future growth would potentially interfere with groundwater recharge due to increased impervious surfaces.

According to the Public Policy Institute of California, groundwater overdraft in some agricultural regions averages about 2 million af annually.⁷⁴ In contrast to surface water, groundwater use has largely been unregulated under California law until recently. Many basins have experienced long-term overdraft, and 21 of the state's 515 basins are now considered critically overdrafted, including Indian Wells Valley Basin which has portions within San Bernardino County and the Santa Clara River Valley – Oxnard Basin in Ventura County.^{75,76}

⁷⁴ The Public Policy Institute. 2017. *Just the Facts. Groundwater in California*. May. Available online at: https://www.ppic.org/wp-content/uploads/ITF_GroundwaterITF.pdf, accessed August 14, 2019.

⁷⁵ The Public Policy Institute. 2017. *Just the Facts. Groundwater in California*. May. Available online at: https://www.ppic.org/wp-content/uploads/ITF_GroundwaterITF.pdf, accessed August 14, 2019.

Most transportation projects involve the modification of existing facilities and do not themselves generate water supply impacts but could affect groundwater by increasing impervious surfaces and reducing opportunities for recharge. The Plan anticipates approximately 6,346 new lane miles would be added to the region in the form of new facilities, additional right-of-way on existing transportation facilities, extending roads to accommodate bike lanes on existing transportation facilities, and even associated landscaping and future plantings. Additionally, under the Plan, 41,546 acres of greenfield land is anticipated to be urbanized as the region adds housing and jobs. Under natural conditions, vegetation intercepts and retains rainfall before infiltration or runoff occurs. Without hard-surfaced land areas, this hydrology cycle favors groundwater recharge. With a roadway or other hard surface this infiltration dynamic is significantly impeded. The magnitude of this effect is reported by studies indicating that the volume of storm water washed off one-acre of roadway is about sixteen times greater than that of a comparably sized meadow.

The increase in impervious surfaces due to additional lane miles and conversion of greenfields into developed land would potentially affect groundwater recharge rates. Reduction in groundwater recharge, either through a net deficit in aquifer volume or through a lowering of the local groundwater table level, presents a significant impact and requires the consideration of mitigation measures.

Mitigation Measures

SCAG Mitigation Measure

SMM HYD-2: SCAG shall build from existing efforts including those at the sub-regional and local level and shall continue to work with local jurisdictions and water agencies, to encourage regional-scale planning for improved stormwater management and groundwater recharge, including consideration of alternative recharge technologies and practices. Future adverse impacts may be avoided through cooperative planning, information sharing, and comprehensive implementation efforts within the SCAG region.

Project Level Mitigation Measures

PMM HYD-2: In accordance with provisions of sections 15091(a)(2) and 15126.4(a)(1)(B) of the *State CEQA Guidelines*, a Lead Agency for a project can and should consider mitigation

⁷⁶ California Department of Water Resources. 2019. *Bulletin 118 Groundwater Basins Subject to Critical Conditions of Overdraft*. Available online at: <https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Groundwater-Management/Bulletin-118/Critically-Overdrafted-Basins/Files/2018COBAsins.pdf?la=en&hash=3014D2F2299AA503C469D41BBC0E8DCFCE0267F8>, accessed September 17, 2019.

measures to reduce substantial adverse effects from violation of any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality, as applicable and feasible. Such measures may include the following or other comparable measures identified by the Lead Agency:

- a) Avoid designs that require continual dewatering where feasible.

For projects requiring continual dewatering facilities, implement monitoring systems and long-term administrative procedures to ensure proper water management that prevents degrading of surface water and minimizes adverse impacts on groundwater for the life of the project, Construction designs shall comply with appropriate building codes and standard practices including the Uniform Building Code.

- b) Maximize, where practical and feasible, permeable surface area in existing urbanized areas to protect water quality, reduce flooding, allow for groundwater recharge, and preserve wildlife habitat. Minimize new impervious surfaces, including the use of in-lieu fees and off-site mitigation.
- c) Avoid construction and siting on groundwater recharge areas, to prevent conversion of those areas to impervious surface.
- d) Reduce hardscape to the extent feasible to facilitate groundwater recharge as appropriate.

Level of Significance after Mitigation

As discussed above, regulations and policies would reduce impacts but given the regional scale of the analysis in this PEIR, it is not possible to determine if all impacts would be fully mitigated by existing regulations and policies. Therefore, this PEIR identifies project-level mitigation measures consistent with applicable regulations and policies designed to reduce impacts. Lead Agencies may choose to include project-level mitigation measures in environmental documents as they determine to be appropriate and feasible. However, because of the regional nature of the analysis and the lack of project specific-detail, including project components and locations, and SCAG’s lack of authority to impose project-level mitigation measures, this PEIR finds impacts related to groundwater supplies could be significant and unavoidable even with implementation of mitigation..

Impact HYD-3a Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition

of impervious surfaces, in a manner which would result in substantial erosion or siltation on- or off-site.

Significant and Unavoidable Impact - Mitigation Required.

Implementation of transportation projects as well as anticipated development under the Plan would occur within watersheds that have impaired water bodies. Many of the impaired water bodies are located near a freeway, transit, or rail projects included in the Plan. Several projects may impact water bodies by placing fill material within a stream channel. For example, several of the lane widening projects and new transportation facilities could cross existing creeks or be expanded into wetland areas. However, these potential intrusions would have to comply with existing State and local regulations and would be subject to permitting by the USACOE and a RWQCB pursuant to Sections 404 and 401 of the CWA.

Stormwater runoff is influenced by rainfall intensity, ground surface permeability, watershed size and shape, and physical barriers. The introduction of impermeable surfaces greatly reduces natural infiltration, allowing for a greater volume of runoff. In addition, paved surfaces and drainage conduits can accelerate the velocity of runoff, concentrating peak flows in downstream areas faster than under natural conditions. Significant increases to runoff and peak flow can overwhelm drainage systems and alter flood elevations in downstream locations.

Construction and earth-moving activities can be a major source of sediment loading in local waterways. There is significant potential for unprotected soil to erode as stormwater runoff as a result of construction activity. However, state regulation requires that prior to commencement of construction, a SWPPP must be submitted to the SWRCB. SWPPPs identify best management practices (BMPs) used during construction. Individual projects included or discussed in the Plan, are expected to adopt BMPs appropriate to local conditions and to the proposed construction techniques that will reduce stormwater runoff.

The Plan recognizes that as population continues to grow, there is increasing pressure on natural lands. One of the goals of the Plan (See **Section 2.0, Project Description**) is to promote conservation of natural lands and restoration of critical habitats which would have a positive effect on the region's hydrology. The land use mix for the Plan assumes that 60 percent of new housing and 73 percent of new jobs will be in Growth Priority Areas and therefore would be directed away from sensitive habitat or greenfields. However, the Plan would still result in an overall increase in impervious surface.

In addition, due to the anticipated demographic growth in the SCAG region reflected in the Plan, urbanization may also occur in areas that have the potential to result in changes to the drainage patterns. Examples include hillsides and ridgelines which can experience development pressure as urbanization

increases in nearby cities. While the Plan encourages denser, infill development in existing urban areas near HQTAs, many of which are located on relatively flat lands, construction on hillsides and other similar land areas greatly increases the potential for impacts to occur. Therefore, impacts related to altering the existing drainage patterns of a site or area is considered significant.

Mitigation Measures

SCAG Mitigation Measures

See SMM HYD-1 and SMM HYD-2.

SMM HYD-3: SCAG shall build from existing efforts including those at the sub-regional and local level and shall continue to work with local jurisdictions to encourage regional-scale planning for maintaining and/or improving existing drainage patterns. Future adverse impacts may be avoided through cooperative planning, information sharing, and comprehensive implementation efforts within the SCAG region.

Project Level Mitigation Measures

See PMM HYD-1.

Level of Significance after Mitigation

As discussed above, regulations and policies would reduce impacts but given the regional scale of the analysis in this PEIR, it is not possible to determine if all impacts would be fully mitigated by existing regulations and policies. Therefore, this PEIR identifies project-level mitigation measures consistent with applicable regulations and policies designed to reduce impacts. Lead Agencies may choose to include project-level mitigation measures in environmental documents as they determine to be appropriate and feasible. However, because of the regional nature of the analysis and the lack of project specific-detail, including project components and locations, and SCAG's lack of authority to impose project-level mitigation measures, this PEIR finds impacts related to drainage facilities and potential erosion or siltation could be significant and unavoidable even with implementation of mitigation.

Impact HYD-3b **Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would substantially increase the rate or amount of flooding on- or off-site.**

Significant and Unavoidable Impact - Mitigation Required.

As discussed in Impact HYD-3a, the Plan has the potential to change existing drainage patterns. Transportation projects such as lane widening projects, new highways, as well as bridges/tunnels, and transportation facilities projects that could cross existing creeks, water crossings, rivers or be expanded into wetland areas may impact water bodies by placing fill material within a stream channel. Such changes could result in increased flooding. In addition, implementation of the Plan's land use strategies, while mostly aimed at concentrating development in more compact urban areas, would result in more impervious surfaces including the consumption of 41,546 acres of greenfield lands. Impacts related to the substantial alteration of the existing drainage pattern of the site or area and/or the substantial increase in the rate or amount of surface runoff that would result in flooding on site or off site would be significant, requiring mitigation measures.

Mitigation Measures*SCAG Mitigation Measures*

See SMM HYD-1 through SMM HYD-3.

Project Level Mitigation Measures

See PMM HYD-1 and PMM HYD-2.

Level of Significance after Mitigation

As discussed above, regulations and policies would reduce impacts but given the regional scale of the analysis in this PEIR, it is not possible to determine if all impacts would be fully mitigated by existing regulations and policies. Therefore, this PEIR identifies project-level mitigation measures consistent with applicable regulations and policies designed to reduce impacts. Lead Agencies may choose to include project-level mitigation measures in environmental documents as they determine to be appropriate and feasible. However, because of the regional nature of the analysis and the lack of project specific-detail, including project components and locations, and SCAG's lack of authority to impose project-level mitigation measures, this PEIR finds impacts related to flooding and drainage could be significant and unavoidable even with implementation of mitigation.

Impact HYD-3c	Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would create or contribute runoff
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water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff.

Significant and Unavoidable Impact - Mitigation Required.

As discussed in Impact HYD-3a, the Plan has the potential to alter existing drainage patterns. Implementation of the Plan's transportation projects as well as land use strategies may increase impervious surfaces, which in turn could increase urban runoff if not regulated, resulting in the transport of greater volumes of polluted water into storm drain systems. Storm water runoff is influenced by rainfall intensity, ground surface permeability, watershed size and shape, and physical barriers. The introduction of impermeable surfaces greatly reduces natural infiltration, allowing for a greater volume of runoff.

As stated previously, paved surfaces and drainage conduits can accelerate the velocity of runoff, concentrating peak flows in downstream areas faster than under natural conditions. Significant increases to runoff and peak flow can overwhelm drainage systems and alter flood elevations in downstream locations. Increased runoff velocity can also promote scouring of existing drainage facilities, reducing system reliability and safety (see **Table 3.10-3, Pollutants Associated with Transportation**). In addition, this increase in velocity has the potential to create or contribute runoff flows that would exceed the capacity of existing or planned storm water drainage systems. In addition, placing new structures within an existing floodplain can impede flood waters, altering the flood risks both upstream and downstream. As a result, there is a significant impact to substantially create and contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems and providing substantial additional sources of polluted runoff, requiring mitigation measures.

Mitigation Measures

SCAG Mitigation Measures

See SMM HYD-1 through SMM HYD-3.

Project Level Mitigation Measures

See PMM HYD-1 and PMM HYD-2.

Level of Significance after Mitigation

As discussed above, regulations and policies would reduce impacts but given the regional scale of the analysis in this PEIR, it is not possible to determine if all impacts would be fully mitigated by existing

regulations and policies. Therefore, this PEIR identifies project-level mitigation measures consistent with applicable regulations and policies designed to reduce impacts. Lead Agencies may choose to include project-level mitigation measures in environmental documents as they determine to be appropriate and feasible. However, because of the regional nature of the analysis and the lack of project specific-detail, including project components and locations, and SCAG's lack of authority to impose project-level mitigation measures, this PEIR finds impacts related to drainage and stormwater facility capacity and potential for polluted runoff could be significant and unavoidable even with implementation of mitigation.

Impact HYD-4 In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation.

Significant and Unavoidable Impact – Mitigation Required.

The entire SCAG region is susceptible to impacts from seismic activity including the occurrence of seiches in Big Bear Lake, Lake Arrowhead, Lake Casistas, Castaic Lake, Pyramid Lake, Lake Elsinore, Diamond Valley Lake, and the Salton Sea. With more than 150 miles of coastline, significant portions of the SCAG region are also at risk of tsunamis.

With regard to flooding, implementation of transportation projects and development projects anticipated to occur under the Plan built in low-lying areas or in proximity to waterways and/or dam inundation zones may be subject to flood hazards. Flooding risks are associated with projects that are located downstream of dams and retention basins or afforded protection by levee system. These areas may be subject to failure as a result seismic ground-shaking or other natural or anthropogenic actions that compromise the stability of such structures. Additional compact urban development, as well as possible expansion of existing urban areas in areas that are potentially subject to flooding as a result of failure of a levee or dam, could create a potential to expose people or structures to a significant risk of loss, injury, or death involving flooding. Furthermore, for the Plan's transportation projects and anticipated development projects that are near the coast in areas susceptible to tsunamis, there is a potentially significant risk of releasing pollutants due to project inundation (See **Figure 3.7-6, Areas Susceptible to Tsunamis**). However, compliance with existing regulatory requirements described above and in 3.10.2 Regulatory Framework would ensure that the land use changes and transportation network would not expose people or structures to a significant risk of loss, injury, or death from flooding, tsunami, or seiche.

The Plan encourages higher-density housing and commercial development in the region's HQTAs. HQTAs are generally located in areas that are subject to Flood Management Plans (FMPs) and major

flood control infrastructure that have been constructed to constrain the 100-year flood in to flood control systems.

Flood-prone areas in Imperial County are managed pursuant to an FMP, which includes a future-oriented approach to planning in flood risk areas. It is a pre-disaster planning approach that is required by FEMA for the County to continue to participate in the National Flood Insurance Program (NFIP). When a community chooses to join the NFIP, it must adopt and enforce minimum floodplain management standards for participation. The floodplain management requirements within the Special Flood Hazard Area (SFHA) are designed to prevent new developments from increasing the flood threat and to protect new and existing buildings from anticipated flood events. When a community chooses to join the NFIP, it must require permits for all development within the SFHA and ensure that construction materials and methods used will minimize future flood damage.

The Los Angeles Flood Control District includes the vast majority of drainage infrastructure within incorporated and unincorporated areas in every watershed in the County, including 500 miles of open channel, 2,800 miles of underground storm drain, and an estimated 120,000 catch basins.

The County of Orange maintains 350 miles of concrete, rock lined and earthen flood control facilities. Flood control facilities are designed to handle water flow from storm drains and other runoff and "channel" the water into the bay or ocean.

The Riverside County Flood Control District owns and operates over 600 miles of channels storm drains and levees along with 74 dams and detention basin that reduce flood risk throughout the District.

Similarly, the San Bernardino County Flood Control District has developed a very extensive system of facilities, including dams, conservation basins, channels, and storm drains to intercept and convey flood flows through and away from the major developed areas of the County.

The Ventura County Flood Control District provides for the control and conservation of flood and storm waters and for the protection of watercourses, watersheds, public highways, life and property in the district from damage or destruction from these waters.

The flood control districts in the SCAG region participate in the NFIP, which is based on a mutual agreement between the federal government and communities. Participating communities agree to regulate floodplain development according to specified criteria and standards. Specifically, communities must adopt and enforce minimum floodplain management regulations so that development, including buildings, is undertaken in ways that reduce exposure to flooding.

The Plan encourages development in HQTAs and other land use patterns of development in areas that are generally located in areas afforded flood protection by flood control facilities and are subject to specific land use planning regulations pursuant to the NFIP; therefore, the Plan would not be expected to result in development in flood hazard zones.

Rising sea levels will increase the potential for coastal flooding and flood hazards in the future (see **Section 3.10.1.7**, above), and the issue of sea-level rise is a critical component of land use planning and hazard analysis in coastal areas. Until the year 2050, most of the climate models predict a similar degree of sea-level rise; however, after 2050, projections of sea-level rise become less certain because of divergent modeling results and differences in various estimates of greenhouse gas emissions (California Climate Action Team 2010). In 2045 it is expected that an additional 1,301 persons and 151 dwelling units would be at risk due to sea level rise.⁷⁷ **Figure 3.10-3, Areas Vulnerable to Sea Level Rise**, shows areas vulnerable to sea level rise with the Plan.

The CCC's Sea-Level Rise Policy Guidance outlines the types of information, analysis, and design considerations the CCC's staff requires to determine whether shoreline projects conform to the Coastal Act policies. In order to be consistent with the Coastal Act, projects must be designed to minimize conflicts with applicable requirements, including that new development: (1) be designed to eliminate or mitigate adverse effects on local shoreline sand supply; and (2) ensure stability and structural integrity, and neither create nor contribute significantly to erosion, geologic instability, or destruction of a site or surrounding area or in any way require the construction of protective devices that would substantially alter natural landforms along the coast (California Coastal Act Sections 30235 and 30253).

Sea level rise and the risk of tsunamis are existing environmental conditions, and unless the Project will exacerbate these conditions, they are not considered potentially significant impacts under CEQA. As discussed in **Section 3.8, Greenhouse Gas Emissions**, the Plan could result in a significant impact with respect to greenhouse gas emissions (GHGs) and GHGs are considered a primary cause of global climate change and sea level rise. However, the relationship between development in any given region or country and measurable sea level rise is not possible to determine and is therefore considered too speculative to be analyzed any further in this environmental document.

Transportation and anticipated development projects are expected to be built in areas already subject to the flooding hazards discussed above, and existing planning and design standards and regulations would serve to address and minimize the associated potential impacts. In addition, project-specific technical studies would be required to reduce potential risks associated with the Plan to levels of

⁷⁷ SCAG SPM modeling 2019

insignificance. Based on the above analysis and compliance with the regulations outlined in Section 3.10.2, people or structures would not be exposed to a significant risk of inundation due to flooding, tsunamis, and seiches from development associated with the Plan. Therefore, the Plan would result in significant impacts with respect to risk of inundation by flooding, tsunami, or seiche. Consideration of the following mitigation measures is necessary.

Mitigation Measures

SCAG Mitigation Measure

SMM HYD-4: SCAG shall continue to work with local jurisdictions and water quality agencies to encourage flood protection and prevent development in flood hazard areas that do not have appropriate protections. This shall be accomplished through cooperation and information sharing regarding specific alignments and rights-of-way planning for RTP projects, and regional program development as part of SCAG's ongoing regional planning efforts. These include but are not limited to web-based data distribution planning tools and sustainability programs in conjunction with local governments. Such services would potentially consist of an inventory of areas located in or near a 100-year flood hazard zone or hazard areas that would potentially be affected by a failure of a levee or dam; or inundation by seiche, tsunami, or mudflow.

Project Level Mitigation Measure

PMM HYD-4: In accordance with provisions of sections 15091(a)(2) and 15126.4(a)(1)(B) of the *State CEQA Guidelines*, a Lead Agency for a project can and should consider mitigation measures capable of avoiding or reducing the potential impacts of locating structures that would impede or redirect flood flows, as applicable and feasible. Such measures may include the following or other comparable measures identified by the Lead Agency:

- a) Ensure that all roadbeds for new highway and rail facilities be elevated at least one foot above the 100-year base flood elevation. Since alluvial fan flooding is not often identified on FEMA flood maps, the risk of alluvial fan flooding should be evaluated and projects should be sited to avoid alluvial fan flooding. Delineation of floodplains and alluvial fan boundaries should attempt to account for future hydrologic changes caused by global climate change.

Level of Significance after Mitigation

As discussed above, regulations and policies would reduce impacts but given the regional scale of the analysis in this PEIR, it is not possible to determine if all impacts would be fully mitigated by existing regulations and policies. Therefore, this PEIR identifies project-level mitigation measures consistent with applicable regulations and policies designed to reduce impacts. Lead Agencies may choose to include project-level mitigation measures in environmental documents as they determine to be appropriate and feasible. However, because of the regional nature of the analysis and the lack of project specific-detail, including project components and locations, and SCAG's lack of authority to impose project-level mitigation measures, this PEIR finds impacts related to flood hazards could be significant and unavoidable even with implementation of mitigation.

Impact HYD-5 Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan

Significant and Unavoidable Impact - Mitigation Required.

As discussed in Section 3.10.1, there are six RWQCBs (either wholly or in part) that have jurisdiction within the SCAG region (**Figure 3.10-1, Regional Water Quality Control Boards**). The RWQCB is responsible for the protection of the beneficial uses of waters within each county. In general, the RWQCB uses its planning, permitting, and enforcement authority to meet this responsibility and adopts a Water Quality Control Plan (basin plan) to implement plans, policies, and provisions for water quality management. The basin plan for each of the six SCAG counties is discussed in **Section 3.10.2.3**. In accordance with state policy for water quality control, the RWQCB employs a range of beneficial use definitions for surface waters, groundwater basins, marshes, and mudflats that serve as the basis for establishing water quality objectives and discharge conditions and prohibitions. The basin plan identifies existing and potential beneficial uses supported by the key surface water drainages throughout its jurisdiction. The basin plan also includes water quality objectives that are protective of the identified beneficial uses; the beneficial uses and water quality objectives collectively make up the water quality standards for a given region and basin plan.

As discussed under **Impact HYD-2**, implementation of Connect SoCal would increase impervious surfaces due to additional lane miles and conversion of greenfields to developed land. An increase in impervious surfaces would increase water runoff and potentially affect groundwater recharge rates and water quality in the basins. Therefore, the Plan may conflict with or obstruct the implementation of a water quality control plan or sustainable groundwater management plan and mitigation measures are required.

Mitigation Measures

SCAG Mitigation Measure

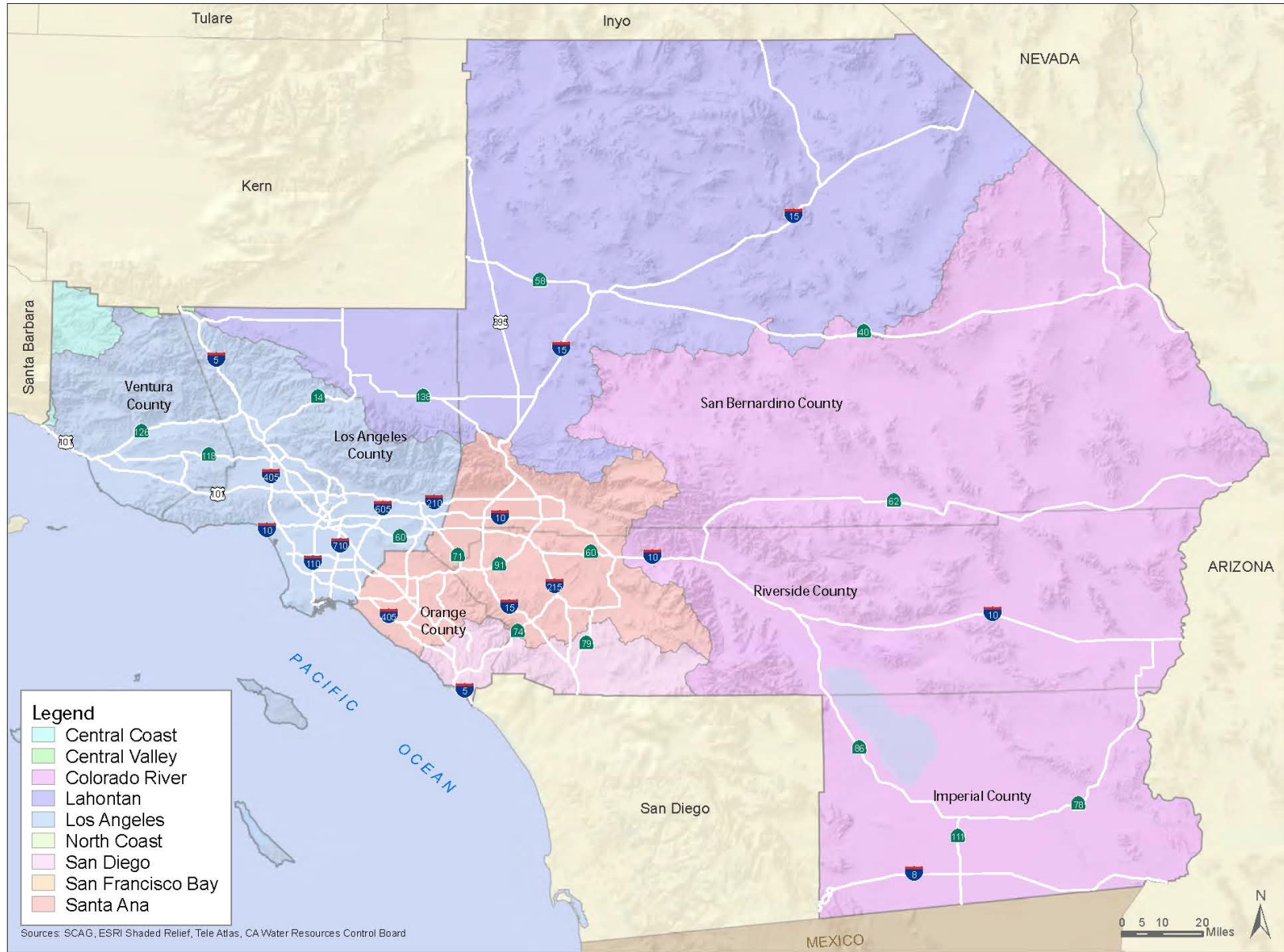
See SMM HYD-2.

Project Level Mitigation Measure

See PMM HYD-2.

Level of Significance after Mitigation

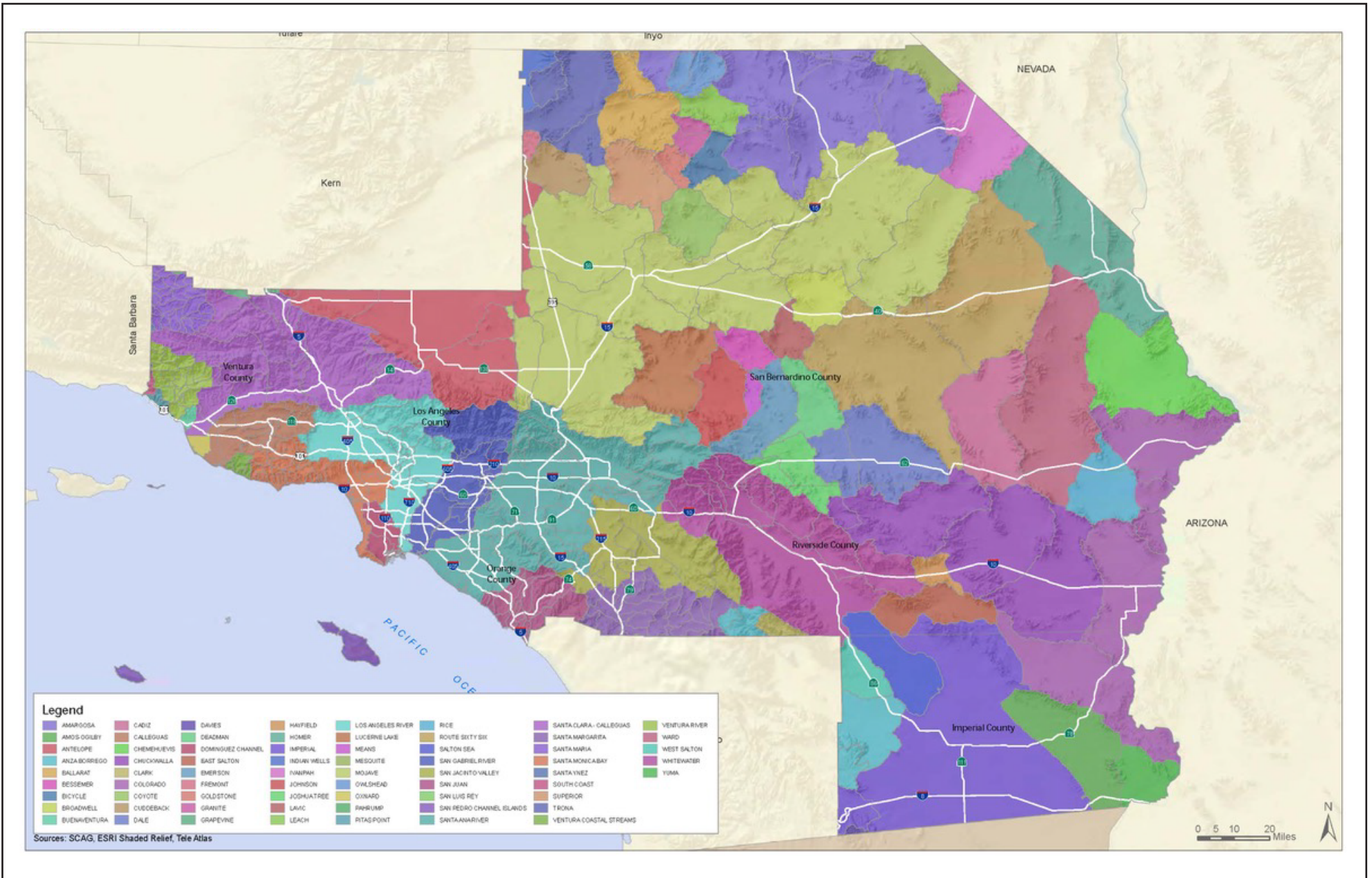
As discussed above, regulations and policies would reduce impacts but given the regional scale of the analysis in this PEIR, it is not possible to determine if all impacts would be fully mitigated by existing regulations and policies. Therefore, this PEIR identifies project-level mitigation measures consistent with applicable regulations and policies designed to reduce impacts. Lead Agencies may choose to include project-level mitigation measures in environmental documents as they determine to be appropriate and feasible. However, because of the regional nature of the analysis and the lack of project specific-detail, including project components and locations, and SCAG's lack of authority to impose project-level mitigation measures, this PEIR finds impacts related to potential conflicts with water quality control plans and groundwater management plans could be significant and unavoidable even with implementation of mitigation.



SOURCE: SCAG, ESRI Shaded Relief, TeleAtlas, CA Water Resources Control Board, 2012

FIGURE 3.10-1

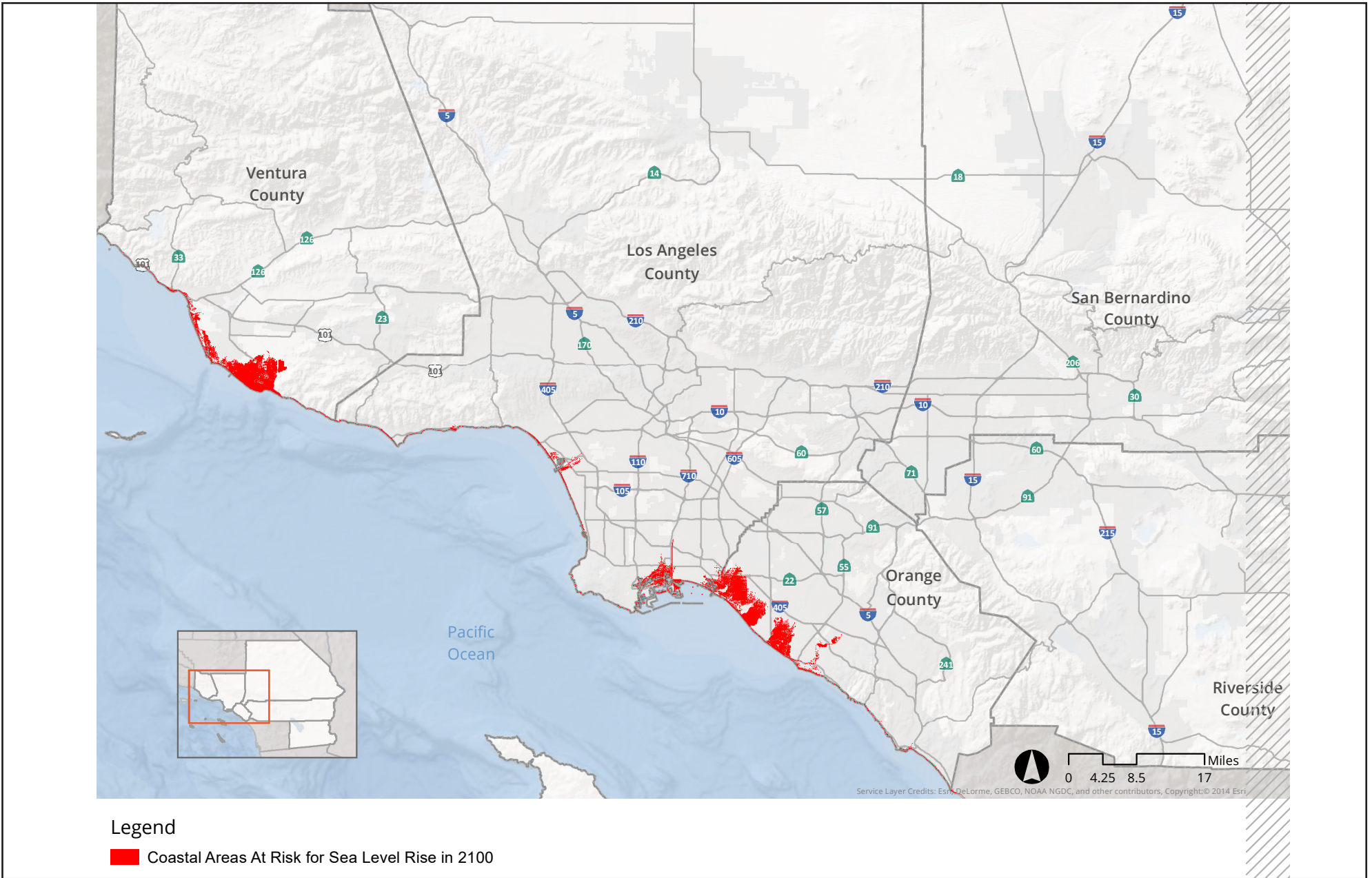
Regional Water Quality Control Boards



SOURCE: SCAG, ESRI Shaded Relief, TeleAtlas, 2015

FIGURE 3.10-2

Watersheds in the SCAG Region



SOURCE: SCAG, 2019

FIGURE 3.10-3

Areas Vulnerable to Sea Level Rise

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