

2.9 Water Quality and Storm Water Runoff

2.9.1 Regulatory Setting

2.9.1.1 Federal Requirements: Clean Water Act

In 1972, Congress amended the Federal Water Pollution Control Act, making the addition of pollutants to the waters of the United States (U.S.) from any point source¹ unlawful unless the discharge is in compliance with a National Pollutant Discharge Elimination System (NPDES) permit. This act and its amendments are known today as the Clean Water Act (CWA). Congress has amended the act several times. In the 1987 amendments, Congress directed dischargers of storm water from municipal and industrial/construction point sources to comply with the NPDES permit scheme. The following are important CWA sections:

- Sections 303 and 304 require states to issue water quality standards, criteria, and guidelines.
- Section 401 requires an applicant for a federal license or permit to conduct any activity that may result in a discharge to waters of the U.S. to obtain certification from the state that the discharge will comply with other provisions of the act. This is most frequently required in tandem with a Section 404 permit request (see below).
- Section 402 establishes the NPDES, a permitting system for the discharges (except for dredge or fill material) of any pollutant into waters of the U.S. Regional Water Quality Control Boards (RWQCBs) to administer this permitting program in California. Section 402(p) requires permits for discharges of storm water from industrial/construction and municipal separate storm sewer systems (MS4s).
- Section 404 establishes a permit program for the discharge of dredge or fill material into waters of the U.S. This permit program is administered by the U.S. Army Corps of Engineers (USACE).

The goal of the CWA is “to restore and maintain the chemical, physical, and biological integrity of the Nation’s waters.”

The USACE issues two types of 404 permits: General and Individual. There are two types of General permits: Regional and Nationwide. Regional permits are issued for a general category of activities when they are similar in nature and cause minimal

¹ A point source is any discrete conveyance such as a pipe or a man-made ditch.

environmental effect. Nationwide permits are issued to allow a variety of minor project activities with no more than minimal effects.

Ordinarily, projects that do not meet the criteria for a Regional or Nationwide Permit may be permitted under one of the USACE's Individual permits. There are two types of Individual permits: Standard permits and Letters of Permission. For Individual permits, the USACE decision to approve is based on compliance with U.S. Environmental Protection Agency's (U.S. EPA) Section 404 (b)(1) Guidelines (40 Code of Federal Regulations [CFR] Part 230), and whether the permit approval is in the public interest. The Section 404(b)(1) Guidelines (Guidelines) were developed by the U.S. EPA in conjunction with the USACE, and allow the discharge of dredged or fill material into the aquatic system (waters of the U.S.) only if there is no practicable alternative which would have less adverse effects. The Guidelines state that the USACE may not issue a permit if there is a least environmentally damaging practicable alternative (LEDPA) to the proposed discharge that would have lesser effects on waters of the U.S. and not have any other significant adverse environmental consequences. According to the Guidelines, documentation is needed that a sequence of avoidance, minimization, and compensation measures has been followed, in that order. The Guidelines also restrict permitting activities that violate water quality or toxic effluent¹ standards, jeopardize the continued existence of listed species, violate marine sanctuary protections, or cause "significant degradation" to waters of the U.S. In addition, every permit from the USACE, even if not subject to the Section 404(b)(1) Guidelines, must meet general requirements. See 33 CFR 320.4. A discussion of the LEDPA determination, if any, for the document is included in the Wetlands and Other Waters section.

2.9.1.2 State Requirements: Porter-Cologne Water Quality Control Act
California's Porter-Cologne Water Quality Control Act (Porter-Cologne Act), enacted in 1969, provides the legal basis for water quality regulation within California. This act requires a "Report of Waste Discharge" for any discharge of waste (liquid, solid, or gaseous) to land or surface waters that may impair beneficial uses for surface and/or groundwater of the state. It predates the CWA and regulates discharges to waters of the state. Waters of the state include more than just waters of the U.S., like groundwater and surface waters not considered waters of the U.S. Additionally, it prohibits discharges of "waste" as defined, and this definition is broader than the

¹ The U.S. EPA defines "effluent" as "wastewater, treated or untreated, that flows out of a treatment plant, sewer, or industrial outfall."

CWA definition of “pollutant.” Discharges under the Porter-Cologne Act are permitted by Waste Discharge Requirements (WDRs) and may be required even when the discharge is already permitted or exempt under the CWA.

The State Water Resources Control Board (SWRCB) and RWQCBs are responsible for establishing the water quality standards (objectives and beneficial uses) required by the CWA and regulating discharges to ensure compliance with the water quality standards. Details about water quality standards in a project area are included in the applicable RWQCB Basin Plan. In California, RWQCBs designate beneficial uses for all water body segments in their jurisdictions and then set criteria necessary to protect these uses. As a result, the water quality standards developed for particular water segments are based on the designated uses and vary depending on those uses. In addition, the SWRCB identifies waters failing to meet standards for specific pollutants. These waters are then State-listed in accordance with CWA Section 303(d). If a state determines that waters are impaired for one or more constituents and the standards cannot be met through point source or non-point source controls (NPDES permits or WDRs), the CWA requires the establishment of Total Maximum Daily Loads (TMDLs). TMDLs specify allowable pollutant loads from all sources (point, non-point, and natural) for a given watershed.

2.9.1.3 State Water Resources Control Board and Regional Water Quality Control Boards

The SWRCB administers water rights, sets water pollution control policy, and issues water board orders on matters of statewide application, and oversees water quality functions throughout the State by approving Basin Plans, TMDLs, and NPDES permits. RWCQBs are responsible for protecting beneficial uses of water resources within their regional jurisdiction using planning, permitting, and enforcement authorities to meet this responsibility.

National Pollutant Discharge Elimination System (NPDES) Program Municipal Separate Storm Sewer Systems (MS4)

Section 402(p) of the CWA requires the issuance of NPDES permits for five categories of storm water discharges, including Municipal Separate Storm Sewer Systems (MS4s). An MS4 is defined as “any conveyance or system of conveyances (roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, human-made channels, and storm drains) owned or operated by a state, city, town, county, or other public body having jurisdiction over storm water, that is designed or used for collecting or conveying storm water.” The SWRCB has identified the

California Department of Transportation (Caltrans) as an owner/operator of an MS4 under federal regulations. The Caltrans' MS4 permit covers all Caltrans rights-of-way, properties, facilities, and activities in the State. The SWRCB or the RWQCB issues NPDES permits for 5 years, and permit requirements remain active until a new permit has been adopted.

Caltrans's MS4 Permit, Order No. 2012-0011-DWQ (adopted on September 19, 2012 and effective on July 1, 2013), as amended by Order No. 2014-006-EXEC (effective January 17, 2014), Order 2014-0077-DWQ (effective May 20, 2014), and Order No. 2015-0036-EXEC (conformed and effective April 7, 2015) has three basic requirements:

1. Caltrans must comply with the requirements of the Construction General Permit (see below);
2. Caltrans must implement a year-round program in all parts of the State to effectively control storm water and non-storm water discharges; and
3. Caltrans storm water discharges must meet water quality standards through implementation of permanent and temporary (construction) Best Management Practices (BMPs), to the maximum extent practicable, and other measures as the SWRCB determines to be necessary to meet the water quality standards.

To comply with the permit, Caltrans developed the Statewide Storm Water Management Plan (SWMP) to address storm water pollution controls related to highway planning, design, construction, and maintenance activities throughout California. The SWMP assigns responsibilities within Caltrans for implementing storm water management procedures and practices as well as training, public education and participation, monitoring and research, program evaluation, and reporting activities. The SWMP describes the minimum procedures and practices that Caltrans uses to reduce pollutants in storm water and non-storm water discharges. It outlines procedures and responsibilities for protecting water quality, including the selection and implementation of BMPs. The proposed project will be programmed to follow the guidelines and procedures outlined in the latest SWMP to address storm water runoff.

Construction General Permit

Construction General Permit, Order No. 2009-0009-DWQ (adopted on September 2, 2009 and effective on July 1, 2010), as amended by Order No. 2010-0014-DWQ (effective February 14, 2011) and Order No. 2012-0006-DWQ (effective on July 17,

2012). The permit regulates storm water discharges from construction sites that result in a Disturbed Soil Area (DSA) of one acre (ac) or greater, and/or are smaller sites that are part of a larger common plan of development. By law, all storm water discharges associated with construction activity where clearing, grading, and excavation result in soil disturbance of at least one ac must comply with the provisions of the General Construction Permit. Construction activity that results in soil disturbances of less than one ac is subject to this Construction General Permit if there is potential for significant water quality impairment resulting from the activity as determined by the RWQCB. Operators of regulated construction sites are required to develop Storm Water Pollution Prevention Plans (SWPPPs); to implement sediment, erosion, and pollution prevention control measures; and to obtain coverage under the Construction General Permit.

The Construction General Permit separates projects into Risk Levels 1, 2, or 3. Risk levels are determined during the planning and design phases, and are based on potential erosion and transport to receiving waters. Requirements apply according to the Risk Level determined. For example, a Risk Level 3 (highest risk) project would require compulsory storm water runoff pH and turbidity monitoring, and before construction and after construction aquatic biological assessments during specified seasonal windows. For all projects subject to the permit, applicants are required to develop and implement an effective SWPPP. In accordance with Caltrans' SWMP and Standard Specifications, a Water Pollution Control Program (WPCP) is necessary for projects with DSA less than one ac.

Section 401 Permitting

Under Section 401 of the CWA, any project requiring a federal license or permit that may result in a discharge to a water of the U.S. must obtain a 401 Certification, which certifies that the project will be in compliance with State water quality standards. The most common federal permits triggering 401 Certification are CWA Section 404 permits issued by the USACE. The 401 permit certifications are obtained from the appropriate RWQCB, dependent on the project location, and are required before the USACE issues a 404 permit.

In some cases, the RWQCB may have specific concerns with discharges associated with a project. As a result, the RWQCB may issue a set of requirements known as WDRs under the State Water Code (Porter-Cologne Act) that define activities, such as the inclusion of specific features, effluent limitations, monitoring, and plan submittals that are to be implemented for protecting or benefiting water quality.

WDRs can be issued to address both permanent and temporary discharges of a project.

2.9.2 Affected Environment

This section is based on the *Water Quality Assessment Report (2017)* prepared for the proposed project.

2.9.2.1 Surface Water

Regional and Local Hydrology

The Study Area is located in the San Diego Creek/Newport Bay Watershed, which encompasses approximately 154 square miles (sq mi) in the Cities of Irvine and Tustin, parts of the Cities of Lake Forest, Santa Ana, and Costa Mesa, and incorporated areas of Orange County. This is geographically bound by the Santa Ana Mountains to the east and the San Joaquin Hills to the west and southwest.

For regulatory purposes, the Santa Ana RWQCB designates watershed areas in Hydrologic Units (HUs), which are further divided into Hydrologic Areas (HAs) and Hydrologic Subareas (HSAs). As designated by the Santa Ana RWQCB, the Study Area is in the Santa Ana River HU; the Lower Santa Ana River HA; and the East Coastal Plain HSA. The Santa Ana River HU covers approximately 300 sq mi in Orange County.

Receiving waters for storm water within the Study Area include, from south to north, Agua Chinon Channel, Bee Canyon Channel, Marshburn Channel, Central Irvine Channel, Peters Canyon Channel, and El Modena–Irvine Channel. All of these waterbodies are channelized storm water channels and are concrete lined, except for a small portion of Peters Canyon Channel west of Interstate 5 (I-5) that has concrete-lined banks with an earthen channel bottom. All of these channels drain to San Diego Creek Reach 1, which ultimately discharges into the Upper Newport Bay, Lower Newport Bay, and eventually to the Pacific Ocean.

Receiving waters in the Study Area are not used for drinking water or water recharge. In addition, the Study Area is not in a “high risk” area, defined as a location where spills from State-owned rights-of-way, activities, or facilities can discharge directly to municipal or domestic water supply reservoirs or groundwater percolation facilities. Additionally, no wellhead protection areas are located in the Study Area.

Surface Water Quality Objectives

The surface water quality objectives for all enclosed bays and estuaries and all inland surface waters in the region from the SWRCB's *Santa Ana Region Basin Plan* (Basin Plan) that are applicable to the Build Alternative are provided in Tables D and E of the *Water Quality Assessment Report* (2017).

No site-specific numeric water quality objectives were listed in the Basin Plan for Upper and Lower Newport or the San Diego Creek tributaries, including Agua Chinon Channel, Bee Canyon Channel, and Peters Canyon Channel.

San Diego Creek, Reach 1 (below Jeffrey Road), has the following site-specific numeric Water Quality Objectives:

- **Total Dissolved Solids (TDS):** 1,500 milligrams per liter (mg/L)
- **Total Inorganic Nitrogen:** 13 mg/L
- **Chemical Oxygen Demand:** 90 mg/L

Reach 1 (below Jeffrey Road), has the following site-specific numeric Water Quality Objectives:

- **TDS:** 1,500 mg/L
- **Total Inorganic Nitrogen:** 13 mg/L
- **Chemical Oxygen Demand:** 90 mg/L

Beneficial Uses

Beneficial uses of water are defined in the Basin Plan as those necessary for the survival or wellbeing of humans, plants, and wildlife. Examples of those beneficial uses include drinking water supplies, swimming, industrial and agricultural water supply, and the support of freshwater and marine habitats and their organisms. The following existing or potential beneficial uses are identified in the Basin Plan for Lower Newport Bay:

- **NAV:** Shipping, travel or other transportation by private, commercial, or military vessels
- **REC-1:** Water-contact recreation (swimming/wading)
- **REC-2:** Non-contact water recreation (boating/fishing)
- **COMM:** Commercial and sport fishing
- **WILD:** Habitat for wild plants and animals
- **RARE:** Habitat for rare, threatened, or endangered species

- **SPWN:** Spawning, reproduction, and development habitat for fish and wildlife
- **MAR:** Ecosystems that support marine habitats, vegetation, fish and shellfish, and wildlife
- **SHEL:** Waters supporting habitat necessary for shellfish that are collected for human consumption, commercial, or sport

The following existing or potential beneficial uses are identified in the Basin Plan for Upper Newport Bay:

- **REC-1:** Water-contact recreation (swimming/wading)
- **REC-2:** Non-contact water recreation (boating/fishing)
- **COMM:** Commercial and sport fishing
- **WILD:** Habitat for wild plants and animals
- **RARE:** Habitat for rare, threatened, or endangered species
- **SPWN:** Spawning, reproduction, and development habitat for fish and wildlife
- **MAR:** Ecosystems that support marine habitats, vegetation, fish and shellfish, and wildlife
- **SHEL:** Waters supporting habitat necessary for shellfish that are collected for human consumption, commercial, or sport
- **EST:** Estuarine habitat supporting estuarine ecosystems

In 1988, the State Board adopted the Sources of Drinking Water Policy (SWRCB Resolution No. 88-63), which directed the Regional Boards to add the Municipal and Domestic Supply (MUN) Beneficial Use for all waterbodies not already so designated unless they meet certain exception criteria. Upper and Lower Newport Bay are exempt from the MUN designation.

The present or potential beneficial uses for San Diego Creek Reach 1 (below Jeffery Road) as identified in the Basin Plan are listed below:

- **REC-1:** Water-contact recreation (swimming/wading)
- **REC-2:** Non-contact water recreation (boating/fishing)
- **WARM:** Warm water habitat for fish amenable for reproduction in warm water
- **WILD:** Habitat for wild plants and animals

Although REC-1 is a beneficial use, access is prohibited in all or part of the creek by the Orange County Resources Development and Management Division. Additionally, San Diego Creek is exempt from the MUN designation.

The present or potential beneficial uses for other tributaries of San Diego Creek including Agua Chinon Channel, Bee Canyon Channel, and Peters Canyon Channel, and other tributaries to these creeks as identified in the Basin Plan are listed below. The beneficial uses are identified as intermittent.

- **GWR:** Groundwater recharge
- **REC-1:** Water-contact recreation (swimming/wading)
- **REC-2:** Non-contact water recreation (boating/fishing)
- **WARM:** Warm water habitat for fish amenable for reproduction in warm water
- **WILD:** Habitat for wild plants and animals

These tributaries are exempt from the MUN designation.

Water Quality Impairments

The SWRCB approved the 2012 Integrated Report (CWA Section 303[d] List/305[b]) on April 8, 2015. On July 30, 2015, the EPA approved the 2012 California 303(d) List of Water Quality Limited Segments. As shown in Table 2.9.1, Peters Canyon Channel is listed on the 303(d) List of Water Quality Limited Segments as impaired for dichlorodiphenyltrichloroethane (DDT), indicator bacteria, toxaphene, and pH. San Diego Creek (Reach 1) is listed as impaired for fecal coliform, nutrients, pesticides, sedimentation/siltation, selenium, and toxaphene. Upper Newport Bay is listed as impaired for chlordane, copper, DDT, indicator bacteria, metals, nutrients, polychlorinated biphenyls (PCBs), pesticides, sedimentation/siltation, and sediment toxicity. Lower Newport Bay is listed as impaired for chlordane, copper, DDT, indicator bacteria, nutrients, PCBs, pesticides, and sediment toxicity. Agua Chinon Channel, Bee Canyon Channel, Marshburn Channel, Central Irvine Channel, and El Modena-Irvine Channel are not listed as impaired on the 303(d) List of Water Quality Limited Segments.

To address water quality impairments, TMDLs have been adopted for pesticides, for nutrients, and for sediments in the Newport Bay Watershed, including San Diego Creek, for copper, lead, zinc, and cadmium, and for fecal coliform in Newport Bay, and for selenium in Newport Bay and San Diego Creek.

Table 2.9.1: 2012 California 303(d) Listing for Receiving Waters in the Study Area

Water Body	Pollutant	Expected TMDL Completion Date	Potential Sources
Peters Canyon Channel	DDT	2019	Source Unknown
	Indicator bacteria	2021	Source Unknown
	pH	2021	Source Unknown
	Toxaphene	2019	Source Unknown
San Diego Creek (Reach 1)	Fecal coliform	2019	Source Unknown
	Nutrients	1999	Source Unknown
	Pesticides	2004	Unknown Non-point Source
	Sedimentation/siltation	1999	Source Unknown
	Selenium	2007	Source Unknown
	Toxaphene	2019	Source Unknown
Upper Newport Bay	Chlordane	2019	Source Unknown
	Copper	2007	Source Unknown
	DDT	2019	Source Unknown
	Indicator bacteria	2000	Source Unknown
	Metals	2019	Source Unknown
	Nutrients	1999	Source Unknown
	PCBs	2019	Source Unknown
	Pesticides	2004	Agriculture, Unknown Non-point Source
	Sedimentation/siltation	1999	Agriculture, Channel Erosion, Construction/Land Development, Erosion/Siltation
	Sediment Toxicity	2019	Source Unknown
Lower Newport Bay	Chlordane	2019	Source Unknown
	Copper	2007	Source Unknown
	DDT	2019	Source Unknown
	Indicator bacteria	2000	Source Unknown
	Nutrients	1999	Source Unknown
	PCBs	2019	Source Unknown
	Pesticides	2004	Agriculture, Unknown Non-point Source
	Sediment toxicity	2019	Source Unknown

Source: State Water Resources Control Board (2016).

DDT = Dichlorodiphenyltrichloroethane

PCB = polychlorinated biphenyls

TMDL = total maximum daily loads

2.9.2.2 Groundwater

Groundwater Hydrology

The Study Area is located within the Coastal Plain of the Orange County

Groundwater Basin, which is bounded by consolidated rocks exposed on the north in the Puente and Chino Hills, on the east in the Santa Ana Mountains, and on the south

in the San Joaquin Hills. The Groundwater Basin is bounded by the Pacific Ocean on the southwest and by a low topographic divide approximated by the Orange County/ Los Angeles County line on the northwest.

For regulatory purposes, the Santa Ana RWQCB designated Groundwater Management Zones for the Santa Ana Region. The Study Area is within the Orange County and Irvine Groundwater Management Zones, as designated by the Santa Ana RWQCB.

Historical high groundwater depth near the southern end of the Study Area to the central portion between Interstate 405 (I-405) and Culver Drive ranges from 20 feet (ft) to greater than 40 ft below ground surface. Historical high groundwater depth from the central portion to the northern end of the Study Area between Culver Drive and State Route 55 (SR-55) ranges from approximately 10 ft to greater than 40 ft below ground surface. Overall, the groundwater depth decreases from the southern end of the proposed project to the central portion and increases from the central portion to the northern end of the Study Area.

Groundwater Quality Objectives

The groundwater quality objectives for the Santa Ana Region as designated in the Basin Plan are provided in Table F of the *Water Quality Assessment Report (2017)*. The site-specific groundwater quality objectives for the Irvine Groundwater Management Zone are:

- **TDS:** 580 mg/L
- **Nitrate as Nitrogen:** 3.4 mg/L

The site-specific groundwater quality objectives for the Orange County Groundwater Management Zones are:

- **TDS:** 910 mg/L
- **Nitrate as Nitrogen:** 5.9 mg/L

Beneficial Uses

The present or potential beneficial uses for the Irvine and Orange County Groundwater Management Zones as designated in the Basin Plan are listed below:

- **MUN:** Waters are used for community, military, municipal, or individual water supply systems

- **AGR:** Waters are used for farming, horticulture, or ranching
- **IND:** Waters are used for industrial activities that do not depend primarily on water quality (e.g., mining, cooling, or gravel washing)
- **PROC:** Waters are used for industrial activities that depend primarily on water quality (e.g., food preparation)

Groundwater Quality

Water in the Irvine and Orange County Groundwater Management Zones is primarily sodium-calcium bicarbonate based. TDS range from 232 to 661 mg/L and average 475 mg/L. Groundwater in these management zones is impaired by salinity, nitrate, and methyl tertiary-butyl ether (MTBE). The Irvine Groundwater Management Zone is mostly used for non-potable uses since the groundwater is high in TDS, nitrates, and color.

2.9.3 Environmental Consequences

2.9.3.1 Temporary Impacts

Alternative 2A

Pollutants of concern during construction include sediments, trash, petroleum products, concrete waste (dry and wet), sanitary waste, and chemicals. During construction activities, excavated soil would be exposed, and there would be an increased potential for soil erosion compared to existing conditions. During construction, Alternative 2A would disturb a total of 173.4 ac of surface area. Construction activities including grading; construction of additional general-purpose lanes and auxiliary lanes; re-establishment of existing auxiliary lanes; road widening; improvement of existing on-/off-ramps and bridges; and diversion of the drainage channel flow would expose and disturb soil. Additionally, during a storm event, soil erosion could occur at an accelerated rate.

During construction, there is also the potential for construction-related pollutants to be spilled or leaked or to be transported via storm runoff into drainages adjacent to the Study Area and into downstream receiving waters. Chemicals, liquid products, petroleum products (e.g., paints, solvents, and fuels), and concrete-related waste may be spilled or leaked and have the potential to be transported via storm runoff into receiving waters.

Temporary or portable sanitary facilities provided for construction workers would be a source of sanitary waste that could be transported to downstream receiving waters. Construction workers would also generate trash and debris (e.g., food wrappers) that

could also be transported to receiving waters. If water is detained at the construction site, it has the potential to reach ambient air temperatures and, if discharged to receiving waters, could contribute to the increase in water temperatures.

Work in the drainage channels would include construction of foundations and pier walls, restoration of channel lining, bridge deck demolition, falsework installation/removal, and construction of box culvert extensions. Temporary clear water flow diversions would be required to divert flows around the construction zone in the drainage channels.

As described in Project Feature PF-WQ-1, construction activities associated with Build Alternative 2A would comply with the requirements of the Construction General Permit (CGP). In compliance with the CGP, preparation of a SWPPP and implementation of Construction BMPs would be required to identify sources of stormwater pollution, minimize erosion, control stormwater, and prevent spills. Construction BMPs would include, but not be limited to, Erosion Control and Sediment Control BMPs (which are designed to minimize erosion and retain sediment on site) and Good Housekeeping BMPs to prevent spills, leaks, and discharge of construction debris and waste into receiving waters. The SWPPP would be developed and Construction BMPs selected and implemented to target pollutants of concern during construction. Potential Construction BMPs include, but are not be limited to, stabilized construction entrance/exit, preservation of existing vegetation, slope protection, construction scheduling, storm drain inlet protection, perimeter and runoff controls, sediment barriers, tire/wheel wash, street sweeping and vacuuming, wind erosion control, concrete waste management, temporary stockpiles, streambank stabilization, gravel bag berms, sandbag barriers, clean water diversion, concrete curing, and solid waste management. The Construction BMPs would retain sediment and other pollutants on the project site, which would prevent these pollutants from reaching receiving waters.

PF-WQ-1 Prior to commencement of construction activities, the Build Alternative shall obtain coverage under the State Water Resources Control Board's (SWRCB) National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities (Construction General Permit [CGP]) Order No. 2009-0009-DWQ, as amended by 2010-0014-DWG and 2012-0006- DWQ, NPDES No. CAS000002, or any other subsequent permit. This shall include

submission of Permit Registration Documents, including a Notice of Intent for coverage under the permit to the SWRCB via the Storm Water Multiple Application and Report Tracking System (SMARTS). Construction activities shall not commence until a Waste Discharge Identification Number is obtained from SMARTS. A Storm Water Pollution Prevention Plan (SWPPP) shall be prepared and implemented to address all construction-related activities, equipment, and materials that have the potential to impact water quality. The SWPPP shall identify the sources of pollutants that may affect the quality of storm water and include Best Management Practices (BMPs) to ensure that the potential for soil erosion, sedimentation, and spills is minimized and to control the discharge of pollutants in storm water runoff as a result of construction activities. Upon completion of construction activities and stabilization of the site, a Notice of Termination shall be implemented via SMARTS.

Alternative 2A is anticipated to be Risk Level 2 under the CGP and, therefore, effluent monitoring for pH and turbidity levels would be required during storm events. This would ensure that pH and turbidity levels remain below Numeric Action Levels, as established in the CGP. Discharges of storm water and authorized non-storm water discharges are not anticipated to cause or contribute to any violations of applicable water quality standards or objectives, or adversely affect human health. In addition, runoff during construction would not contain pollutants in quantities that would create a condition of nuisance or adversely affect beneficial uses of the waters of the state. Properly designed BMPs, with appropriate implementation and maintenance, as incorporated by Project Feature PF-WQ-1, would retain pollutants on site and prevent them from entering receiving waters. Therefore, no adverse water quality impacts are anticipated during construction of Alternative 2A.

Groundwater dewatering may be necessary during construction of the bridge piles. Groundwater may contain elevated levels of TDS, nitrates, color, or other constituents that could affect surface water quality when discharged to surface waters. As specified in Project Feature PF-WQ-2, if groundwater dewatering becomes necessary during construction, construction activities associated with Alternative 2A would comply with the requirements of Order No. R8-2015-0004 (NPDES No. CAG998001) or Order No. R8-2009-0045 (NPDES No. CAG918002) depending on the nature of the groundwater being discharged. Order No. R8-2015-0004 (NPDES No. CAG998001) covers general WDRs for discharges to surface waters that pose an

insignificant (de minimus) threat to water quality in the Santa Ana Region; whereas, Order No. R8-2009-0045 (NPDES No. CAG918002) covers general discharge permits for discharges to surface waters of groundwater polluted by petroleum hydrocarbons, solvents, metals and/or salts, or nutrients, selenium, and other pollutants of TMDL concern. Under both orders, permittees are required to monitor their discharges from groundwater extraction waste from construction to ensure that effluent limitations for constituents are not exceeded.

PF-WQ-2 If dewatering is required, construction site dewatering shall comply with one of two orders, or any subsequent orders that apply to groundwater discharges to surface waters within the Santa Ana Region depending on the nature of the groundwater. Order No. R8-2015-0004 (NPDES No. CAG998001) covers general waste discharge requirements (WDRs) for discharges to surface waters that pose an insignificant (de minimus) threat to water quality within the Santa Ana Region. This order would be applicable to the project if it can be demonstrated that the groundwater being discharged to surface waters does not contain pollutants of concern (selenium and nitrates) in the discharge. However, if groundwater in the Study Area is found to contain petroleum hydrocarbons, solvents, metals and/or salts, the project would be subject to Order No. R8-2007-0041, as amended by Order No. R8-2009-0045 (NPDES No. CAG918002). Order No. R8-2009-0045 covers general discharge permits for discharges to surface waters of groundwater resulting from groundwater dewatering operations and/or groundwater cleanup activities at sites within the San Diego Creek/Newport Bay Watershed polluted by petroleum hydrocarbons, solvents, metals and/or salts, or nutrients, selenium, and other pollutants of Total Maximum Daily Loads (TMDL) concern. Under both orders, permittees are required to monitor their discharges from groundwater extraction waste from construction to ensure that effluent limitations for constituents are not exceeded.

Design Option 3

Design Option 3 would add to the existing footprint of Alternative 2A. This would result in an additional disturbed soil area of 3.66 ac compared to Alternative 2A without the Design Option, for a total disturbed soils area of 177 ac. The additional disturbed soil area would result in a small increase in the potential for soil erosion compared to Alternative 2A without the Design Option. The additional disturbed soil

area would be addressed in the SWPPP as stated in Project Feature PF-WQ-1. This project feature would implement Construction BMPs, minimize erosion, and prevent spills, further preventing them from entering receiving waters. Therefore, no adverse effects would result from Design Option 3.

Alternative 2B (Preferred Alternative)

Alternative 2B would result in similar impacts to water quality as those discussed above for Alternative 2A. During construction, Alternative 2B would disturb a total area of 133.0 ac. Construction of Alternative 2B would disturb a smaller area than Alternative 2A. Therefore, Alternative 2B would involve the least amount of exposed soil and would result in the lowest potential for soil erosion and downstream sedimentation to occur when compared to Alternative 2A.

As included in Project Feature PF-WQ-1, construction activities associated with Alternative 2B would comply with the requirements of the CGP. In compliance with the CGP, preparation of a SWPPP and implementation of Construction BMPs would be required to minimize erosion and prevent spills. Construction BMPs would include, but not be limited to, Erosion Control and Sediment Control and Good Housekeeping BMPs to prevent spills, leaks, and discharge of construction debris and waste into receiving waters. The SWPPP would be developed and Construction BMPs selected and implemented to target pollutants of concern during construction. Potential Construction BMPs would be the same as those included in Alternative 2A. The Construction BMPs would retain sediment and other pollutants on the project site, which would prevent these pollutants from reaching receiving waters.

Groundwater dewatering may be necessary during construction of the bridge piles. Groundwater may contain elevated levels of TDS, nitrates, color, or other constituents that could affect surface water quality when discharged to surface waters. As incorporated in Project Feature PF-WQ-2, if groundwater dewatering becomes necessary during construction, construction activities associated with Alternative 2B would comply with the requirements of Order No. R8-2015-0004 (NPDES No. CAG998001) or Order No. R8-2009-0045 (NPDES No. CAG918002) depending on the nature of the groundwater being discharged. Under both orders, permittees are required to monitor their discharges from groundwater extraction waste from construction to ensure that effluent limitations for constituents are not exceeded.

When the Design Variations are compared to one another, construction of Alternative 2B would involve the least amount of disturbed soil area. Therefore, Alternative 2B

would involve the least amount of exposed soil and would result in the lowest potential for soil erosion and downstream sedimentation to occur when compared to Alternative 2A.

Design Option 3

Design Option 3 would add to the existing footprint of Alternative 2B. This would result in an additional disturbed soil area of 6.5 ac compared to Alternative 2B without the Design Option, for a total disturbed soils area of 139.5 ac. The additional disturbed soil area would result in a small increase in the potential for soil erosion compared to Alternative 2B without the Design Option. The additional disturbed soil area would be addressed in the SWPPP as stated in Project Feature PF-WQ-1. This project feature would implement Construction BMPs, minimize erosion, and prevent spills, further preventing them from entering receiving waters. Therefore, no adverse effects would result from Design Option 3.

No Build Alternative (Alternative 1)

Under the No Build Alternative, the I-5 widening from SR-55 to I-405 would not be constructed. Therefore, the No Build Alternative would not result in short-term water quality impacts from construction-related activities.

2.9.3.2 Permanent Impacts

Alternative 2A

Pollutants of concern during operation of Alternative 2A include suspended solids/sediments, nutrients, pesticides, heavy metals, oil and grease, toxic organic compounds, and trash and debris. Alternative 2A would result in a permanent increase in impervious surface area of 22.3 ac. An increase in impervious surface area would increase the volume of runoff during a storm, thereby increasing the potential for more effectively transporting pollutants to receiving waters. In addition, an increase in impervious surface area would increase the total amount of pollutants in the storm water runoff and non-storm water runoff, which would increase the amount of pollutants traveling to on-site drainages and downstream receiving waters.

Operation of Alternative 2A has the potential to contribute to the downstream nutrient load, sedimentation/siltation, metals, copper, and toxicity impairments. Treatment BMPs would be implemented under Alternative 2A to target these pollutants of concern. As a result, Alternative 2A would not be a substantial source of pollutants that would contribute to any existing impairments and, therefore, there is a low potential for the alternative to adversely affect water quality. Alternative 2A would

increase the existing amount of impervious surface area in the study by 22.3 ac. Although Alternative 2A would result in an increase in new and replaced impervious surfaces, BMPs for Alternative 2A would treat 100 percent of the new and replaced impervious surface area, providing greater overall water quality benefits to on-site drainages and downstream receiving waters.

No existing Treatment BMPs are located in the Study Area. As specified in Project Features PF-WQ-3, PF-WQ-4, and PF-WQ-5, Alternative 2A would comply with the Caltrans NPDES Permit and would implement Caltrans-approved Treatment and Design Pollution Prevention BMPs to reduce the discharge of pollutants of concern to the maximum extent practicable. Design Pollution Prevention BMPs are features that focus on reducing or eliminating runoff and controlling sources of pollutants during operation of the project. Treatment BMPs utilize treatment mechanisms to remove pollutants that have entered storm water runoff.

PF-WQ-3 The Build Alternative shall comply with the provisions of the NPDES Permit, Statewide Storm Water Permit, WDRs for the State of California, Department of Transportation (Caltrans) Order No. 2012-0011-DWQ, as amended by WQ 2014-0077-DWQ, NPDES No. CAS000003 (Caltrans Permit) or any subsequent permit.

PF-WQ-4 Caltrans-approved Design Pollution Prevention BMPs shall be implemented to the maximum extent practicable (MEP) consistent with the requirements of the Caltrans Permit. Design Pollution Prevention BMPs include preservation of existing vegetation; discharge into closed drainage systems and lined channels; protection of disturbed slope areas with temporary or permanent erosion control measures; conveyance systems such as overside drains, ditches, and rock slope; and revegetation or replacement planting of disturbed soil areas.

PF-WQ-5 Caltrans-approved Treatment BMPs shall be implemented to the MEP consistent with the requirements of the Caltrans Permit. Treatment BMPs may include biofiltration swales, biofiltration strips, and detention basins.

The proposed Treatment BMPs for Alternative 2A include biofiltration swales and strips and detention basins. Biofiltration swales are vegetated channels that convey storm water. Both biofiltration strips and swales remove pollutants by filtration

through grass, sedimentation, adsorption to soil particles, and infiltration through soil. Biofiltration strips and swales are effective at removing debris and solid particles, and some removal of dissolved constituents. Detention basins would capture and retain runoff temporarily, decreasing the volume and velocity of runoff before releasing it to receiving waters.

As stated above, the Treatment BMPs would target constituents of concern from transportation facilities. Furthermore, the Design Pollution Prevention BMPs would control sources of pollutants in the Study Area, thereby reducing the amount of pollutants that would drain to downstream receiving waters. Therefore, Alternative 2A would not result in any adverse impacts to water quality during operation with inclusion of Project Features PF-WQ-3, PF-WQ-4, and PF-WQ-5.

Design Option 3

Design Option 3 would increase the additional impervious surface area of Alternative 2A by 5.5 ac, for a total of 27.8 ac of additional impervious surface area. Therefore, the Design Option would result in a greater increase in the total amount of pollutants in storm water and non-storm water runoff compared to Alternative 2A without the Design Option, which would more effectively transport pollutants to receiving waters. The inclusion of Project Features PF-WQ-3, PF-WQ-4, and PF-WQ-5 would implement Treatment BMPs and Design Pollution Prevention BMPs for the project. These project features would target constituents of concern from transportation facilities and control sources of pollutants in the Study Area that would prevent adverse impacts resulting from the increased impervious surface area from Design Option 3.

Alternative 2B (Preferred Alternative)

Operation of Alternative 2B would produce the same pollutants of concern during operation as Alternative 2A. Alternative 2B would result in a permanent increase in impervious surface area of 15.3 ac. An increase in impervious surface area would increase the volume of runoff during a storm, thereby increasing the potential for more effectively transporting pollutants to receiving waters. In addition, an increase in impervious surface area would increase the total amount of pollutants in both storm water runoff and non-storm water runoff, which would increase the amount of pollutants traveling to on-site drainages and downstream receiving waters.

Operation of Alternative 2B has the potential to contribute to the downstream nutrient load, sedimentation/siltation, metals, copper, and toxicity impairments. Treatment

BMPs, similar to BMPs included in Alternative 2A, would be implemented under Alternative 2B to target these pollutants of concern. As a result, Alternative 2B would not be a substantial source of pollutants that would contribute to any existing impairments and, therefore, there is a low potential for the alternative to adversely affect water quality. Alternative 2B would increase the existing amount of impervious surface area in the Study Area by 15.3 ac. Although Alternative 2B would result in an increase in new and replaced impervious surfaces, BMPs for Alternative 2B would treat 100 percent of the new and replaced impervious surface area, providing greater overall water quality benefits to on-site drainages and downstream receiving waters.

As stated in Project Features PF-WQ-3, PF-WQ-4, and PF-WQ-5, Alternative 2B would include the Design and Treatment BMPs to target constituents of concern in storm water runoff to the maximum extent practical similar to those described under Alternative 2A. The Treatment BMPs would target constituents of concern from transportation facilities. Additionally, the Design Pollution Prevention BMPs would control sources of pollutants in the Study Area, thereby reducing the amount of pollutants that would drain to downstream receiving waters. Therefore, Alternative 2B would not result in any adverse impacts to water quality during operation with incorporation of Project Features PF-WQ-3, PF-WQ-4, and PF-WQ-5.

Design Option 3

Design Option 3 would increase the additional impervious surface area of Alternative 2B by 5.6 ac, for a total of 20.9 ac of additional impervious surface area. Therefore, the Design Option would result in a greater increase in the total amount of pollutants in storm water and non-storm water runoff compared to Alternative 2B without the Design Option, which would more effectively transport pollutants to receiving waters. The inclusion of Project Features PF-WQ-3, PF-WQ-4, and PF-WQ-5 would implement Treatment BMPs and Design Pollution Prevention BMPs for the project. These project features would target constituents of concern from transportation facilities and control sources of pollutants in the Study Area that would prevent adverse impacts resulting from the increased impervious surface area from Design Option 3.

No Build Alternative (Alternative 1)

Under the No Build Alternative, the I-5 widening from SR-55 to I-405 would not be constructed. Therefore, under the No Build Alternative, there would not be an increase in impervious area or change in land use in the Study Area. The No Build Alternative would not result in an increase in storm water runoff or pollutant loading.

2.9.4 Avoidance, Minimization, and/or Mitigation Measures

The Preferred Alternative will incorporate the project features outlined above in Section 2.9.3.1 and 2.9.3.2 that will address potential impacts. No avoidance, minimization, and/or mitigation measures are required.

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