3.9 Floodplains, Hydrology, and Water Quality

3.9.1 Introduction

This section identifies potential floodplains, hydrologic, and water quality resources within the Tier 1/Program EIS/EIR Study Area and evaluates the effects associated with implementing the No Build Alternative and Build Alternative Options.

3.9.2 Regulatory Framework

In accordance with NEPA (42 USC Section 4321 et seq.), CEQ regulations implementing NEPA (40 CFR Parts 1501 through 1508), FRA's Procedures for Considering Environmental Impacts (64 FR 28545, May 26, 1999) and CEQA, FRA identified potential floodplains, water quality, and hydrologic resources within the Tier 1/Program EIS/EIR Study Area and evaluated the potential impacts that could occur from implementation of the Build Alternative Options.

Federal

Clean Water Act

The CWA, as amended, serves as the primary federal law protecting the quality of the nation's surface waters, including wetlands. The CWA prohibits any discharge of pollutants into the nation's waters unless specifically authorized by a permit. The CWA (33 USC Section 1251 et seq.) defines waters of the U.S., as follows:

- All waters that are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters that are subject to the ebb and flow of the tide
- All interstate waters, including interstate wetlands
- 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
- All impoundments of waters otherwise defined as waters of the U.S.
- Tributaries to the foregoing types of waters

- Wetlands adjacent to the foregoing waters (33 CFR Part 328.3 – the term adjacent means bordering, contiguous, or neighboring)

The applicable sections of the CWA are further discussed below:

- Section 303 identifies and sets pollutant standards (TMDL) for impaired waterbodies. TMDLs are the maximum amount of a pollutant that can be present in the waterbody and establishes restrictions for discharges to the waterbody.
- Under Section 401, activities that may result in a discharge into waters of the U.S. must obtain certification from the state in which the discharge would originate or from the interstate water pollution control agency with jurisdiction over affected waters. Project sponsors must obtain a 401 Water Quality Certification from the SWRCB.
- Under Section 402, discharges, including, but not limited to, construction-related stormwater discharges to surface waters, are regulated through the NPDES program. Project sponsors must obtain an NPDES Permit from the SWRCB.
- Under Section 404, USACE and the U.S. EPA regulate the discharge of dredged and fill materials into the waters of the U.S., including wetlands. Project sponsors must obtain a permit from USACE for discharges of dredged or fill materials into jurisdictional aquatic resources.

Executive Order 11988, Floodplain Management

EO 11988 requires federal agencies to avoid, to the extent possible, the short- and long-term adverse effects associated with the occupancy and modification of floodplains. Federal agencies are to avoid direct and indirect support of floodplain development wherever there is a practicable alternative.

Federal Emergency Management Agency

The Federal Emergency Management Agency (FEMA) administers the National Flood Insurance Program. FEMA identifies flood hazard areas throughout the U.S. and its territories and produces Flood Hazard Boundary Maps and Flood Insurance Rate Maps. These maps are used for floodplain management and to determine risk-based flood insurance premiums for the National Flood Insurance Program.

Floodplain Management Department of Transportation Order 5650.2, Floodplain Management and Protection

The purpose of USDOT Order 5650.2 is to ensure that proper consideration is given to the avoidance and mitigation of adverse floodplain effects by USDOT actions, planning programs, and budget requests.

State

California Department of Transportation National Pollutant Discharge Elimination System Statewide Stormwater Permit

Caltrans operates under a permit (Order Number 2012-0011-DWQ, NPDES Number CAS000003, as amended by 2014-0006-EXEC, 2014-0077-DWQ, 2015-0036-EXEC, and Order WQ 2017-0026-EXEC) that regulates stormwater discharge from Caltrans properties, facilities, and activities and requires the Caltrans construction program to comply with the adopted statewide General Construction Permit. The permit requires Caltrans to implement a year-round program in all parts of the state to control stormwater and non-stormwater discharges from Caltrans' properties and facilities, and discharges associated with operation and maintenance of the state highway system.

National Pollutant Discharge Elimination System General Construction Permit

Under the CWA, discharges of stormwater from construction sites must comply with the conditions of an NPDES permit. The SWRCB is the permitting authority in California and has adopted the General Construction Permit that applies to projects resulting in 1 or more acres of soil disturbance. For projects disturbing more than 1 acre of soil, the SWRCB requires permittees to prepare a stormwater pollution prevention plan. The stormwater pollution prevention plan specifies site management activities that permittees or their construction contractors must implement during site development. These management activities include construction stormwater BMPs, erosion and sedimentation controls, dewatering (nuisance-water removal), runoff controls, and construction equipment maintenance.

Porter-Cologne Water Quality Control Act (California Water Code, Section 13000 et seq.)

The Porter-Cologne Water Quality Control Act requires the regulation of all pollutant discharges, including wastes in project runoff that could affect the quality of the state's water. Any entity proposing to discharge a waste must file a Report of Waste Discharge with the appropriate RWQCB or SWRCB. The RWQCBs are responsible for implementing CWA Sections 401, 402, and 303(d). Because the Program is of statewide importance, any Report of Waste Discharge will be filed with the SWRCB. The act also provides for the development and periodic review of basin plans that

designate beneficial uses for California's major rivers and groundwater basins and establish water quality objectives for those waters.

Regional

Regional Water Quality Control Board Water Quality Control Plans (Basin Plans)

The Porter-Cologne Water Quality Control Act combined the State Water Rights Board and the SWRCB and created the nine RWQCBs. CWA Section 102 requires the planning agency of each state (in California, the SWRCB and, by extension, the RWQCBs) to prepare a water quality control plan known as a basin plan. The basin plan establishes the beneficial uses of water within the region; the water quality objectives necessary to protect those uses, including an antidegradation policy; the prohibitions, policies, and action plans, by which protections are implemented; and the monitoring, which is conducted to ensure attainment of water quality standards. The Program Corridor crosses three RWQCBs: Region 4 (Los Angeles), Region 7 (Colorado River), and Region 8 (Santa Ana) and would be subject to these RWQCBs basin plans.

Stormwater Management Programs

Stormwater discharges are permitted under the NPDES program. Section 402(p) of the CWA requires that Stormwater Management Programs be developed and implemented for municipalities to meet the requirements for stormwater discharges from Municipal Separate Storm Sewer System (MS4) Permits. Stormwater Management Programs limit, to the maximum extent practicable, the discharge of pollutants from storm sewer systems. A single state agency or a coalition, often consisting of more than one municipality (such as cities and counties), may implement these programs. Each program includes BMPs intended to reduce the quantity and improve the quality of stormwater discharged to the stormwater system. Discharges to storm sewer systems must comply with the Stormwater Management Program's requirements.

In compliance with this requirement to develop a Stormwater Management Program, the county and Cities in Los Angeles, Orange, San Bernardino, and Riverside Counties developed Stormwater Management Programs.

LOS ANGELES COUNTY MUNICIPAL SEPARATE STORM SEWER SYSTEM PERMIT

The Los Angeles County MS4 Permit identifies programs and objectives associated with municipal discharges of stormwater and non-stormwater by the Los Angeles County Flood Control District, the County of Los Angeles, and 84 incorporated cities within Los Angeles County. For construction activities and new development/redevelopment, the Los Angeles County MS4 Permit requires the co-permittees to prepare a Stormwater Quality Management Plan, which includes identification and

implementation of BMPs that would be used to reduce the discharge of pollutants in stormwater to the maximum extent practicable.

ORANGE COUNTY MUNICIPAL SEPARATE STORM SEWER SYSTEM PERMIT

The Orange County MS4 Permit identifies programs and objectives associated with municipal discharges of stormwater and non-stormwater by the Orange County Flood Control District, the County of Orange, and 25 incorporated cities within Orange County. For construction activities and new development/significant redevelopment, the Orange County MS4 Permit requires the co-permittees to prepare a Local Implementation Plan, which includes identification and implementation of the BMPs that would be used to reduce the discharge of pollutants in stormwater to the maximum extent practicable.

RIVERSIDE COUNTY (SANTA ANA REGION) MUNICIPAL SEPARATE STORM SEWER SYSTEM PERMIT

The Riverside County (Santa Ana Region) MS4 Permit identifies programs and objectives associated with municipal discharges of stormwater and non-stormwater by the Riverside County Flood Control and Water Conservation District, the County of Riverside, and 14 incorporated cities within Western Riverside County. For construction activities and new development/significant redevelopment, the Riverside County (Santa Ana Region) MS4 Permit requires development of a standard design and post-development BMP guidance to guide application of low impact development BMPs to the maximum extent practicable on streets, roads, or highways.

RIVERSIDE COUNTY (COLORADO RIVER REGION) MUNICIPAL SEPARATE STORM SEWER SYSTEM PERMIT

The Riverside County (Colorado River Region) MS4 Permit identifies programs and objectives associated with municipal discharges of stormwater and non-stormwater by the Riverside County Flood Control and Water Conservation District, the County of Riverside, Coachella Valley Water District, and 10 incorporated cities within Eastern Riverside County. For construction activities and new development/significant redevelopment, identification, and implementation of site design BMPs and source control BMPs are required to prevent or minimize water quality impacts from new development and redevelopment projects to the maximum extent practicable.

SAN BERNARDINO COUNTY (SANTA ANA REGION) MUNICIPAL SEPARATE STORM SEWER SYSTEM PERMIT

The San Bernardino County (Santa Ana Region) MS4 Permit identifies programs and objectives associated with municipal discharges of stormwater and non-stormwater by the San Bernardino County Flood Control District, the County of San Bernardino, and 16 incorporated cities within San Bernardino County. The San Bernardino County (Santa Ana Region) MS4 Permit prohibits the

discharges of urban runoff from the permittees' MS4 to waters of the U.S. containing pollutants that have not been reduced to the maximum extent practicable and requires project proponents to first consider preventative and conservation techniques (e.g., preserve and protect natural features to the maximum extent practicable) prior to considering mitigation (structural treatment, such as infiltration systems).

Local and Tribal Governments

Regulations from cities, local agencies, and tribal governments would be identified in the Tier 2/Project-level analysis once site-specific rail infrastructure improvements and station facilities are known. Floodplain regulations are adopted and enforced at the local level with floodplain permits issued from the local participating community.

3.9.3 Methods for Evaluating Environmental Effects

The methodology for this service-level evaluation assesses the effects on floodplains, water resources, and hydrologic resources within the Tier 1/Program EIS/EIR Study Area.

GIS layers, USGS topographic maps, and aerial photography from web mapping services were overlaid on the Tier 1/Program EIS/EIR Study Area to identify the existing Special Flood Hazard Areas and water resources that could be affected within the Program Corridor. The GIS layers were used to identify where the Build Alternative Options would be in or cross floodplains or water resources such as rivers and creeks.

Tier 1/Program EIS/EIR Study Area

This service-level evaluation is limited to a desktop evaluation of the data sources described in Section 3.9.3. The Tier 1/Program EIS/EIR Study Area was combined with GIS overlays to identify potential floodplains and hydrologic zones or areas that could be affected by the Program. These potential areas were identified on a broad scale using available mapping information. A detailed description of the Tier 1/Program EIS/EIR Study Area is provided in Section 3.1, Introduction to Environmental Analysis.

Data Sources

Data sources included U.S. Department of Agriculture, USGS, FEMA, the SWRCB, and the RWQCBs. The location of watersheds and surface waters were identified using data from the U.S. Department of Agriculture Natural Resource Conservation Service National Cartography and Geospatial Center and the USGS National Hydrology Dataset. Floodplains and flood zones were identified using FEMA floodplain maps. A list of beneficial uses that may be potentially affected by

the Build Alternative Options were identified from the basin plans for the Los Angeles, Santa Ana, and Colorado RWQCBs.

Related Resources

This evaluation incorporates data from related resources to inform the assessment of effects related to floodplains, hydrology, and water quality impacts. These related resources are identified in Table 3.9-1 and include jurisdictional waters and wetland resources and the effects on these resources that overlap with identified water resources.

Table 3.9-1. Related Resource Inputs for Floodplains, Hydrology, and Water Quality

Resource	Input for Floodplain, Hydrology, and Water Quality Assessment
Jurisdictional Waters and Wetland Resources (Section 3.7)	Supplemental information related to the location of potential jurisdictional waters and wetlands resources was used.

3.9.4 Affected Environment

The Program Corridor crosses a large geographic area within Southern California, spanning a distance of approximately 144 miles from its western terminus in Los Angeles to its eastern terminus in Coachella. The topological characteristics within the Program Corridor largely determines the hydrology of the region.

Climatic conditions within the Western Section of the Program Corridor are characterized by generally warm summers and mild winters with moderate humidity and breezes. Within the Eastern Section of the Program Corridor, climatic conditions become increasingly drier and warmer with larger temperature swings from day to night. The area between the Los Angeles Basin and the Coachella Valley experiences variable climatic patterns that are largely driven by the topology of the region. Orographic lift is responsible for much of the precipitation on mountain ranges close to the coast, while the rain shadow effect leads to drier conditions on interior slopes. Overall, the region experiences less precipitation in the summer months than the winter months, which can lead to periods of drought and flooding, sometimes severe.

Floodplains

A floodplain is composed of two major parts: the floodway and the area between the floodway and the limit of the floodplain. The floodway is the main channel of a watercourse that must be kept free of encroachment to discharge flood waters. The minimum standards of the National Flood Insurance Program prohibit development within the floodway unless it can be shown that the development

would not increase the water surface elevation during the 1 percent annual chance flood. Development outside the floodway, but still within the floodplain, is permitted provided the development meets National Flood Insurance Program and any local floodplain regulations. If a portion of the floodplain is also considered a water of the U.S. under Section 404 of the CWA, a USACE permit is required prior to the placement of dredged or fill material.

Flooding is common in Southern California where large amounts of precipitation can fall in a short period of time. Because of the arid climate, vegetation is often sparse, and soils tend to be thin and discontinuous. With little soil to absorb water and little vegetation to hold it back, precipitation runs off quickly and can result in floods. The potential for flooding is higher in urban areas where most of the land is covered with buildings and pavement.

Most major rivers and washes along with smaller washes within the Program Corridor have 1 percent annual chance floodplains and floodways (also known as Zone A areas) mapped by FEMA. The Program Corridor crosses or runs parallel to several valley floodplains and floodways. In some cases, the Program Corridor crosses floodplains and floodways of a single waterbody in multiple locations.

The Special Flood Hazard Areas include Zones A include AO, AH, A1-A30, AE, A99, and AR. These categories reflect the flood risk for that location in the Special Flood Hazard Area. For purposes of this Tier 1/Program EIS/EIR evaluation, anything within a 1 percent annual chance of flooding (Zone A) category is included in the definition of a floodplain.

Figure 3.9-1 depicts the location of floodplains with a 1 percent annual chance of flooding within the Tier 1/Program EIS/EIR Study Area.

Figure 3.9-1. Federal Emergency Management Agency Flood Areas within the Tier 1/Program EIS/EIR Study Area

(Page 1 of 6)

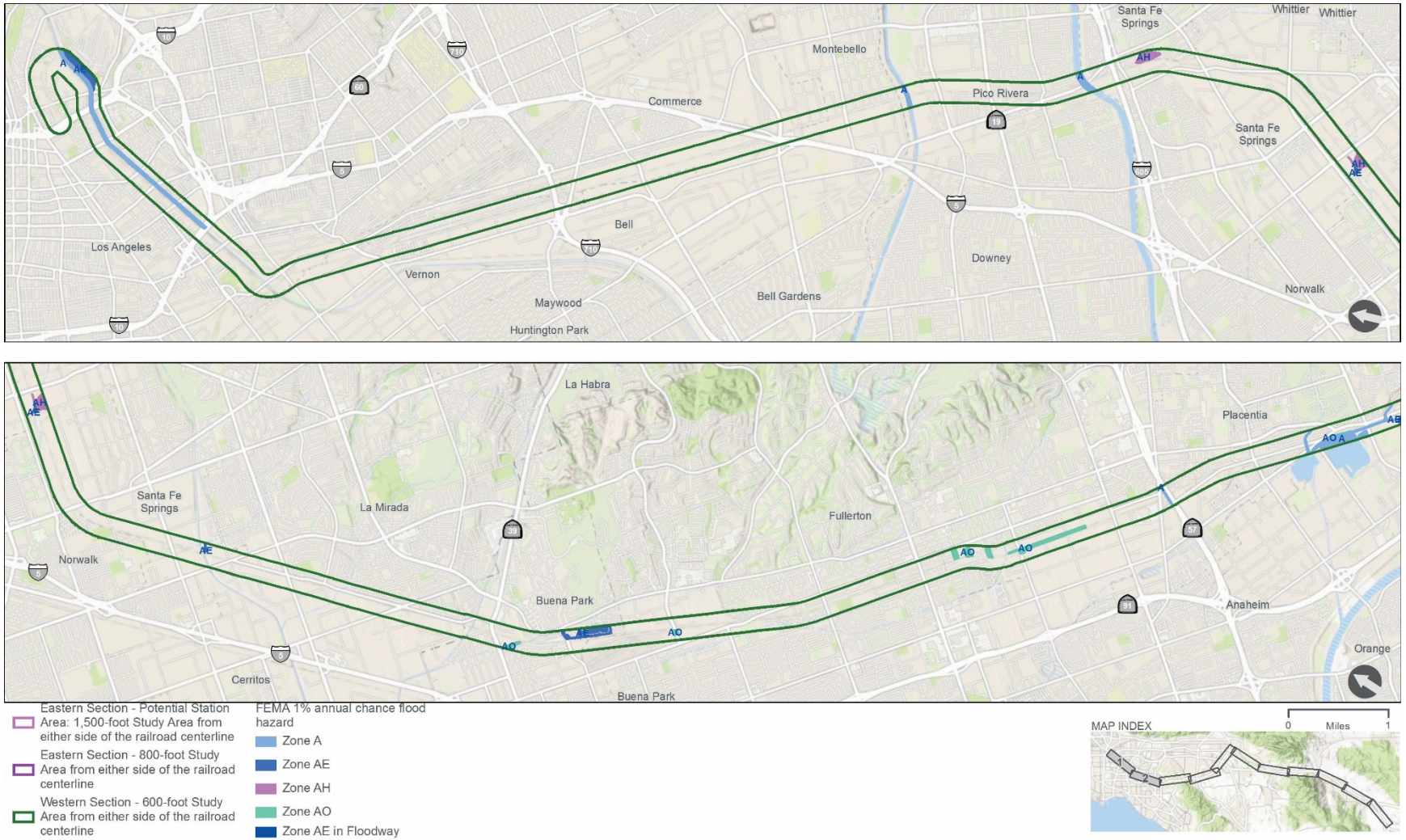

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Figure 3.9-1. Federal Emergency Management Agency Flood Areas within the Tier 1/Program EIS/EIR Study Area

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Figure 3.9-1. Federal Emergency Management Agency Flood Areas within the Tier 1/Program EIS/EIR Study Area

(Page 3 of 6)

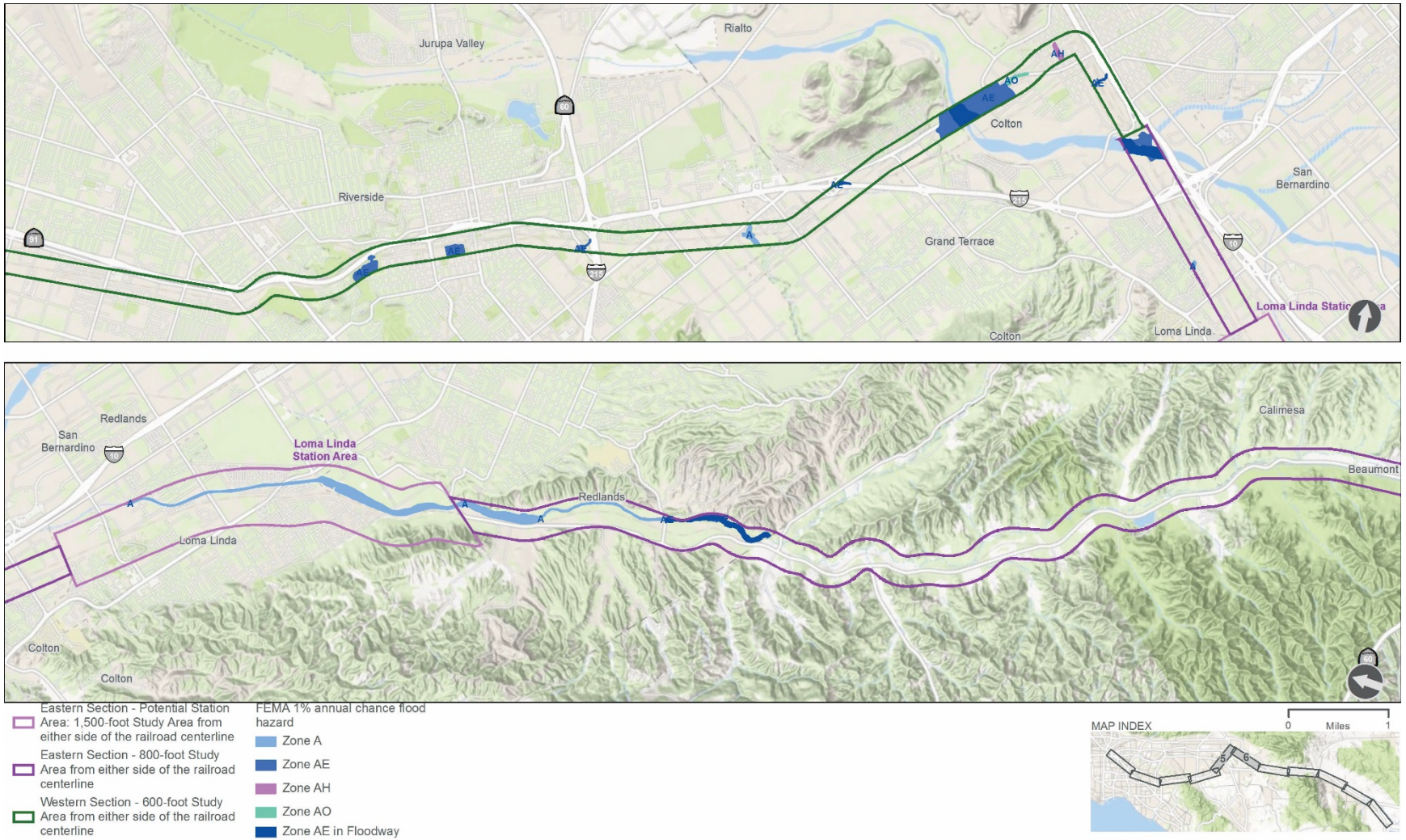

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Figure 3.9-1. Federal Emergency Management Agency Flood Areas within the Tier 1/Program EIS/EIR Study Area

(Page 4 of 6)

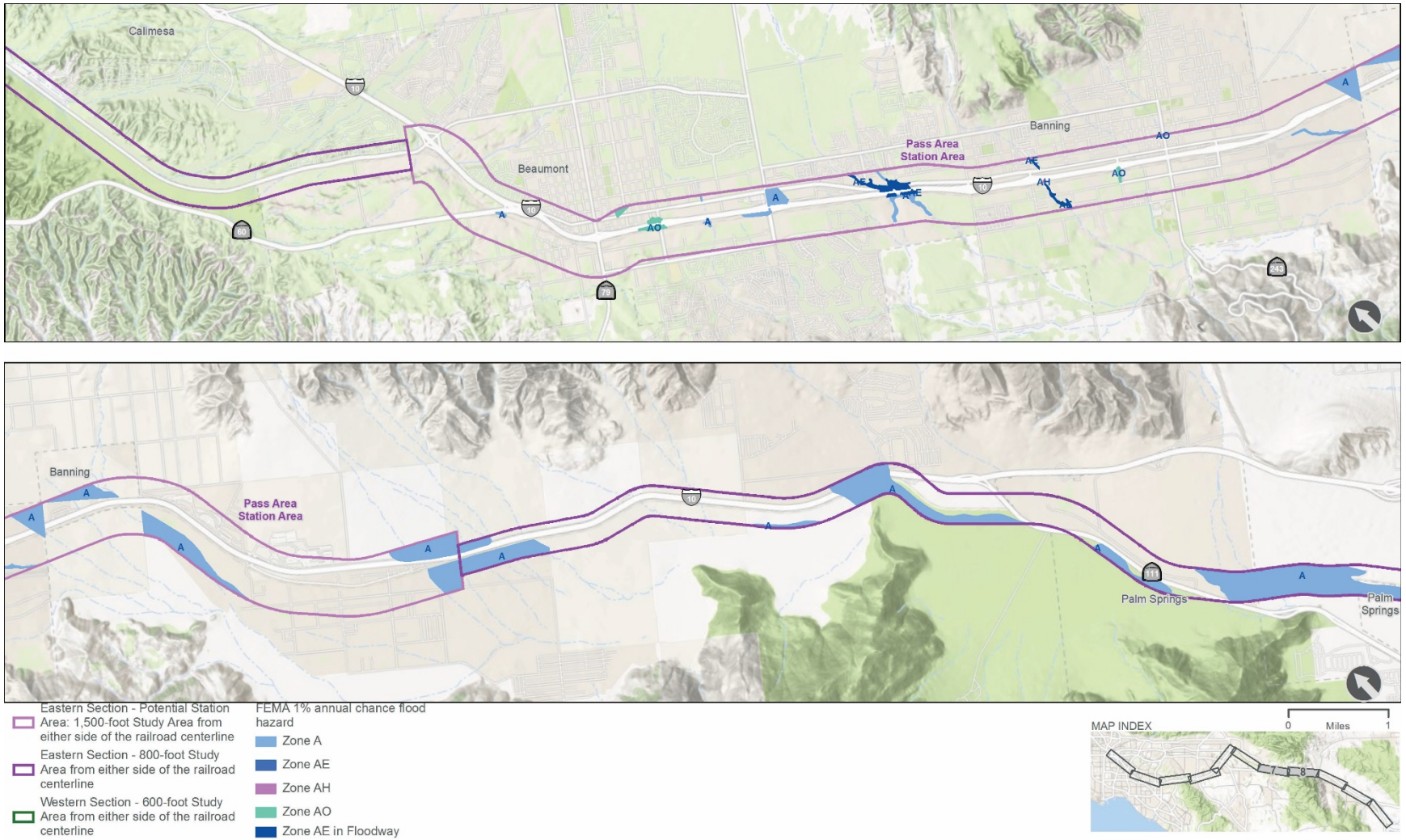

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Figure 3.9-1. Federal Emergency Management Agency Flood Areas within the Tier 1/Program EIS/EIR Study Area

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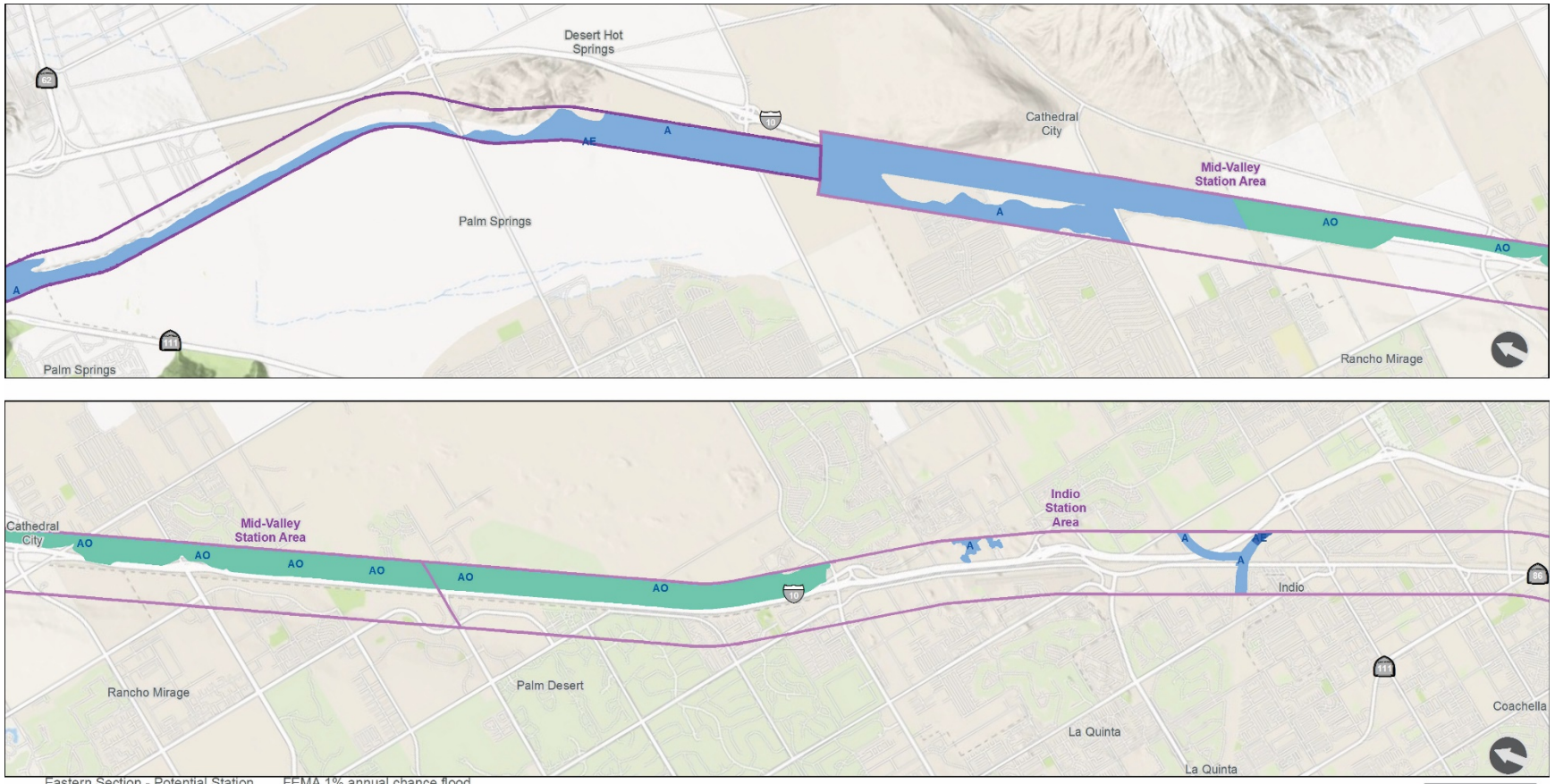

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Figure 3.9-1. Federal Emergency Management Agency Flood Areas within the Tier 1/Program EIS/EIR Study Area

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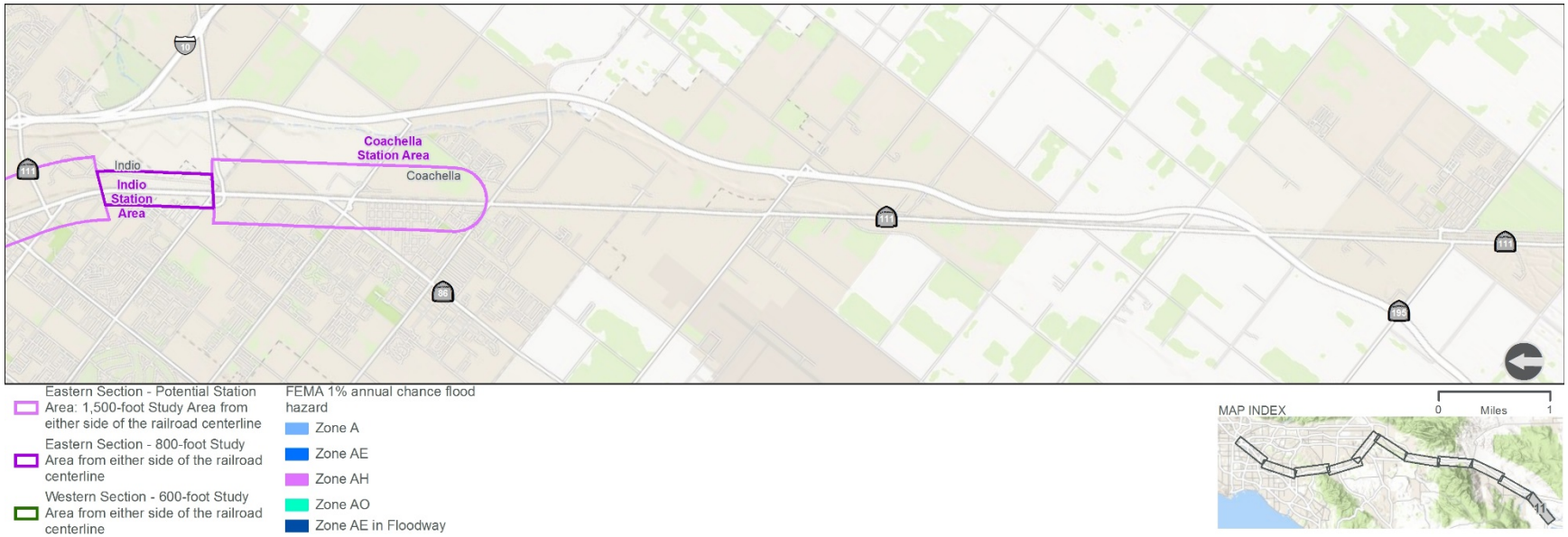

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Build Alternative Option 1 (Coachella Terminus)

As shown on Figure 3.9-1, for the Western Section of Build Alternative Option 1, approximately 637.4 acres of land is mapped as being within a 1 percent annual chance of flooding. For the Eastern Section of Build Alternative Option 1, approximately 4,401.3 acres of land is mapped as being within a 1 percent annual change of flooding. Table 3.9-2 provides a summary of mapped floodplain areas within Build Alternative Option 1.

Table 3.9-2. Summary of Floodplains (Build Alternative Options 1, 2, and 3)

Floodplain Zone	Area of Zone within Western Section (acres)	Area of Zone within Eastern Section (acres)	Total Area of Zone (acres)
Zone A	235.7	2,900.5	**3,136.2**
Zone AE	317.2	101.8	**419.0**
Zone AH	40.5	0.2	**40.7**
Zone AO	44.0	1,319.2	**1,363.2**
Zone AE in floodway	101.4	79.6	**181.0**

Source: FEMA 2020

Build Alternative Option 2 (Indio Terminus)

Floodplain zones within Build Alternative Option 2 are the same as Build Alternative Option 1.

Build Alternative Option 3 (Indio Terminus with Limited Third Track)

Floodplain zones within Build Alternative Option 3 are the same as Build Alternative Option 1.

Watersheds

USGS divided the U.S. into hydrologic units that are arranged or nested within each other, from the largest geographic area to the smallest geographic area. Each hydrologic unit is identified by a unique hydrologic unit code consisting of 2 to 12 digits based on the levels of classification in the hydrologic unit system (region [2], subregion [4], basin [6], subbasin [8], watershed [10], and subwatershed [12]).

As shown on Figure 3.9-2, the Program Corridor crosses five subbasins: Los Angeles River Watershed, San Gabriel River Watershed, Santa Ana River Watershed, San Jacinto River Watershed, and Salton Sea Watershed.

Build Alternative Option 1 (Coachella Terminus)

Table 3.9-4 summarizes the major water features and watersheds located within Build Alternative Option 1.

Table 3.9-3. Subbasins and Watersheds (Build Alternative Options 1, 2, and 3)

Subbasin	Watershed	Major Water Features
Los Angeles River Watershed	Lower Los Angeles River; Rio Hondo	Los Angeles River, Rio Hondo
San Gabriel River Watershed	Lower Santa Ana River; Middle Santa Ana River; Upper Santa Ana River; Temescal Wash; San Timoteo Wash	San Gabriel River, Coyote Creek
San Jacinto River Watershed	Middle San Jacinto River	—[a]
Santa Ana River Watershed	Colorado Lagoon-Frontal Alamitos Bay; Lower San Gabriel River;	Santa Ana River, San Timoteo Creek
Salton Sea Watershed	San Gorgonio River; Headwaters Whitewater River; Little Morongo Creek-Morongo Wash; Upper Whitewater River; Middle Whitewater River; Lower Whitewater River	San Gorgonio River, Whitewater River

Source: USGS 2016

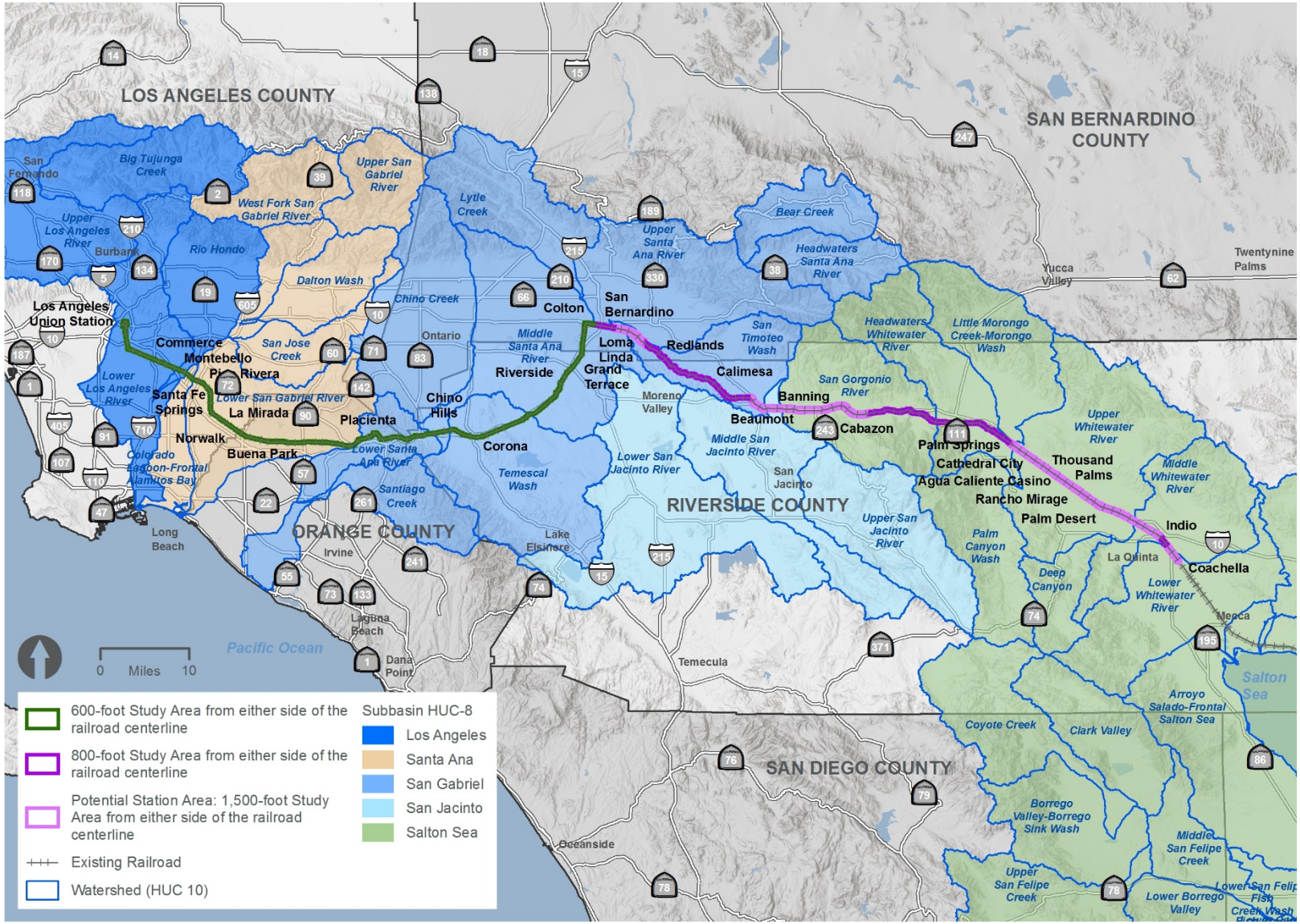
Notes:

[a] The Program Corridor passes through a small portion of the San Jacinto River Watershed Subbasin and Middle San Jacinto River Watershed. Within this small portion, no major water features are present.

Build Alternative Option 2 (Indio Terminus)

Subbasins and watersheds within Build Alternative Option 2 are the same as Build Alternative Option 1.

Figure 3.9-2. Subbasins and Watersheds within the Tier 1/Program EIS/EIR Study Area



Source: Department of Forestry and Fire Protection 2019

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Build Alternative Option 3 (Indio Terminus with Limited Third Track)

Subbasins and watersheds within Build Alternative Option 3 are the same as Build Alternative Option 2.

Surface Waters

For purposes of this Tier 1/Program EIS/EIR, surface waters include freshwater bodies, such as creeks, streams, rivers, lakes, and ponds, that are above ground. Creeks, streams, and rivers typically run within a defined channel. Lakes and ponds are inundations of water that may or may not be connected to other waterbodies. Surface water quality refers to physical, chemical, and biological characteristics of a waterbody. Water quality determines what activities or functions (drinking, recreation, etc.) are suitable for the waterbody. A waterbody that has poor water quality is referred to as impaired. Streams identified as impaired have established TMDLs. A TMDL is a calculation of the maximum amount of a pollutant that a waterbody can receive and still safely meet water quality standards.

For surface waters within the Program Corridor, natural flows in river and stream headwaters are generally relatively free of pollutants. As water flows from the headwaters through mountain streams and into the valley or basin, streams and rivers tend to accumulate both natural and anthropogenic pollutants. In relation to water quality, pollutant sources typically fall into two broad categories: point sources, such as outfalls or direct discharges, and non-point sources, which are sources of pollution diffused across the landscape. As natural flow volumes decrease seasonally during the dry summer months, concentrations of pollutants increase. Stormwater and irrigation runoff enter streams directly as overland subsurface flows or direct discharges; therefore, surrounding land uses affect surface water quality. Urban development, industry, wastewater treatment facilities, dams and reservoirs, and many other human activities have substantial effects on water quality. Urban and irrigation runoff can carry the dissolved or suspended residue of both natural and human land use practices within the watershed. Pollutant sources in urban areas include parking lots and streets; residential, commercial, and industrial development; rooftops; exposed earth at construction sites; non-landscaped, undeveloped areas; and petroleum-fueled railroads.

Water quality is determined and enforced at the state level, based on standards set by both the state and federal government. The water quality of surface water features within the Program Corridor is regulated through regional water quality control plans known as a basin plan. To protect these features, the Los Angeles, Santa Ana, and Colorado RWQCBs have established the beneficial uses and water quality objectives for each surface water feature. Water quality objectives are levels of pollutants above or below which that pollutant would reasonably expect to impair a beneficial use. When beneficial uses are impaired by a pollutant that chronically exceeds its water quality objective,

the RWQCBs place the waterbody and pollutant on the CWA Section 303(d) list of water quality impairments. Once a waterbody is placed on the 303(d) list, the RWQCBs must begin developing a TMDL program that provides a programmatic response to the impairment for the waterbody to meet the water quality objective and continue to support its beneficial uses.

Table 3.9-4 provides the definitions for the beneficial uses within these basin plans.
Table 3.9-5 summarizes the beneficial uses of waterbodies in the Program Corridor.

Table 3.9-4. Water Resource Beneficial Use Definitions

Beneficial Use	Beneficial Use Definition
MUN	Uses of water for community, military, or individual water supply systems, including, but not limited to, drinking water supply
AGR	Uses of water for farming, horticulture, or ranching, including, but not limited to, irrigation, stock watering, and support of vegetation for range grazing
IND	Uses of water for industrial activities that do not depend primarily on water quality, including, but not limited to, mining, cooling water supply, hydraulic conveyance, gravel washing, fire protection, and oil well repressurization
FRSH	Uses of water for natural or artificial maintenance of surface water quantity or quality
PROC	Uses of water for industrial activities that depend primarily on water quality
GWR	Uses of water for natural or artificial recharge of groundwater for purposes of future extraction, maintenance of water quality, or halting of saltwater intrusion into freshwater aquifers
WARM	Uses of water that support warmwater ecosystems, including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish, or wildlife, including invertebrates
COLD	Uses of water that support cold water ecosystems, including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish, or wildlife, including invertebrates
WILD	Uses of water that support terrestrial ecosystems, including, but not limited to, preservation and enhancement of terrestrial habitats, vegetation, wildlife (e.g., mammals, birds, reptiles, amphibians, invertebrates), or wildlife water and food sources
RARE	Uses of water that support habitats necessary, at least in part, for the survival and successful maintenance of plant or animal species established under state or federal law as rare, threatened, or endangered
POW	Uses of water for hydropower generation

Beneficial Use	Beneficial Use Definition
WET	Uses of water that support wetland ecosystems, including, but not limited to, preservation or enhancement of wetland habitats, vegetation, fish, shellfish, or wildlife; and unique wetlands functions that enhance water quality, such as providing flood and erosion control, streambank stabilization, and filtration and purification of naturally occurring contaminants
REC1	Uses of water for recreational activities involving body contact with water where ingestion of water is reasonably possible, including, but not limited to, swimming, wading, water skiing, skin and scuba diving, surfing, white water activities, fishing, or use of natural hot springs
REC2	Uses of water for recreational activities involving proximity to water but not normally involving body contact with water where ingestion of water is reasonably possible, including, but not limited to, picnicking, sunbathing, hiking, beachcombing, camping, boating, tide pool and marine life study, hunting, sightseeing, or aesthetic enjoyment in conjunction with the above activities

Sources: Los Angeles RWQCB 2014; Santa Ana RWQCB 2016; Colorado River RWQCB 2017

Notes:

AGR=agriculture supply; COLD=cold freshwater habitats; FRSH=freshwater replenishment; GWR=groundwater recharge; IND=industrial service supply; MUN=municipal and domestic water supply; POW=hydropower generation; PROC=industrial process supply; RARE=rare, threatened, or endangered species; REC1=water contact recreation; REC2=non-contact water recreation; WARM=warm freshwater habitat; WET=wetland habitat; WILD=wildlife habitat

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Table 3.9-5. Beneficial Uses of Potentially Affected Surface Waters within the Program Corridor

Potentially Affected Waterbody	MUN	AGR	IND	FRSH	PROC	GWR	WARM	COLD	WILD	RARE	POW	WET	REC1	REC2
Los Angeles River	P*	—	P	—	—	E	E	—	P	—	—	—	E	E
Rio Hondo	P*	—	—	—	—	I	P	—	I	—	—	—	P	E
San Gabriel River	P*	—	P	—	P	I	I	—	E	E	—	—	E	E
La Mirada Creek	P*	—	P	—	P	—	P	—	P	E	—	—	P	I
Coyote Creek	P*	—	P	—	P	—	P	—	P	E	—	—	P	I
Brea Creek	P*	—	P	—	P	—	P	—	P	E	—	—	P	I
Fullerton Creek	P*	—	P	—	P	—	P	—	P	E	—	—	P	I
Anaheim Lake	+	—	—	—	—	E/P	E/P	—	E/P	—	—	—	E/P	E/P
Carbon Canyon Creek	E/P	—	E/P	—	—	—	E/P	—	E/P	E/P	—	—	E/P	E/P
Santa Ana River	+	—	—	—	—	—	E/P	—	E/P	E/P	—	—	E/P	E/P
Temescal Wash	+	E/P	E/P	—	—	E/P	E/P	—	E/P	—	—	—	E/P	E/P
Tequesquite Arroyo	+	—	—	—	—	E/P	E/P	—	E/P	—	—	—	E/P	E/P
San Timoteo Wash/Creek	+	—	—	—	—	E/P	E/P	—	E/P	—	—	—	E/P	E/P

Potentially Affected Waterbody	MUN	AGR	IND	FRSH	PROC	GWR	WARM	COLD	WILD	RARE	POW	WET	REC1	REC2
Yucaipa Creek	+	—	—	—	—	E/P	E/P	—	E/P	—	—	—	E/P	E/P
Little San Gorgonio Creek	+	—	—	—	—	E/P	E/P	—	E/P	—	—	—	E/P	E/P
Noble Creek	+	—	—	—	—	E/P	E/P	—	E/P	—	—	—	E/P	E/P
San Gorgonio River	P	E	—	—	—	E	—	E	E	—	—	—	E	E
Potrero Creek	P	E	—	—	—	E	E	—	E	—	—	—	E	E
Mission Creek	P	E	—	—	—	E	E	—	E	—	—	—	E	E
Morongo Wash	P	E	—	—	—	E	E	—	E	—	--	—	E	E
Whitewater River	E	E	—	—	—	E	I	E	E	—	E	—	E	E
Unlisted Perennial and Intermittent Streams	P	—	—	E	—	I	—	—	—	—	—	—	—	—

Sources: Los Angeles RWQCB 2014; Santa Ana RWQCB 2016; Colorado River RWQCB 2017

Notes:

* Asterisked MUN designations are exempted

+ The waterbody has been specifically excepted from the MUN designation

AGR=agriculture supply; COLD=cold freshwater habitats; E=existing beneficial use; FRSH=freshwater replenishment; GWR=groundwater recharge; I=intermittent beneficial use; IND=industrial service supply; MUN=municipal and domestic water supply; P=potential beneficial use; POW=hydropower generation; PROC=industrial process supply; RARE=rare, threatened, or endangered species; REC1=water contact recreation; REC2=non-contact water recreation; WARM=warm freshwater habitat; WET=wetland habitat; WILD=wildlife habitat

Build Alternative Option 1 (Coachella Terminus)

Six rivers, 26 named drainages, and 1 named lake are within Build Alternative Option 1. In addition to the named waters, numerous unnamed ephemeral washes traverse Build Alternative Option 1. The descriptions and maps for waterbodies are included as part of Appendix G of this Tier 1/Program EIS/EIR.

Table 3.9-6 provides a summary of the named waters with water quality impairments (TMDLs) within Build Alternative Option 1.

Table 3.9-6. Named Surface Waters with Pollutant Impairments (Build Alternative Options 1, 2, and 3)

Waterbody Name	Pollutant Impairment
Los Angeles River	Ammonia, coliform bacteria, copper, lead, nutrients (algae), oil, and trash
Rio Hondo	Cyanide, coliform bacteria, copper, lead, toxicity, trash, zinc, and potential of hydrogen
San Gabriel River	Temperature, cyanide, and lead
Coyote Creek	Indicator bacteria, Iron, malathion, potential of hydrogen, and toxicity
Santa Ana River	Lead, bacteria, and copper
Warm Creek	Bacteria
San Timoteo Wash/Creek	Bacteria

Source: USGS 2017; SWRCB 2018

Build Alternative Option 2 (Indio Terminus)

Waterbodies with identified pollutant impairments within Build Alternative Option 2 are the same as Build Alternative Option 1.

Build Alternative Option 3 (Indio Terminus with Limited Third Track)

Waterbodies with identified pollutant impairments within Build Alternative Option 3 are the same as Build Alternative Option 1.

Groundwater

Groundwater is a component of the hydrologic cycle and is found in subsurface water-bearing formations. A groundwater basin is defined as a hydrogeologic unit containing one large aquifer or

several connected and interrelated aquifers. Further, a groundwater basin is an area underlain by permeable materials capable of furnishing a significant supply of groundwater to wells or storing a significant amount of water and has reasonably well-defined boundaries in a lateral direction and a definable bottom. Groundwater basins may be recharged naturally as precipitation infiltrates and/or artificially with imported or reclaimed water. Alternately, groundwater may discharge naturally by flowing into a stream, lake, or ocean, by flowing to the surface as a spring or seep or extracted by a well. The Program Corridor crosses multiple groundwater basins.

Build Alternative Option 1 (Coachella Terminus)

Table 3.9-7 provides a summary of the groundwater basins located within Build Alternative Option 1.

Table 3.9-7. Groundwater Basins (Build Alternative Options 1, 2, and 3)

Groundwater Basin Name	Beneficial Use Designations
Coastal Plan of Los Angeles – Central	MUN, IND, PROC, AGR
Coachella Valley – San Gorgonio Pass	MUN, IND, AGR
Coachella Valley - Indio	MUN, IND, AGR
San Jacinto	MUN, IND, PROC, AGR
San Gabriel Valley	MUN, IND, PROC, AGR
Upper Santa Ana Valley	MUN, IND, PROC, AGR
Upper Santa Ana Valley – Chino	MUN, IND, PROC, AGR
Upper Santa Ana Valley – Riverside-Arlington	MUN, IND, PROC, AGR
Upper Santa Ana Valley – Rialto-Colton	MUN, IND, PROC, AGR
Upper Santa Ana Valley – San Bernardino	MUN, IND, PROC, AGR
Upper Santa Ana Valley – San Timoteo	MUN, IND, PROC, AGR

Source: Los Angeles RWQCB 2014; Santa Ana RWQCB 2016; Colorado River RWQCB 2017

Notes:

AGR=agriculture supply; IND=industrial service supply; MUN=municipal and domestic water supply; PROC=industrial process supply

Build Alternative Option 2 (Indio Terminus)

Groundwater basins within Build Alternative Option 2 are the same as Build Alternative Option 1.

Build Alternative Option 3 (Indio Terminus with Limited Third track)

Groundwater basins within Build Alternative Option 3 are the same as Build Alternative Option 1.

Tsunami Inundation and Seiche Areas

Tsunamis are most commonly associated with oceans, which can generate waves of massive and devasting height upon hitting coastlines. Official tsunami inundation maps prepared by the California Geological Survey (CSG), California Office of Emergency Services, and the Tsunami Research Center at the University of Southern California reflect the maximum potential tsunami run-up from a number of tsunami sources. Since the Program Corridor is not located adjacent to ocean frontage, there is no oceanic tsunami risk within the Tier 1/Program EIS/EIR Study Area. For the inland waterbodies, the following seiche discussion addresses all types of waterbody wave hazards, regardless of source or type.

A seiche is an underwater wave that oscillates through a body of water that could result in localized flooding at a lake's shore. Seiches can be caused by high winds, earthquakes, or underwater landslides. In terms of seiche hazards within the Program Corridor, the region's semi-arid climate makes naturally occurring enclosed waterbodies uncommon. Only two waterbodies, Lake Perris and Lake Elsinore, are of any concern relative to potential hazards from seismically induced seiche. The Program Corridor does not cross or is not adjacent to Lake Perris or Lake Elsinore.

3.9.5 Environmental Consequences

Overview

Effects as a result of implementing the Build Alternative Options can be broadly classified into construction and operational effects. Long-term or permanent effects and short-term or temporary effects on floodplains, hydrology, and water quality would be anticipated as a result of constructing any of the Build Alternative Options.

Most effects on floodplains, hydrology, and water quality would occur during construction when ground-disturbing activities could result in the addition of pollutants to surface and groundwater, increased erosion and siltation, and shifts in existing drainage patterns. Additionally, fuel oils, chemicals, or concrete leachate could be spilled during construction activities. An increase in sediment loading and turbidity from grading and filing activities could contribute sediment-laden runoff to surface and groundwater, thereby degrading water quality.

Operational or long-term effects would include the addition of pervious surfaces, which could contribute to increased polluted runoff, result in changes to existing drainage patterns, and affect groundwater recharge.

No Build Alternative

The No Build Alternative, as described in Chapter 2, Program Alternatives, is used as the baseline for comparison. The No Build Alternative would not implement the proposed Program associated with this service-level evaluation. Because no physical changes would occur, no effects related to floodplains, hydrology or water quality are anticipated under the No Build Alternative.

Build Alternative Options 1, 2, and 3

Floodplain and Flooding Effects

CONSTRUCTION

Western Section. The Build Alternative Options would not require construction of additional rail or station infrastructure in the Western Section of the Program Corridor because the existing rail infrastructure and stations from LAUS to Colton would be used. When compared with the No Build Alternative, short-term/temporary effects related to floodplains or flooding would be negligible because no additional construction activities are planned within the Western Section under Build Alternative Options 1, 2, and 3.

Eastern Section. As shown on Figure 3.9-1, the Build Alternative Options traverse FEMA-mapped floodplains. Construction activities associated with the Build Alternative Options could have temporary impacts in or adjacent to floodplains. This could include parking vehicles or storing equipment or materials in a floodplain or having construction equipment in the floodplain for short periods of time. Elements of linear construction projects often include access roads, staging areas, temporary access roads, and areas of earth excavation or temporary soil storage. These temporary effects would occur only during the construction phase for a site-specific project and would comply with all local, state, and federal floodplain regulations.

New rail infrastructure improvements and station facilities contemplated under the Build Alternative Options would cross and likely permanently encroach on several floodplains. Depending on how close a passenger rail line might be to the existing rail tracks, this could include adding track and sidings, widening or replacing bridges, and replacing or extending culverts. Until Tier 2/Project-level studies define the site-specific improvements, the amount of floodplain affected cannot be determined.

When compared with the No Build Alternative, Build Alternative Option 1 could have a moderate effect on floodplains within the Eastern Section of the Program Corridor. When compared with Build Alternative Option 1, Build Alternative Option 2 would have slightly reduced effects due to a shorter route alignment and reduced station options. However, the magnitude of effects would be similar and considered moderate when compared with the No Build Alternative. When compared with Build

Alternative Options 1 or 2, Build Alternative Option 3 may have slightly reduced effects due to a smaller footprint associated with a shorter route alignment, reduced station options, and reduced third track rail infrastructure. However, the magnitude of effects would be similar for Build Alternative Option 3 and considered moderate when compared with the No Build Alternative.

Potential avoidance and minimization of impacts on floodplains would be further evaluated in the Tier 2/Project-level analysis. Any proposed encroachments in a floodplain area for rail infrastructure improvements or station facilities would require coordination with the local floodplain administrators to discuss floodplain development permitting and potential site-specific mitigation measures.

OPERATION

Western Section. Under Build Alternative Options 1, 2, and 3, passenger train frequencies proposed as part of the Program would consist of the addition of two daily round-trip intercity diesel-powered passenger trains operating the entire length of the Program Corridor between Los Angeles and Indio/Coachella. Operation of these additional passenger trains would not require additional modification or encroachment into floodplains. Therefore, effects associated with the Western Section of the Program Corridor under Build Alternative Options 1, 2, and 3 would be negligible when compared with the No Build Alternative.

Eastern Section. Operational effects associated with floodplains for the Build Alternative Options within the Eastern Section would be the same as those identified for the Western Section of the Program Corridor. Effects associated with the Eastern Section of the Program Corridor under Build Alternative Options 1, 2, and 3 would be negligible when compared with the No Build Alternative.

Water Quality Effects

CONSTRUCTION

Western Section. The Build Alternative Options would not require construction of additional rail or station infrastructure in the Western Section of the Program Corridor because the existing rail infrastructure and stations from LAUS to Colton would be used. When compared with the No Build Alternative, short-term/temporary effects related to water quality would be negligible because no additional construction activities are planned within the Western Section under Build Alternative Options 1, 2, and 3.

Eastern Section. Construction of Build Alternative Option 1, 2, or 3 in the Eastern Section of the Program Corridor would require the construction of rail stations, reconfiguration of existing or creation of new rail infrastructure (sidings, additional main line track, wayside signals, drainage, and grade-separation structures), and potential ROW acquisition. These construction activities may require grading, implementation of temporary stream diversions, and use of construction staging

areas, which could result in effects on water quality within the area. Construction effects on water quality could include an increase in sediment volume in stormwater, increases in pollutant loading in runoff, and pollutant discharges into receiving waters and groundwater systems.

Although construction activities have the potential to affect water quality within the Eastern Section of the Program Corridor, improvements identified under any of the Build Alternative Options would be required to comply with the federal, state, and local permitting requirements that regulate water quality. These regulations include CWA Section 401, CWA Section 404, CDFW Section 1600, and the RWQCB Construction General Permit. Through these regulations and requirements, the development of proposed rail infrastructure and station facilities would require temporary and permanent BMPs. These BMPs could include sediment traps, velocity dissipation devices (i.e., check dams and outfall protection), and detention/retention/infiltration facilities and would be incorporated into construction activities to reduce short-term increases in sediment transport caused by temporary hydromodification effects during construction.

The type and identification of the BMPs that would be used with future construction activities, and to what extent, cannot be determined at this time, as the sites where rail infrastructure and station improvements would be constructed have not yet been selected. During Tier 2/Project-level analysis, detailed and specific evaluation of water quality effects would be completed once design details are known.

When compared with the No Build Alternative, Build Alternative Option 1 could have a moderate effect on water quality within the Eastern Section of the Program Corridor. When compared with Build Alternative Option 1, Build Alternative Option 2 would have slightly reduced effects due to a shorter route alignment and reduced station options. However, the magnitude of effects would be similar and considered moderate when compared with the No Build Alternative. When compared with Build Alternative Options 1 or 2, Build Alternative Option 3 may have slightly reduced effects due to a smaller footprint associated with a shorter route alignment, reduced station options, and reduced third track rail infrastructure. However, the magnitude of effects would be similar for Build Alternative Option 3 and considered moderate when compared with the No Build Alternative.

OPERATION

Western Section. Under Build Alternative Options 1, 2, and 3, passenger train frequencies proposed as part of the Program would consist of the addition of two daily round-trip intercity diesel-powered passenger trains operating the entire length of the Program Corridor between Los Angeles and Indio/Coachella. The operation of the additional two daily round-trip intercity diesel-powered passenger trains within the Western Section of the Program Corridor would consist of ongoing maintenance along the tracks, maintenance facilities, and at existing stations, similar to existing conditions. These operational activities would require the use and transport of materials and

substances (e.g., petroleum, oils, and lubricants). While petroleum, oils, and lubricants would be used in rail operations or maintenance, proper use, storage, and disposal practices would minimize the potential for accidental releases, similar to existing conditions. Effects associated with the Western Section of the Program Corridor under Build Alternative Options 1, 2 and 3 would be negligible when compared with the No Build Alternative.

Eastern Section. Operational effects on water quality under the Build Alternative Options would mainly be associated with stormwater runoff generated during operation and maintenance activities. Stormwater runoff may contain sediment, nutrients, pesticides, petroleum derivatives, solid wastes, or other chemicals and metals that could enter receiving waters within the Eastern Section of the Program Corridor.

The Build Alternative Options would result in the addition of new or modified impervious surfaces from new stations and the new track and at-grade separations. Introducing impervious surfaces where they currently do not exist would have the potential to increase the rate and amount of stormwater runoff and could potentially cause erosion in areas adjacent to the new impervious surfaces. The placement of new impervious surfaces could result in effects on the existing runoff rates to receiving waters (i.e., hydromodification), including increases in low flow and peak flow velocity and volume. This could result in corresponding water quality effects, such as mobilization of new pollutants from the impervious surface, bed and bank erosion and sedimentation, and habitat loss.

Similar to construction effects identified for the Eastern Section of the Program Corridor, operational activities envisioned under the Build Alternative Options would require compliance with federal, state, and local permitting requirements that regulate water quality. These requirements may include regulatory compliance with the local MS4 Permits and implementation of low impact development features and BMPs, depending on the extent of the work and the impervious area being added or replaced. For any improvements within the Caltrans ROW, the Build Alternative Options would comply with the Caltrans MS4 Permit requirements. To offset the potential hydrology effects associated with new impervious surfaces and new sources of pollutants, Tier 2/Project-level design would include low impact development features and permanent BMPs to avoid potential permanent hydromodification and water quality effects.

This Tier 1/Program EIS/EIR evaluation does not identify the nature or potential of operational water quality effects at specific sites because the sites where rail infrastructure improvements and station facilities would be constructed has not yet been selected. The Tier 2/Project-level analysis would evaluate site specific impacts associated with operational water quality. When compared with the No Build Alternative, Build Alternative Option 1 could have a substantial effect on water quality within the Eastern Section of the Program Corridor. Although there are programs and regulations in place

to reduce, minimize, and avoid effects on water quality, the operation of new stations and rail infrastructure could potentially result in long-term effects from pollutant discharge into receiving waters in the area. When compared with Build Alternative Option 1, Build Alternative Option 2 would have slightly reduced effects due to a shorter route alignment and reduced station options. However, the magnitude of effects would be similar and substantial when compared with the No Build Alternative. When compared with Build Alternative Options 1 or 2, Build Alternative Option 3 may have slightly reduced effects due to a smaller footprint associated with a shorter route alignment, reduced station options, and reduced third track rail infrastructure. However, the magnitude of effects would be similar for Build Alternative Option 3 and considered substantial when compared with the No Build Alternative.

3.9.6 NEPA Summary of Potential Effects

Table 3.9-8 and Table 3.9-9 summarizes the qualitative assessment of potential effects (negligible, moderate, or substantial) under NEPA for each of the Build Alternative Options. This service-level evaluation uses the Tier 1/Program EIS/EIR Study Area to determine the types of resources that may be affected and, more importantly, the relative magnitude of the effect.

Table 3.9-8. NEPA Summary of Effects on Flooding

Alternative Options	Potential Intensity of Effect: Western Section	Potential Intensity of Effect: Eastern Section
No Build Alternative[a]	Construction: None Operation: None	Construction: None Operation: None
Build Alternative Option 1 (Coachella Terminus)	Construction: Negligible Operation: Negligible	Construction: Moderate Operation: Substantial
Build Alternative Option 2 (Indio Terminus)	Construction: Negligible Operation: Negligible	Construction: Moderate Operation: Substantial
Build Alternative Option 3 (Indio Terminus with Limited Third Track)	Construction: Negligible Operation: Negligible	Construction: Moderate Operation: Substantial

Notes:

[a] The No Build Alternative, as identified, includes existing and potential expansion of roadway, passenger rail, and air travel facilities within the Tier 1/Program EIS/EIR Study Area; however, for the service-level evaluation, identifying levels of effect from potential expansion of those facilities is speculative and would be dependent on Tier 2/Project-level analysis.

Table 3.9-9. NEPA Summary of Effects on Water Quality

Alternative Options	Potential Intensity of Effect: Western Section	Potential Intensity of Effect: Eastern Section
No Build Alternative[a]	Construction: None Operation: None	Construction: None Operation: None
Build Alternative Option 1 (Coachella Terminus)	Construction: Negligible Operation: Negligible	Construction: Moderate Operation: Substantial
Build Alternative Option 2 (Indio Terminus)	Construction: Negligible Operation: Negligible	Construction: Moderate Operation: Substantial
Build Alternative Option 3 (Indio Terminus with Limited Third Track)	Construction: Negligible Operation: Negligible	Construction: Moderate Operation: Substantial

Notes:

[a] The No Build Alternative, as identified, includes existing and potential expansion of roadway, passenger rail, and air travel facilities within the Tier 1/Program EIS/EIR Study Area; however, for the service-level evaluation, identifying levels of effect from potential expansion of those facilities is speculative and would be dependent on Tier 2/Project-level analysis.

3.9.7 CEQA Summary of Potential Impacts

Based on the information provided in Sections 3.9.4 and 3.9.5, and considering the CEQA Guidelines Appendix G Checklist questions for hydrology and water quality, the Build Alternative Options would have potentially significant impacts on hydrology and water quality when reviewed on a Program-wide basis. Placing the infrastructure improvements and new stations largely within or along the existing ROW reduces the potential for significant impacts on these resources. However, because the sites have not been selected, some resources may be significantly impacted. At the Tier 1/Program analysis level, it is not possible to precisely know the location, extent, and characteristics of impacts on these resources or areas. Proposed programmatic mitigation strategies discussed in Section 3.9.8 will be applied to reduce potential impacts.

Table 3.9-10 summarizes the CEQA significance conclusions for the Build Alternative Options; the proposed programmatic mitigation strategies that could be applied to minimize, reduce, or avoid the potential impacts; and the significance determination after mitigation strategies are applied. The identification and implementation of additional site-specific mitigation measures necessary for Project implementation would occur as part of the Tier 2/Project-level analysis.

Table 3.9-10. CEQA Summary of Impacts for Hydrology and Water Quality

Impact Summary	Mitigation Strategy	Significance with Mitigation Strategy
Would the Program violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?		
Construction		
Western Section – No Impact. No construction impacts are anticipated at the Tier 1/Program EIS/EIR evaluation level because no physical improvements are proposed or required within the Western Section under Build Alternative Option 1, 2, or 3.	Not applicable	Not applicable
Eastern Section – Potentially Significant. Potential construction impacts are dependent on the location of rail infrastructure improvements, station facilities, and type of construction activities that would be required. Construction activities could impact water quality by creating debris and pollutants like concrete waste and sediment. Due to the variety of potential construction techniques and numerous waterways and drainages in the Eastern Section, site-specific impacts and associated BMPs to minimize impacts cannot be determined at this time. However, the Tier 2/Project-level analysis would evaluate site-specific impacts associated with water quality.	HWQ-2 LU-3	**Less than Significant.** HWQ-2 and LU-3 would minimize, reduce, or avoid potential impacts related to violating water quality standards and waste discharge requirements by requiring compliance with applicable regulations and further evaluation during the Tier 2/Project-level analysis.

Impact Summary	Mitigation Strategy	Significance with Mitigation Strategy
Operation		
Western Section – Less Than Significant. The change in train service (two additional round-trip daily trains within the Program Corridor) on an existing rail corridor would require maintenance of existing infrastructure. However, with adherence to existing developed maintenance plans and procedures, maintenance activities on the existing rail corridor would not violate water quality standards or waste discharge requirements within the area. Therefore, a less than significant impact under Build Alternative Option 1, 2, or 3 is anticipated to occur at the Tier 1/Program EIS/EIR evaluation level.	Not applicable	Not applicable
Eastern Section – Potentially Significant. Introducing new impervious surfaces and buildings where they currently do not exist would have the potential to increase the rate and amount of stormwater runoff that could enter receiving waters. The generation of new stormwater sources may contain sediment, nutrients, pesticides, petroleum derivatives, solid wastes, or other chemical and metals that could degrade water quality in the area if not properly managed. The Tier 2/Project-level analysis would identify and evaluate the potential for changes in water quality associated with site-specific projects.	HWQ-3 LU-3	**Potentially Significant.** HWQ-3 and LU-3 would minimize, reduce, or avoid potential impacts associated with water quality standards and waste discharge requirements through design and further analysis. However, impacts may remain significant and unavoidable as further analysis may determine that operational activities would result in water quality impacts.
Would the Program substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the Program may impede sustainable groundwater management of the basin?		
Construction		
Western Section – No Impact. No construction impacts are anticipated at the Tier 1/Program EIS/EIR evaluation level because no physical improvements are proposed or required within the Western Section under Build Alternative Option 1, 2, or 3.	Not applicable	Not applicable

Impact Summary	Mitigation Strategy	Significance with Mitigation Strategy
Eastern Section – Potentially Significant. Although construction activities would require the use of water in site preparation, building preparation, material preparation, and for dust suppression, it is anticipated that construction water supply would not use groundwater supplies for these uses. Water used in construction (such as water used for concrete batching or preparation of mortar), would need to meet certain parameters, as water quality affects the overall strength of concrete. However, the siting of new rail infrastructure improvements and station facilities may encroach on areas that are identified for groundwater recharge activities. The Tier 2/Project-level analysis would identify and evaluate impacts on specific groundwater resources once site-specific projects are known.	LU-3	**Less than Significant.** LU-3 would minimize, reduce, or avoid potential impacts related to groundwater supplies by identifying groundwater depths in the Tier 2/Project-level Study Area and minimizing infrastructure improvements in those areas.
Operation		
Western Section – No Impact. The change in train service (two additional round-trip daily trains within the Program Corridor) on an existing rail corridor would require maintenance of existing infrastructure. However, these maintenance activities on the existing rail corridor do not require groundwater supplies and would not decrease groundwater supplies or interfere substantially with groundwater recharge within the area. Therefore, no impacts are anticipated to occur at the Tier 1/Program EIS/EIR evaluation level under Build Alternative Option 1, 2, or 3.	Not applicable	Not applicable
Eastern Section – Potentially Significant. New rail infrastructure improvements are not anticipated to require the use of groundwater supplies during operation or maintenance activities. However, depending on the location and type of amenities identified for new station facilities, there is the potential that groundwater supplies may be needed during operation. The Tier 2/Project-level analysis would identify and evaluate the potential of site-specific Project impacts on groundwater supplies.	UTL-1 LU-3	**Potentially Significant.** UTL-1 and LU-3 would minimize, reduce, or avoid potential impacts associated with groundwater supplies through design and further analysis. However, impacts may remain significant and unavoidable, as further analysis may determine that operational activities would result in groundwater supply impacts.

Impact Summary	Mitigation Strategy	Significance with Mitigation Strategy
Would the Program 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?		
Construction		
Western Section – No Impact. No construction impacts are anticipated at the Tier 1/Program EIS/EIR evaluation level because no physical improvements are proposed or required within the Western Section under Build Alternative Option 1, 2, or 3.	Not applicable	Not applicable
Eastern Section – Potentially Significant. Potential construction impacts associated with erosion or siltation are dependent on the location of rail infrastructure improvements and station facilities, which are currently unknown. The construction of these improvements and facilities has the potential to alter the existing drainage patterns of the site through the addition of new impervious surfaces and structures. The Tier 2/Project-level analysis would identify and evaluate impacts associated with site-specific drainage pattern changes.	HWQ-2 LU-3	**Less than Significant.** HWQ-2 and LU-3 would minimize, reduce, or avoid potential impacts from erosion or siltation by requiring compliance with applicable regulations. Erosion and sediment control BMPs would be identified to minimize, reduce, or avoid potential impacts from erosion or siltation.
Operation		
Western Section – No Impact. The change in train service (two additional round-trip daily trains within the Program Corridor) on an existing rail corridor would require maintenance of existing infrastructure. However, these maintenance activities do not require the alteration of existing drainage patterns or the addition of new impervious surfaces. Therefore, no impacts are anticipated to occur at the Tier 1/Program EIS/EIR evaluation level under Build Alternative Option 1, 2, or 3.	Not applicable	Not applicable

Impact Summary	Mitigation Strategy	Significance with Mitigation Strategy
Eastern Section – No Impact. Operational activities would consist of ongoing maintenance of existing infrastructure and would not require the alteration of existing drainage patterns or the addition of new impervious surfaces once construction is complete. Therefore, no impacts are anticipated to occur at the Tier 1/Program EIS/EIR evaluation level under Build Alternative Option 1, 2, or 3.	Not applicable	Not applicable
Would the Program 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 surface runoff in a manner which would result in flooding on- or off-site?		
Construction		
Western Section – No Impact. No construction impacts are anticipated at the Tier 1/Program EIS/EIR evaluation level because no physical improvements are proposed or required within the Western Section under Build Alternative Option 1, 2, or 3.	Not applicable	Not applicable
Eastern Section – Potentially Significant. Potential construction impacts related to surface runoff rate and volume increases are dependent on the location of rail infrastructure improvements and station facilities. The construction of these improvements and facilities has the potential to alter the existing drainage patterns of the site and flood flows within the area. There are numerous drainages, waterways, and floodplains in the Tier 1/Program EIS/EIR Study Area, but a detailed analysis on how drainage patterns and flood flow could change cannot be considered at the Tier 1/Program EIS/EIR level, as the locations of infrastructure and facilities is unknown. The Tier 2/Project-level analysis would identify and evaluate impacts associated with site-specific drainage patterns and flood flow changes.	HWQ-1 LU-3	**Less than Significant.** HWQ-1 and LU-3 would minimize, reduce, or avoid potential impacts from surface runoff by requiring compliance with applicable regulations and additional analysis during the Tier 2/Project-level analysis.

Impact Summary	Mitigation Strategy	Significance with Mitigation Strategy
Operation		
Western Section – No Impact. The change in train service (two additional round-trip daily trains within the Program Corridor) on an existing rail corridor would require maintenance of existing infrastructure. However, these maintenance activities do not require the alteration of existing drainage patterns or the addition of new impervious surfaces. Therefore, no impacts are anticipated to occur at the Tier 1/Program EIS/EIR evaluation level under Build Alternative Option 1, 2, or 3.	Not applicable	Not applicable
Eastern Section – No Impact. Operational activities would consist of ongoing maintenance of existing infrastructure and would not require the alteration of existing drainage patterns or the addition of new impervious surfaces once construction is complete. Therefore, no impacts are anticipated to occur at the Tier 1/Program EIS/EIR evaluation level under Build Alternative Option 1, 2, or 3.	Not applicable	Not applicable
Would the Program 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 water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?		
Construction		
Western Section – No Impact. No construction impacts are anticipated at the Tier 1/Program EIS/EIR evaluation level because no physical improvements are proposed or required within the Western Section under Build Alternative Option 1, 2, or 3.	Not applicable	Not applicable

Impact Summary	Mitigation Strategy	Significance with Mitigation Strategy
Eastern Section – Potentially Significant. Potential construction impacts related to surface runoff rate and volume increases are dependent on the location of rail infrastructure improvements and station facilities. The construction of these improvements and facilities has the potential to alter the existing drainage patterns of the site. There are numerous drainages, waterways, and floodplains in the Tier 1/Program EIS/EIR Study Area, but a detailed analysis on how drainage patterns could change cannot be considered at the Tier 1/Program EIS/EIR level as the locations of infrastructure and facilities is unknown. The Tier 2/Project-level analysis would identify and evaluate impacts associated with site-specific drainage patterns.	LU-3	**Less than Significant.** LU-3 would minimize, reduce, or avoid potential impacts from surface runoff by requiring compliance with applicable regulations and additional analysis during the Tier 2/Project-level analysis. LU-3 would minimize, reduce, or avoid potential impacts on stormwater drainage systems by requiring compliance with applicable regulations and additional analysis during the Tier 2/Project-level analysis.
Operation		
Western Section – No Impact. The change in train service (two additional round-trip daily trains within the Program Corridor) on an existing rail corridor would require maintenance of existing infrastructure. However, these maintenance activities do not require the alteration of existing drainage patterns or the addition of new impervious surfaces. Therefore, no impacts are anticipated to occur at the Tier 1/Program EIS/EIR evaluation level under Build Alternative Option 1, 2, or 3.	Not applicable	Not applicable
Eastern Section – No Impact. Operational activities would consist of ongoing maintenance of existing infrastructure and would not require the alteration of existing drainage patterns or the addition of new impervious surfaces once construction is complete. Therefore, no impacts are anticipated to occur at the Tier 1/Program EIS/EIR evaluation level under Build Alternative Option 1, 2, or 3.	Not applicable	Not applicable

Impact Summary	Mitigation Strategy	Significance with Mitigation Strategy
Would the Program 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 impede or redirect flood flows?		
Construction		
Western Section – No Impact. No construction impacts are anticipated at the Tier 1/Program EIS/EIR evaluation level because no physical improvements are proposed or required within the Western Section under Build Alternative Option 1, 2, or 3.	Not applicable	Not applicable
Eastern Section – Potentially Significant. Potential impacts related to impeding or redirecting flood flows are dependent on the location of rail infrastructure improvements and station facilities. The construction of these improvements and facilities has the potential to alter the existing drainage patterns of the site and flood flows within an area through the addition of new impervious surfaces and structures. A detailed analysis of changes to these drainage patterns and flood flow cannot be considered at the Tier 1/Program EIS/EIR evaluation level as the locations of infrastructure and station facilities is unknown. The Tier 2/Project-level analysis would identify and evaluate impacts associated with site-specific drainage pattern and flood flow changes.	HWQ-1 LU-3	**Less than Significant.** HWQ-1 and LU-3 would minimize, reduce, or avoid potential impacts from changes in drainage patterns and flood flows by requiring compliance with applicable regulations and additional analysis during the Tier 2/Project-level analysis.
Operation		
Western Section – No Impact. The change in train service (two additional round-trip daily trains within the Program Corridor) on an existing rail corridor would require maintenance of existing infrastructure. However, these maintenance activities do not require the alteration of existing drainage patterns or the addition of new impervious surfaces. Therefore, no impacts are anticipated to occur at the Tier 1/Program EIS/EIR evaluation level under Build Alternative Option 1, 2, or 3.	Not applicable	Not applicable

Impact Summary	Mitigation Strategy	Significance with Mitigation Strategy
Eastern Section – No Impact. Operational activities would consist of ongoing maintenance of existing infrastructure and would not require the alteration of existing drainage patterns or the addition of new impervious surfaces once construction is complete. Therefore, no impacts are anticipated to occur at the Tier 1/Program EIS/EIR evaluation level under Build Alternative Option 1, 2, or 3.	Not applicable	Not applicable
Would the Program be located in flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?		
Construction		
Western Section – No Impact. No construction impacts are anticipated at the Tier 1/Program EIS/EIR evaluation level because no physical improvements are proposed or required within the Western Section under Build Alternative Option 1, 2, or 3.	Not applicable	Not applicable
Eastern Section – Potentially Significant. Potential impacts related to flood hazards are dependent on the location of rail infrastructure improvements and station facilities. While the Eastern Section is not within an identified area for tsunami or seiche zone risks, it crosses numerous FEMA flood zones. Construction activities associated with new rail infrastructure or station facilities may impact flood flows. The Tier 2/Project-level analysis would evaluate the potential of flood risk associated with site-specific construction activities and whether construction activities would have water quality impacts on the environment.	HWQ-1 HWQ-2	**Less than Significant.** HWQ-1 and HWQ-2 would minimize, reduce, or avoid potential impacts from flood flows by requiring compliance with applicable regulations. Tier 2/Project-level analysis would consider flood conveyance and potential flood risk associated with site-specific projects.

Impact Summary	Mitigation Strategy	Significance with Mitigation Strategy
Operation		
Western Section – Less Than Significant. The change in train service (two additional round-trip daily trains within the Program Corridor) on an existing rail corridor would require maintenance of existing infrastructure. Although portions of the Western Section cross through areas identified as a potential flooding hazard area, maintenance activities within these areas are governed by existing developed maintenance plans and procedures. Maintenance activities on the existing rail corridor would not exacerbate flood risk within the area. Therefore, a less than significant impact is anticipated to occur at the Tier 1/Program EIS/EIR evaluation level under Build Alternative Option 1, 2, or 3.	Not applicable	Not applicable
Eastern Section – Less Than Significant. Operational activities would consist of ongoing maintenance of existing infrastructure. Although portions of the Eastern Section cross through areas identified as a potential flooding hazard area, maintenance activities within these areas would be governed by developed maintenance plans and procedures. Maintenance activities would not exacerbate flood risk within the area. Therefore, a less than significant impact is anticipated to occur at the Tier 1/Program EIS/EIR evaluation level under Build Alternative Option 1, 2, or 3.	Not applicable	Not applicable
Would the Program conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?		
Construction		
Western Section – No Impact. No construction impacts are anticipated at the Tier 1/Program EIS/EIR evaluation level because no physical improvements are proposed or required within the Western Section under Build Alternative Option 1, 2, or 3.	Not applicable	Not applicable

Impact Summary	Mitigation Strategy	Significance with Mitigation Strategy
Eastern Section – Potentially Significant. Potential conflicts with a water quality control plan or sustainable groundwater management plan are dependent on where the rail infrastructure improvements and station facilities are located. Construction impacts could occur in multiple jurisdictions under different regional water quality programs. The Tier 2/Project-level analysis would identify the applicable water quality control plans and sustainable groundwater management plans and analyze conflicts that may occur during construction.	HWQ-2 LU-3	**Less than Significant.** HWQ-2 and LU-3 would minimize, reduce, or avoid potential conflicts with water quality control plans or sustainable groundwater management plans by requiring compliance with applicable regulations and identifying specific resources that would be impacted by Tier 2/Project-level implementation.
Operation		
Western Section – No Impact. The increase in train service (two additional round-trip daily trains within the Program Corridor) would not change existing land use that would result in conflicts or obstruction of a water quality control plan or groundwater management plan. Therefore, no operational impacts anticipated to occur at the Tier 1/Program EIS/EIR evaluation level under Build Alternative Option 1, 2, or 3 are.	Not applicable	Not applicable
Eastern Section – Potentially Significant. Potential conflicts with a water quality control plan or sustainable groundwater management plan are dependent on where rail infrastructure improvements and station facilities are located. Operational impacts could occur in multiple jurisdictions under different regional water quality programs. The Tier 2/Project-level analysis would identify the applicable water quality control plans and sustainable groundwater management plans and analyze conflicts that may occur during operation.	HWQ-3 UTL-1 LU-3	**Less than Significant.** HWQ-3, UTL-1, and LU-3 would minimize, reduce, or avoid potential conflicts with water quality control plans or sustainable groundwater management plans by requiring compliance with applicable regulations and identifying specific resources that would be impacted by Project operation.

Notes:

BMP=best management practice; EIR=environmental impact report; EIS=environmental impact statement; FEMA=Federal Emergency Management Agency

3.9.8 Avoidance, Minimization, and Mitigation Strategies

Identified below are proposed programmatic mitigation strategies for further consideration in the Tier 2/Project-level analysis. Specific mitigation measures, to the extent required, would be identified and discussed during Tier 2/Project-level analysis after design details are known and specific impacts are identified for floodplains, hydrology, and water quality.

Programmatic mitigation strategies include minimizing the length of river/stream crossings or employing appropriate stormwater management measures to minimize stormwater runoff, including the preparation of a stormwater pollution prevention plan, and compliance with regulations for local water quality permits. Proposed programmatic mitigation strategies include, but are not limited to, the following:

Mitigation Strategy HWQ-1: During Tier 2/Project-level analysis, additional floodplain hydrology documentation shall be conducted to determine if the siting of specific rail infrastructure or station facility proposed would encroach into a floodplain. If the siting of specific rail infrastructure or station facility requires encroachment into a floodplain, a floodplain assessment shall be conducted to evaluate the impacts of specific designs on water surface elevations and flood conveyance and evaluate potential flooding risk. Any project that would result in floodplain encroachment shall coordinate with the governing agency or local jurisdiction. Any additional requirements that may be needed shall be determined in coordination with the applicable regulatory agencies.

Mitigation Strategy HWQ-2: Based on the results of the Tier 2/Project-level analysis and recommendations, the construction of specific rail infrastructure or station facility proposed shall comply with the provisions of the National Pollutant Discharge Elimination System General Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities (Order Number 2009-0009-DWQ, National Pollutant Discharge Elimination System Number CAS000002) and any subsequent amendments (Order Number 2010-0014-DWQ and Order Number 2012-0006-DWQ). These provisions shall include, but are not limited to, the following:

- Construction activities shall not commence until a waste discharger identification number is received from the State Water Resources Control Board Stormwater Multiple Application and Report Tracking System.
- Identification of good housekeeping, erosion control, and sediment control best management practices shall be utilized during construction activities.
- A stormwater pollution prevention plan shall be prepared.
- A rain event action plan shall be prepared.

- A notice of termination shall be submitted to the State Water Resources Control Board within 90 days of completion of construction and stabilization of the site.

These requirements, and any additional approvals, shall be determined in coordination with the governing agencies or local jurisdiction before construction on a project commences.

Mitigation Strategy HWQ-3: Based on the results of the Tier 2/Project-level analysis and recommendations, the operation of specific rail infrastructure or station facility proposed shall comply with the provisions of the applicable Regional Water Quality Control Board Municipal Separate Storm Sewer System Program. These provisions shall include, but are not limited to, the following:

- Low impact, site design, and source control best management practices shall be identified to be utilized during operational activities.
- A water quality management plan shall be prepared that will be implemented and maintained throughout the life of a project and used by property owners, facility operators, tenants, facility employees, and maintenance contractors.

These requirements, and any additional approvals, shall be determined in coordination with the governing agencies or local jurisdiction before operation on a project commences.

Mitigation Strategy LU-3: During a subsequent Tier 2/Project-level analysis, a land use consistency analysis shall be conducted by the identified lead agency or agencies to determine consistency of the Tier 2/Project-level improvement being proposed with the applicable local jurisdictional general plans or programs. If the land use consistency analysis identifies sensitive land uses or environmental resources within the Tier 2/Project-level Study Area, design or siting strategies shall be identified by the lead agency or agencies to avoid or minimize conflicts with sensitive land uses or environmental resources.

Mitigation Strategy UTL-1: During Tier 2/Project-level analysis, additional water supply documentation shall be conducted by the identified lead agency or agencies to determine water supply impacts (including groundwater basin withdrawals) associated with the operation of rail infrastructure or station facility proposed. If require by the identified lead agency or agencies, this documentation shall include, but is not limited to, the following:

- A site-specific water supply assessment shall be prepared, per Senate Bill 610 requirements.
- Water supply verification letters shall be obtained from the applicable water purveyor per Senate Bill 221 requirements.