

## 3.10 Hydrology/Water Quality

### 3.10.1 Introduction

This section describes study area water bodies, existing drainage and water quality conditions in the project corridor, and the regulations, plans and policies designed to protect water quality, maintain adequate drainage, minimize exposure to flooding and other hazards, and promote groundwater recharge. It also reports impacts of the Expo Phase 2 project compared with No-Build conditions. Water quality impacts associated with disturbance of contaminated soils are discussed in Section 3.9 (Hazards and Hazardous Materials) and Chapter 4 (Construction Impacts).

Greater detail on Hydrology and Water Quality can be found in the *Hydrology/Water Quality Technical Background Report*. Full bibliographic references can be found in Appendix B (Bibliography).

### 3.10.2 Existing Conditions

#### Watersheds and Drainage

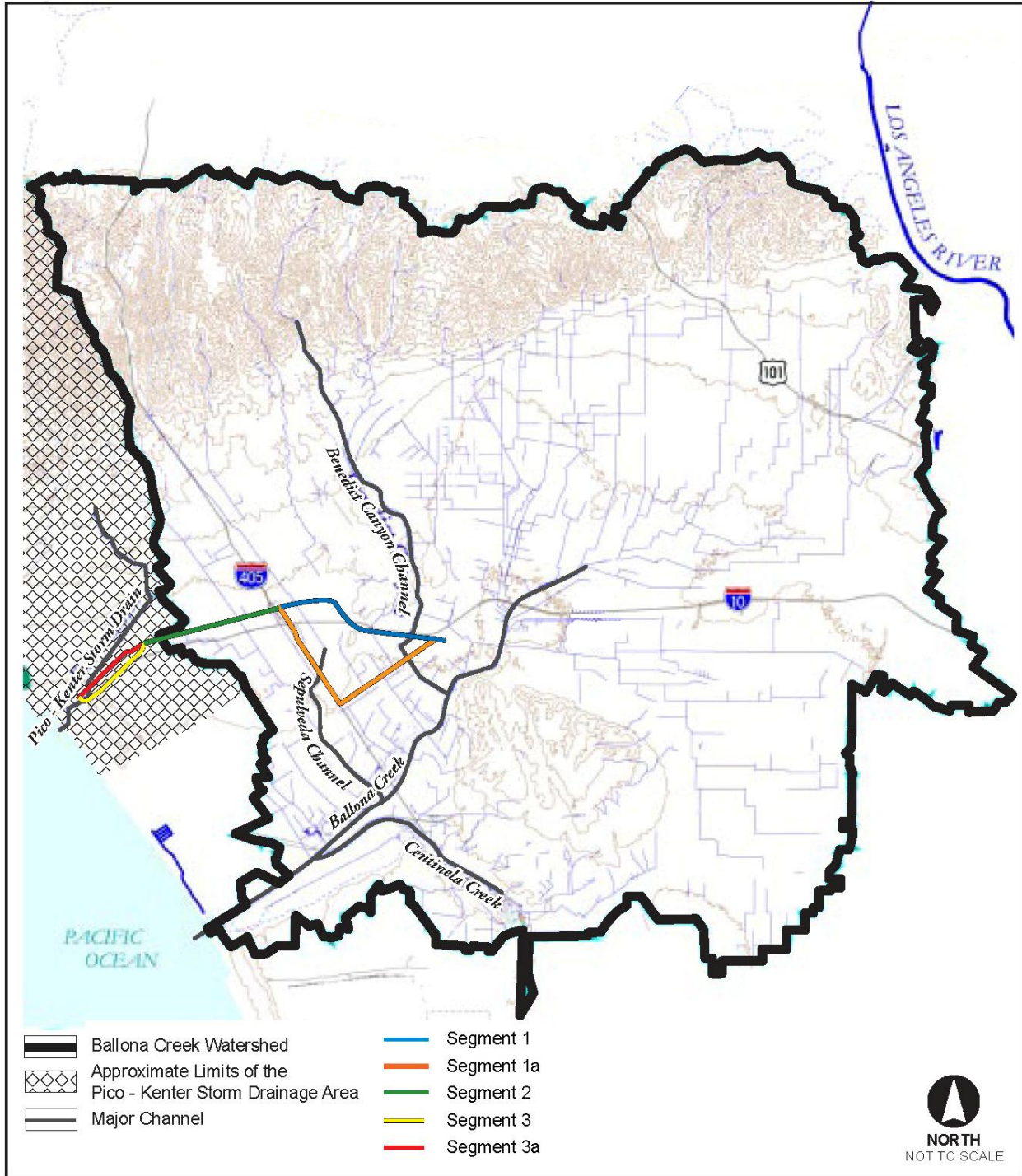
The eastern two-thirds of the study area (i.e., 0.5-mile buffer from either side of the LRT Alternative alignments) is located within the Ballona Creek Watershed. The western one-third is located within the Pico-Kenter Storm Drainage Area. Both of these drainages are part of the Santa Monica Bay Hydrologic Unit and Interior Santa Monica Bay Hydrologic Area. Within the project vicinity, Ballona Creek, the Sepulveda Channel, and the Pico-Kenter Storm Drain are the major drainage channels. Figure 3.10-1 (Drainage Features) illustrates the location of the Ballona Creek Watershed and the Pico-Kenter Storm Drainage Area and the major channels, creeks, and storm drains within the study area.

The study area drains to Ballona Creek and the Sepulveda Channel, both of which are located within the Ballona Creek Watershed, and the Pico-Kenter Storm Drain, which drains the Pico-Kenter Storm Drainage Area. While the Sepulveda Channel is located within the Ballona Creek Watershed, it is also part of the Sawtelle-Westwood Flood Control System, which includes undergrounded tributaries to Ballona Creek.

Segment 1 (Expo ROW), Segment 1a (Venice/Sepulveda), and Segment 2 (Sepulveda to Cloverfield) all drain to Ballona Creek; portions of Segment 1a drain to the Sepulveda Channel and then to Ballona Creek; and Segment 3 (Olympic) and Segment 3a (Colorado) drains to the Pico-Kenter Storm Drain or directly to the ocean.

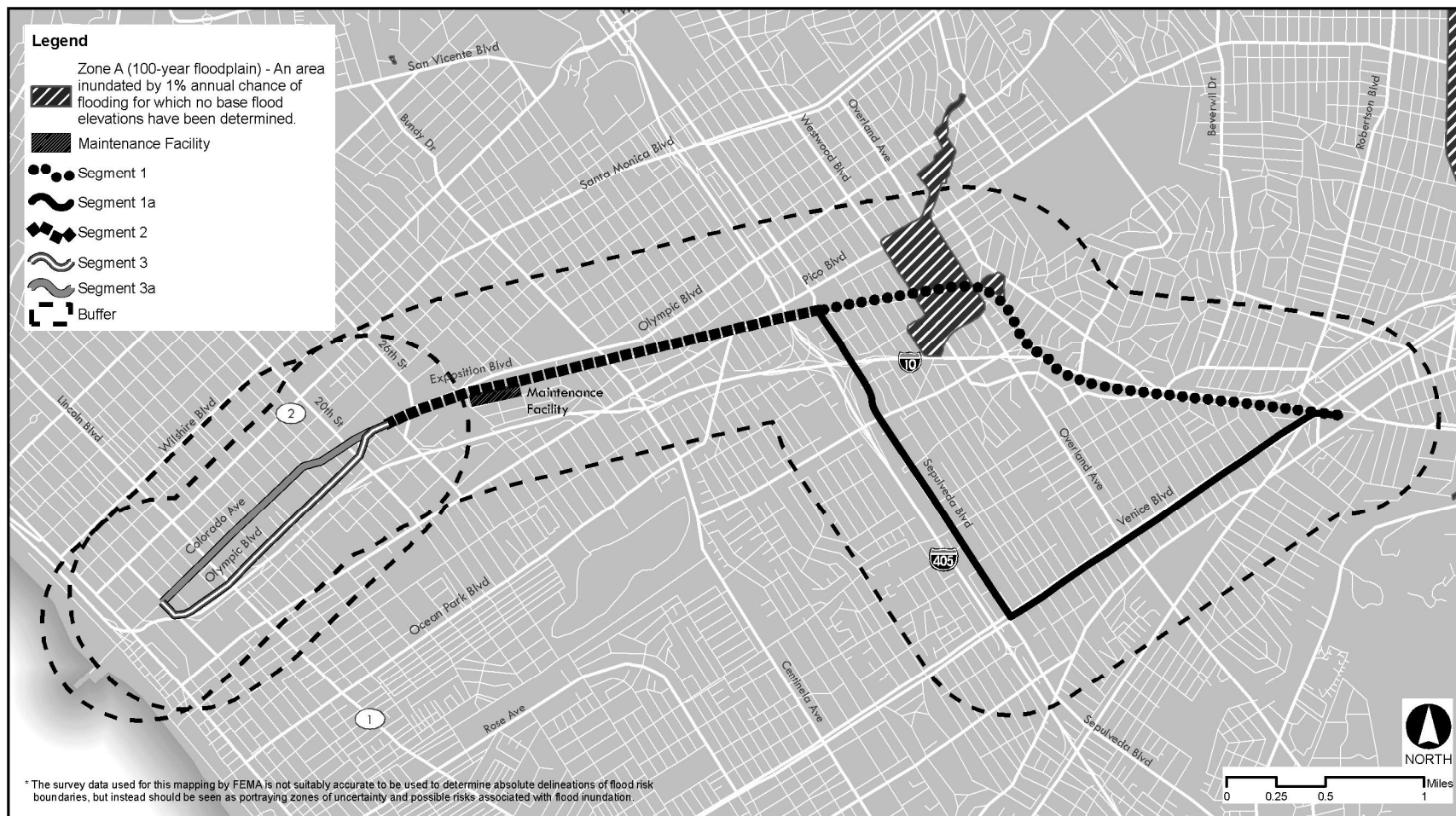
#### Flooding

Los Angeles and nearby cities are located in a relatively flat alluvial plain (or basin), about 30 miles wide, lying on uplift terraces surrounded by mountain ranges. The Federal Emergency Management Agency (FEMA) has prepared flood maps identifying areas in Los Angeles County that would be subject to flooding during 100-year and 500-year storms events. Figure 3.10-2 (100-Year Floodplains) depicts the 100-year flood areas within and near the study area.



Source: PBS&J.

Figure 3.10-1 Drainage Features



Source: PBS&J, ESRI, FEMA

Figure 3.10-2 100-Year Floodplains

Only Segment 1 contains a FEMA 100-year flood hazard area, which is generally bounded by Olympic Boulevard to the north, Manning Avenue to the east, Kelton Avenue to the west, and Coventry Place to the south. This area includes the Expo ROW from Overland Avenue to Westwood Boulevard. There are no 500-Year floodplains in the vicinity of the project site.

### **Surface Water Quality**

The Water Quality Control Plan for the Los Angeles Basin (Basin Plan) indicates that Ballona Creek is impaired by pollutants from industrial and municipal effluent and urban nonpoint runoff. In addition, untreated sewage overflows discharged into Ballona Creek during the rainy season historically have caused beach closures along Santa Monica Bay. Specific pollutants include high levels of dissolved solids (e.g., chlorides, sulfates, and heavy metals), bacteria, nutrients from fertilizers and other sources, petroleum hydrocarbons, sediment, solid waste and debris. Rainfall results in these contaminants entering municipal storm drains, which subsequently convey the contaminants to surface waters. In addition, high concentrations of Dichloro-Diphenyl-Trichloroethane (DDT) in sediments at the mouth of Ballona Creek and in Marina del Rey provide evidence of past discharges that have resulted in long-term water quality issues.

The Pico Kenter Storm Drain is not listed as an impaired waterbody; however, it discharges to the Santa Monica Bay, which is listed as impaired. Ballona Creek is listed as impaired by metals in sediment. Santa Monica Bay also is listed as impaired for sediment toxicity, and a Fish Consumption Advisory was issued for fish caught within the Bay because of bioaccumulation of pollutants, debris, and an historic pesticide, DDT, that could be present in sediment and soils.

### **Groundwater**

Based on local topography and measured groundwater levels in the Charnock subbasin, which is a subbasin of the Santa Monica Basin upon which the project is located, depth to groundwater is estimated to be between 110 to 180 feet below ground surface (bgs) along Segment 1 and Segment 2; depth to groundwater along Segment 1a is expected to be about 100 feet bgs. Depth to groundwater along Segment 3 and Segment 3a is estimated to be between 60 to 140 feet BGS (SMPCDD 2004, 4.5-41).<sup>69</sup> Because of the potential for perched (water trapped near the surface of the soil) groundwater, local groundwater levels may be higher along the alignment. Only in areas where surfaces are pervious would there be any potential for groundwater recharge within the proposed alignments. These pervious areas are generally limited to the unpaved portions of Segment 1, including the Expo ROW through the trench extending to Sepulveda Boulevard. Because of the compact nature of the soils in Segment 1 pervious areas, infiltration rates would be low and, therefore, these areas would not be expected to meaningfully contribute to groundwater recharge.

Generally, the Expo Phase 2 ROW is underlain by contaminant-affected groundwater (Leighton 2009). The contaminants are typically volatile organic compounds (VOCs), methyl tertiary-butyl ether (MTBE), tetrachloroethylene (i.e., perchloroethylene) (PCE), and trichloroethylene (TCE) from existing uses along the alignment. In 1996, groundwater wells serving the cities of Santa Monica, Culver City, and Los Angeles ceased pumping and production due to the affected groundwater in the Charnock well field. The source of the contamination was attributed to leaking underground storage tanks from multiple gas stations. Currently, the City of Santa

<sup>69</sup> Depth to groundwater measured for a project near 4<sup>th</sup> Street in Santa Monica indicated groundwater levels at about 47 to 50 feet bgs.

Monica, the Palms and Mar Vista areas of the City of Los Angeles, and the City of Culver City import water from the Metropolitan Water District (MWD) as an interim measure of groundwater replacement. Additionally, the City of Santa Monica operates the Olympic subbasin well field and is developing a groundwater treatment facility to remove the MTBE from groundwater available for production in the Charnock well field. While the presence of groundwater contamination exists, the regional groundwater contamination issue has low potential to affect the Expo Phase 2 project based on the conceptual engineering design.

### 3.10.3 Regulatory Setting

#### Federal

##### **Clean Water Act**

The federal *Clean Water Act* (CWA) was designed to restore and maintain the chemical, physical, and biological integrity of the nation's waters. The CWA also directs states to establish water quality standards for all waters of the United States and to review and update such standards on a triennial basis. Other provisions of the CWA include Section 208, which authorizes the preparation of waste treatment management plans, and Section 319, which mandates specific actions for the control of pollution from nonpoint sources. The Environmental Protection Agency (U.S. EPA) has delegated responsibility for implementation of portions of the CWA to the State Water Resources Control Board (SWRCB) and the Regional Water Quality Control Board (RWQCB), including water quality control planning and control programs, such as the National Pollutant Discharge Elimination System (NPDES) Program.

##### **Floodplain Development**

FEMA is responsible for determining flood elevations and floodplain boundaries based on U.S. Army Corps of Engineers (USACE) studies and approved agency studies. FEMA is also responsible for distributing the Flood Insurance Rate Maps (FIRMs), which are used in the National Flood Insurance Program (NFIP). These maps identify the locations of special flood hazard areas (SFHAs), including the 100-year flood zone or area. Segment 1 contains a FEMA defined 100-year flood hazard area.

#### State

Responsibility for the protection of water quality in California rests with the State Water Resource Control Board (SWRCB) and nine RWQCBs. The SWRCB establishes statewide policies and regulations for the implementation of water quality control programs mandated by federal and state water quality statutes and regulations. The RWQCBs develop and implement Water Quality Control Plans (Basin Plans) that consider regional beneficial uses, water quality characteristics, and water quality problems. The Los Angeles RWQCB implements a number of federal and state laws, the most important of which are the state *Porter-Cologne Water Quality Control Act* and the federal CWA. In California, the RWQCB issues Water Quality Certifications pursuant to Section 401 of the CWA. This section of the CWA protects water quality within the Sepulveda Channel.

All projects resulting in discharges, whether to land or water, are subject to Section 13263 of the California Water Code and are required to obtain approval of Waste Discharge Requirements (WDRs) by the RWQCB. WDRs for discharges to surface waters meet requirements for

National Pollution Discharge Elimination System (NPDES) permits, which are further described below. Land and groundwater-related WDRs (i.e., non-NPDES WDRs) regulate discharges of privately or publicly treated domestic wastewater, and process and wash-down wastewater.

### **Porter-Cologne Water Quality Control Act**

The *Porter-Cologne Water Quality Control Act* authorizes the SWRCB to adopt, review, and revise policies for all waters of the U.S. (including both surface and groundwaters); regulates discharges to surface and groundwater; and directs the RWQCB to develop regional Basin Plans. Section 13170 of the *California Water Code* also authorizes the SWRCB to adopt water quality control plans on its own initiative.

### **National Pollutant Discharge Elimination System (NPDES)**

The NPDES permit system was established in the CWA to regulate point source discharges—a municipal or industrial discharge at a specific location or pipe—to surface waters of the U.S. Two exceptions that are regulated under the NPDES program are (1) diffuse source discharges caused by general construction activities of over 1 acre and (2) stormwater discharges in municipal stormwater systems as a separate system in which runoff is carried through a developed conveyance system to specific discharge locations.

### **Construction General Permit**

The SWRCB permits all regulated construction activities under Order No. 98-08-DWQ (1999), which requires that, prior to beginning any construction activities, the permit applicant must obtain coverage under the Construction General Permit by preparing and submitting a Notice of Intent (NOI) to the SWRCB, and preparing and implementing a Stormwater Pollution Prevention Plan (SWPPP), in accordance with the Construction General Permit requirements, for all construction activities disturbing one or more acre of land surface. In addition, 2003 revisions to the original Construction General Permit clarify that all construction activity, including small construction sites that are part of a larger common plan, must obtain coverage under this Construction General Permit. Because construction of the Expo Phase 2 project would disturb more than 1 acre, it would be subject to these permit requirements. Construction impacts are discussed in Chapter 4 (Construction Impacts).

### **Industrial General Permit**

The SWRCB and RWQCBs regulate all specified industrial activities, such as the proposed maintenance facility, under the *Waste Discharge Requirements for Discharges of Storm Water Associated with Industrial Activities Excluding Construction Activities* (SWRCB Order No. 97-03-DQ, NPDES General Permit No. CAS000001). Industrial facility operators must comply with all of the conditions of the Industrial General Permit. Noncompliance constitutes a violation of the *Clean Water Act* (CWA) and the *Porter-Cologne Water Quality Control Act* and is grounds for (a) enforcement action; (b) Industrial General Permit termination, revocation and reissuance, or modification; or (c) denial of an Industrial General Permit renewal application. The proposed project is a Category 8 industrial discharger because of the associated maintenance facility (Category 8 includes transportation facilities that conduct any type of vehicle maintenance such as fueling, cleaning, repairing, and others) and, therefore, is subject to conditions of the Industrial General Permit.

**Regional**

**Water Quality Control Plan for the Los Angeles Region (Basin Plan)**

The Los Angeles RWQCB has prepared the Basin Plan in accordance with state and federal law. The Basin Plan sets forth the regulatory water quality standards for surface waters and groundwater within its region. The applicable water quality standards address both the designated beneficial use for each water body and the water quality objectives to meet designated beneficial uses. Where multiple designated beneficial uses exist, water quality standards must protect the most sensitive use. Water quality objectives are typically numeric, although narrative criteria, based upon biomonitoring methods, may be employed where numerical objectives cannot be established or where they are needed to supplement numerical objectives.

**Total Maximum Daily Loads (TMDL)**

In accordance with the federal CWA and state *Porter-Cologne Water Quality Control Act*, TMDLs have been developed and incorporated into the Basin Plan for some pollutants identified on the 303(d) list as causing contamination in project sites receiving waters. For other pollutants listed on the 303(d) list (e.g., Section 303[d] of the *Clean Water Act*), TMDLs are scheduled for development, undergoing development, or in the process of review by the SWRCB.

**Municipal NPDES Permit**

The study area is located in Los Angeles County and would be regulated under the Los Angeles County Municipal NPDES Stormwater Permit (Municipal NPDES Permit), NPDES Permit No. CAS004001 (Order No. 01-182) (LARWQCB 2007). Under the Municipal Permit, development would have to comply with the Los Angeles County Master Drainage Plan (MDP) and the Standard Urban Stormwater Mitigation Plan (SUSMP).

Master Drainage Plan (MDP) for the Los Angeles County

The Los Angeles County Department of Public Works (LACDPW) has developed MDPs that address many individual watershed areas within the District's jurisdiction. The MDPs include proposed drainage facilities to protect upstream and downstream properties from serious flooding.

Standard Urban Storm Water Mitigation Plan (SUSMP)

The SUSMP requires that all projects that fall into one of nine categories incorporate appropriate SUSMP requirements into the project plans. One of the nine categories includes development of parking lots of 5,000 square feet or more or with 25 or more parking spaces. The SUSMP and Site-Specific Stormwater Mitigation Plans must be incorporated into project plans. Numerical design criteria for volumetric or flow-based treatment controls are included in Section 5.50.040. Prior to receiving a Final Inspection or Occupancy Permit, whichever is applicable, verification that construction of all stormwater pollution control BMPs and structural and/or treatment control BMPs identified on the approved project plans have been completed is required through a signed certification statement.

**Discharge of Nonhazardous Contaminated Soils WDRs**

*Waste Discharge Requirements for Discharge of Non-Hazardous Contaminated Soils and Other Wastes in Los Angeles River and Santa Clara River Basins (Order No. 91-93)* allows the disposal of up to 100,000 cubic yards of nonhazardous contaminated soils and other wastes for a maximum period of 90 days. This requirement applies to the proposed project because there are known contaminated soils near the alignments and because portions of the alignments are along an old railroad right-of-way, where contaminated soils may exist (refer to Section 3.9 [Hazards and Hazardous Materials] for areas of potential contamination). This WDR also requires that waste used as soil backfill shall not contain any substance in concentrations toxic to human, animal, plant, or aquatic life. ~~This~~ The Construction General Permit allows for temporary stockpiling of nonhazardous, contaminated soils until they can be appropriately disposed of or reused, per permit conditions.

**Construction Dewatering General Permit**

*Waste Discharge Requirements for Discharges of Groundwater from Construction Project Dewatering to Surface Waters In Coastal Watersheds of Los Angeles and Ventura Counties (R4-2008-0032, General NPDES Permit No. CAG994004)*. Discharges covered by this permit include, but are not limited to, treated or untreated groundwater generated from permanent or temporary dewatering operations. This permit includes effluent and receiving water limitations for metals and other potential contaminants in discharges from dewatering operations to freshwater and saltwater, as well as monitoring and reporting requirements. This WDR would apply to the proposed project if there were construction dewatering activities. Construction impacts are discussed in Chapter 4 (Construction Impacts).

**3.10.4 Analytic Methodology**

The methodology for evaluating hydrology and/or water quality impacts involved an analysis of existing data related to flooding, drainage, water quality, evaluation of the project’s runoff potential and drainage/treatment facilities, and an assessment of project consistency with laws pertaining to hydrology and water quality. Each of the LRT Alternatives would be designed and operated similarly; therefore, for the purposes of this analysis, the LRT Alternatives are discussed together, except where an LRT Alternative would have impacts that would be substantially different from the others.

**3.10.5 Criteria, Impact Evaluation, and Mitigation Measures**

<b>Criterion</b> <b>Would the proposed project conflict with applicable legal requirements related to hydrology or water quality, including a violation of state water quality standards or waste discharge requirements?</b>
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The applicable WDRs for the Expo Phase 2 project are specified in the Municipal NPDES Permit and the Industrial General Permit. As stated above, construction impacts are discussed in Chapter 4 (Construction Impacts); the Construction General Permit, the Discharge of Non-Hazardous Contaminated Soils WDRs, and the Construction Dewatering WDRs are considered there.

### **No-Build Alternative**

There would be roadway and transit service improvements associated with the No-Build Alternative. However, the only improvement that would change the physical environment in the Expo Phase 2 ROW would be the I-405 Widening project. Widening the I-405 would physically modify the area and impact water discharge, but no conflict is anticipated. The project would comply with Caltrans NPDES permit regulations, runoff would drain into freeway storm drains instead of city storm drains, and the project would not further impair 303(d)-listed water bodies. Potential operational impacts on water quality associated with increased bus capacity would be minimal. Therefore, the No-Build Alternative would not violate any water quality standards or waste discharge requirements. The No-Build Alternative would result in a ***less-than-significant*** impact.

### **Transportation Systems Management (TSM) Alternative**

The TSM Alternative would include all of the improvements under the No-Build Alternative and new on-street bus services to directly serve the Expo Phase 2 community transit needs. Those additional improvements would include minor physical modifications such as upgraded bus stops and additional buses. As a result, operational effects on water quality would be minimal, and the TSM Alternative would result in a ***less-than-significant*** impact.

### **LRT Alternatives**

Pollutants and their concentrations in runoff vary according to land cover, land use, topography, and the amount of impervious cover, as well as the intensity and frequency of irrigation or rainfall. Runoff in developed areas may typically contain oil, grease, and metals accumulated in streets, driveways, parking lots, and rooftops, as well as pesticides, herbicides, particulate matter, nutrients, animal waste, and other oxygen-demanding substances from landscaped areas.

The LRT Alternatives could result in a small amount of additional impervious areas in Segment 1 (approximately 1.1 acre), Segment 1a (approximately 0.7 acre), and Segment 3 (approximately 0.6 acre) for stations, station parking facilities, and the guideway. It is anticipated that the proportion of impervious to pervious surfaces in the study area would remain similar to existing conditions with implementation of the LRT Alternatives—that is, the mostly paved study area would remain paved. In some cases, such as at the Maintenance Facility, existing impervious surface cover would be replaced with pervious surface cover. Therefore, facilities associated with the LRT Alternatives would not contribute to a substantial increase in stormwater runoff. Moreover, all runoff leaving the alignments would be routed to existing underground storm drain systems and/or lined channels. Therefore, any potential increase in stormwater runoff within the alignments would not cause or contribute to off-site erosion water quality or habitat degradation. Operation of the light-rail vehicles along the guideway would not be expected to cause or contribute to substantial additional pollutant loads because the vehicles would be powered by overhead electrical lines and would generate only a small increase in oil, grease, and metals.

The proposed maintenance facility would provide vehicle cleaning, maintenance, wheel truing facilities, and light repairs and could release oil and grease, metals, solvents (e.g., degreasing chemicals) onto surfaces that would potentially be flushed into the existing underground storm drain systems; however, Metro Fire/Life Safety Design Criteria would require that the drainage system for the Maintenance Facility include oil separators, grease and sand traps on all floor

drainage systems which service maintenance and vehicle storage areas to provide for the extraction of oil, grease, sand and other substances that are harmful or hazardous to the structure or public drainage systems, thereby reducing this impact. Additionally, all solvents used in association with the maintenance activities will be water based and, the *Metro Design Criteria* would require that the wash facility be equipped with required waste water treatment facility.

Also, trash and debris and other pollutants associated with the maintenance facility could be transported to the storm drain system; however, operation of the LRT Alternatives, including the *Maintenance Facility*, would be subject to existing regulatory requirements, including Best Management Practices (BMPs) for materials and waste handling and parking facility BMPs, as well as waste discharge requirements and the SUSMP, all of which would reduce or eliminate effects associated with these pollutants. Additionally, pursuant to the *Metro Design Criteria*, the Municipal Codes, and the Municipal NPDES Permit, the LRT Alternatives would be required to implement and maintain post-construction BMPs to reduce potential stormwater pollution.

The *Metro Design Criteria* requires that, at all stations, station parking lots, and the pedestrian pathway, sufficient trash containers be provided at convenient locations. Containers would be anchored to prevent loss of materials and covered to prevent rainfall comingling. Trash would be regularly removed. These measures would prevent adverse water quality effects associated with these gross pollutants.

Existing regulations, described in Section 3.10.3 (Regulatory Setting), would ensure that the LRT Alternatives would not violate any waste discharge requirements during operational activities. Therefore, operation of any of the LRT Alternatives would not violate water quality standards or waste discharge requirements and a ***less-than-significant*** impact would occur.

### **FEIR Design Options**

Development of the Sepulveda Grade Separation, Colorado Parking Retention, Colorado/4<sup>th</sup> Parallel Platform and South Side Parking, Maintenance Facility Buffer, or Expo/Westwood Station No Parking design options would involve minor alterations to the footprint of the proposed alignment; however, the operation or uses associated with the design options would not change from what was contemplated for the LRT Alternatives. Therefore, impacts with respect to proposed uses in those areas would be largely the same as the LRT Alternatives. In addition, the type of development that is contemplated under the design options is substantially similar to the LRT Alternatives such that compliance with *Metro Fire/Life Safety Design Criteria*, *Metro Design Criteria*, and other existing regulatory requirements, such as BMPs, would insure impacts are ***less than significant***, consistent with the LRT Alternatives discussion above.

<p><b>Criterion</b>    <b>Would the proposed project substantially degrade groundwater quality or interfere with groundwater recharge, or deplete groundwater resources in a manner that would cause water-related hazards, such as subsidence?</b></p>
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### **No-Build Alternative**

There would be roadway and transit service improvements associated with the No-Build Alternative. However, the only improvement that would change the physical environment in the Expo Phase 2 ROW would be the I-405 Widening project. The paving associated with this portion of the project in the Expo ROW would not be expected to affect groundwater recharge in

the area. The existing drainage systems are sufficient to contain and treat anticipated increased runoff and no increase in pollutant loadings is anticipated that would percolate into groundwater. Bus and other on-street improvements are also proposed as part of the No-Build Alternative but they would not involve ground disturbance or interference with groundwater quality or recharge. Therefore, the No-Build Alternative would not increase groundwater supply withdrawals, would not alter groundwater recharge potential, and would not affect groundwater quality. The No-Build Alternative would result in **no impact**.

### **Transportation Systems Management (TSM) Alternative**

The TSM Alternative would include all of the improvements under the No-Build Alternative and new on-street bus services to directly serve the Expo Phase 2 ~~study area~~community transit needs. Those additional improvements would include minor physical modifications such as upgraded bus stops and additional buses, which would not affect groundwater resources. As with the No-Build Alternative, the TSM Alternative would result in **no impact**.

### **LRT Alternatives**

No new wells would be developed as part of the LRT Alternatives ~~and there~~. However, an environmental site assessment was conducted after the preliminary selection of the Recommended Preferred Alternative in the fall 2009, which identified that groundwater monitoring wells are located within the Expo ROW. Therefore, the Expo Authority would be required to remove any existing groundwater monitoring wells located within the ROW, as required by state law, and in coordination with the RWQCB. There would be no direct effect on groundwater levels. Potential indirect effects on groundwater levels are discussed below.

Potential groundwater recharge within the Santa Monica Basin is primarily from upland runoff through streams and over land surfaces. Direct precipitation on the basin within the proposed project study area is not a major source of groundwater recharge. However, groundwater recharge could be impeded if a substantial amount of pervious (i.e., unpaved) area was converted to impervious (i.e., paved) surfaces. Pervious portions of the alignment would remain essentially pervious (ballast or crushed rock guideway) except for the Expo/Westwood Station parking facility area between Overland Avenue and Westwood Avenue in Segment 1, and the Expo/Bundy Station parking facility between Barrington and Centinela in Segment 2, which would be paved. Therefore, the LRT Alternatives may create some additional impervious areas with construction in Segment 1 (approximately 1.1 acres), Segment 1a (approximately 0.7 acre), and Segment 3 (approximately 0.6 acre) for stations, station parking facilities, and the guideway. However, because rainfall is not a major source of groundwater recharge in the study area, the increase in impervious surface created by the project would not substantially affect groundwater recharge. The development of the remainder of Segment 2 and Segment 3a would not increase pervious area as the majority of these segments are paved currently. Further, portions of the currently paved Verizon site would be converted to pervious surface with development of the Maintenance Facility at that site.

Generally, the alignment is underlain by contaminated groundwater. However, as discussed in the Hydrology/Water Quality Technical Background Report and based on the conceptual engineering design and proposed construction and operation BMPs, the project would not contribute to or be affected by this existing condition and the effect to the project is considered low. The LRT Alternatives would result in a **less-than-significant** impact.

**FEIR Design Options**

Development of the Sepulveda Grade Separation, Colorado Parking Retention, Colorado/4<sup>th</sup> Parallel Platform and South Side Parking, Maintenance Facility Buffer, or Expo/Westwood Station No Parking design options would involve minor alterations to the footprint of the proposed alignment; however, the level of impervious surfaces would not dramatically increase with the Sepulveda Boulevard Grade Separation Design Option, Colorado Parking Retention, Colorado/4<sup>th</sup> Parallel Platform and South Side Parking. The Maintenance Facility Buffer Design Option could, to some degree, increase the level of pervious surfaces in the buffer zone. The Expo/Westwood Station No Parking Design Option would reduce the level of pervious surfaces with the reduction of surface parking spaces from 170 to 20. The potential impacts associated with the design options relative to groundwater resources would be ***less than significant***, consistent with the above discussion for the LRT Alternatives.

<p><b>Criterion</b>    <b>Would the proposed project alter the existing drainage pattern of the site or area in a manner that would cause substantial flooding, erosion, or siltation?</b></p>
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**No-Build Alternative**

There would be roadway and transit service improvements associated with the No-Build Alternative. However, the only improvement that would change the physical environment in the Expo Phase 2 ROW would be the I-405 Widening project. For the I-405 Widening project, a Construction SWPPP would be prepared to ensure compliance with existing NPDES permits and implementation of BMPs would prevent sediment and other pollutants from entering the storm drain system. Four drainages need to be relocated but they are not located in the Expo Phase 2 ROW. Bus and other on-street improvements are also proposed in the No-Build Alternative but these modifications would occur in a highly urbanized area and would not alter drainage patterns affect wetlands. Therefore, the No-Build Alternative would result in ***no impact*** with respect to drainage.

**Transportation Systems Management (TSM) Alternative**

The TSM Alternative would include all of the improvements under the No-Build Alternative and new on-street bus services to directly serve the Expo Phase 2 -community transit needs. Those additional improvements would include minor physical modifications such as upgraded bus stops and additional buses, which would not alter drainage patterns. As with the No-Build Alternative, the TSM Alternative would result in ***no impact***.

**LRT Alternatives****Segment 1: Expo ROW (LRT Alternatives 1 and 2)**

Increased impervious area can greatly alter runoff from small, frequent flood events by up to 10 times increased flow rate (SCBWM 2003, 4-10). Development of the parking facility at the Expo/Westwood Station would increase the amount of impervious area by approximately 1 acre, which could contribute to localized flooding within this area and vicinity. This is a potentially significant impact. Implementation of mitigation measure MM WQ-1 would reduce potential effects of localized flooding within the 100-year flood zone in Segment 1 to a ***less-than-significant*** level.

MM WQ-1

*The Expo Authority shall grade the Expo/Westwood Station and associated station parking facility and provide a stormwater drainage system with detention facilities and/or pervious pavement adequate to convey runoff from the Expo/Westwood Station during a 100-year storm event to prevent on-site flooding. The Expo Authority shall also implement stormwater detention facilities and/or pervious pavement for parking lots to reduce the off-site peak runoff from the Expo/Westwood Station and associated parking lots to existing condition levels. All detention facilities shall be designed to drain within 48 hours to minimize vector control and human safety concerns.*

*The Expo Authority shall include these facilities and their design specifications in the engineering plans. Use of pervious pavement shall be consistent with the SUSMP and Municipal NPDES Permit limitations on infiltration BMPs. Construction and operation of these BMPs shall be incorporated as part of the proposed project and subject to all applicable existing regulatory requirements.*

#### FEIR Design Options

The Expo/Westwood Station No Parking Design Option would reduce the number of surface parking spaces from 170 to 20; however, the area of development would remain largely the same with implementation of this design option. Mitigation measure WQ-1 would reduce potential impacts associated with altering the existing drainage of this area to **less than significant**.

The Sepulveda Boulevard Grade Separation Design Option, which is the only other design option located within Segment 1 (Expo ROW), would not increase the amount of impervious surface over the at-grade crossing configuration. Impacts would be **less than significant**, similar to the LRT Alternatives.

#### **Segment 1a: Venice/Sepulveda, Segment 2: Sepulveda to Cloverfield, Segment 3: Olympic, and Segment 3a: Colorado (All LRT Alternatives)**

There would be site grading and some increase in impervious surface within Segment 1a, Segment 2, Segment 3, and Segment 3a, but the existing area topography would be retained. Further, portions of the currently paved Verizon site would be converted to pervious surface with development of the Maintenance Facility at that site. While the volume of runoff water would increase, the existing drainage pattern of the site and its surroundings would not be changed in a manner that would result in substantial flooding, erosion, or siltation, and a **less-than-significant** impact would occur.

#### FEIR Design Options

The proposed Colorado Parking Retention and Colorado/4<sup>th</sup> Street Parallel Platform Design Options would involve minor alterations to the existing alignment that would not alter the drainage pattern of the area, beyond that already discussed above for the LRT Alternatives. Further, the 100- to 110-foot buffer to the south of the proposed Maintenance Facility Buffer Design Option could potentially replace existing structures and paved surfaces with a pervious surface. As such, the potential for additional flooding and erosion impacts with implementation of the contemplated design options would be minimal. Impacts would be **less than significant**, consistent with the project analysis.

<b>Criterion</b> Would the proposed project create or contribute to runoff that would exceed the drainage and flood control capacity of existing or planned stormwater drainage systems?
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### **No-Build Alternative**

There would be roadway and transit service improvements associated with the No-Build Alternative. However, the only improvement that would change the physical environment in the Expo Phase 2 ROW would be the I-405 Widening project. In total, the I-405 Widening project would include paving of permeable land (14.3 acres) and disturb 121 acres of soil area. Bus and other on-street improvements are also proposed as part of the No-Build Alternative but would not adversely affect drainage systems. Therefore, the No-Build Alternative could alter runoff conditions but would not contribute to drainage system capacity exceedance. The No-Build Alternative would result in a ***less-than-significant*** impact.

### **Transportation Systems Management (TSM) Alternative**

The TSM Alternative would include all of the improvements under the No-Build Alternative and new on-street bus services to directly serve the Expo Phase 2 community transit needs. Those additional improvements would include minor physical modifications such as upgraded bus stops and additional buses which would not contribute to additional runoff. As with the No-Build Alternative, the TSM Alternative would result in a ***less-than-significant*** impact.

### **LRT Alternatives**

Because the LRT Alternatives would not substantially increase flooding or runoff as previously discussed, and the project would implement mitigation measure MM WQ-1, the LRT Alternatives would not contribute to flows exceeding the capacity of existing or planned stormwater drainage systems, and impacts would be ***less than significant***.

### **FEIR Design Options**

Development of the Sepulveda Grade Separation, Colorado Parking Retention, Colorado/4<sup>th</sup> Parallel Platform and South Side Parking, Maintenance Facility Buffer, or Expo/Westwood Station No Parking design options would involve minor alterations to the existing alignment that would not alter the drainage pattern of the area beyond that already discussed above for the LRT Alternatives. The 100- to 110-foot buffer to the south of the proposed Maintenance Facility Buffer Design Option could potentially replace existing structures and paved surfaces with a pervious surface, and the Expo/Westwood Station No Parking Design Option would reduce impervious surfaces, with a reduction in surface parking from 170 to 20 spaces. However, the potential for additional stormwater flows that could exceed the capacity of the local storm drainage facilities with implementation of the contemplated design options would be minimal. Impacts would be ***less than significant***, consistent with the LRT Alternatives.

<b>Criterion</b> Would the proposed project place within a 100-year flood hazard area structures that would impede or redirect flood flows, or otherwise expose people and/or property to water-related hazards, such as flooding?
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### **No-Build Alternative**

There would be roadway and transit service improvements associated with the No-Build Alternative. However, the only improvement that would change the physical environment in the Expo Phase 2 ROW would be the I-405 Widening project. There is no 100-year flood hazard area associated with the 405 project within the Expo Phase 2 ROW. Bus and other on-street improvements are also proposed as part of the No-Build Alternative but such improvements would not affect flood flows. Therefore, the No-Build Alternative would result in ***no impact*** associated with flooding hazards.

### **Transportation Systems Management (TSM) Alternative**

The TSM Alternative would include all of the improvements under the No-Build Alternative and new on-street bus services to directly serve the Expo Phase 2 community transit needs. Those additional improvements would include minor physical modifications such as upgraded bus stops and additional buses. In addition to the impacts identified in the No-Build Alternative, the TSM Alternative would construct upgraded bus stops. However, the new on-street improvements would not affect flood flows. Therefore, the TSM Alternative would result in ***no impact*** associated with flooding hazards.

### **LRT Alternatives**

#### **Segment 1: Expo ROW (LRT Alternatives 1 and 2)**

The proposed Expo/Westwood Station would be located within an area designated as a 100-year flood hazard area Zone A, as illustrated by Figure 3.10-2 (100-Year Floodplains). Placement of the LRT system within a designated 100-year flood hazard area would result in a potentially significant impact. Initial surveys appropriate for this stage of project development suggest that project facilities would not be at an elevation that would result in flood hazard. This is further bolstered by the fact that several properties in the area have successfully obtained Letters of Map Amendment (LOMA) from FEMA, demonstrating that those properties, or portions of the property, are not at an elevation that would result in flood hazard.

Since ~~Should~~ Segment 1 be part of the ~~Locally-preliminary Recommended Preferred Alternative (LPA)~~, the Expo Authority ~~will~~ conducted a detailed survey in August 2009 to ~~during PE, and would request~~ a determination from FEMA that distinguishes the station area as outside the 100-year flood hazard area. Based on the survey, it was determined that the minimum conditions for approval of a LOMA application are not satisfied. Since the mitigation measure MMWQ 2(a) to submit an application to FEMA for a LOMA is no longer applicable, it was eliminated. Instead, a Letter of Map Revision (LOMR) is the more appropriate mechanism to remove the project from the 100-year flood hazard area.

Removing the proposed project alignment from the FEMA-defined 100-year flood hazard area, or mitigating potential flooding, would ensure that the LRT system is not exposed to service disruption during a flood event and that people and structures are not exposed to flood risks.

This can be accomplished through implementation of either of the mitigation measures described below.

~~MM WQ-2(a) The Expo Authority shall conduct a detailed topographic survey of the Segment 1 (Expo ROW) within the Federal Emergency Management Agency (FEMA)-defined 100-year flood hazard area, including Westwood Boulevard, and extending at least 50 feet beyond the proposed project ROW. The Expo Authority shall consult with the Los Angeles County Department of Public Works and/or FEMA to determine the current flood elevations within this area. The Expo Authority shall submit an application to FEMA for a LOMA, removing the proposed project alignment from the FEMA 100-year flood hazard area.~~

OR:

MM WQ-2(b) The Expo Authority shall design drainage and flood protection improvements to remove the portion of the LRT Alternative from the Federal Emergency Management Agency (FEMA)-defined 100-year flood hazard area. This shall include sufficient drainage structures to pass existing flood flow from areas up-gradient from the portion of the LRT Alternative to areas down-gradient, such that there is no net change in off-site flooding and flood flows or on storm drain system capacity. This may include rerouting of flood waters from Westwood Boulevard at locations further north from the portion of the LRT Alternative to bypass the alignment corridor and Westwood Boulevard intersection.

Prior to the beginning of construction activities, the Expo Authority shall submit to FEMA an application for and obtain a Conditional Letter of Map Revision (CLOMR) and shall implement all conditions imposed by FEMA. The CLOMR would ensure that the project design is sufficient for removing the portion of the LRT Alternative from the 100-year flood hazard area. Prior to the beginning of operation, the Expo Authority shall obtain a Letter of Map Revision (LOMR), and potentially a No Rise Certificate, indicating that construction and implementation of the designed improvements have been conducted in accordance with the CLOMR and FEMA requirements and that the proposed project alignment corridor has been effectively removed from the 100-year flood hazard area.

Implementation of Segment 1 (Expo ROW) would use fill material, or place other structures (such as station platforms) in the floodplain, that could impede flood flows or reduce flood storage capacity. Therefore, MM WQ-2(b) shall not include use of fill material within an existing floodplain unless sufficient additional detention and flood storage is also provided. Any detention used as part of the flood improvements shall be designed to drain within 48 hours to minimize vector control and human safety issues.

The Expo Authority shall include any facilities used for flood improvements and their design specifications in the engineering drawings. As such, construction and operation of these facilities shall be incorporated as part of the proposed project and subject to existing regulatory requirements.

With implementation of mitigation measure MM WQ-2(b), LRT Alternatives 1 and 2 would result in a **less-than-significant** impact in terms of flood hazards.

FEIR Design Options

The Expo/Westwood Station No Parking Design Option would reduce the number of surface parking spaces from 170 to 20, reducing the station construction footprint within the 100-year flood hazard area; however, the area of overall development for the LRT guideway and station platforms would remain largely the same with implementation of this design option. Mitigation measure WQ-2 would ensure that impacts remain **less than significant** with development of the Expo/Westwood Station No Parking Design Option.

The contemplated Sepulveda Boulevard Grade Separation Design Option, which is located within Segment 1 (Expo ROW), would not be located within a 100-year flood hazard area. As such, **no impact** would occur.

**Segment 1a: Venice/Sepulveda, Segment 2: Sepulveda to Cloverfield, Segment 3: Olympic, and Segment 3a: Colorado (All LRT Alternatives)**

Segment 1a, Segment 2, Segment 3, and Segment 3a (all LRT Alternatives) are not located within a flood hazard area; therefore, development in these areas would have **no impact** associated with flood hazards.

FEIR Design Options

The contemplated Maintenance Facility Buffer, Colorado Parking Retention, and Colorado/4<sup>th</sup> Street Parallel Platform design options would not be located within a 100-year flood hazard area. As such, **no impact** would occur.

**Impact Summary by Alternative**

Table 3.10-1 (Summary of Hydrology/Water Quality Impacts by LRT Alternative) provides a summary of the anticipated hydrology and water quality impacts by LRT Alternative.

**Table 3.10-1 Summary of Hydrology/Water Quality Impacts by LRT Alternative**

LRT Alternative	Impact Findings with Mitigations			
	Surface Water Quality	Groundwater Quality	Drainage Patterns and Runoff Capacity	Flood Hazards
LRT 1: Expo ROW–Olympic	NI	NI	With MM WQ-1, Expo/Westwood Station—Localized Flooding would be LTS	With MM WQ-2, Potential Flooding—100-Year Flood Zone would be LTS
LRT 2: Expo ROW–Colorado	NI	NI	With MM WQ-1, Expo/Westwood Station—Localized Flooding would be LTS	With MM WQ-2, Potential Flooding—100-Year Flood Zone would be LTS
LRT 3: Venice/Sepulveda–Olympic	NI	NI	NI	NI
LRT 4: Venice/Sepulveda–Colorado	NI	NI	NI	NI

SOURCE: DMJM Harris.

NI= no impact; LTS= less than significant