3.10 Hydrology and Water Quality

3.10.1 Introduction

This section describes the regulatory and environmental setting for hydrology and water quality in in the vicinity of the Proposed Project and the Atwater Station Alternative. It also describes the impacts on hydrology and water quality that would result from implementation of the Proposed Project and the Atwater Station Alternative, and the mitigation measures that would reduce significant impacts, where feasible and appropriate.

Section 3.16, *Safety and Security* discusses the potential for accident conditions involving passenger trains that could affect water quality. Cumulative impacts on hydrology and water quality, in combination with planned, approved, and reasonably foreseeable projects, are discussed in Chapter 4, *Other CEQA-Required Analysis.*

3.10.2 Regulatory Setting

This section summarizes federal, state, regional, and local regulations related to hydrology and water quality and applicable to the Proposed Project and the Atwater Station Alternative.

3.10.2.1 Federal

Clean Water Act

The primary federal law governing water quality is the Clean Water Act (CWA) of 1972. The CWA provides for the restoration and maintenance of the chemical, physical, and biological integrity of the nation's waters. The CWA also limits the amount of pollutants that may be discharged and requires wastewater to be treated with the best treatment technology economically achievable regardless of receiving water conditions. The control of pollutant discharge is established through National Pollutant Discharge Elimination System (NPDES) permits that contain effluent limitations and standards. The U.S. Environmental Protection Agency (USEPA) has delegated responsibility for implementation of portions of the CWA, such as Sections 303, 401, and 402 (discussed in this section), to the State Water Resources Control Board (State Water Board).

Clean Water Act Section 303(d) and Total Maximum Daily Loads

California adopts water quality standards to protect beneficial uses of waters of the state as required by Section 303(d) of the CWA and the Porter-Cologne Water Quality Control Act of 1969 (Porter-Cologne Act). Section 303(d) of the CWA established the total maximum daily load (TMDL) process to guide the application of state water quality standards. Implementation of this program for the Proposed Project is conducted by the Central Valley Regional Water Quality Control Board (Central Valley Water Board) (see Section 3.10.2.2, *State*). To identify candidate waterbodies for TMDL analysis, a list of water quality–impaired segments is generated by the State Water Board. These stream or river segments are impaired by the presence of pollutants such as sediment and are more sensitive to disturbance because of this impairment.

In addition to the impaired waterbody list required by CWA Section 303(d), CWA Section 305(b) requires states to develop a report assessing statewide surface water quality. Both CWA requirements are being addressed through the development of a 303(d)/305(b) Integrated Report, which addresses an update to the 303(d) list and a 305(b) assessment of statewide water quality. The State Water Board developed a statewide 2012 California Integrated Report based on the Integrated Reports from each of the nine geographically separated Regional Water Quality Control Boards (Regional Water Boards). The 2012 California Integrated Report was approved by the State Water Board on April 8, 2012, and approved by USEPA on July 30, 2015.

Clean Water Act Section 401—Water Quality Certification

Section 401 of the CWA requires that an applicant pursuing a federal permit to conduct an activity that may result in a discharge of a pollutant obtain a Water Quality Certification (or waiver). A Water Quality Certification requires the evaluation of water quality considerations associated with dredging or placement of fill materials into waters of the United States. Water Quality Certifications are issued by one of the nine Regional Water Boards in California. Under the CWA, the Regional Water Board must issue or waive a Section 401 Water Quality Certification for a project to be permitted under CWA Section 404. Where a project would take place in two or more jurisdictional regions of the Regional Water Boards, the State Water Board would issue the Water Quality Certification.

As described in Chapter 2, *Project Description*, construction of the Proposed Project may require obtaining a Water Quality Certification if permanent facilities or construction disturbance are proposed within state jurisdictional waters.

Clean Water Act Section 402—National Pollutant Discharge Elimination System

The 1972 amendments to the Federal Water Pollutant Control Act established the NPDES permit program to control discharges of pollutants from point sources (Section 402). The 1987 amendments to the CWA created a new section of the CWA devoted to stormwater permitting (402(p)). USEPA has granted the State of California (the State Water Board and Regional Water Boards) primacy in administering and enforcing the provisions of CWA and NPDES. NPDES is the primary federal program that regulates point-source and nonpoint-source discharges to waters of the United States. CWA Section 402 also includes waste discharge requirements (WDR) for dewatering activities.

National Pollutant Discharge Elimination System Construction General Permit

The General NPDES Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities (Order 2012-0006-DWQ) (Construction General Permit) regulates stormwater discharges for construction activities under CWA Section 402. Dischargers whose projects disturb 1 or more acres of soil, or whose projects disturb less than 1 acre but are part of a larger common plan of development that in total disturbs 1 or more acres, are required to obtain coverage under the Construction General Permit. The Construction General Permit requires the development and implementation of a stormwater pollution prevention plan (SWPPP). The Construction General Permit also includes post-construction stormwater performance standards, which address water quality and channel protection.

The construction activities subject to this permit include clearing, grading, and disturbances to the ground such as stockpiling or excavation, but do not include regular maintenance activities

performed to restore the original line, grade, or capacity of the facility (AECOM 2016a). The Proposed Project and the Atwater Station Alternative would require a Construction General Permit because they would involve disturbances to more than an acre of ground, including clearing, grading, and excavation activities.

The Construction General Permit allows non-stormwater discharge (NSWD) of dewatering effluent if the water is not contaminated and is properly filtered or treated, using appropriate technologies such as retention in settling ponds and filtration using gravel and sand filters. If the dewatering activity is deemed by the local Regional Water Board not to be covered by the Construction General Permit, then the discharger would be required to prepare a Report of Waste Discharge (RWD), and if approved by the local Regional Water Board, be issued site-specific WDRs under NPDES regulations. Site-specific WDRs contain rigorous monitoring requirements and performance standards that, when implemented, ensure that receiving water quality is not substantially degraded.

The discharge of dewatering effluent is authorized under the Construction General Permit if the following conditions are met.

- The discharge does not cause or contribute to a violation of any water quality standard.
- The discharge does not violate any other provision of the Construction General Permit.
- The discharge is not prohibited by the applicable basin plan.
- The discharger has included and implemented specific best management practices (BMPs) required by the Construction General Permit to prevent or reduce the contact of the NSWD with construction materials or equipment.
- The discharge does not contain toxic constituents in toxic amounts or (other) significant quantities of pollutants.
- The discharge is monitored and meets the applicable numeric action levels.
- The discharger reports the sampling information in the annual report.

If any of the above conditions are not satisfied, the discharge of dewatering effluent is not authorized by the Construction General Permit. The discharger must notify the local Regional Water Board of any anticipated NSWDs not already authorized by the Construction General Permit or another NPDES permit, to determine whether a separate NPDES permit is necessary.

National Pollutant Discharge Elimination System Industrial General Permit

The NPDES General Permit for Stormwater Discharges Associated with Industrial Activities (Order 2014-0057-DWQ) (Industrial General Permit) regulates stormwater discharges and authorized NSWDs under CWA Section 402 from specific categories of industrial facilities, including rail transportation facilities with fueling and equipment cleaning operations. The Industrial General Permit does not apply to industrial stormwater discharges and NSWDs that are regulated by other individual or general NPDES permits. The Industrial General Permit requires the use of BMPs, best available technology economically achievable (BAT), and best conventional pollutant control technology (BCT) to reduce and prevent discharges of pollutants to meet applicable water quality standards. The Industrial General Permit includes requirements for training of personnel responsible for implementation of permit requirements; preparation of a SWPPP; and sampling, visual observations, reporting and record keeping (State Water Resources Control Board 2014). The Industrial General Permit expired June 30, 2020. Because the General Permit was not reissued or

replaced prior to the expiration date, it administratively continues in accordance with 40 Code of Federal Regulations 122.6 and remains in full force and effect. An unofficial draft is available until the State Water Board certifies the modified Industrial General Permit that contains the amendments adopted by the State Water Board in 2018. The Industrial Storm Water General Permit, as amended by Order 2015-0122-DWQ in 2018, includes new requirements effective as of July 1, 2020. The new requirements include sufficiently sensitive analytical test method implementation, Total Maximum Daily Load applicability and implementation, and compliance options to incentivize storm water capture and use.

National Pollutant Discharge Elimination System Municipal Stormwater Permits

CWA Section 402 mandates programmatic permits for municipalities to address stormwater discharges, which are regulated under the NPDES General Permit for Municipal Separate Storm Sewer Systems (MS4) (MS4 Permit). Phase I MS4 regulations cover municipalities with populations greater than 100,000 and Phase II (Small MS4) regulations cover municipalities with populations smaller than 100,000. NPDES permits for regulated MS4s require permittees to develop stormwater management plans, which describe the stormwater control practices that will be implemented consistent with permit requirements to minimize the discharge of pollutants from the sewer system.

The State Water Board is advancing low-impact development (LID) in California as a means of complying with municipal stormwater permits. LID incorporates site design, including the use of vegetated swales and retention basins and minimizing impermeable surfaces, to manage stormwater to maintain a site's predevelopment runoff rates and volumes.

Stormwater runoff from new stations (e.g., station parking lots, driveways, pedestrian paths, and landscaped areas) would be regulated by various NPDES permits under the Municipal Storm Water Permitting Program. Currently, stormwater runoff from railroad track alignments within the Union Pacific Railroad (UPRR) right-of-way (ROW) is not actively regulated under municipal NPDES permits because UPRR is not included on the list of non-traditional Small MS4 Permittees (State Water Resources Control Board 2013). The various NPDES permits that would be applicable are those associated with stations and are discussed in this section.

Central Valley Region

Stormwater discharges in the Central Valley Region (which includes Stanislaus County and Merced County) are regulated by various NPDES permits, including those discussed in this section.

Central Valley Regional Phase I MS4

A regional Phase I MS4 NPDES Permit for municipal stormwater discharges (NPDES Permit No. CAS0085324, State Water Board Order No. R5-2016-0040, known as the Central Valley Permit) became effective for the Central Valley Region (including San Stanislaus County and Merced County) beginning on October 1, 2016 (Central Valley Regional Water Quality Control Board 2016). The Central Valley Permit will be locally overseen by the Central Valley Water Board. Owners and operators of large and medium MS4s (i.e., municipalities with populations greater than 100,000) are expected to enroll under the Central Valley Permit as their current individual Phase I MS4 Permits expire. Owners and operators of small regulated MS4s (i.e., municipalities with populations less than 100,000) that are currently enrolled under the State Water Board's Statewide General Phase II MS4 Permit may voluntarily enroll under the Central Valley Permit. Current individual Phase I MS4

Permits and the Statewide General Phase II MS4 Permit that are applicable to the Proposed Project and the Atwater Station Alternative are described in this section.

The Central Valley Permit requires enrolled permittees to define the criteria and thresholds for the Priority Development Projects that will be required to incorporate appropriate stormwater mitigation measures, including LID source control, site design, stormwater treatment, and hydromodification management, into the design plan for their project. The Central Valley Permit indicates that the following projects are Priority Development Projects.

- Parking lots with 5,000 square feet or more or with 25 or more parking spaces.
- Redevelopment projects that add or create at least 5,000 square feet of impervious surface to the original developments; if the addition constitutes less than 50 percent of the original development, the design standard only applies to the addition.

Although the permittee's Storm Water Management Plan may include its own definition of Priority Development Projects, that definition must be designed to achieve equivalent protection of water quality as that achieved with the above criteria (Central Valley Regional Water Quality Control Board 2016). Improvements associated with new stations and the layover and maintenance facility would be Priority Development Projects under the Central Valley Permit because they would add or create more than 5,000 square feet of impervious surface.

Statewide General Phase II MS4

Municipal stormwater discharges in Merced County and in areas of Stanislaus County are currently regulated under the State Water Board's Statewide General Phase II MS4 NPDES Permit No. CAS000004, State Water Board Order No. 2013-0001-DWQ (Small MS4 Permit) (State Water Resources Control Board 2013). The Small MS4 Permit is locally overseen by local municipalities and the Central Valley Water Board in the Central Valley Region. The Small MS4 Permit indicates that regulated projects are required to incorporate appropriate stormwater mitigation measures, including LID source control, site design, stormwater treatment, and hydromodification management, into the design plan for projects that create or replace 5,000 square feet or more of impervious surface, including development, redevelopment, and roadwork projects. The new stations and layover and maintenance facility for the Proposed Project or for the Atwater Station Alternative would be regulated projects because they add or create more than 5,000 square feet of impervious surface.

Clean Water Act Section 404—Dredge/Fill Permitting

The discharge of dredged or fill material into waters of the United States is subject to permitting specified under Title IV (Permits and Licenses) of this act and specifically under Section 404 (Discharges of Dredge or Fill Material) of the CWA. Section 404 of the CWA regulates the placement of fill material into the waters of the United States. Section 404 Permits are administered by the U.S. Army Corps of Engineers (USACE).

A Section 404 Permit would be required for the Proposed Project, if structure foundations, other permanent features, or construction activities occur within federal jurisdictional waters.

National Flood Insurance Program

In response to increasing costs of disaster relief, Congress passed the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. The intent of these acts was to reduce the need for large, publicly funded, flood-control structures and disaster relief by restricting development on floodplains. The National Flood Insurance Program (NFIP) was created as a result of the passage of the National Flood Insurance Act of 1968. The Federal Emergency Management Agency (FEMA) administers the NFIP to provide subsidized flood insurance to communities that comply with FEMA regulations by limiting development in floodplains. FEMA issues Flood Insurance Rate Maps (FIRM) for communities participating in the NFIP. These maps delineate flood hazard zones in the community. A FIRM is the official map of a community prepared by FEMA to delineate both the special flood hazard areas (SFHA) and the flood risk premium zones applicable to the community.

The NFIP applies to Proposed Project because portions of the corridor are in FEMA-designated SFHAs, as discussed in Section 3.10.3, *Environmental Setting*. SFHAs are defined as the areas that will be inundated by a flood event having a 1 percent chance of being equaled or exceeded in any given year. The 1 percent annual chance flood is also referred to as the *base flood* or *100-year flood*. Other areas of flood hazards identified by FEMA include areas with reduced flood risk due to protection by levees.

3.10.2.2 State

Porter-Cologne Water Quality Control Act

The Porter-Cologne Act is the basic water quality control law for California. The Porter-Cologne Act authorizes the state to implement the provisions of the CWA and establishes a regulatory program to protect the water quality of the state and the beneficial uses of state waters.

The act requires project proponents whose projects would result in discharging, or proposing to discharge, wastes that could affect the quality of the state's water to file a RWD with the appropriate Regional Water Board. The Porter-Cologne Act also requires that State Water Board or a Regional Water Board adopt basin plans for the protection of water quality. Basin plans are updated and reviewed every 3 years and provide the technical basis for determining WDRs, taking enforcement actions, and evaluating clean water grant proposals. A basin plan must include the following sections.

- A statement of beneficial water uses that the Regional Water Board will protect.
- Water quality objectives needed to protect the designated beneficial water uses.
- Strategies and time schedules for achieving the water quality objectives.

The Proposed Project and the Atwater Station Alternative, as well as waters in the Sacramento River Basin and San Joaquin River Basin, are under the jurisdiction of the Central Valley Water Board. The basin plan for these areas is *The Water Quality Control Plan (Basin Plan) for the California Regional Water Quality Control Board, Central Valley Region* (Central Valley Basin Plan), revised in 2018 (Central Valley Regional Water Quality Control Board 2018). Counties within Central Valley Water Board's jurisdiction in which the Proposed Project and the Atwater Station Alternative are located include Stanislaus and Merced Counties.

Regional Water Boards designate beneficial uses for all waterbody segments in their jurisdictions, and then set criteria necessary to protect these uses. Consequently, the water quality objectives developed for particular water segments are based on the designated use and vary depending on such use. The Central Valley Basin Plan specifies region-wide and waterbody-specific beneficial uses and has set numeric and narrative water quality objectives for several substances and parameters in numerous surface waters in their regions. Specific objectives for concentrations of chemical constituents are applied to bodies of water based on their designated beneficial uses (Central Valley Regional Water Quality Control Board 2018).

In addition, the State Water Board identifies waters failing to meet standards for specific pollutants, which are then state-listed in accordance with CWA Section 303(d). If it is determined that waters of the state are impaired for one or more constituents and the standards cannot be met through point-source or nonpoint-source controls (e.g., NPDES permits or WDRs), the CWA requires the establishment of TMDLs.

California Department of Fish and Game 1602

Under Chapter 6 of the California Fish and Game Code (Fish & G. Code), the California Department of Fish and Wildlife (CDFW) is responsible for the protection and conservation of the state's fish and wildlife resources. Section 1602 et seq. of the code defines the responsibilities of CDFW. It indicates that an entity may not "divert or obstruct the natural flow of, or substantially change or use any material from the bed, channel, or bank of any river, stream, or lake, or deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake." This applies unless the CDFW informs the entity, in writing, that the activity will not substantially adversely affect an existing fish or wildlife resource, or if CDFW determines that the activity may substantially adversely affect an existing fish or wildlife resource and issues a final Streambed Alteration Agreement to the entity that includes reasonable measures necessary to protect the resource and the entity conducts the activity in accordance with the agreement.

The Proposed Project would involve permanent and temporary disturbances to the beds and banks of stream and rivers for the construction of bridges. Therefore, written notification of the construction activities would be provided to CDFW, in accordance with the notification requirements described in Fish & G. Code Section 1602. Streambed Alteration Agreements would be required for those construction activities that could adversely affect an existing fish or wildlife resource, as determined by CDFW.

California Department of Pesticide Regulation

California Department of Pesticide Regulation (DPR) is the lead agency for regulating the registration, sale, and use of pesticides in California. It is required by law to protect the environment, including surface waters, from adverse effects of pesticides by prohibiting, regulating, or controlling the use of such pesticides. DPR has surface water and groundwater protection programs that address sources of pesticide residues in surface waters and has preventive and response components that reduce the presence of pesticides in surface water and groundwater. The preventive component includes local outreach and promotion of management practices that reduce pesticide runoff and prevent continued movement of pesticides to groundwater in contaminated areas. To promote cooperation and to protect water quality from the adverse effects of pesticides, DPR and the State Water Board signed a Management Agency Agreement (MAA). The MAA, and its

companion document, *The California Pesticide Management Plan for Water Quality* (California Environmental Protection Agency and State Water Resource Control Board 1997*)*, are intended to coordinate interaction, facilitate communication, promote problem solving, and ultimately protect water quality.

Pesticides are used as a part of current operations and maintenance to maintain and clear vegetation from the UPRR ROW. The current and future use of pesticides for vegetation removal near the track alignment and other facilities as part of operation and maintenance activities must comply with DPR regulations.

Sustainable Groundwater Management Act

The Sustainable Groundwater Management Act of 2014 (SGMA) is a comprehensive three-bill package that Governor Jerry Brown signed into California state law in September 2014. The SGMA provides a framework for sustainable management of groundwater supplies by local authorities, with a limited role for state intervention only if necessary, to protect the resource. The plan is intended to ensure a reliable groundwater water supply for California for years to come. SGMA requires the formation of local Groundwater Sustainability Agencies (GSAs), which are required to adopt groundwater sustainability plans (GSPs) to manage the sustainability of groundwater basins. GSAs for all high- and medium-priority basins, as identified by the California Department of Water Resources (DWR), must adopt a GSP, or submit an alternative to a GSP. SGMA also requires governments and water agencies of high- and medium-priority basins to halt overdraft and bring groundwater basins into balanced levels of pumping and recharge.

The Proposed Project and the Atwater Station Alternative overlie the Turlock Subbasin and Merced Subbasin of the larger San Joaquin Valley Groundwater Basin. Both the Turlock and Merced Subbasins are designated as high priority basins. Groundwater in the Turlock Subbasin is managed under the Turlock Subbasin GSA. The Turlock Subbasin must be covered by a DWR-approved GSP by January 31, 2022. Groundwater in the Merced Subbasin in managed under the Merced Irrigation-Urban GSA. The Merced Subbasin GSP has been adopted by all three GSAs in the Merced Subbasin (Merced Irrigation-Urban GSA, Merced Subbasin GSA, and the Turner Island Water District GSA) and submitted to the DWR by the January 31, 2020 deadline. The GSAs are now moving into the GSP implementation phase.

Central Valley Flood Protection Board and Central Valley Flood Protection Act of 2008

The Central Valley Flood Protection Board (CVFPB), formerly the California Reclamation Board, regulates the alteration and construction of levees and floodways in the Central Valley, defined as part of the Sacramento Valley and San Joaquin Valley flood-control projects. The purpose and mission of CVFPB, with authority granted under the California Water Code and Title 23 of the California Code of Regulations (Cal. Code Regs.), is threefold.

- Control flooding along the Sacramento and San Joaquin Rivers and their tributaries in cooperation with USACE.
- Cooperate with various agencies of the federal, state, and local governments in establishing, planning, constructing, operating, and maintaining flood-control works.
- Maintain the integrity of the existing flood-control system and designated floodways through the board's regulatory authority by issuing permits for encroachments.

CVFPB requires applications to be filed for all proposed encroachments within the floodways under its jurisdiction and any levees adjacent thereto, as well as on streams that may affect those floodways. The Proposed Project would require encroachment permits from CVFPB because upgrades to existing tracks, new tracks, and new railroad bridges would be constructed across levees and across floodways under CVFPB's jurisdiction.

The Central Valley Flood Protection Act of 2008 directed DWR to prepare the Central Valley Flood Protection Plan (CVFPP) for CVFPB adoption (California Department of Water Resources 2012). The CVFPP was updated in 2017 (California Department of Water Resources 2017). The Central Valley Flood Protection Act of 2008 establishes that urban areas (i.e., any contiguous area in which more than 10,000 residents are protected by State Plan of Flood Control levees) require protection from flooding that has a 1-in-200 chance of occurring in any given year (200-year flood). The Proposed Project would encroach on levees and floodways under CVFPB's jurisdiction; therefore, compliance with CVFPP would be required.

CEQA Court Rulings on "Reverse CEQA"

The California Second District Court of Appeals has held that, although an environmental impact report (EIR) must analyze the environmental effects that may result from a project, an EIR is not required to examine the effects of the environment on a project (see *Ballona Wetlands Land Trust v. City of Los Angeles*, 201 Cal. App. 4th 455).

The California Supreme Court concluded in the *California Building Industry Association vs. Bay Area Air Quality Management District* (CBIA v. BAAQMD) decision, that "CEQA generally does not require an analysis of how existing environmental conditions will impact a project's future users or residents." The CBIA v. BAAQMD ruling provided for several exceptions to the general rule where an analysis of the project on the environment is warranted.

1. If the project would exacerbate existing environmental hazards (such as exposing hazardous waste that is currently buried)
2. If the project qualifies for certain specified exemptions (certain housing projects and transportation priority projects per California Public Resources Code [Public Res. Code] 21159.21 (f),(h); 21159.22 (a),(b)(3); 21159.23 (a)(2)(A); 21159.24 (a)(1),(3); or 21155.1 (a)(4),(6));
3. If the project is exposed to potential noise and safety impacts on the project occupants due to proximity to an airport (per Public Res. Code 21096)
4. School projects requiring specific assessment of certain environmental hazards (per Public Res. Code 21151.8).

3.10.2.3 Regional and Local

The San Joaquin Regional Rail Commission (SJRRC), a state joint powers agency, proposes improvements inside and outside of the UPRR ROW. The Interstate Commerce Commission Termination Act (ICCTA) affords railroads engaged in interstate commerce considerable flexibility in making necessary improvements and modifications to rail infrastructure, subject to the

requirements of the Surface Transportation Board.[1] ICCTA broadly preempts state and local regulation of railroads and this preemption extends to the construction and operation of rail lines. As such, activities within the UPRR ROW are clearly exempt from local building and zoning codes and other land use ordinances. The Proposed Project outside of the UPRR ROW and the Atwater Station Alternative, however, would be subject to regional and local plans and regulations. Though ICCTA does broadly preempt state and local regulation of railroads, SJRRC intends to obtain local agency permits for construction of facilities that fall outside of the UPRR ROW even though SJRRC has not determined that such permits are legally necessary or required.

Appendix G of this EIR, *Regional Plans and Local General Plans*, provides a list of applicable goals, policies, and objectives from regional and local plans of the jurisdictions in which the Proposed Project and the Atwater Station Alternative are located. Section 15125(d) of the California Environmental Quality Act (CEQA) Guidelines requires an EIR to discuss "any inconsistencies between the proposed project and applicable general plans, specific plans, and regional plans." These plans were considered during the preparation of this analysis and were reviewed to assess whether the Proposed Project and the Atwater Station Alternative would be consistent with the plans of relevant jurisdictions.[2] The Proposed Project and the Atwater Station Alternative would be generally consistent with the applicable goals, policies, and objectives related to hydrology and water quality identified in Appendix G.

3.10.3 Environmental Setting

This section describes the environmental setting related to hydrology and water quality for the Proposed Project and the Atwater Station Alternative. For the purposes of this analysis, the study area for hydrology and water quality includes the watersheds, tributaries, and receiving streams that are connected to the environmental footprints for the Proposed Project and the Atwater Station Alternative. Figure 3.10-1 depicts hydrologic basins and large watersheds, and Figure 3.10-2 depicts the groundwater basins and subbasins of the study area for hydrology and water quality.

The information presented in this section regarding locations of watersheds, sub watersheds, and surface waters was obtained from the U.S. Geological Survey (USGS) National Hydrography Dataset (NHD) (U.S. Geological Survey 2014). This section begins with a general discussion of regional hydrology, surface water and groundwater quality, and flooding. Following this discussion, a detailed description of the local hydrology is presented that includes information regarding watersheds, sub watersheds, and surface waters that may receive runoff; beneficial uses of surface water and water quality; groundwater basins and subbasins and water quality (including beneficial uses); and flooding hazards.

3.10.3.1 Regional Hydrology, Water Quality, and Flooding

Regional Hydrology and Water Quality

The Proposed Project is located in watersheds of the San Joaquin River Basin, which drains to the San Joaquin River. The San Joaquin River discharges to the Sacramento–San Joaquin Delta (Delta),

[1] The Altamont Corridor Express (ACE) operates within a ROW and on tracks owned by the UPRR, which operates interstate freight rail service in the same ROW and on the same tracks.

[2] An inconsistency with regional or local plans is not necessarily considered a significant impact under CEQA, unless it is related to a physical impact on the environment that is significant in its own right.

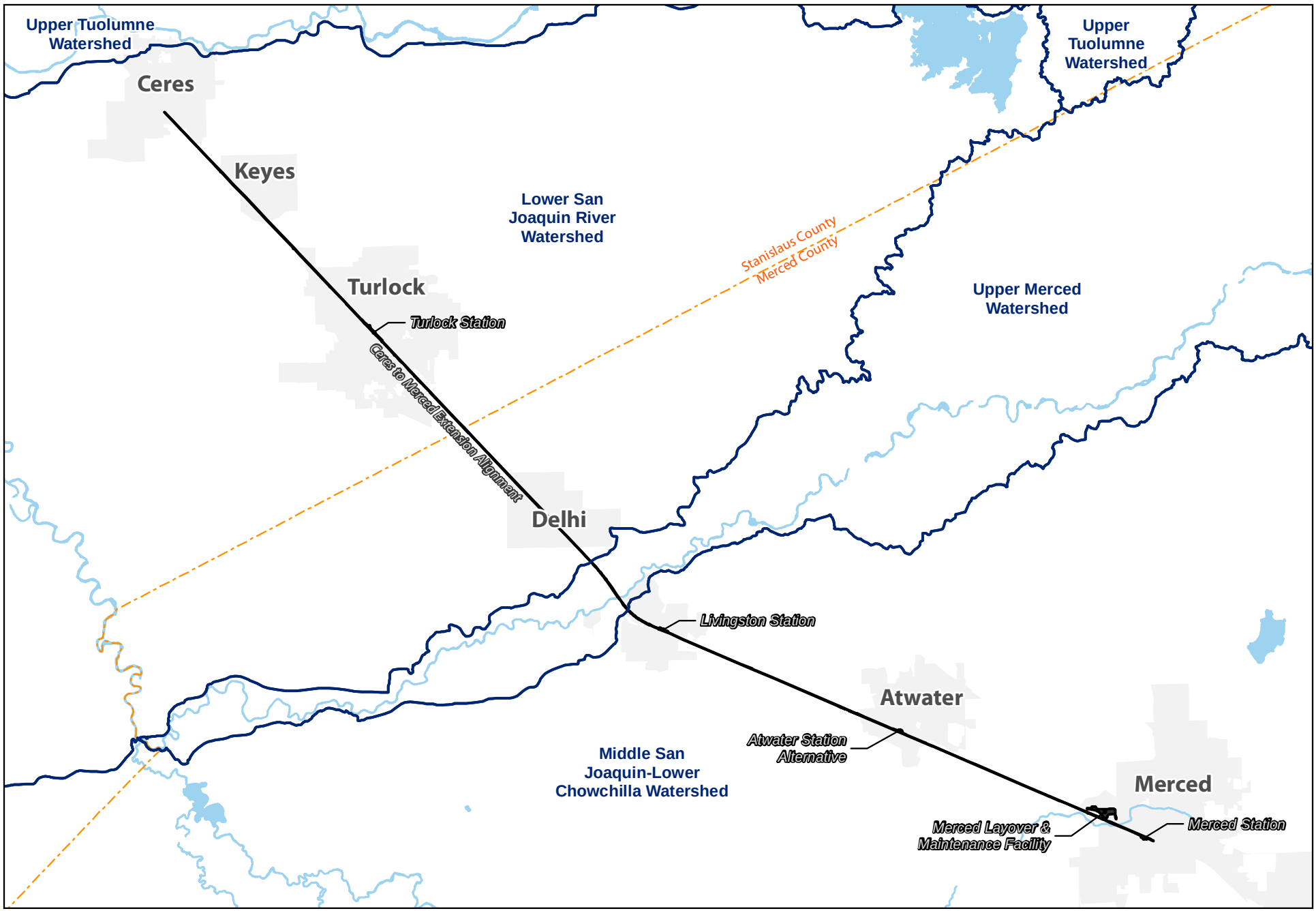
which discharges to San Francisco Bay. The San Joaquin River Basin includes all watersheds tributary to the San Joaquin River and the Delta south of the Sacramento River and south of the American River watershed. The principal streams in the basin are the San Joaquin River and its larger tributaries: the Cosumnes, Mokelumne, Calaveras, Stanislaus, Tuolumne, Merced, Chowchilla, and Fresno Rivers. Unless otherwise designated by the Central Valley Water Board, all groundwater in the San Joaquin River Basin is considered suitable or potentially suitable, at a minimum, for beneficial uses listed in Table 3.10-1 (Central Valley Regional Water Quality Control Board 2018).

In general, groundwater quality throughout the region is suitable for most urban and agricultural uses with only local impairments. A variety of historical and ongoing industrial, urban, and agricultural activities and their associated discharges degrade groundwater quality (California Department of Water Resources 2003). The primary pollutant sources and constituents of concern and existing and potential beneficial uses of the San Joaquin River are listed in Table 3.10-1. The State Water Board has listed various segments of the San Joaquin River as an impaired waterbody due to impacts from pollutants (State Water Resources Control Board 2018). The San Joaquin River Basin has TMDL projects currently underway as well as completed TMDL projects (Central Valley Regional Water Quality Control Board 2019). Pollutants causing impairment and TMDLs that have been approved by USEPA and officially incorporated into the Central Valley Basin Plan are listed in Table 3.10-1.

Table 3.10-1. Overview of Watershed Basin Traits

Watershed Basin	Groundwater Beneficial Uses	Primary Sources of Groundwater Contamination and Constituents of Concern	Surface Water Beneficial Uses	Surface Water Pollutants and Established TMDLs
San Joaquin River Basin	Municipal and domestic supply, agricultural supply, industrial service supply, industrial process supply.	Concentration of salts due to evaporation and poor drainage, disposal of human and animal waste products and fertilizer, agricultural pesticides and herbicides, and industrial organic contaminants. Constituents of Concern are TDS, nitrate, boron, chloride, organic compounds.	Municipal and domestic supply, agricultural supply, industrial supply, contact and non-contact recreation, warm and cold freshwater habitat, fish migration and spawning, and wildlife habitat.	Pesticides and heavy metals. TMDLs established for pesticides including diazinon and chlorpyrifos, metals including selenium and boron, salt, and dissolved oxygen.

Sources: Central Valley Regional Water Quality Control Board 2018; California Department of Water Resources 2003; State Water Resources Control Board 2018.
TDS = total dissolved solids.
TMDL = total maximum daily load.



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Direct Impacts Study Area
Hydrologic Basins

*Entire mapsheet is within the San Joaquin River Basin

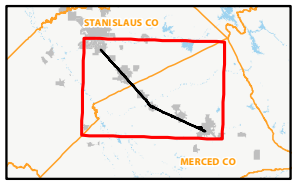
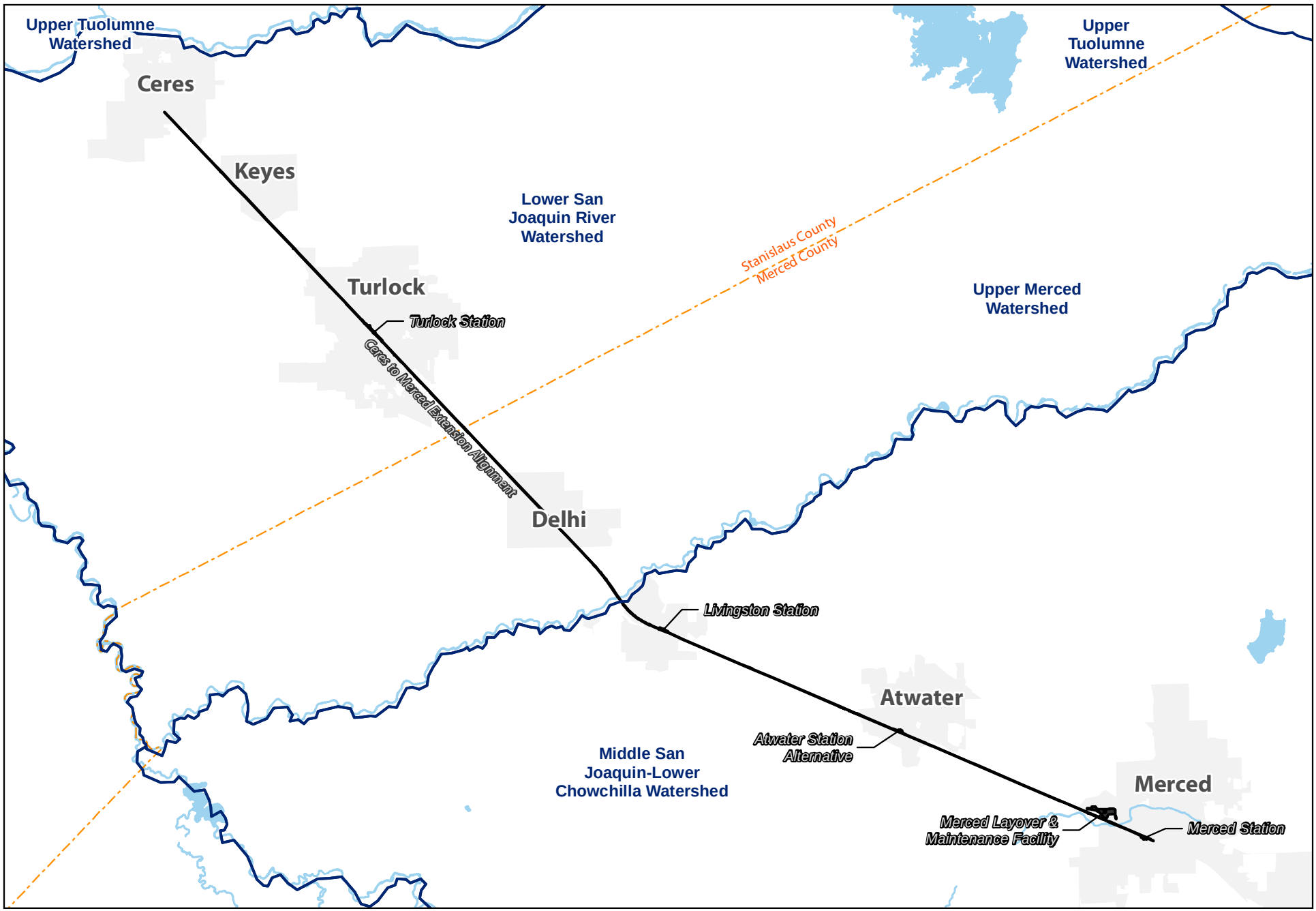


Figure 3.10-1
Hydrologic Basins and Large Watersheds
ACE Ceres-Merced Extension Project



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Direct Impacts Study Area
Groundwater Subbasins

*Entire mapsheet is within the San Joaquin Valley Basin

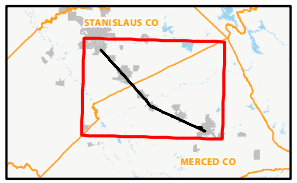


Figure 3.10-2
Groundwater Basins and Subbasins
ACE Ceres-Merced Extension Project

Regional Flooding

Flooding hazards can potentially occur in the Central Valley region, where the Proposed Project and the Atwater Station Alternative would be located, as a result of storms, dam or levee failure, and rarely, seiches. Because the Proposed Project and the Atwater Station Alternative would not be located in coastal areas, the Proposed Project and the Atwater Station Alternative would not be subject to tsunamis, extreme high tide, or sea level rise (SLR), and these topics are not discussed.

Storm-Related Flooding

Storm-related flooding can occur as a result of heavy rainfall and overflowing of watercourses. Storm-related flooding hazards are mapped by FEMA for areas throughout the United States. Additional mapping and evaluation of flood hazards has been performed by DWR for the Sacramento–San Joaquin Valley, where flood risks are among the highest in the nation (California Department of Water Resources 2017). The storm-related flooding hazards for the study area are based on information obtained from FEMA's National Flood Hazard Layer (NFHL) (Federal Emergency Management Agency 2020) and DWR's Best Available Maps (California Department of Water Resources 2015a). In the Sacramento-San Joaquin Valley, DWR has mapped areas of potential flood risks that may warrant further studies or analyses for land-use decision making, including areas that would be inundated by a flood event having a 0.5 percent chance of being equaled or exceeded in any given year, also referred to as a 200-year flood (California Department of Water Resources 2015a).

Seiche

A *seiche* is the oscillation of a body of water. Seiches occur most frequently in enclosed or semi-enclosed basins such as lakes, bays, or harbors. They can be triggered in an otherwise still waterbody by strong winds, changes in atmospheric pressure, earthquakes, tsunamis, or tides. Searching could potentially occur in reservoirs, which could cause overtopping of dams and flooding of areas down-gradient of dams. The flooding resulting from overtopping of a dam by seiching would be expected to be similar to or less severe than the flooding caused by catastrophic failure of a dam.

3.10.3.2 Local Hydrology, Water Quality, and Flooding

Watersheds

As illustrated in Figure 3.10-1, the Proposed Project is in the Lower San Joaquin River watershed, Upper Merced watershed, and Middle San Joaquin-Lower Chowchilla watershed of the San Joaquin River Basin. The Atwater Station Alternative is in the Middle San Joaquin-Lower Chowchilla watershed. The Lower San Joaquin River watershed drains an area of approximately 920 square miles into the San Joaquin River extending from the east side of the Diablo Range to the east side of the Central Valley, between the Tuolumne River to the north and the Merced River to the south. The Upper Merced watershed drains an area of approximately 1,270 square miles surrounding the Merced River extending from the Sierra Nevada to the Central Valley where the Merced River discharges into the San Joaquin River. The Middle San Joaquin-Lower Chowchilla watershed drains an area of approximately 3,500 square miles into the San Joaquin River extending from the east side

of the Diablo Range to the foothills of the Sierra Nevada, between the Merced River to the north and the east–west trending section of the San Joaquin River to the south.

Sub watersheds and Surface Waters

Figures 3.10-3 and 3.10-4 illustrates the sub watersheds and surface waters that may receive runoff from the Proposed Project and the Atwater Station Alternative. Table 3.10-2 lists the sub watersheds intersected by Proposed Project and the Atwater Station Alternative and surface waters crossed by or within 0.5 mile that may receive runoff.

Table 3.10-2. Sub watersheds and Surface Waters that May Receive Runoff

Proposed and Alternative Facilities	Sub watersheds Intersected	Surface Waters Crossed or Within 0.5 Mile that May Receive Runoff
Proposed Project		
Ceres to Merced Extension Alignment	Turlock Lake, Lake Ramona-San Joaquin River, Pear Slough-San Joaquin River, Jones Drain-Merced River, Shag Slough-San Joaquin River, City of Winton-Bear Creek, Black Rascal Creek-Bear Creek, Canal Creek, Lower Black Rascal Creek, Bear Creek, Lower Owens Creek	Unnamed canal ditches, Upper Lateral Number Three (canal), Upper Lateral Number Four (canal), unnamed canal ditches tributary to Highline Canal, Highline Canal, Merced River, Hammatt Lateral (canal), Arena Canal, unnamed canal ditches, Atwater Canal, Atwater Drain (canal ditch), unnamed canal ditches tributary to Canal Creek, Canal Creek, Hesse Lateral (canal), unnamed canal tributary to Bear Creek, Bear Creek
Turlock Station	Pear Slough-San Joaquin River	Upper Lateral Number Four (canal)
Livingston Station	City of Winton-Bear Creek	Hammatt Lateral (canal)
Merced Layover & Maintenance Facility	Bear Creek	Hesse Lateral (canal), unnamed canal tributary to Bear Creek, Bear Creek
Merced Station	Lower Owens Creek	None
Atwater Station Alternative		
Atwater Station Alternative	City of Winton-Bear Creek	Atwater Drain (canal ditch)

Source: U.S. Geological Survey 2014.

Beneficial Uses of Surface Waters and Water Quality

Table 3.10-3 lists the existing and potential beneficial uses designated in Central Valley Basin Plan for surface waters that could receive runoff from the Proposed Project. Surface waters listed in Table 3.10-2 but not listed in Table 3.10-3 are not surface waters with beneficial uses identified in the Central Valley Basin Plan.

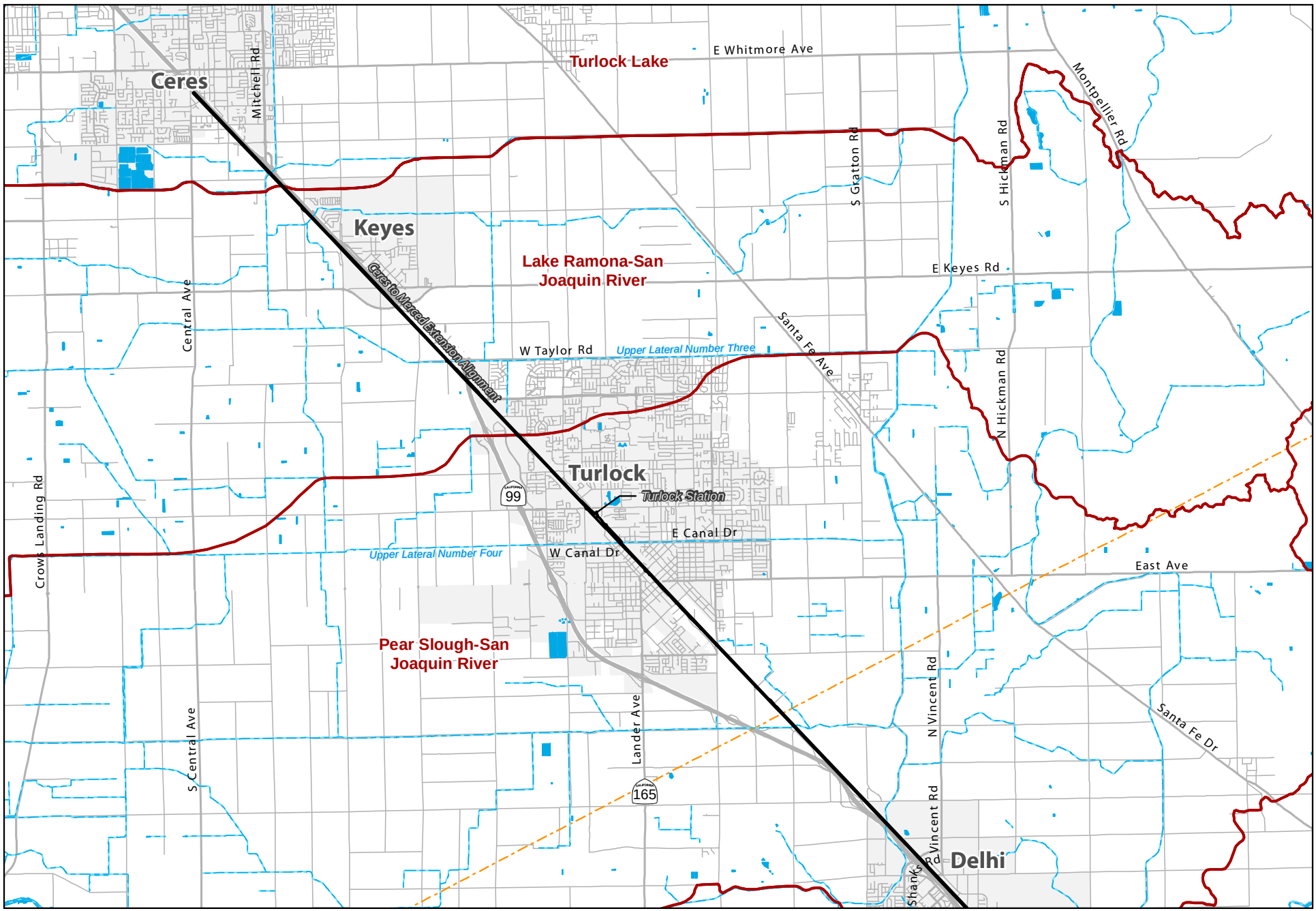
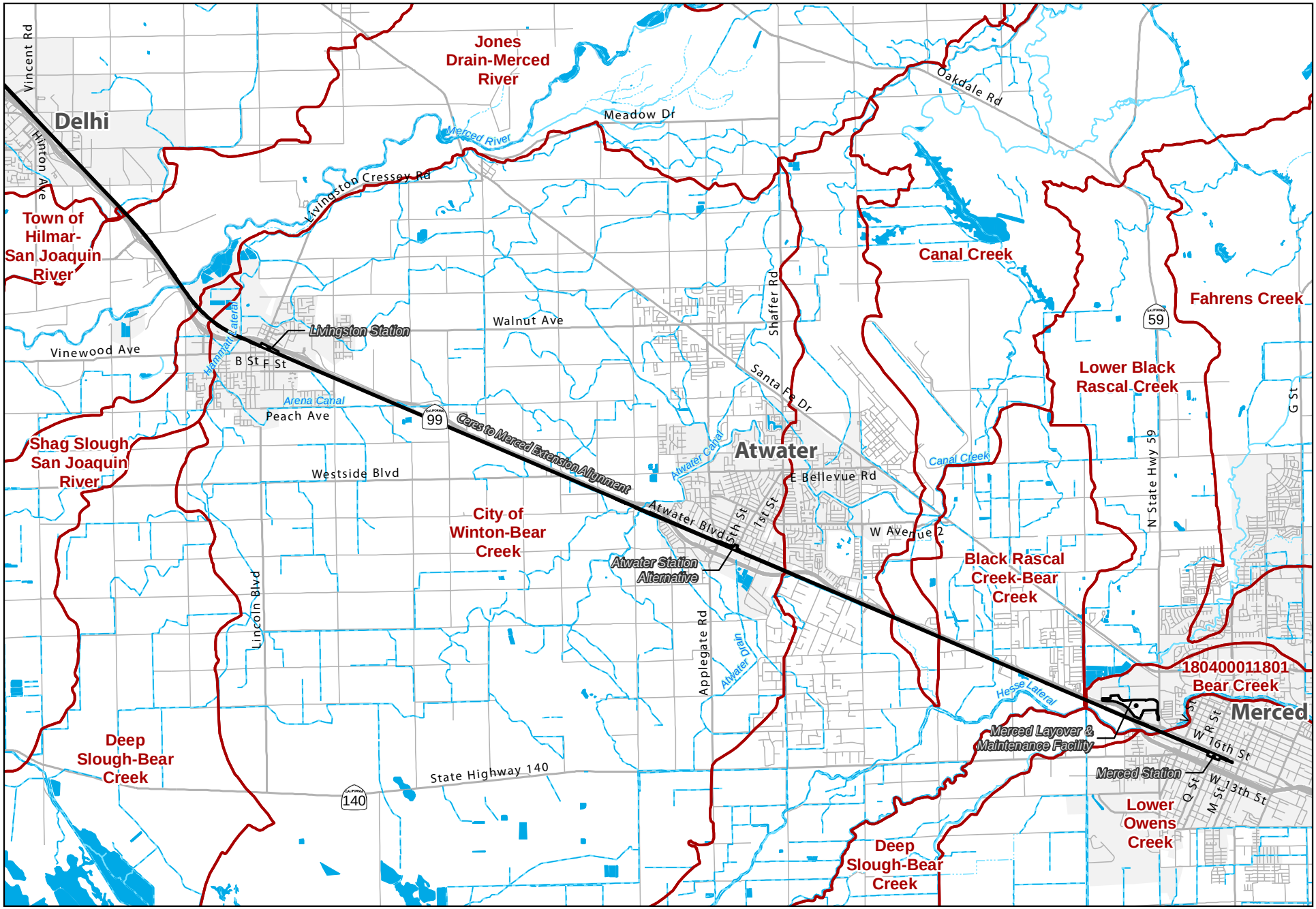


Figure 3.10-3
Subwatersheds and Surface Waters
ACE Ceres-Merced Extension Project



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- Direct Impacts Study Area
- Subwatersheds
- River/Stream (Perennial)
- River/Stream (Intermittent)
- River/Stream (Canal, Ditch, or Connector)

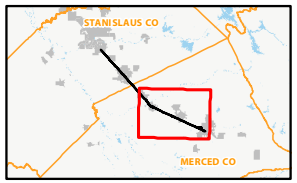


Figure 3.10-4
Subwatersheds and Surface Waters
ACE Ceres-Merced Extension Project

Table 3.10-3. Beneficial Uses of Surface Waters

Waterbodies	Agricultural (Stock) Water Supply	Municipal & Domestic Water Supply	Industrial Process & Service Supply	Hydropower Generation	Warm and Cold Freshwater Habitat	Warm and Cold Fish Migration	Warm and Cold Fish Spawning	Wildlife Habitat	Water Contact Recreation	Non-Contact Water Recreation
Merced River	E	E	E	E	E	E	E	E	E	E

Source: Central Valley Regional Water Quality Control Board 2018.
E = existing beneficial use.
P= potential beneficial use.

Table 3.10-4 lists impaired waterbodies included on the State Water Board's 303(d) list that could receive runoff from the Proposed Project, the pollutants of concern and whether they have approved TMDLs, potentially contributing tributaries to the impaired waterbodies, and the Proposed Project facilities in the vicinity of the tributaries or the impaired waterbodies.

Table 3.10-4. Ceres to Merced—Impaired Waterbodies

Impaired Waterbody	Pollutants	Source	USEPA TMDL Report Completion	Facilities in the Vicinity of Tributaries or the Impaired Waterbody
Highline Canal	Chlorpyrifos	Agriculture	2026	Ceres to Merced Extension Alignment
	Simazine	Unknown	2027	
	toxicity	Unknown	2027	
Merced River	Chlorpyrifos	Agriculture	2026	Ceres to Merced Extension Alignment
	Group A pesticides	Unknown	2011	
	Mercury	Unknown	2019	
	Temperature	Unknown	2027	
	Toxicity	Unknown	2027	
Black Rascal Creek	Indicator bacteria	Unknown	2023	Ceres to Merced Extension Alignment
	Dissolved oxygen	Unknown	2027	
Bear Creek	Indicator bacteria,	Unknown	2021	Ceres to Merced Extension Alignment, Merced Layover & Maintenance Facility
	Toxicity	Unknown	2021	

Source: State Water Resources Control Board 2018.
USEPA = U.S. Environmental Protection Agency.
TMDL = total maximum daily load.

Groundwater

As illustrated on Figure 3.10-2, the Proposed Project is in the Turlock Subbasin (Subbasin ID 5-22.03) and Merced Subbasin (Subbasin ID 5-22.03) of the San Joaquin Valley Groundwater Basin (California Department of Water Resources 2015b). The Atwater Station Alternative is in the Merced Subbasin (Subbasin ID 5-22.04) of the San Joaquin Valley Groundwater Basin (California Department of Water Resources 2015b). Long-term hydrographs show groundwater level decline in both the Turlock and Merced Subbasins (California Department of Water Resources 2020). The Central Eastside groundwater study area includes three groundwater subbasins: Modesto, Turlock, and Merced. In the Central Eastside study area, trace elements are present at high and moderate concentrations in approximately 17 percent and 33 percent of the primary aquifer, respectively. Arsenic and vanadium are the two trace elements that most frequently occur at concentrations above benchmark levels. Nutrients, such as nitrate, are naturally present at low concentrations in groundwater. Nitrate is present at high concentrations in approximately 2 percent and moderate concentrations in about 15 percent of the primary aquifer (Landon, et. al. 2010).

Flooding Hazards

Table 3.10-5 lists the types of flood hazards applicable to the San Joaquin River Basin and indicates which types of flood hazard zones are intersected by the Proposed Project. This EIR relies on the available mapping from FEMA and DWR's Best Available Maps. Mapping of the 200-year flood zones from DWR is not available in all areas of the Project, including the areas in Merced, so the evaluation of the 200-year flood zones is limited to the mapped zones from DWR. There are no mapped flooding hazard zones at the proposed Turlock Station or Livingston Station. In addition, there are no mapped flooding hazard zones at the Atwater Station Alternative. Figures 3.10-5 and 3.10-6 depict the mapped flooding hazards zones in the Proposed Project environmental footprint.

Table 3.10-5. Types of Flooding Hazard Zones Intersected by the Proposed Project [a]

Proposed Facility	Mapped FEMA 100-Year Flood Zone [b]	Mapped DWR 200-Year Flood Zone [c]
Ceres to Merced Extension Alignment	X (Adjacent to Merced River between Delhi and Livingston, northwest of Merced, and in Merced)	--
Merced Layover & Maintenance Facility	X	--
Merced Station	X	--

Sources:

[a] Mapping for the 200-year flood zones is not available in some areas of the Proposed Project, including in Merced. The information presented here is based on the best available maps from DWR and mapping for the Proposed Project area

[b] Federal Emergency Management Agency 2020.

[c] California Department of Water Resources 2015a.

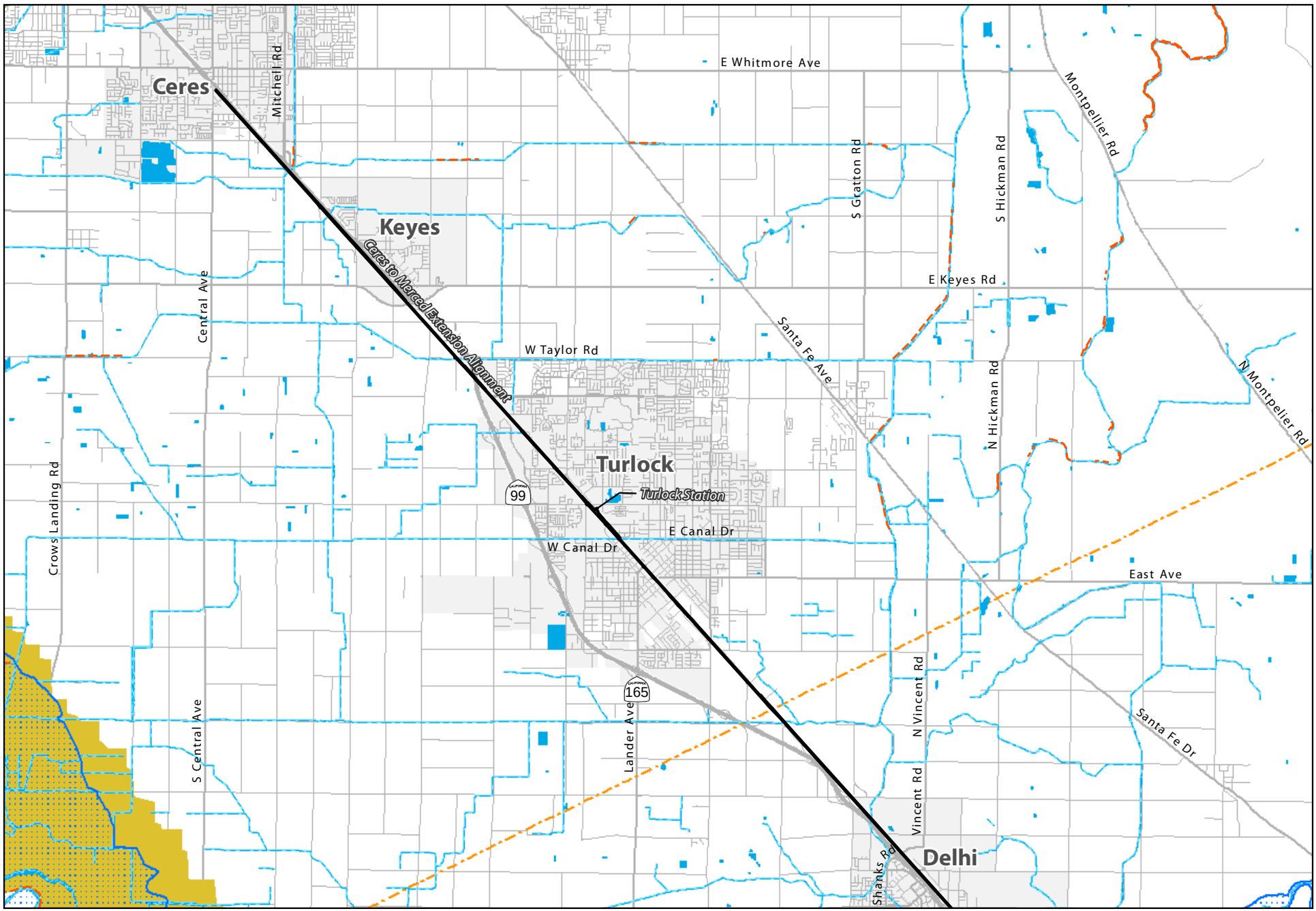
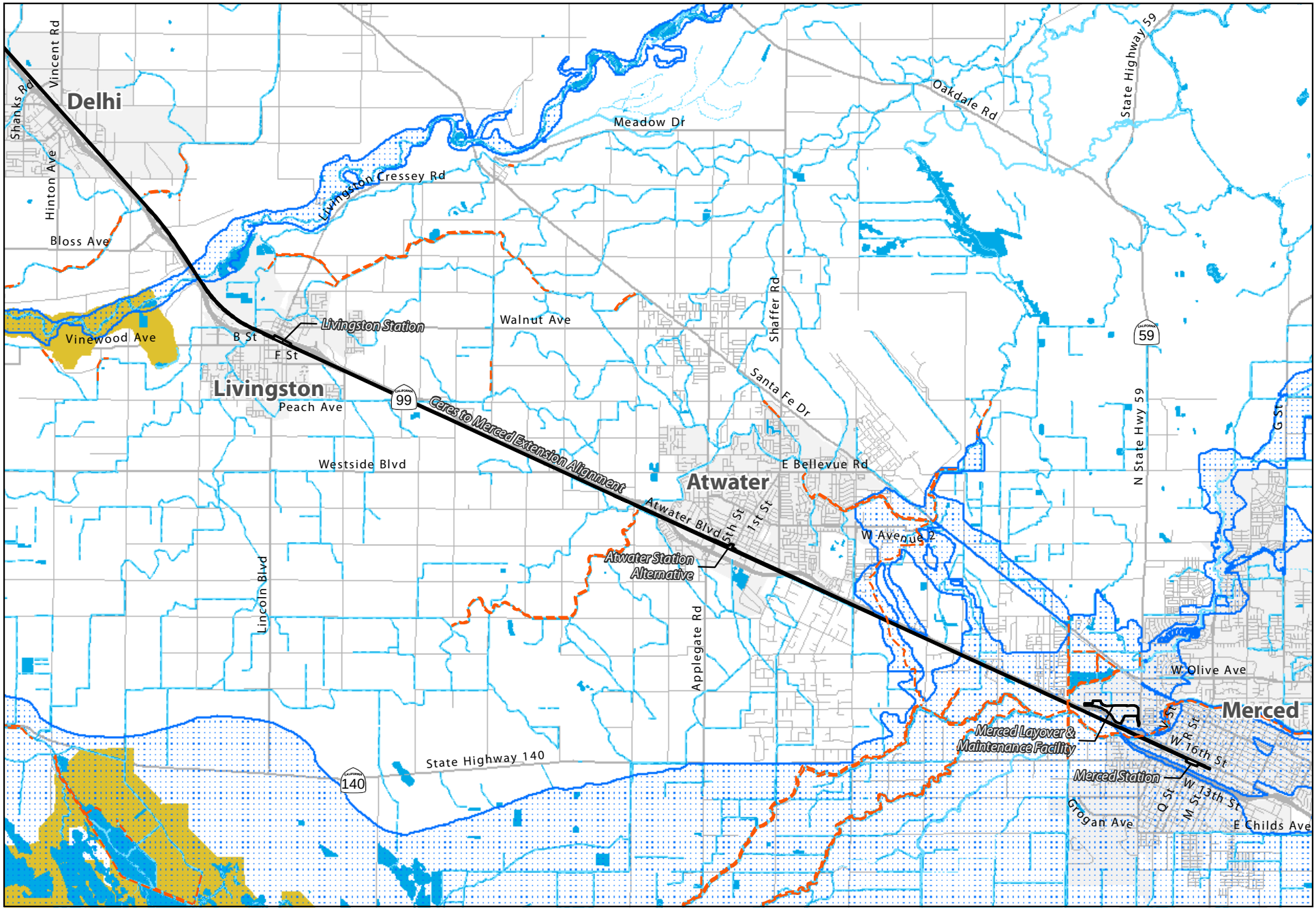


Figure 3.10-5
Flooding Hazard Zones ACE
Ceres-Merced Extension Project



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- Direct Impacts Study Area
- Levee
- Surface Water
- FEMA 100-Year Flood Hazard Zone
- DWR 200-Year Flood Hazard Zone

Note: Mapping for the 200-year flood zones is not available in some areas of the Proposed Project, including in Merced. The information presented here is based on the best available maps from DWR and mapping for the Proposed Project area.

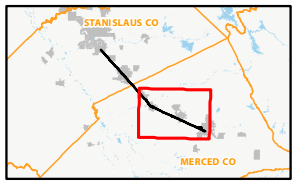

Figure 3.10-6
Flooding Hazard Zones ACE
Ceres-Merced Extension Project

3.10.3.3 Existing Setting of Proposed Project Facilities

Ceres to Merced Extension Alignment

As shown in Figures 3.10-3 and 3.10-4, a number of canal and canal ditches, tributaries, and creeks cross the Ceres to Merced Extension Alignment. As summarized in Table 3.10-2, the Ceres to Merced Extension Alignment is located within 0.5 mile of the Upper Lateral Number Three canal, Upper Lateral Number Four canal, unnamed canal ditches tributary to Highline Canal, Highline Canal, Merced River, Hammatt Lateral canal, Arena Canal, Atwater Canal, Atwater Drain canal ditch, unnamed canal ditches tributary to Canal Creek, Canal Creek, Hesse Lateral canal, El Captain Canal, unnamed canal tributary to Bear Creek, and Bear Creek. The Ceres to Merced Extension Alignment crosses the Merced River in Livingston and Bear Creek in Merced.

As shown in Figure 3.10-6, the Ceres to Merced Extension Alignment crosses the mapped 100-year flood hazard zone associated with the Merced River northwest of Livingston. The Ceres to Merced Extension Alignment is predominantly within the mapped 100-year flood hazard zone southeast of Atwater through Merced. Levees on Black Rascal Creek, Black Rascal Creek Diversion, sections of Owens Creek, Owens Creek Diversion, sections of Bear Creek, and Canal Creek protect low-lying areas in the region (Peterson Brustad Inc. 2013). The nearest mapped 200-yr flood zone are 9.3 miles west of Turlock Station and 1 mile west of Livingston, associated with the San Joaquin River and Merced River, respectively.

Turlock Station

As shown in Figure 3.10-5, there are no waterways within the footprint of the Turlock Station. As summarized in Table 3.10-2, the Turlock Station is located within 0.5 mile of the Upper Lateral Number Four canal. The Turlock Station site includes a combination of impervious surfaces associated with roadways and pervious surfaces associated with undeveloped areas located next to roadways. As shown in Figure 3.10-6 and summarized in Table 3.10-5, the Turlock Station site is not located in a mapped 100-year flood hazard zone. The nearest mapped flood hazard zone is the mapped 200-year and mapped 100-year flood hazard zone associated with the San Joaquin River and Merced River, respectively. However, the San Joaquin River and the Merced River are located approximately 9.3 miles west and 9.7 miles south from the Turlock Station site, respectively.

Livingston Station

As shown in Figure 3.10-4, there are no waterways within the footprint of the Livingston Station. As summarized in Table 3.10-2, the Livingston Station is located within 0.5 mile of the Hammatt Lateral canal. In addition, the Livingston Station is located approximately 1.4 miles from the Merced River. The Livingston Station site includes a combination of impervious surfaces associated with paved areas and a building, and pervious surfaces associated with undeveloped grassy areas. As shown in Figure 3.10-6, the Livingston Station site is not located in a mapped 100-year or mapped 200-year flood hazard zone. The nearest mapped flood hazard zone is the mapped 100-year flood hazard zone associated with the Merced River. However, the Merced River is located approximately 1.4 miles from the Livingston Station site.

Merced Station

As shown in Figure 3.10-4 and summarized in Table 3.10-2, there are no waterways within the footprint of the Merced Station or within 0.5 mile of the Merced Station. The closest waterway to the

Merced Station is Bear Creek, which is located approximately 0.7 mile from the Merced Station. The Merced Station site includes a combination of impervious surfaces associated with paved areas and buildings, and pervious surfaces associated with undeveloped grassy areas. As shown in Figure 3.10-6 and summarized in Table 3.10-5, the Merced Station site is located in a mapped 100-year flood hazard zone.

Merced Layover & Maintenance Facility

As shown in Figure 3.10-4, there are no waterways within the footprint of the Merced Layover & Maintenance Facility. As summarized in Table 3.10-2, the Merced Layover & Maintenance Facility is located within 0.5 mile of the Hesse Lateral canal, unnamed canal tributary to Bear Creek, and Bear Creek. The Merced Layover & Maintenance Facility site currently includes impervious areas associated with industrial buildings and parking lots and pervious areas associated with agricultural lands and grassy, undeveloped areas. As shown in Figure 3.10-6 and summarized in Table 3.10-5, the Merced Layover & Maintenance Facility site is located in a mapped 100-year flood hazard zone.

3.10.3.4 Existing Setting of Atwater Station Alternative

As shown in Figure 3.10-4, there are no waterways within the footprint of the Atwater Station Alternative. As summarized in Table 3.10-2, the Atwater Station Alternative is located within 0.5 mile of the Atwater Drain canal ditch. The Atwater Station Alternative site currently includes primarily impervious areas associated with commercial buildings, parking lots, areas with concrete, and areas with gravel. The Atwater Station Alternative includes very little pervious areas; however, there are some areas of landscaping near existing parking that is considered pervious. As shown in Figure 3.10-6, the Atwater Station Alternative site is not located in a mapped 100-year or mapped 200-year flood hazard zone.

3.10.4 Impact Analysis

This section describes the environmental impacts of the Proposed Project or the Atwater Station Alternative on hydrology and water quality. It describes the methods used to evaluate the impacts and the thresholds used to determine whether an impact would be significant. Measures to mitigate significant impacts are provided, where appropriate.

3.10.4.1 Methods for Analysis

Potential impacts related to hydrology and water quality were evaluated based on a review of available information regarding watersheds, surface waters, groundwater, flooding hazards, and stormwater control and treatment requirements in the study area. Principle sources consulted during the analysis are listed here.

- The Central Valley Basin Plan (Central Valley Regional Water Quality Control Board 2018).
- MS4 Permits for cities and counties intersected by the Proposed Project or the Atwater Station Alternative.
- Construction General Permit (State Water Resources Control Board 2012).
- Industrial General Permit (State Water Resources Control Board 2014)
- USGS's NHD (U.S. Geological Survey 2014).

- The State Water Board's 303(d) List (State Water Resources Control Board 2018).
- FEMA's NFHL (Federal Emergency Management Agency 2020).
- DWR's Best Available Maps (California Department of Water Resources 2015a).
- DWR's SGMA Basin Prioritization Dashboard (California Department of Water Resources 2020)
- General plans from cities and counties intersected by the Proposed Project or the Atwater Station Alternative.
- Hydrology studies performed for the project including Preliminary Hydrology and Drainage Reports (AECOM 2015, 2016b), a Preliminary Stormwater Management Plan (AECOM 2016a), and a Preliminary Floodplain Impact Report (AECOM 2016c).

The following approaches were used to evaluate the potential for hydrology and water quality–related impacts as a result of the Proposed Project and the Atwater Station Alternative.

- Evaluation of potential discharges of contaminants and sediments that could affect surface waters and/or groundwater.
- Evaluation of proposed and alternative facilities that would require dewatering or increase impervious surfaces to evaluate potential impacts on groundwater supplies.
- Evaluation of proposed and alternative facilities that would alter drainage to determine potential impacts on stormwater drainage systems and surface waters.
- Evaluation of encroachments into drainage courses (e.g., rivers, creeks, sloughs, canals, ditches) and floodplains to determine whether proposed and alternative facilities could impede or redirect flood flows from flood events. The analysis in this EIR section assesses the impacts relative to mapped flood zone areas. For 200-year flood zones, these zones are assessed only for areas that are mapped by DWR in their Best Available Maps as 200-year flood zones.[3] For 100-year flood zones, these zones are assessed relative to FEMA 100-year flood zones.

Increases in impervious surfaces have not been quantified at this time; therefore, potentially applicable MS4 Permit requirements for stormwater control are described generally in this analysis.

3.10.4.2 Thresholds of Significance

The CEQA Guidelines Appendix G (14 Cal. Code Regs. 15000 et seq.) has identified significance criteria to be considered for determining whether a project could have significant impacts on existing hydrology and water quality.

An impact would be considered significant if construction or operations of the project would have any of the following consequences.

- Violate any water quality standards or WDRs or otherwise substantially degrade surface or groundwater quality.
- Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin.

[3] As noted above, DWR has not mapped the 200-year flood zones in all areas.

- 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 impervious surfaces, in a manner which would:
  - Result in substantial erosion or siltation onsite or offsite.
  - Substantially increase the rate or amount of surface runoff in a manner which would result in flooding onsite or offsite.
  - 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.
  - Impede or redirect flood flows.
- In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation.
- Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan.

For impacts related to flood hazards, the significance criteria used in this EIR relies on standards established by FEMA and local agencies and considerations in the Central Valley Flood Protection Act of 2008.

- Outside of urban areas protected by the Central Valley Flood Protection Act of 2008 and waterways governed by the CVFPB, in order to avoid significant impacts related to flooding, encroachment into a floodplain, the project shall not increase the water surface elevation of the 100-year flood by more than 1 foot in floodplains and 0.1 feet in floodways.
- In urban areas protected by the Central Valley Flood Protection Act of 2008 and waterways governed by the CVFPB, in order to avoid significant impacts related to flooding related to encroachment into a floodplain, the project shall not increase the water surface elevation of the 200-year flood by more than 1 foot in floodplains and 0.1 feet in floodways.

3.10.4.3 Impacts and Mitigation Measures

Impact HYD-1	Construction of the Proposed Project could violate water quality standards or WDRs or otherwise substantially degrade surface or groundwater quality.
Level of Impact	**Potentially significant impact**
Mitigation Measures	HYD-1.1: Avoid water quality impacts from groundwater or dewatering discharges HYD-1.2: Avoid water quality impacts from construction adjacent to, within, and crossing over surface waters HYD-1.3: Limit groundwater or dewatering discharge flow rates HAZ-2.2: Conduct Site Investigations HAZ-2.3: Implement construction risk management plan
Level of Impact after Mitigation	**Less than significant impact**

Impact Characterization

Construction of the Proposed Project could violate water quality standards or WDR or provide substantial sources of polluted runoff in the following ways.

- Improper management of soils, fill, and hazardous materials.
- Construction involving dewatering, groundwater discharge, or within or adjacent to surface waters.

Impact Details and Conclusions

Proposed Project

Improper Management of Soils, Fill, and Hazardous Materials

Construction of the Proposed Project would involve disturbing and handling existing soil and imported fill materials and the use and storage of hazardous materials (e.g., fuels and lubricants for construction equipment) during construction activities. The improper handling and management of disturbed soil and imported fill could result in pollution of stormwater runoff with sediment and contaminants that may be in the existing soil or imported fill materials, potentially reducing the quality of the receiving waters. If spilled or improperly stored substances, such as fuels and oils, directly enter nearby surface waters or are transported to nearby surface waters in stormwater runoff, this would reduce the quality of the receiving waters. Polluted stormwater runoff and spills of hazardous materials can also infiltrate through pervious surfaces and degrade groundwater quality. Handling and management of existing soil, imported fill material, and hazardous materials in upland construction areas would be performed in accordance with a SWPPP, as required by the Construction General Permit, to ensure that stormwater runoff, surface waters, and groundwater are not polluted by these construction activities.

The Construction General Permit uses a risk-based permitting approach and mandates certain requirements based on the project risk level (i.e., Level 1, Level 2, or Level 3). The project risk level is based on the risk of sediment discharge and the receiving water risk. The sediment discharge risk depends on the project location and timing (i.e., wet season versus dry season activities). The receiving water risk depends on whether the project would discharge to a sediment-sensitive receiving water. A sediment-sensitive waterbody is one that appears on the most recent 303(d) list for waterbodies impaired for sediment; has a USEPA-approved TMDL implementation plan for sediment; or has the beneficial uses of cold freshwater habitat, fish migration, and fish spawning. The determination of the project risk level would be made by the project applicant when the Notice of Intent is filed and more details of the timing of the construction activity are known.

The performance standard in the Construction General Permit is that dischargers would be required to minimize or prevent pollutants in stormwater discharges and authorized NSWDs through the use of controls, structures, and BMPs that achieve BAT for treatment of toxic and nonconventional pollutants and BCT for treatment of conventional pollutants. A SWPPP must be prepared by a Qualified SWPPP Developer that meets the certification requirements in the Construction General Permit. The purpose of the SWPPP is: (1) to help identify the sources of sediment and other pollutants that could affect the quality of stormwater discharges; and (2) to describe and ensure the implementation of BMPs to reduce or eliminate sediment and other pollutants in stormwater, as well as NSWDs resulting from construction activity. Operation of BMPs must be overseen by a Qualified SWPPP Practitioner that meets the requirements outlined in the permit (State Water Resources Control Board 2012).

According to the Preliminary Stormwater Management Plan (AECOM 2016a), at a minimum the following BMPs would be implemented to provide temporary and permanent erosion and sediment control during construction of the Proposed Project.

- Preserve existing vegetation where required and when feasible.
- Control the disturbed area such that erosion control BMPs can be implemented quickly and effectively.
- Stabilize non-active areas of construction activities.
- Control erosion in concentrated flow paths by applying erosion control blankets, check dams, erosion control seeding, or alternate methods.
- Prior to the completion of construction, apply permanent erosion control to remaining disturbed soil areas.
- Use erosion control techniques suitable for temporary, permanent, and wind conditions (types of erosion control to be considered include rolled erosion control products and hydraulically applied mulches).
- Use sediment control techniques with the specific objective of maintaining sediment loads consistent with preconstruction levels (types of sediment control BMPs to be considered include fiber rolls, silt fence, drainage inlet protection, and sediment traps and basins).

According to the Preliminary Stormwater Management Plan (AECOM 2016a), BMPs to control potential pollution sources during construction of the Proposed Project would include the following practices.

- Covering and containing pollutants such as petroleum products, chemicals, and fertilizers.
- Covering stockpiles when not in active use.
- Inspecting all vehicles, equipment, and petroleum product storage and dispensing areas regularly to detect any leaks or spills, and to identify maintenance needs to prevent leaks or spills.
- Incorporating secondary containment for onsite fueling tanks and petroleum product storage containers.
- Using spill prevention measures, such as drip pans, when fueling or performing maintenance and repair of vehicles or equipment. These activities should occur no closer than 100 feet from any stream, ditch, or other stormwater conveyance.
- Using temporary plastic sheeting beneath, and if it is raining, over a vehicle when performing emergency repairs onsite.
- Cleaning contaminated surfaces immediately, and removing contaminated soils.

The SWPPP must also include a construction site monitoring program. Depending on the project risk level, the monitoring program would involve visual observations of site discharges, water quality monitoring of site discharges (e.g., pH, turbidity, and non-visible pollutants, if applicable), and receiving water monitoring (e.g., pH, turbidity, suspended sediment concentration, and bioassessment, if applicable) (State Water Resources Control Board 2012).

The performance standard in the Construction General Permit and requirements for preparation and implementation of a SWPPP would ensure proper handling and management of existing soil, imported fill material, and hazardous materials. In addition, according to the Preliminary Stormwater Management Plan (AECOM 2016a), BMPs would be implemented to provide temporary and permanent erosion and sediment control and to control potential pollution sources during construction of the Proposed Project. Thus, with implementation of these requirements, the impacts related to surface water quality and groundwater quality from the management of soils, fill, and hazardous materials would be less than significant.

Construction Involving Groundwater Discharge, Dewatering, or within or Adjacent to Surface Waters

Construction of the Turlock Station, Livingston Station, and Merced Station would not involve construction adjacent to surface waters. However, if groundwater is encountered during construction of the Turlock Station, Livingston Station, and Merced Station, the discharge of groundwater would be required. The Ceres to Merced Extension Alignment would entail construction of new bridges over the Merced River, Canal Creek, Weber Canal, Bear Creek, irrigation canals, and a drainage ditch, and new culverts over various canals, which would involve the discharge of groundwater or dewatering effluent. Construction of the Merced Layover & Maintenance Facility would involve construction near but not within Bear Creek and may require the discharge of groundwater.

Construction activities associated with the Ceres to Merced Extension Alignment could violate water quality standards or WDRs because disturbance of soil along the banks of surface waters or sediment within surface waters could result in increased turbidity and potentially release contaminants entrained in soil or sediments. Construction materials that are not appropriately handled and installed could potentially be released into surface waters, which could increase turbidity and contribute pollutants to the surface water. Also, surface waters could be polluted by spills or leaks of hazardous materials (e.g., fuels and lubricants for construction equipment) directly into or adjacent to surface waters.

According to the Preliminary Stormwater Management Plan (AECOM 2016a), work done above and adjacent to waterways would include specific BMPs to protect water quality.

- Minimizing demolition and construction activities within or over stream channels during the wet season.
- Using non-shattering demolition methods rather than methods that would normally scatter debris.
- Securing all materials adjacent to streams to prevent discharges into receiving waters via wind.
- Using attachments on equipment to catch debris from small demolition operations.
- Stockpiling accumulated debris and waste generated from demolition away from streams.
- Isolating work areas within streams from flow using sheet piling, k-rails, or other methods of isolation.
- Pumping stream flow within pipes around the construction area.
- Using drip pans during equipment operation, maintenance, cleaning, fueling, and storage for spill prevention.
- Keeping equipment used in streams leak-free.

- Directing water from concrete curing and finishing operations away from inlets and watercourses to collection areas for dewatering.

In addition, all construction activities within the banks of surface waters would require compliance with resource agency permit requirements that would reduce potential impacts on water quality during construction activities along the banks of surface waters and within surface waters. All construction activities within the banks of surface waters would require a USACE Section 404 permit and associated Section 401 Water Quality Certification from the State Water Board. Work within a stream or on a streambank would require a CDFW Streambed Alteration Agreement. These permit applications must include a discussion of construction BMPs, including erosion and sediment control BMPs, which would minimize impacts on water quality. The permits would include any additional requirements for protection of water quality as deemed necessary by the reviewing agencies.

The improper handling and management of groundwater or dewatering discharges could result in the discharge of contaminated water or water containing sediments into nearby surface waters, which could violate water quality standards or WDRs. The Construction General Permit allows the discharge of dewatering effluent to storm drains or directly to surface waters if the groundwater is not contaminated, is properly filtered or treated using appropriate technology, and the Construction General Permit conditions (described in Section 3.10.2.1, *Federal*) are met, to ensure that receiving water quality is not substantially degraded.

Construction activities associated with the Proposed Project would have the potential to result in the discharge of groundwater or dewatering effluent to nearby surface waters. In addition, construction activities associated with the Ceres to Merced Extension Alignment would have the potential for soil, sediment, construction materials, and hazardous materials to be released into surface water during work adjacent to, within, or crossing surface water. Thus, construction activities associated with Proposed Project could violate water quality standards or WDRs. These impacts would be potentially significant

Atwater Station Alternative

Construction impacts from the Atwater Station Alternative would be similar to the impacts of the Livingston Station. As discussed above, the improper handling and management of disturbed soil and imported fill could result in polluted stormwater runoff, potentially reducing the quality of the receiving waters. Handling and management of soil, imported fill, and hazardous materials in accordance with a SWPPP, as required by the Construction General Permit, would ensure that stormwater runoff, surface waters, and groundwater are not polluted. In addition, BMPs would be implemented to provide temporary and permanent erosion and sediment control during construction of the Atwater Station Alternative. Impacts on water quality from the management of soils, fill, and hazardous materials would be less than significant.

Like the proposed Livingston Station, construction of the Atwater Station Alternative would not involve construction adjacent to surface waters but could require groundwater discharge if groundwater is encountered during construction. Thus, construction activities associated with Atwater Station Alternative could violate water quality standards or WDRs, and this would be a potentially significant impact.

There is a greater potential to encounter hazardous materials in the groundwater encountered at the Atwater Station Alternative than the proposed Livingston Station. As summarized in Table 3.9-7

in Section 3.9, *Hazardous Materials,* groundwater at the Atwater Station Alternative site could be affected by a hazardous material release site of concern. Nonetheless, there would be no substantial difference in impact between the Atwater Station Alternative and the proposed Livingston Station (both would result in a potentially significant impact that would be reduced to a less-than-significant level with mitigation).

Mitigation Measures

Mitigation Measures HYD-1.1, HYD-1.3, HAZ-2.2, and HAZ-2.3 would apply to the Proposed Project and the Atwater Station Alternative. Mitigation Measure HYD-1.2 would also apply to the Ceres to Merced Extension. The description of Mitigation Measure HAZ-2.2 and HAZ-2.3 are presented in Section 3.9, *Hazardous Materials*.

Mitigation Measure HYD-1.1: Avoid water quality impacts from groundwater or dewatering discharges

Groundwater and dewatering effluent generated by temporary construction dewatering activities will be contained by the construction contractor(s) in an appropriately-sized storage tank and tested to determine whether the effluent is contaminated prior to discharging. Testing and discharging of the effluent will be performed in accordance with the Construction General Permit, risk management plan (RMP) (per Mitigation Measure HAZ-2.3 in Section 4.9, *Hazardous Materials*), and applicable resource agency permit requirements, including treating the effluent prior to discharge, if necessary. If groundwater is discharged to storm drains or directly to surface water, the discharge will be performed at appropriate flow rates to ensure that drainage capacity of storm drains and receiving waters is not exceeded (as required by Mitigation Measure HYD-1.3), and to ensure that the flow rate of the receiving waters would not increase substantially, which could result in erosion of stream banks and affect water quality.

If the effluent is not suitable for discharge to storm drains or directly to receiving waters, the effluent will be discharged to sanitary sewer systems or transported for disposal at an appropriate offsite treatment or disposal facility. If the effluent would be discharged to sanitary sewer, the appropriate permit will be obtained from the local utility agency with jurisdiction over discharges to the sanitary sewer system, and permit criteria for discharging to the sewer will be followed. These criteria include testing of the effluent, application of treatment technologies that would result in achieving compliance with the wastewater discharge limits, and discharging at or below the maximum allowable flow rate.

Mitigation Measure HYD-1.2: Avoid water quality impacts from construction adjacent to, within, and crossing over surface waters

The construction contractor(s) will obtain applicable resource agency permits and approvals and comply with permit requirements to prevent impacts on water quality and demonstrate that water quality standards and/or WDRs are not violated. Prior to the start of construction activities that could disturb potentially contaminated soil or sediment adjacent to or within surface waters, sampling and analysis of the potentially contaminated soil or sediment will be performed as required by Mitigation Measure HAZ-2.2 (see Section 3.9, *Hazardous Materials*), to ensure that the soil or sediment is appropriately handled, reused, or disposed of based on the sampling and analysis results. The sampling and analysis results will be presented to the State Water Board for review so that appropriate water quality monitoring parameters can be

designated in permit requirements. CDFW, USACE, and/or the State Water Board may require the following permit requirements and avoidance measures.

a) Installation of temporary physical barriers (e.g., coffer dams, silt curtains) in water around construction activities to prevent potential localized impacts on water quality (e.g., increase in turbidity) from spreading within the surface water.

b) Installation of temporary physical barriers (e.g., elevated platforms, netting, floating platforms) over surface waters and beneath elevated construction activities to prevent construction materials from being released into the surface water below.

c) The design and installation of temporary physical barriers as part of permit requirements and avoidance measures will ensure that stream flow (including storm flows) would not be impeded to the degree that adverse flooding impacts could occur.

d) Performing water quality monitoring including sampling and analysis for constituents required by resource agency permits, which may include total suspended solids, pH, temperature, conductivity, pollutants of concern identified in soil or sediment during preconstruction sampling and analysis, and pollutants with TMDLs established for the surface water if construction activities could result in the release of these pollutants.

The results of water quality monitoring will be compared to performance standards established by the State Water Board in the CWA Section 401 certification. If water quality monitoring indicates that performance standards are not being achieved, additional avoidance measures (e.g., installation of additional silt curtains) will be implemented until water quality monitoring indicates that performance standards are being achieved.

Mitigation Measure HYD-1.3 Limit groundwater or dewatering discharge flow rates

If groundwater or dewatering effluent would be discharged to storm drainage systems (e.g., storm drains, conveyance pipes, canals, ditches, creeks, and rivers) in accordance with permit requirements and Mitigation Measure HYD-1.1, the discharge flow rates will be limited to ensure that the capacity of storm drainage systems would not be exceeded by the discharge. The construction contractor(s) will determine the capacity of storm drainage systems that would receive discharges by coordinating with the local government agencies that have jurisdiction over the protection and maintenance of the storm drainage systems. The capacity of storm drainage systems will be determined for various times of year and various storm events. If the capacity of the storm drainage systems cannot be determined through coordination with local government agencies, evaluations of the capacity of the storm drainage systems that would receive discharges will be performed and certified by a professional engineer. The discharge flow rates will not exceed the capacity determined for various times of year and various storm events.

Mitigation Measure HAZ-2.2: Conduct Site Investigations

Refer to measure description in Section 3.9, *Hazardous Materials*.

Mitigation Measure HAZ-2.3: Implement construction risk management plan

Refer to measure description in Section 3.9, *Hazardous Materials*.

Significance with Application of Mitigation

Mitigation Measure HYD-1.1 requires specific procedures for the construction of the Proposed Project entailing the discharge of groundwater or dewatering effluent. Mitigation Measure HYD-1.2 requires specific procedures for construction work for the Proposed Project adjacent to, within, or crossing surface water. Mitigation Measure HYD-1.3 requires dewatering discharge to be performed at appropriate flow rates to ensure that erosion of stream banks, which could affect water quality, would not occur. Mitigation Measure HAZ-2.2 requires site investigations to evaluate the chemical quality of soil and groundwater that could be disturbed during construction. Mitigation Measure HAZ-2.3 requires a RMP that provides a framework for proper characterization and management of contaminated soil and groundwater that could be disturbed during construction. With implementation of Mitigation Measures HYD-1.1, HYD-1.2, HYD-1.3, HAZ-2.2, HAZ-2.3, impacts on water quality, including surface water and groundwater quality, during construction of the Proposed Project would be less than significant.

Likewise, with implementation of Mitigation Measures HYD-1.1, HYD-1.2, HYD-1.3, HAZ-2.2, HAZ-2.3, impacts on water quality, including surface water and groundwater quality, during construction of the Atwater Station Alternative would be less than significant.

Impact HYD-2	Operation of the Proposed Project could violate water quality standards or WDRs or otherwise substantially degrade surface or groundwater quality.
Level of Impact	**Potentially significant impact**
Mitigation Measures	HAZ-2.3: Implement construction risk management plan
Level of Impact after Mitigation	**Less than significant impact**

Impact Characterization

Operation and maintenance could violate water quality standards or WDR or provide substantial sources of polluted runoff in the following ways.

- Reuse of contaminated soils or fill.
- Alteration of existing drainage patterns and creation of new sources of polluted runoff.
- Use of pesticides for track maintenance.
- Train operations and accident conditions.

Impact Details and Conclusions

Proposed Project

Use of Contaminated Soils or Fill

The Proposed Project would involve grading and reuse of existing soil and use of imported fill materials. If contaminants are present in reused existing soil or fill materials that are placed in a location exposed to stormwater, contaminants could leach into stormwater runoff from the reused existing soil or imported fill and result in pollution of stormwater runoff and surface water, potentially reducing the quality of the receiving waters. This is a potentially significant impact.

Alteration of Existing Drainage Patterns and New Sources of Polluted Runoff

Ceres to Merced Extension Alignment

The Ceres to Merced Extension Alignment would alter drainage patterns (e.g., altering or creating drainage systems) along tracks. If adequate stormwater control and treatment systems are not designed or constructed as part of the Proposed Project, pollutants that may be entrained in sediments could be transported from tracks to surface waters in stormwater runoff. The Construction General Permit includes post-construction stormwater performance standards that address water quality and channel protection for projects that are not in an area subject to post-construction standards of an active Phase I or II MS4 Permit with an approved Stormwater Management Plan. The Construction General Permit requires post-construction runoff to match preconstruction runoff for the 85th-percentile storm event, which not only reduces the risk of impacts on the receiving water's channel morphology, but also provides some protection of water quality. The Construction General Permit also requires implementation of post-construction BMPs to reduce pollutants in stormwater discharges that are reasonably foreseeable after all construction phases have been completed. Compliance with the post-construction requirements of the Construction General Permit must be demonstrated by submitting a map and post-construction runoff calculation worksheets with the Notice of Intent (State Water Resources Control Board 2012).

According to the Preliminary Stormwater Management Plan (AECOM 2016a), it appears unlikely that hydromodification management measures would be required for the Ceres to Merced Extension Alignment because improvements to tracks are not likely to create substantial runoff because while the soil would be compacted where tracks would be constructed, the adjacent areas would not be compacted, which would allow infiltration through adjacent pervious soils in the UPRR ROW. However, detailed design-level studies may conclude that increases in the post-construction runoff would exceed the Construction General Permit criteria in some locations. If estimated post-construction runoff volumes are found to exceed the criteria, the improvements within UPRR ROW would be required to incorporate hydromodification management to control flows and reduce the post-construction flow rates and durations for management of erosion and sediment. Hydromodification management may include facilities to retain, detain, bypass, split, or infiltrate runoff to mimic preconstruction flows, durations, and associated sediment transport.

According to the Preliminary Stormwater Management Plan, stormwater control and treatment BMPs would be designed and constructed for improvements within the UPRR ROW (i.e., the Ceres to Merced Extension Alignment) in accordance with the Project Planning and Design Guide (PPDG) developed by the California Department of Transportation (Caltrans) (2019), and may include biofiltration swales, biofiltration strips, infiltration devices, detention devices, media filters, wet basins, and dry weather diversion (AECOM 2016a). Design and construction of stormwater control and treatment BMPs in accordance with the PPDG would ensure that the Ceres to Merced Extension Alignment would have a less-than-significant impact on water quality.

Turlock Station, Livingston Station, and Merced Station

The Turlock Station, Livingston Station, and Merced Station would alter existing drainage through the construction of station platforms, driveways, and parking areas. Improvements associated with

these stations would create new impervious pavement surfaces. These stations would result in the following net change in impervious surfaces.[4]

- The Turlock Station would include the construction of approximately 72,000 sf of net impervious surfaces.[5]
- The Livingston Station would include the construction of approximately 99,000 sf of net impervious surfaces.[6] In addition, as described in Chapter 2, *Project Description,* the Livingston Station would not significantly alter drainage patterns from the relocation of the detention basin on the site because this detention basin would not be removed, rather it would be relocated further south within the environmental footprint.
- The Merced Station would include the construction of approximately 68,000 sf of net impervious surfaces.[7]

These new stations would alter drainage patterns (e.g., increase runoff from new impervious surfaces and create new stormwater drainage systems) and provide new sources of polluted runoff associated with motor vehicle traffic and train fueling/cleaning. Increasing runoff can cause erosion of unlined drainage courses (e.g., natural creeks and earthen canals and ditches) that would receive runoff from these new stations, which can increase the turbidity of surface waters and cause sedimentation downstream. Pollutants that may be transported include sediment; metals; organic compounds including diesel, gasoline, oil, and grease; and trash and debris. The Turlock Station, Livingston Station, and Merced Station improvements within the UPRR ROW would be required to comply with the post-construction stormwater performance standards of the Construction General Permit, and stormwater control systems for these improvements would be designed and constructed in accordance with the PPDG. Improvements outside the UPRR ROW would be regulated as a Priority Development Project under the Small MS4 Permit or Central Valley Permit based on the construction of more than 5,000 square feet of parking lot and would be required to incorporate appropriate stormwater mitigation measures, including LID source control, site design, stormwater treatment, and hydromodification management, into the design plan. As such, compliance with these requirements would ensure that stormwater runoff from the new stations would not contain significant levels of pollutants or cause erosion and sedimentation in receiving waters, resulting in a less-than-significant impact.

[4] Net impervious surfaces means the net change from pervious surfaces to impervious surfaces. These calculations do not account for any increases in pervious areas that would be implemented with the Proposed Project, related to landscaping.

[5] The Turlock Station would include the construction of less than 1,000 sf of impervious areas associated with the pedestrian bridge on areas that are currently impervious and approximately 72,000 sf of paved, impervious areas associated with parking and pedestrian paths on areas that are currently undeveloped and pervious.

[6] The Livingston Station would include the construction of approximately 27,000 sf of paved, impervious areas associated with bus and pedestrian access on areas that are currently paved impervious areas and approximately 99,000 sf of paved, impervious areas associated with parking and pedestrian access on areas that are currently grassy and pervious.

[7] The Merced Station would include the construction of approximately 91,000 sf of paved, impervious areas associated with parking on areas that are currently paved impervious areas and approximately 68,000 sf of paved, impervious areas associated with parking on areas that are currently grassy and pervious.

Merced Layover & Maintenance Facility

The Merced Layover & Maintenance Facility would alter existing drainage through construction of new impervious pavement surfaces. The Merced Layover & Maintenance Facility would include the construction of approximately 65,000 sf of net impervious surfaces.[8]

Improvements within the UPRR ROW for the Merced Layover & Maintenance Facility would be required to comply with the post-construction stormwater performance standards of the Construction General Permit, and stormwater control systems for these improvements would be designed and constructed in accordance with the PPDG. Improvements located outside the UPRR ROW for the Merced Layover & Maintenance Facility would be regulated as a Priority Development Project under the Small MS4 Permit or Central Valley Permit based on the construction of more than 5,000 square feet of new impervious surface for a parking lot or industrial/commercial facility and would be required to incorporate appropriate stormwater mitigation measures, including LID source control, site design, stormwater treatment, and hydromodification management, into the design plan.

Because the Merced Layover & Maintenance Facility would include train fueling/cleaning operations, these improvements would be required to comply with the Industrial General Permit, which requires the use of BMPs, BAT, and BCT to reduce and prevent discharges of pollutants to meet applicable water quality standards. Both the Small MS4 Permit and Central Valley Permit require source control measures to be developed for pollutant-generating activities including fueling areas and vehicle/equipment wash areas. The Merced Layover & Maintenance Facility would therefore be required to incorporate appropriate stormwater mitigation measures, including LID source control, site design, stormwater treatment, and hydromodification management, into the design plan. The Small MS4 Permit requires that the source control measures for these pollutant-generating activities be designed in accordance with the recommendations of the *California Stormwater Quality Association* (CASQA) *Stormwater Best Management Practices Handbook for New Development and Redevelopment* (California Stormwater Quality Association 2003) or equivalent manual. The CASQA handbook includes the following information and recommendations regarding fueling areas and vehicle/equipment washing areas.

- **Fueling Areas**—Spills at vehicle and equipment fueling areas can be a significant source of pollution because fuels contain toxic materials and heavy metals that are not easily removed by stormwater treatment devices. Project plans must be developed for emergency spill cleanup, containment, and leak prevention. Fuel dispensing areas should provide an overhanging roof structure or canopy. If fueling large equipment or vehicles that would prohibit the use of covers or roofs, the fueling island should be designed to sufficiently accommodate the larger vehicles and equipment and to prevent stormwater run-on and runoff. Fuel dispensing areas should be paved with Portland cement concrete (or equivalent smooth impervious surface). Fueling areas should be graded to drain toward a dead-end sump. Runoff from downspouts/roofs should be directed away from fueling areas. Do not locate storm drains in the immediate vicinity of the fueling area. In the case of an emergency, provide storm drain seals, such as isolation valves,

[8] The Merced Layover & Maintenance Facility would include the construction of approximately 399,000 sf of impervious areas associated with a vehicle access road, maintenance shop, parking, maintenance offices, and train wash on areas that are currently impervious; approximately 65,000 sf of paved, impervious areas associated with a vehicle access road and maintenance shop on areas that are currently pervious; and new maintenance tracks in areas that are currently impervious and pervious. These calculations do not account for any increases in pervious areas that would be implemented with the Proposed Project, related to landscaping.

drain plugs, or drain covers, to prevent spills or contaminated stormwater from entering the stormwater conveyance system.

- **Vehicle/Equipment Washing Areas**—Vehicle washing, equipment washing, and steam cleaning may contribute high concentrations of metals, oil and grease, solvents, phosphates, and suspended solids to wash waters that drain to stormwater conveyance systems. Project plans should include appropriately designed area(s) for washing/steam cleaning of vehicles and equipment. Depending on the size and other parameters of the wastewater facility, wash water may be conveyed to a sewer, an infiltration system, recycling system or other alternative. Pretreatment may be required for conveyance to a sanitary sewer. Areas for washing/steam cleaning should incorporate one of the following features.
    - Be self-contained and/or covered with a roof or overhang.
    - Be equipped with a clarifier or other pretreatment facility.
    - Have a proper connection to a sanitary sewer.
    - Include other features which are comparable and equally effective.
- It is generally advisable to cover areas used for regular washing of vehicles, trucks, or equipment, surround them with a perimeter berm, and clearly mark them as a designated washing area. Sumps or drain lines can be installed to collect wash water, which may be treated for reuse or recycling, or for discharge to the sanitary sewer. Jurisdictions may require some form of pretreatment, such as a trap, for these areas.
- Stormwater and non-stormwater could accumulate in containment areas and sumps with impervious surfaces. Contaminated accumulated water must be disposed of in accordance with applicable laws and cannot be discharged directly to the storm drain or sanitary sewer system without the appropriate permit (California Stormwater Quality Association 2003).

As such, compliance with these requirements would ensure that stormwater runoff from the Merced Layover & Maintenance Facility would not contain significant levels of pollutants or cause erosion and sedimentation in receiving waters, resulting in a less-than-significant impact.

Use of Pesticides

Pesticides would be used (similar to current operations) to maintain and clear vegetation from tracks. The future use of pesticides for vegetation removal near the tracks would be required to comply with DPR regulations that are intended to protect human health and the environment (see discussion under *California Department of Pesticide Regulation* in Section 3.10.2.2, *State*). DPR puts special controls on pesticides that can be especially dangerous to human health or the environment if not used correctly, limiting their use to trained individuals and only at times and places approved by a permit from the County Agricultural Commissioners (California Department of Pesticide Regulation 2017). Use of pesticides for vegetation removal near the tracks would therefore result in a less-than-significant impact on water quality.

Train Operations and Accident Conditions

Trains can be sources of pollutants such as petroleum products (e.g., oil, grease, and diesel) and metals. Under normal operating conditions, the amount of these pollutants released by modern trains is minimal (i.e., only minor drips) because trains undergo regular inspections and maintenance to prevent and fix leaks. Impacts from minor drips would be limited to the area

immediately below the railroad tracks, and the track ballast material would minimize stormwater runoff from the area of localized impacts and prevent significant impacts on water quality. Therefore, Proposed Project operations within the UPRR ROW would not contribute new significant sources of pollutants to stormwater runoff unless an accidental release of hazardous materials occurs along the tracks.

As described in Impact SAF-4 in Section 3.16, *Safety and Security*, the potential increases in accident conditions resulting from the Proposed Project operations include the accidental release of hazardous materials. However, based on historic Federal Railroad Administration accident/incident data, these occurrences are rare and travel by rail remains one of the safest modes of transportation. Proposed Project operations would comply with stringent federal and state protocols and regulations intended to reduce the likelihood of accident conditions. Accident conditions, including the accidental release of hazardous materials, are not expected to increase with Proposed Project operations. As such, the release of pollutants from train operations and from potential train accidents would result in a less-than-significant impact on water quality.

Atwater Station Alternative

The Atwater Station Alternative would alter existing drainage through the construction of station platforms, driveways, and parking areas. Improvements associated with the Atwater Station Alternative would create new impervious pavement surfaces. The Atwater Station Alternative would include the construction of less than 1,000 sf of net impervious surfaces.[9]

Operations impacts from the Atwater Station Alternative would be similar to impacts of the Livingston Station described above. Compliance with existing regulations and the design and construction of stormwater control systems in accordance with the PPDG would ensure that stormwater runoff from the Atwater Station Alternative would not cause erosion and sedimentation in receiving waters and that runoff from impervious surface areas is managed and treated to remove contaminants. Use of pesticides for vegetation removal near tracks would comply with DPR regulations to ensure runoff would not affect water quality. Compliance with existing regulations would ensure that potential sources of polluted runoff and associated adverse water quality conditions would result in less-than-significant impacts due to the Atwater Station Alternative.

However, construction of the Atwater Station Alternative would require earthwork. If contaminants are present in reused existing soil or imported fill materials that are exposed to stormwater, contaminants could leach into stormwater runoff and result in polluted stormwater runoff and surface water, potentially reducing the quality of the receiving water. This is a potentially significant impact.

There would be no substantial difference in the impact conclusion between the Atwater Station Alternative and the proposed Livingston Station (both would result in a potentially significant impact that would be reduced to a less-than-significant level with mitigation). Nonetheless, the Atwater Station Alternative could result in fewer impacts associated with changes in impervious

[9] The Atwater Station Alternative would include the construction of approximately 121,000 sf of paved, impervious areas associated with parking and pedestrian areas on areas that are currently impervious areas associated with parking, concrete, gravel, or buildings and less than 1,000 sf of impervious areas associated with parking on a small portion of landscaped areas that are pervious. These calculations do not account for any increases in pervious areas that would be implemented with the Atwater Station Alternative, related to landscaping.

surfaces since the Atwater Station Alternative would create less impervious surfaces than the proposed Livingston Station.

Mitigation Measures

Mitigation Measure HAZ-2.3 would apply to the Proposed Project and the Atwater Station Alternative. The description of Mitigation Measure HAZ-2.3 is presented in Section 3.9, *Hazardous Materials*.

Mitigation Measure HAZ-2.3: Implement construction risk management plan

Refer to measure description in Section 3.9, *Hazardous Materials*.

Significance with Application of Mitigation

Implementation of Mitigation Measure HAZ-2.3 requires preparation of an RMP. The RMP would include guidelines for testing and reuse of existing soil to ensure that potentially contaminated existing soil would not be reused in a manner that could pollute stormwater runoff, surface waters, or groundwater. The RMP would include guidelines for testing and use of imported fill material to ensure that contaminated fill materials are not used in a manner that could pollute stormwater runoff, surface waters, or groundwater. Implementation of Mitigation Measure HAZ-2.3, design and construction of stormwater controls and treatment systems in accordance with the PPDG, compliance with the post-construction requirements of the Construction General Permit, and compliance with requirements of applicable MS4/NPDES permits for stormwater control and treatment would ensure that operation of the Proposed Project would have a less-than-significant impact on water quality.

For the same reasons as the Proposed Project, implementation of Mitigation Measure HAZ-2.3 and the regulatory requirements would ensure that operations of the Atwater Station Alternative would have a less-than-significant impact on water quality.

Impact HYD-3	Construction of the Proposed Project would not substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the Proposed Project may impede sustainable groundwater management of the basin.
Level of Impact	**Less than significant impact**

Impact Characterization and Significance Conclusion

As discussed under Impact HYD-1, when temporary and limited groundwater dewatering would be required for construction activities, dewatering effluent would be treated and discharged (in accordance with provisions of the Construction General Permit, RMP, and Mitigation Measure HYD-1.1) back to the nearby surface water, if possible, providing an opportunity for groundwater recharge.

Proposed Project

The Ceres to Merced Extension Alignment would entail construction of new bridges over the Merced River, Canal Creek, Weber Canal, Bear Creek, irrigation canals, and a drainage ditch and new culverts over various canals, which would involve the discharge of groundwater or dewatering effluent. If groundwater is encountered during construction of the Turlock Station, Livingston Station, Merced

Station, or the Merced Layover & Maintenance Facility, the discharge of groundwater would be required.

Dewatering effluent generated during construction of the Proposed Project would be treated and discharged (in accordance with provisions of the Construction General Permit, RMP, and Mitigation Measure HYD-1.1) back to the nearby surface water, if possible, providing an opportunity for groundwater recharge. Therefore, the Proposed Project would not impede sustainable groundwater management of the basin. Since dewatering activities for construction of bridges and culverts would be short term and limited to bridge and culvert locations, and the discharged effluent would have the opportunity to recharge the aquifer, the dewatering activities associated with construction of the Proposed Project would have a less-than-significant impact on groundwater resources and groundwater recharge.

Atwater Station Alternative

Like construction of the proposed Livingston Station, if groundwater is encountered during construction of the Atwater Station Alternative, the discharge of groundwater or would be required. Because discharged groundwater would have the opportunity to recharge the aquifer, the dewatering activities that may occur with the Atwater Station Alternative would have a less-than-significant impact on groundwater resources and groundwater recharge. There would be no difference in impact between the proposed Livingston Station and the Atwater Station Alternative (both would result in a less-than-significant impact).

Impact HYD-4	Proposed Project operations would not substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the Proposed Project may impede sustainable groundwater management of the basin.
Level of Impact after Mitigation	**Less than significant impact**

Impact Characterization and Significance Conclusion

Proposed Project

Proposed Project operations would not involve dewatering or other use of groundwater that could deplete groundwater resources. The Ceres to Merced Extension Alignment would not involve creation of new impervious pavement surfaces and would not impede groundwater recharge. However, the new stations (Turlock Station, Livingston Station, and Merced Station) and the Merced Layover & Maintenance Facility would create new impervious surfaces, which can impede groundwater recharge, since stormwater would runoff of the impervious surfaces rather than infiltrating the ground surface and recharging aquifers. As discussed under Impact HYD-2, the Proposed Project would be required to comply with the post-construction requirements of the Construction General Permit for the new impervious surfaces within the UPRR ROW (e.g., new station platforms), which requires post-construction runoff to match preconstruction runoff for the 85th-percentile storm event. Other new impervious surfaces outside of the UPRR ROW, such as the construction of parking areas, driveways, pedestrian paths, and layover facility support areas at new stations and facilities would be required to comply with requirements of the applicable MS4/NPDES permits for stormwater control and treatment, which include LID source control, site design, stormwater treatment, and hydromodification management. Stormwater control and treatment systems may include vegetated swales, retention basins, biofiltration, and minimizing impermeable

surfaces to maintain predevelopment runoff rates, volumes, and quality and enhance infiltration and groundwater recharge.

The Turlock Station, Livingston Station, Merced Station, and Merced Layover & Maintenance Facility would involve creation of new impervious pavement surfaces as part of establishing new stations. Improvements within the UPRR ROW for these stations would be required to comply with the post-construction stormwater performance standards of the Construction General Permit, and improvements outside the UPRR ROW would be regulated as a Priority Development Project under the Small MS4 Permit or Central Valley Permit. Design and construction of stormwater controls and treatment systems for the Proposed Project, in accordance with the PPDG, and in compliance with the post-construction requirements of the Construction General Permit and with requirements of the applicable MS4/NPDES permits for stormwater control and treatment, would ensure that operation of the Proposed Project would have a less-than-significant impact on groundwater recharge and would not impede sustainable groundwater management of the basin.

Atwater Station Alternative

The operations impact of the Atwater Station Alternative would be similar to impacts of the Livingston Station. Operations of the Atwater Station Alternative would not involve dewatering or other use of groundwater that could deplete groundwater resources. The Atwater Station Alternative would create new impervious surfaces, which can reduce infiltration and impede groundwater recharge. New impervious surfaces would comply with the post-construction requirements of the Construction General Permit, the applicable MS4/NPDES permits, and the PPDG for stormwater control and treatment. Thus, operation of the Atwater Station Alternative would have a less-than-significant impact on groundwater recharge and would not impede sustainable groundwater management of the basin. There would be no difference in impact between the Atwater Station Alternative and the proposed Livingston Station (both would result in a less-than-significant impact).

Impact HYD-5	Construction of the Proposed Project could substantially alter the existing drainage pattern of the site or area in a manner that would result in substantial erosion, siltation, or impede or redirect flood flows.
Level of Impact	**Potentially significant impact** Proposed Project Ceres to Merced Extension Alignment Merced Layover & Maintenance Facility Merced Station **Less than significant impact** Proposed Project Turlock Station Livingston Station Alternative Analyzed at an Equal Level of Detail Atwater Station Alternative
Mitigation Measures	HYD-5.1: Prevent construction materials and equipment from impeding or redirecting flood flows
Level of Impact after Mitigation	**Less than significant impact**

Impact Details and Conclusions

Proposed Project

Erosion and Siltation

During construction of the Proposed Project, stormwater drainage patterns could be temporarily altered. However, the Proposed Project would implement BMPs required in the SWPPP to minimize the potential for erosion or siltation in nearby storm drains and temporary changes in drainage patterns during construction. During construction, implementation of erosion control techniques would provide temporary and permanent erosion and sediment control during construction of the Proposed Project. Construction BMPs would capture and infiltrate small amounts of sheet-flow into the ground such that offsite runoff from the construction site would not increase, ensuring that drainage patterns are not significantly altered. Measures required by the Construction General Permit would also limit site runoff during construction and would not alter stormwater drainage patterns. BMPs would be implemented to control construction site runoff, ensure proper stormwater control and treatment, and reduce the discharge of pollution to the storm drain system. As such, with implementation of the SWPPP and the Construction General Permit, the Proposed Project's impact related to erosion and siltation during construction would be less than significant.

Flood Flows

Potential flooding hazards were identified for areas intersected by the Proposed Project including storm-related flooding (mapped 100-year flood zones and mapped 200-year flood zones). Construction of the Turlock Station and Livingston Station would not entail activities within drainage courses or mapped flood zones, and, therefore, would result in less-than-significant impacts related to impeding or redirecting flood flows during construction.

The Ceres to Merced Extension Alignment would intersect flood hazard zones including the mapped 100-year flood zones around the Merced River, Canal Creek, and Bear Creek. Construction of the Ceres to Merced Extension Alignment may be located within drainage courses during construction of bridges and culverts, which could also alter drainage courses and cause flooding during construction because the placement of construction materials, equipment, and new structures (e.g., culverts, bridge supports, fill material, and temporary bridges for equipment access) within drainage courses, and potential diversion of surface water around work areas within drainage courses could obstruct flood flows. This is a potentially significant impact.

The Proposed Project would also require construction within mapped 100-year floodplains. The Ceres to Merced Extension Alignment, Merced Layover & Maintenance Facility, and the Merced Station would intersect a mapped 100-year flood zone. If flooding of construction areas occurs, construction materials and equipment could impede or redirect flood flows. This is a potentially significant impact.

Atwater Station Alternative

The construction impacts of the Atwater Station Alternative would be similar to impacts of the Livingston Station. During construction of the Atwater Station Alternative, stormwater drainage patterns could be temporarily altered. As required by the SWPPP and the Construction General Permit, BMPs would be implemented to minimize the potential for erosion or siltation during construction. Erosion control techniques would be implemented to provide temporary and

permanent erosion and sediment control. Measures required by the SWPPP and Construction General Permit would control construction site runoff, ensuring impacts related to erosion and siltation during construction would be less than significant. The Atwater Station Alternative would not intersect any mapped flood zones or drainage courses. Thus, the placement of construction materials, equipment, and new structures would not impede or redirect flood flows. Impacts related to impeding or redirecting flood flows during construction would be less than significant. There would be no difference in impact between the Atwater Station Alternative and the proposed Livingston Station (both would result in a less-than-significant impact).

Mitigation Measures

Mitigation Measure HYD-5.1 would apply to the Ceres to Merced Extension Alignment, Merced Layover & Maintenance Facility, and the Merced Station.

Mitigation Measure HYD-5.1: Prevent construction materials and equipment from impeding or redirecting flood flows

When working within areas of potential storm flooding inundation (mapped 100-year or mapped 200-year flood zones and within drainage courses), SJRRC's construction contractor(s) will closely monitor weather forecasts and will ensure that construction materials and equipment are temporarily moved out of areas of potential flooding inundation prior to the start of a storm that has the potential to cause significant flooding.

Significance with Application of Mitigation

Mitigation Measure HYD-5.1 would prevent construction materials and equipment from impeding or redirecting flood flows. This measure would mitigate potential construction impacts related to impeding or redirecting flood flows to a less-than-significant level.

Impact HYD-6	Proposed Project operations could substantially alter the existing drainage pattern of the site or area in a manner that would result in substantial erosion, siltation, or impede or redirect flood flows.
Level of Impact	**Potentially significant impact** Proposed Project Ceres to Merced Extension Alignment Merced Layover & Maintenance Facility Merced Station **Less than significant impact** Proposed Project Turlock Station Livingston Station Alternative Analyzed at an Equal Level of Detail Atwater Station Alternative
Mitigation Measures	HYD-6.1: Perform detailed hydraulic evaluations and modify designs for facilities within drainage courses and flood zones if required to reduce potential flooding impacts
Level of Impact after Mitigation	**Less than significant impact**

Impact Details and Conclusions

Proposed Project

As discussed under Impact HYD-5, the Proposed Project intersect various flooding hazard areas, including storm-related flooding (mapped 100-year flood zone).

For Proposed Project facilities located within drainage courses and/or mapped flood zones, if the facilities are not appropriately designed, they could potentially impede or redirect flood flows during operation, and railroad tracks could be inundated. Under existing standard procedures, trains would not operate on railroad tracks that are inundated due to the increased risk of derailment. Under existing standard procedures, if tracks were to be inundated by flooding, the line would be shut down, the tracks would be inspected, repairs and removal of debris would be performed if needed, and operation would begin again once the water has receded and the tracks are determined to be safe and free of debris.

As presented in Table 3.10-10, the required design storm interval for new stormwater drainage systems over drainage courses would depend on the location (rural or urban) and type of drainage systems. In the Central Valley region, encroachment permits would be required from CVFPB to construct bridges, and CVFPB requires new bridges to be designed for 200-year flood events. If a bridge design cannot meet the 200-year flood criteria, the bridge would have to go through a CVFPB hearing process for approval. The review and approval of bridge designs by CVFPB would ensure that operation of new bridges in the Central Valley region would not impede or redirect flood flows.

The Turlock Station and Livingston Station would not intersect any mapped flood zones or drainage courses. In addition, as described in Chapter 2, *Project Description*, the Livingston Station would not significantly alter drainage patterns from the relocation of the detention basin on the site because this detention basin would not be removed, rather it would be relocated further south within the environmental footprint. Thus, operations of the Turlock Station and Livingston Station would not substantially alter the existing drainage pattern of the site or area in a manner which would result in substantial erosion, siltation or impede or redirect flood flows. Impacts would be less than significant.

Table 3.10-6. Design Storm Intervals

Storm Drainage System	Rural	Urban
Drainage facilities crossing the track (e.g., large culverts)	2% (50-year)	1% (100-year)
Drainage systems crossing under bridge structures	1% (100-year) (0.5% [200-year for Central Valley])[a]	
Ditches/storm drainage systems adjacent to the track	4% (25-yr)	2% (50-yr)
Critical ACE Structures/Facilities	Min 0.2% (500-yr)	1% (100-yr)

Source: AECOM 2016b.

[a] The drainage system (bridges for rivers and creeks) in the Central Valley may not be feasible to design for 200-year storm event. A design variance shall be required from CVFPB to design the bridges for a less frequent storm event.

Portions of the Ceres to Merced Extension Alignment (near the Merced River, northwest of Merced, and in Merced), the Merced Layover & Maintenance Facility, and the Merced Station would be located in a mapped 100-year flood zone. The Merced River 100-year flows are contained in the

riverbanks at the Ceres to Merced Extension Alignment crossing. The base flood elevation for Merced River at the crossing is 75 feet (AECOM 2016c). The Ceres to Merced Extension Alignment would also include operation of new bridges over the Merced River, Canal Creek, Weber Canal, Bear Creek, irrigation canals, and a drainage ditch, and new culverts over various canals to support the new mainline track. The design of the new bridge crossing the Merced River, Canal Creek, and Bear Creek would follow the existing UPRR and Highway-99 bridge design, such that obstructions to the flows in the river are negligible, and encroachment to the floodplains can be avoided. The bridge foundation/support structures would be designed such that no increase in the flood elevation occurs in the river. Additionally, outside the riverbanks, cross drainage structures would be installed for the east west floodplains. However, Proposed Project facilities within drainage courses and mapped flood zones could impede or redirect flood flows if not appropriately designed, which could result in flooding of offsite areas. This is a potentially significant impact.

Atwater Station Alternative

The Atwater Station Alternative would not intersect any mapped flood zones or drainage courses. Therefore, operations of the Atwater Station Alternative would not substantially alter the existing drainage pattern of the site or area in a manner that would result in substantial erosion, siltation, or impede or redirect flood flows. Impacts would be less than significant. There would be no difference in impact between the Atwater Station Alternative and the proposed Livingston Station (both would result in a less-than-significant impact).

Mitigation Measures

Mitigation Measure HYD-6.1 would apply to the Ceres to Merced Extension Alignment, Merced Layover & Maintenance Facility, and the Merced Station.

Mitigation Measure HYD-6.1: Perform detailed hydraulic evaluations and modify designs for facilities within drainage courses and flood zones if required to reduce potential flooding impacts

Facilities within drainage courses, mapped 100-year flood zones, and mapped 200-year flood zones will be analyzed using detailed hydraulic evaluations to be completed during the next design phase of the facilities to ensure that the facilities would not impede or redirect flood flows. The detailed hydraulic evaluations will be performed and certified by a professional engineer and will be based on the most current and best available information regarding existing flooding hazards and will quantify the following information.

- The potential for facilities within drainage courses, mapped 100-year flood zones, and mapped 200-year flood zones to impede or redirect flood flows including storm-related flooding.
- The potential for facilities within drainage courses, mapped 100-year flood zones, and mapped 200-year flood zones to result in changes to floodplain extent and depth, and receptors and properties that would be affected by the potential changes to floodplain conditions.

If the Ceres to Merced Extension Alignment, Merced Layover & Maintenance Facility, or the Merced Station could result in an increase in offsite flooding conditions by more than 1 foot in floodplains and 0.1 feet in floodways for the 100-year flood or the 200-year flood (depending on location and CVFPB jurisdiction) compared to existing conditions, Project designs will be

modified to reduce the potential flooding impacts to be equivalent to the existing conditions. Modifications to designs may include the following measures.

For the Ceres to Merced Extension Alignment:

- Increasing culvert sizes.
- Installation of cross-drainage facilities to balance the floodplain elevations across new tracks.
- Modifying bridge designs to reduce the restriction of flood flows through drainage courses.

For the Merced Layover & Maintenance Facility:

- Creating no net fill for facilities within floodplains, which may require excavation of detention/retention basins for the Merced Layover & Maintenance Facility.[10]

For the Merced Station:

- Conduct soil sampling to assess soil permeability; model pre-Project and post-Project flooding conditions and if the Project would result in an increase in the flood levels per the significance criteria identified above, then SJRRC would use designs such as but not limited to using pervious pavement for new paving associated with the Merced Station, planted swales, basin areas, including off-site basin areas, and/or other stormwater improvements.

The detailed hydraulic evaluations will be submitted to the regulatory agencies that have jurisdiction over facilities within drainage courses. For facilities requiring encroachment permits from CVFPB, the detailed hydraulic evaluations will be submitted to CVFPB for review and approval.

Significance with Application of Mitigation

Implementation of Mitigation Measure HYD-6.1 would require detailed hydraulic evaluations and modifications of Proposed Project designs (if required) to reduce potential flooding hazards. Implementation of this measure would ensure that operation of facilities within drainage courses and mapped flood zones would not result in substantial erosion, siltation, or impede or redirect flood flows. As such, this impact would be reduced to a less-than-significant level.

Impact HYD-7	Construction of the Proposed Project could alter drainage patterns and/or create or contribute runoff water that could substantially increase the rate or amount of surface runoff in a manner which would result in flooding onsite or offsite, 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.
Level of Impact	**Potentially significant impact**
Mitigation Measures	HYD-1.3: Limit groundwater or dewatering discharge flow rates
Level of Impact after Mitigation	**Less than significant impact**

[10] As shown in the environmental footprint, there is sufficient area within the Merced Layover & Maintenance Facility locations to construct basins if needed for flood management requirements.

Impact Details and Conclusions

Proposed Project

As described in Impact HYD-1, construction of the Proposed Project could require the discharge of groundwater or dewatering effluent. Measures required by the Construction General Permit would control construction site runoff, ensuring proper stormwater control and water quality. Nonetheless, if the discharge is not performed at an appropriate flow rate, the discharge of groundwater or dewatering effluent could potentially increase the rate or amount of surface runoff in a manner that could result in flooding onsite or offsite, 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. This is a potentially significant impact.

Atwater Station Alternative

Like the Livingston Station, construction of the Atwater Station Alternative could require the discharge of groundwater and could result in a similar potentially significant impact. There would be no difference in impact between the Atwater Station Alternative and the proposed Livingston Station (both would result in a potentially significant impact that would be reduced to a less-than-significant level with mitigation).

Mitigation Measures

Mitigation Measure HYD-1.3 would apply to the Proposed Project and the Atwater Station Alternative.

Mitigation Measure HYD-1.3: Limit groundwater or dewatering discharge flow rates

Refer to measure description in Impact HYD-1.

Significance with Application of Mitigation

Mitigation Measure HYD-1.3 would limit flow rates for groundwater or dewatering discharges. This measure would reduce potential onsite or offsite flooding impacts, impacts related to exceeding the capacity of existing or planned stormwater drainage systems, and impacts related to providing additional sources of polluted runoff to a less-than-significant level for the Proposed Project.

Likewise, Mitigation Measure HYD-1.3 would reduce potential onsite or offsite flooding impacts, impacts related to exceeding the capacity of existing or planned stormwater drainage systems, and impacts related to providing additional sources of polluted runoff to a less-than-significant level for the Atwater Station Alternative.

Impact HYD-8	Proposed Project operations could alter drainage patterns or create or contribute runoff water that could substantially increase the rate or amount of surface runoff in a manner which would result in flooding onsite or offsite, 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.
Level of Impact	**Potentially significant impact**
Mitigation Measures	HYD-8.1: Perform detailed hydraulic evaluations and modify designs for stormwater controls if required to prevent storm drainage system capacity exceedance and/or reduce potential flooding impacts
Level of Impact after Mitigation	**Less than significant impact**

Impact Details and Conclusions

Proposed Project

Portions of the Proposed Project located within the UPRR ROW would include altering drainage patterns by modifying or creating trackside ditches and drainage systems. According to the Preliminary Stormwater Management Plan (AECOM 2016a) and Preliminary Hydrology and Drainage Report (AECOM 2016b), at many places along the Ceres to Merced Extension Alignment, trackside drainage ditches are not connected to downstream drainage systems and act as retention and infiltration basins, and excess runoff from these ditches may flow overland into adjacent properties during extreme storm events. In developed urban areas, the Ceres to Merced Extension Alignment crosses several major arterial roads with existing storm drain systems, and new drainage systems may be connected to the existing local roadway drainage system. In rural areas, drainage systems may be connected to adjacent canal ditches, creeks, or rivers after implementing appropriate stormwater management systems. In general, the drainage design concepts would include the following features.

- Construct trackside swales or ditches to collect runoff from the tracks within the UPRR ROW.
- Allow infiltration, and detention onsite and offsite, if feasible.
- Evaluate or improve the capacity of the existing drainage system to carry runoff from the Proposed Project, if required.
- Construct catch basins as required to convey excess flows from the Proposed Project to the local drainage system.
- Construct cross-culverts under the existing or new tracks to carry runoff across the trackway system to maintain the flow pattern.

The design storm interval for new ditches and stormwater drainage systems adjacent to tracks would be a 25-year flood for rural areas and a 50-year flood for urban areas (AECOM 2016b). Stormwater controls would be designed and constructed for facilities within the UPRR ROW in accordance with the PPDG, and may include biofiltration swales, biofiltration strips, infiltration devices, detention devices, media filters, wet basins, and dry weather diversion (AECOM 2016a). Compliance with the post-construction stormwater performance standards of the Construction General Permit would ensure that the stormwater controls are designed so that runoff from tracks would match existing runoff conditions (up to the 85th-percentile storm event).

Furthermore, as summarized in Impact HYD-2, the Ceres to Merced Extension Alignment is not expected to create new impervious surfaces; however, it is expected that the Turlock Station, Livingston Station, Merced Station, and Merced Layover & Maintenance Facility would create new impervious surfaces. In addition, the Livingston Station would not significantly alter drainage patterns from the relocation of the detention basin on the site because this detention basin would not be removed, rather it would be relocated further south within the environmental footprint. As described in Impact HYD-2, the Proposed Project would be required to adhere to the requirements in the Construction General Permit and the applicable MS4/NPDES permits. Compliance with the applicable MS4/NPDES permit requirements, including post-construction requirements of the Construction General Permit, would ensure that operation of the Proposed Project would minimize increases in stormwater runoff compared to the existing condition; however, the Proposed Project could still increase stormwater runoff due to the creation of new impervious surfaces and new connections of trackside drainage ditches to existing storm drainage systems. The new impervious surfaces and connections to existing storm drainage systems could potentially increase the rate or amount of surface runoff in a manner that could result in flooding onsite or offsite, 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. This is a potentially significant impact.

Atwater Station Alternative

Operations impacts from the Atwater Station Alternative would be similar to impacts of the Livingston Station. The Atwater Station Alternative would alter existing drainage through the construction of new impervious surfaces and would be required to adhere to the same requirements (Construction General Permit and the applicable MS4/NPDES permit) as the Proposed Project. Nonetheless, the new impervious surfaces could potentially increase the rate or amount of surface runoff in a manner that could result in flooding onsite or offsite, 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. This is a potentially significant impact. There would be no difference in impact between the Atwater Station Alternative and the proposed Livingston Station (both would result in a potentially significant impact that would be reduced to a less-than-significant level with mitigation).

Mitigation Measures

Mitigation Measure HYD-8.1 would apply to the Proposed Project and Atwater Station Alternative.

Mitigation Measure HYD-8.1: Perform detailed hydraulic evaluations and modify designs for stormwater controls if required to prevent storm drainage system capacity exceedance and/or reduce potential flooding impacts

Facilities that include alteration of drainage patterns such as alteration and construction of trackside ditches, construction of new impervious pavement and stormwater drainage systems at stations, and construction of new connections to existing stormwater drainage systems, will require detailed hydraulic evaluations to be completed during the next improvements design phase to ensure that the new stormwater control infrastructure is appropriately designed and that runoff from facilities would not exceed the capacity of storm drainage systems and result in flooding. The detailed hydraulic evaluations will be performed in accordance with the requirements of latest edition of the *Caltrans Highway Design Manual* (California Department of

Transportation 2020) for tracks and station platforms, and in accordance with regulations and design requirements of local municipalities (including the local MS4 Permit requirements) for other improvements associated with stations. The detailed hydraulic evaluations will be based on the most current and best available information regarding existing stormwater drainage system capacity and existing flooding hazards. A professional engineer will perform and certify the following detailed hydraulic evaluations.

- Facilities comply with regulations and design requirements of local municipalities for discharges to storm drainage systems within those jurisdictions.
- Facilities are designed to accommodate storm frequencies, precipitation data, and runoff calculations.
- The capacity of existing or proposed storm drainage systems that would receive discharges are evaluated.

If facilities could result in exceedance of existing or proposed storm drainage systems and flooding, modification of stormwater control designs or offsite storm drainage systems will be performed to reduce and control runoff and potential for flooding. These modifications may include the following measures.

- Reducing impervious surfaces through use of permeable pavement surfaces for station improvements.
- Increasing the size of drainage ditches, swales, retention basins, infiltration basins, trenches, and cross-drainage facilities within track and station areas.
- Increasing the capacity of downstream stormwater drainage systems by increasing the size of offsite storm drains, drainage canals, and retention and infiltration basins.

Significance with Application of Mitigation

Mitigation Measure HYD-8.1 would require detailed hydraulic evaluations and modification of stormwater controls. This mitigation measure would reduce potential onsite or offsite flooding impacts, impacts related to exceeding the capacity of existing or planned stormwater drainage systems, and impacts related to providing additional sources of polluted runoff to a less-than-significant level for the Proposed Project.

Likewise, Mitigation Measure HYD-8.1 would reduce potential onsite or offsite flooding impacts, impacts related to exceeding the capacity of existing or planned stormwater drainage systems, and impacts related to providing additional sources of polluted runoff to a less-than-significant level for the Atwater Station Alternative.

Impact HYD-9	In a flood hazard, construction of the Proposed Project could risk release of pollutants due to project inundation.
Level of Impact	**Potentially significant impact** Proposed Project Ceres to Merced Extension Alignment Merced Layover & Maintenance Facility Merced Station **Less than significant impact** Proposed Project Turlock Station Livingston Station Alternative Analyzed at an Equal Level of Detail Atwater Station Alternative
Mitigation Measures	HYD-5.1: Prevent materials and equipment from being exposed to storm flooding hazards
Level of Impact after Mitigation	**Less than significant impact**

Impact Details and Conclusions

Proposed Project

Potential flooding hazards were identified for areas intersected by the Proposed Project including storm-related flooding (mapped 100-year flood zone). The Proposed Project is not located near the coast and is not, therefore, susceptible to coastal flooding hazards, such as tsunamis, extreme high tides, or SLR. The potential for the Proposed Project to be subject to flooding impacts related to dam or levee failure during operation is very low as regular inspection and maintenance of dams and levees substantially reduces the potential for their failure.

The Turlock Stations is not located in a mapped flood hazard zone. Therefore, construction of the Turlock Station would result in less-than-significant impacts related to release of pollutants due to inundation. The Livingston Station is not located in an area with storm-related flooding; however, the Livingston Station is located within a dam failure inundation area. Due to the low potential for flooding from dam failure, the potential for release of pollutants due to the inundation of the Livingston Station would be less than significant.

In addition, as summarized in Impact HYD-5, the Ceres to Merced Extension Alignment, Merced Station, and Merced Layover & Maintenance Facility are located in areas with mapped flood hazards. During construction, BMPs would be implemented to capture and infiltrate small amounts of sheet-flow into the ground such that offsite runoff and associated pollutants from the construction site would not increase. Measures required by the Construction General Permit would also limit site runoff and associated pollutants during construction. BMPs would be implemented to control construction site runoff, and ensure proper stormwater control and treatment, and reduce the discharge of pollution to the storm drain system. However, if flooding of construction areas occurs, construction materials and equipment within drainage courses could be inundated, which could risk release of pollutants into surface waters. This is a potentially significant impact.

Atwater Station Alternative

Construction of the Atwater Station Alternative would not be located in a mapped flood hazard area. Therefore, construction of the Atwater Station Alternative would result in less-than-significant impacts related to release of pollutants due to inundation. Although the proposed Livingston Station would be located in a dam failure inundation area, the potential impact from releasing pollutants due to inundation is also expected to be less than significant. There would be no substantial difference in impact between the Atwater Station Alternative and the proposed Livingston Station (both would result in a less-than-significant impact).

Mitigation Measures

Mitigation Measure HYD-1.2 would apply to the Ceres to Merced Extension Alignment. Mitigation Measure HYD-5.1 would apply to the Ceres to Merced Extension Alignment, Merced Station, and Merced Layover & Maintenance Facility.

Mitigation Measure HYD-1.2: Avoid water quality impacts from construction adjacent to, within, and crossing over surface waters

Refer to measure description in Impact HYD-1.

Mitigation Measure HYD-5.1: Prevent construction materials and equipment from impeding or redirecting flood flows

Refer to measure description in Impact HYD-5.

Significance with Application of Mitigation

Mitigation Measure HYD-1.2 requires specific procedures for construction of the Proposed Project adjacent to, within, or crossing surface water. Mitigation Measure HYD-5.1 would prevent construction materials and equipment from impeding or redirecting flood flows and the associated risk of release of pollutants due to project inundation. With implementation of Mitigation Measures HYD-1.2 and HYD-5.1, potential impacts related to the release of pollutants due to inundation from construction of the Proposed Project (due to the Ceres to Merced Extension Alignment, Merced Station, and Merced Layover & Maintenance Facility) would be less than significant.

Impact HYD-10	In a flood hazard, Proposed Project operations could risk release of pollutants due to project inundation.
Level of Impact	**Potentially significant impact** Proposed Project Ceres to Merced Extension Alignment Merced Layover & Maintenance Facility Merced Station **Less than significant impact** Proposed Project Turlock Station Livingston Station Alternative Analyzed at an Equal Level of Detail Atwater Station Alternative
Mitigation Measures	HYD-6.1: Perform detailed hydraulic evaluations and modify designs for improvements within drainage courses and flood zones if required to reduce potential flooding impacts
Level of Impact after Mitigation	**Less than significant impact**

Impact Details and Conclusions

Proposed Project

As discussed under Impact HYD-9, the Turlock Station would not be located in a mapped flood hazard area. As such, operations of the Turlock Station would result in less-than-significant impacts related to release of pollutants due to inundation. As discussed under Impact HYD-9, the Livingston Station is not located in an area with storm-related flooding but is located within a dam failure inundation area. Due to the low potential for flooding from dam failure, the regular inspection and maintenance of dams and levees, which substantially reduces the potential for their failure, the potential for release of pollutants due to the inundation of the Livingston Station is less than significant.

The Ceres to Merced Extension Alignment, Merced Station, and Merced Layover & Maintenance Facility would be located in a mapped flood hazard area. Under existing standard procedures, trains would not operate on railroad tracks that are inundated due to the increased risk of derailment. Railroad tracks could be inundated and can result in spills of pollutants that can impact surface water and/or groundwater. However, under existing standard procedures, if tracks were to be inundated by flooding, the line would be shut down, the tracks would be inspected, repairs and removal of debris would be performed if needed, and operation would begin again once the water has receded and the tracks are determined to be safe and free of debris.

Table 3.10-10, as presented in Impact HYD-6, summarizes the required design storm interval for new stormwater drainage systems and improvements over drainage courses which would depend on the location (rural or urban) and type of drainage systems. CVFPB requires new bridges to be designed for 200-year flood events. If a bridge design cannot meet the 200-year flood criteria, the bridge would have to go through a CVFPB hearing process for approval. The review and approval of bridge designs by CVFPB would ensure that operation of new bridges in the Central Valley region would not impede or redirect flood flows and minimize associated release of pollutants.

Furthermore, the Proposed Project would be required to comply with the post-construction stormwater performance standards of the Construction General Permit and the Small MS4 Permit or Central Valley Permit, which would require the implementation of measures that would overall minimize the release of pollutants from the Proposed Project. Nonetheless, operations of the Proposed Project (due to the Ceres to Merced Extension Alignment, Merced Station, and Merced Layover & Maintenance Facility), which would be located in mapped flood hazard areas could impede or redirect flood flows if not appropriately designed, which could result in flooding of offsite areas and risk release of pollutants due to inundation. This is a potentially significant impact.

Atwater Station Alternative

Construction of the Atwater Station Alternative would not be located in a mapped flood hazard area. Therefore, operations of the Atwater Station Alternative would result in less-than-significant impacts related to release of pollutants due to inundation. Although the proposed Livingston Station would be located in a dam failure inundation area, the potential impact from releasing pollutants due to inundation is also expected to be less than significant. There would be no substantial difference in impact between the Atwater Station Alternative and the proposed Livingston Station (both would result in a less-than-significant impact).

Mitigation Measures

Mitigation Measure HYD-6.1 would apply to the Ceres to Merced Extension Alignment, Merced Station, and Merced Layover & Maintenance Facility. The description of Mitigation Measure HYD-6.1 is presented in Impact HYD-6.

Mitigation Measure HYD-6.1: Perform detailed hydraulic evaluations and modify designs for improvements within drainage courses and flood zones if required to reduce potential flooding impacts

Refer to measure description in Impact HYD-6.

Significance with Application of Mitigation

Implementation of Mitigation Measure HYD-6.1 would require detailed hydraulic evaluations modifications of project designs if required to reduce potential flooding hazards. This measure would mitigate impacts related to the release of pollutants due to inundation within mapped flood hazard areas from the Proposed Project (due to the Ceres to Merced Extension Alignment, Merced Station, and Merced Layover & Maintenance Facility) to a less-than-significant level.

Impact HYD-11	Construction of the Proposed Project would not conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan.
Level of Impact	**Less than significant impact**

Impact Characterization and Significance Conclusion

Proposed Project

Commonly practiced BMPs, as required by the Construction General Permit, would be implemented to control construction site runoff associated with construction of the Proposed Project and to reduce the discharge of pollutants to storm drain systems from stormwater and other nonpoint-

source runoff. As part of compliance with permit requirements during ground disturbing or construction activities, implementation of water quality control measures and BMPs would ensure that water quality standards would be achieved, including the water quality objectives that protect designated beneficial uses of surface and groundwater, as defined in the applicable water quality control plan. Construction runoff would also have to comply with the appropriate water quality objectives for the region. Implementation of stormwater control BMPs during construction, as required by the Construction General Permit, would reduce the discharge of pollutants and adverse impacts to water quality. The Construction General Permit also requires stormwater discharges not to contain pollutants that cause or contribute to an exceedance of any applicable water quality objectives or water quality standards, including designated beneficial uses. In addition, as described in Impact HYD-3, the Proposed Project would not impede sustainable groundwater management of the basin and would have a less-than-significant impact on groundwater resources and groundwater recharge. Thus, construction of the Proposed Project would not conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan, and impacts would be less than significant.

Atwater Station Alternative

Construction of the Atwater Station Alternative would require the implementation of the same BMPs as the Proposed Project and would not, therefore, conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan. Like the Proposed Project, the impact would be less than significant, and there would be no difference in impact between implementation of the proposed Livingston Station and the Atwater Station Alternative (both would result in a less-than-significant impact).

Impact HYD-12	Operation and maintenance of the Proposed Project would not conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan.
Level of Impact	**Less than significant impact**

Impact Characterization and Significance Conclusion

Proposed Project

Stormwater control and treatment BMPs would be designed and constructed for improvements within the UPRR ROW in accordance with the PPDG developed by Caltrans (California Department of Transportation 2019), and may include biofiltration swales, biofiltration strips, infiltration devices, detention devices, media filters, wet basins, and dry weather diversion (AECOM 2016a). Design and construction of stormwater control and treatment BMPs in accordance with the PPDG would reduce stormwater runoff flows and associated pollutants involving operation of the Proposed Project within the UPRR ROW. In addition, the facilities outside of the UPRR ROW, including the Turlock Station, Livingston Station, Merced Station, and Merced Layover & Maintenance Facility would be regulated as a Priority Development Project under the Small MS4 Permit or Central Valley Permit.

The Proposed Project would not result in adverse impacts on the local groundwater aquifer. Incorporation of stormwater control and treatment BMPs such as biofiltration swales, biofiltration strips, infiltration devices, and media filters would manage stormwater and reduce stormwater runoff flows and associated pollutants. Stormwater BMPs that are incorporated would allow water to percolate into the ground, thereby treating stormwater runoff through biological uptake, and

reducing the discharge of pollution to the storm drain system. Any potential contaminants would be filtered, minimizing adverse effects to groundwater quality as well. As described in Impact HYD-4, operation of the Proposed Project would have a less-than-significant impact on groundwater recharge and would not impede sustainable groundwater management of the basin.

Thus, operations of the Proposed Project would not conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan, and impacts would be less than significant.

Atwater Station Alternative

Like the proposed Livingston Station, operation of the Atwater Station Alternative would be regulated as a Priority Development Project under the Small MS4 Permit or Central Valley Permit. Like the Proposed Project, the impact would be less than significant and there would be no difference in impact between implementation of the proposed Livingston Station and the Atwater Station Alternative (both would result in a less-than-significant impact).

3.10.4.4 Overall Comparison of the Proposed Livingston Station and Atwater Station Alternative

The proposed Livingston Station would have slightly greater impacts related to the changes in impervious surfaces. The Livingston Station would include the construction of approximately 99,000 sf of net impervious surfaces while the Atwater Station Alternative would include the construction of less than 1,000 sf of net impervious surfaces. Because the groundwater at the Atwater Station Alternative site could be affected by a hazardous material release site of concern (see Section 3.9, Hazardous Materials), there is a greater potential to encounter hazardous materials in the groundwater encountered at the Atwater Station Alternative than the proposed Livingston Station. Overall, both the Atwater Station Alternative and the proposed Livingston Station would result in similar impacts on hydrology and water quality.