San Joaquin Joint Powers Authority

MITC Merced Intermodal Track Connection

Merced Intermodal Track Connection Project

Draft Environmental Impact Report

July 2024

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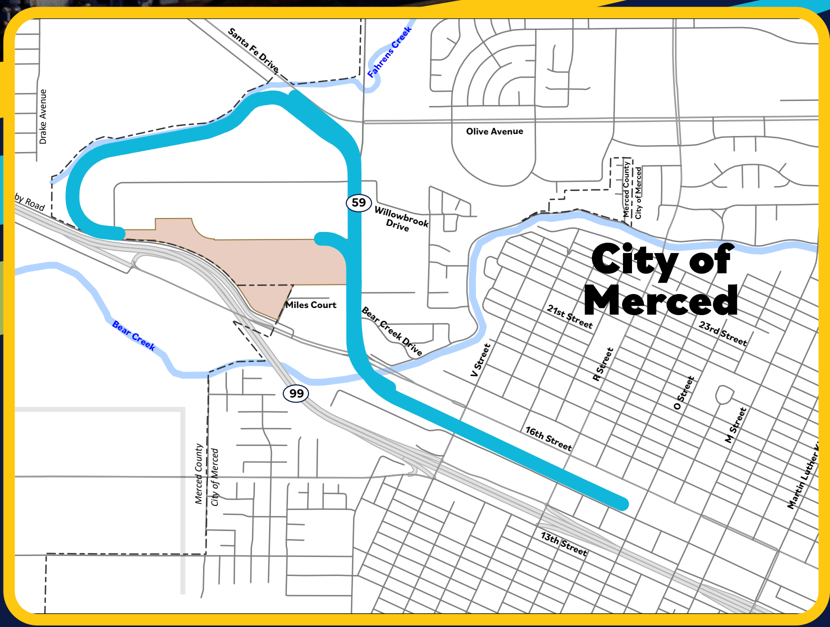

Draft Environmental Impact Report

Merced Intermodal Track Connection Project

State Clearinghouse #2023010061

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Acronyms and Abbreviations

μg/m³	micrograms per cubic meter
AASHTO	American Association of State Highway and Transportation Officials
AB	Assembly Bill
ACE	Altamont Corridor Express
ACM	Asbestos Containing Material
ADA	Americans with Disabilities Act of 1990
AIA	Airport Influence Area
APLIC	Avian Power Line Interaction Committee
AREMA	American Railroad Engineering and Maintenance-of-Way Association
ASTM	American Society for Testing and Materials
BAAQMD	Bay Area Air Quality Management District
BART	Bay Area Rapid Transit
Bay Area	San Francisco Bay Area
BCAG	Butte County Association of Governments
bgs	below ground surface
BMP	Best Management Practice
BNSF	Burlington Northern Santa Fe
Btu	British thermal units
CAA	Clean Air Act
CAAQS	California Ambient Air Quality Standards
CAFE	Corporate Average Fuel Economy
CAISO	California Independent System Operator
Cal Public Res. Code	California Public Resources Code
Cal. Code Regs.	California Code of Regulations
Cal. Gov. Code	California Government Code
Cal/OSHA	California Division of Occupational Safety and Health
CalEEMod	California Emissions Estimator Model
CalEnviroScreen	California Communities Environmental Health Screening Tool
CalEPA	California Environmental Protection Agency
CalFire	California Department of Forestry and Fire Protection
CALGreen	California Green Building Standards Code
California CAA	California Clean Air Act
CalRecycle	California Department of Resources Recycling and Recovery
CalSTA	California State Transportation Authority
Caltrans	California Department of Transportation
CAP	Climate Action Plan
CARB	California Air Resources Board
Carl Moyer Program	Carl Moyer Memorial Air Quality Standards Attainment Program
CBIA	California Building Industry Association

CCA	Community Choice Aggregator
CCAIC	Central California Information Center
CCIC	Central California Information Center
CCR	California Code of Regulations
CCTS	Central California Taxonomic System
CDFW	California Department of Fish and Wildlife
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CESA	California Endangered Species Act
CFR	Code of Federal Regulations
CGP	Construction General NPDES Permit
CGS	California Geological Survey
CH_4	Methane
CHRIS	California Historical Resources Information System
CHSRA	California High-Speed Rail Authority
CIDH	Cast-In-Drilled-Hole
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CO	Carbon Monoxide
CO Protocol	Caltrans Institute of Transportation Studies Transportation Project-Level Carbon Monoxide Protocol
CO_2	Carbon Dioxide
CO_2e	Carbon Dioxide Equivalent
CPUC	California Public Utilities Commission
CRHR	California Register of Historical Resources
CSRP	California State Rail Plan
CUPA	Certified Unified Program Agency
CVFPB	Central Valley Flood Protection Board
CVFPP	Central Valley Flood Protection Plan
CVP	California Valley Project
CWA	Clean Water Act of 1972
CWC	California Water Code
dB	decibel
dBA	A-weighting decibel
DCE	Dichloroethene
Delta	Sacramento–San Joaquin Delta
DHS	Department of Health Services
DHS	Department of Homeland Security
DPM	Diesel Particulate Matter
DPR	California Department of Pesticide Regulation
DTSC	Department of Toxic Substances Control
DWR	California Department of Water Resources
EFH	Essential Fish Habitat

EFZ	Earthquake Fault Zone
EIA	U.S. Energy Information Administration
EIR	Environmental Impact Report
EMS	Emergency Medical Services
EO	Executive Order
EOP	Emergency Operations Plan
EOS	Early Operating Segment
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
ESP	Energy Service Provider
ETO	Early Train Operator
FAA	Federal Aviation Administration
FAR	Federal Aviation Regulations
FAST Act	Fixing America's Surface Transportation Act of 2015
FBI	Federal Bureau of Investigation
FCC	Federal Communications Commission
FEMA	Federal Emergency Management Agency
FERC	Federal Energy Regulatory Commission
FHWA	Federal Highway Administration
FIRM	Flood Insurance Rate Maps
Fish & G. Code	California Fish and Game Code
FR	Federal Register
FRA	Federal Railroad Administration
FTA	Federal Transit Administration
FUDS	Formerly Used Defense Site
g/m^3	micrograms per cubic meter
GHG	Greenhouse Gas
GIS	Geographic Information System
GO	General Order
gpm	gallons per minute
GPS	Global Positioning System
GSA	Groundwater Sustainability Agencies
GSP	Groundwater Sustainability Plan
GWh	Gigawatt Hour
GWP	Global Warming Potential
HARP 2	Hotspots Analysis and Reporting Program Version 2
HCP	Habitat Conservation Plan
Health & Saf. Code	California Health and Safety Code
HFC	Hydrofluorocarbon
Hot Spots Act	Air Toxics Hot Spots Information and Assessment Act of 1987
HRA	Health Risk Assessment
HSR	High-Speed Rail
I-	Interstate
ICCTA	Interstate Commerce Commission Termination Act

ICCTA	Interstate Commerce Commission Termination Act
IGP	Industrial General NPDES Permit
IIPP	Injury and Illness Prevention Program
IpaC	Information for Planning and Conservation
IPCC	Intergovernmental Panel on Climate Change
ITP	Incidental Take Permit
kg	Kilogram
KOP	Key Observation Point
KVP	Key Viewpoint
KWh	Kilowatt Hour
L_{dn}	Day-Night Sound Level
Leq	Equivalent Sound Level
LID	Low-Impact Development
Lmax	Maximum A-weighted sound pressure levels
LOS	Level of Service
LRFD	Load and Resistance Factor Design
LRSP	Local Road Safety Plan
LT	Long-Term Noise Site
LUST	Leaking Underground Storage Tank
Magnuson-Stevens Act	Magnuson-Stevens Fishery Conservation and Management Act
MBTA	Migratory Bird Treaty Act
MCAG	Merced County Association of Governments
MCDPH	Merced County Department of Public Health
Merced Transpo	City of Merced Downtown Transportation Center
MFD	City of Merced Fire Department
mgd	million gallon per day
MID	Modesto Irrigation District
MITC	Merced Intermodal Track Connection
MOU	Memorandum of Understanding
MOW	Maintenance of Way
MP	Milepost
MPD	Merced Police Department
mph	miles per hour
MPO	Metropolitan Planning Organizations
MRI	Magnetic Resonance Imaging
MRZ	Mineral Resource Zone
MS4	Municipal Separate Storm Sewer Systems
MS4 Permit	NPDES General Permit for Municipal Separate Storm Sewer Systems
MSWG	Merced Stormwater Group
MTC	Metropolitan Transportation Commission
MUTCD	Manual on Uniform Traffic Control Devices
MW	Megawatt
MWh	Megawatt hours per day

N_2O	Nitrous Oxide
NAAQS	National Ambient Air Quality Standards
NAGPRA	Native American Graves Protection and Repatriation Act
NAHC	Native American Heritage Commission
NCCP	Natural Community Conservation Plan
NCP	National Contingency Plan
NEPA	National Environmental Policy Act
NESHAP	National Emissions Standards for Hazardous Air Pollutants
NFIP	National Flood Insurance Program
NFPA	National Fire Protection Association
NHFP	National Highway Freight Program
NHPA	National Historic Preservation Act
NHTSA	National Highway Traffic Safety Administration
NMFS	National Marine Fisheries Service
NO	Nitric Oxide
NO_2	Nitrogen Dioxide
NOA	Notice of Availability
NOI	Notice of Intent
NOP	Notice of Preparation
NO_x	Nitrogen Oxide
NPDES	National Pollutant Discharge Elimination System
NRSC	Natural Resource Conservation Service
NSWD	Non-Stormwater Discharge
OEHHA	Office of Environmental Health Hazard Assessment
OHP	Office of Historic Preservation
OMF	Oakland Maintenance Facility
OSHA	Occupational Safety and Health Administration
PAH	Polycyclic Aromatic Hydrocarbons
Pb	Lead
PCE	Tetrachloroethylene
PG&E	Pacific Gas and Electric Company
PI	Plasticity Index
PM	Particulate Matter
PM_{10}	Particulate Matter smaller than 10 microns in diameter
$PM_{2.5}$	Particulate Matter smaller than 2.5 microns in diameter
Porter-Cologne Act	Porter-Cologne Water Quality Control Act of 1969
PPDG	Project Planning and Design Guide
ppm	parts per million
PPV	Peak Particle Velocity
PRC	California Public Resources Code
Project	Merced Intermodal Track Connection Project
PTC	Positive Train Control
Public Res. Code	California Public Resources Code

RC	Reinforced Concrete
RCRA	Resources Conservation Recovery Act
Regional Water Board	Regional Water Quality Control Board
RMS	Root-Mean-Square
ROG	Reactive Organic Gas
ROW	Right-of-Way
RPS	Renewables Portfolio Standard
RSA	Resource Study Area
RTP	Regional Transportation Plan
RWQCB	Regional Water Quality Control Board
SACOG	Sacramento Area Councill of Governments
SAFE	Safer Affordable Fuel-Efficient
SB	Senate Bill
SCAB	South Coast Air Basin
SCS	Sustainable Communities Strategy
SDWA	Safe Drinking Water Act
SED	Safety and Enforcement Division
SEL	Sound Exposure Level
SFBAAB	San Francisco Bay Area Air Basin
SFHA	Special Flood Hazard Area
SGMA	California Department of Water Resources Sustainable Groundwater Management Act of 2014
SHPO	State Historic Preservation Office
SIP	State Implementation Plan
SJJPA	San Joaquin Joint Powers Authority
SJRRC	San Joaquin Regional Rail Commission
SJVAB	San Joaquin Valley Air Basin
SJVAPCD	San Joaquin Valley Air Pollution Control District
SLC	California State Lands Commission
SLCP	Short-Lived Climate Pollutant
SLIC	Spills, Leaks, Investigation, and Cleanup
SMAQMD	Sacramento Metropolitan Air Quality Management District
SO_2	Sulfur Dioxide
SoCo Rail	Southern Alameda County Integrated Rail Analysis
SO_X	Sulfur Oxide
SPRR	Southern Pacific Railroad
SR	State Route
SSAB	Salton Sea Air Basin
StanCOG	Stanislaus County Council of Governments
State Water Board	State Water Resources Control Board
SVAB	Sacramento Valley Air Basin
SVP	Society of Vertebrate Paleontology
SWMP	Stormwater Management Plan

SWPPP	Stormwater Pollution Prevention Plan
SWRCB	State Water Resources Control Board
SWTP	Surface Water Treatment Plant
TAC	Toxic Air Contaminant
Tanner Act	Toxic Air Contaminant Identification and Control Act
TDS	Total Dissolved Solids
TIP	Transportation Improvement Program
TMDL	Total Maximum Daily Load
TMP	Transportation Management Plan
TPH	Total Petroleum Hydrocarbons
TSA	Transportation Security Administration
U.S.C.	United States Code
UC	University of California
UPRR	Union Pacific Railroad
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USDOT	U.S. Department of Transportation
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
UST	Underground Storage Tank
UWMP	Urban Water Management Plan
VdB	Vibration Velocity
VegCAMP	Vegetation Classification and Mapping Program
VMT	Vehicle Miles Traveled
Wat. Code	California Water Code
WDR	Waste Discharge Requirement
WTW	Well-to-Wheel
WY	Water Year
YARTS	Yosemite Area Regional Transportation Service
ZE	Zero-Emission
ZEV	Zero-Emission Vehicle

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Executive Summary

This executive summary presents the key findings of this environmental impact report (EIR) for the San Joaquin Joint Powers Authority (SJJPA)'s Merced Intermodal Track Connection Project (Project). This section summarizes the background, need for the Project, Project objectives, description, environmental impacts and mitigation, alternatives, areas of controversy, and issues to be resolved associated with the Project.

The Project would include a new track connection from the Burlington Northern Santa Fe (BNSF) corridor to the proposed integrated Merced High-Speed Rail (HSR) Station in downtown Merced between O and R Streets, in addition to a new platform that would allow for cross-platform transfer between the San Joaquins passenger rail and HSR. The Project only includes the construction of the track connection; it does not include the construction of the proposed integrated Merced HSR Station.

ES.1 Project Background

SJJPA manages the San Joaquins intercity service between Bakersfield and Oakland and between Bakersfield and Sacramento. SJJPA contracts with the San Joaquin Regional Rail Commission (SJRRC) to provide day-to-day management of the service and contracts with Amtrak to operate the service. The California Department of Transportation (Caltrans) provides funding to operate the service and owns the rolling stock.

SJJPA does not own the tracks on which the San Joaquins operates, but instead has entered into passenger rights agreements with both BNSF and Union Pacific Railroad (UPRR) to operate on portions of their respective tracks. The San Joaquins shares tracks with freight trains dispatched by both UPRR and BNSF within their respective ROWs.

SJJPA has been working with SJRRC, California High-Speed Rail Authority (CHSRA), Caltrans, California State Transportation Agency (CalSTA), the City of Merced, Merced County Association of Governments (MCAG), and the Early Train Operator (ETO) for the California HSR Project to integrate the San Joaquins and the ACE passenger rail services with the Merced-Bakersfield HSR Early Operating Segment (EOS). Currently, SJRRC operates ACE passenger rail service between San Jose and Stockton, with an extension to Merced having secured CEQA clearance in December 2021.

To integrate the San Joaquins and ACE passenger rail services with the Merced-Bakersfield HSR EOS and future Phase I HSR service, CHSRA, CalSTA, Caltrans, the City of Merced, SJJPA, and SJRRC are planning for the proposed integrated Merced HSR Station that will connect three services:

- **ACE Passenger Rail Service**: SJRRC is in the planning process of extending ACE passenger rail service to Merced between O and R Streets (which would become part of the proposed integrated Merced HSR Station). As mentioned above, SJRRC completed the CEQA environmental clearance of the ACE service to Merced in December 2021.
- **HSR Service**: The 2012 Record of Decision for the California HSR Merced to Fresno section approved an HSR station northwest of G Street and 16th Street in Merced (CHSRA 2012). CHSRA has completed an environmental reevaluation for the relocation of the station from the currently proposed site at G Street to the proposed integrated Merced HSR Station between O and R Streets.

- **San Joaquins Intercity Service**: The Project proposes infrastructure improvements to connect the San Joaquins intercity service to the proposed integrated Merced HSR Station. This will result in connecting the San Joaquins intercity service to the Merced-Bakersfield HSR EOS (and future Silicon Valley to Central Valley and Phase I HSR service) in downtown Merced by creating a direct link between BNSF and the proposed integrated Merced HSR Station.

The Project is included in the SJJPA 2024 Business Plan Update, which was approved by the SJJPA Board of Directors (SJJPA 2024). The Project includes a new track connection from the BNSF corridor to the proposed integrated Merced HSR Station, in addition to a new platform, that will allow for a cross-platform transfer between the San Joaquins and HSR. The Project only includes the construction of the connecting track to the planned HSR station; it does not include the construction of station elements. The rest of the proposed integrated Merced HSR Station (with the exception of the ACE track and platform) is included in the HSR project.

CHSRA is planning to construct the Merced-Bakersfield HSR EOS by 2030-2033 and to extend the HSR service to the Bay Area after 2030-2033 (referred to as Silicon Valley to Central Valley HSR). HSR is planned to provide faster, more reliable, and more frequent service than the San Joaquins currently provides between Merced and Bakersfield. When the Merced-Bakersfield HSR EOS is operational, the San Joaquins intercity service between Merced and Bakersfield will be replaced by the HSR service and SJJPA will terminate the San Joaquins intercity service in Merced. SJJPA is expected to be the operating agency for the Merced-Bakersfield HSR EOS.

Implementing the Project would allow direct transfers from San Joaquins intercity service to HSR at the proposed integrated Merced HSR Station in downtown Merced. The San Joaquins would offer intercity service between the Bay Area/Sacramento and northern San Joaquin Valley. The Project would provide a cross-platform transfer between the San Joaquins and HSR for passengers traveling between the Bay Area/Sacramento and Madera, Fresno, Kings/Tulare, Bakersfield, and Southern California (via Thruway Bus connection).

The ETO for CHSRA developed the *Central Valley Segment System Management & Operations Interim Financial Plan* in support of the CHSRA business plans (CHSRA 2020). The report emphasizes the importance of the connections from ACE and San Joaquins to HSR, including:

> "In conclusion, interim HSR services between Merced – Bakersfield creates significant value, when connected to the total existing corridor (including ACE, San Joaquins, and bus network). The development of an integrated service concept with optimized connections results in improved services and reduction in travel time for the passenger."

The *Central Valley Segment System Management & Operations Interim Financial Plan* outlines an integrated service concept evaluated jointly with CHSRA and SJRRC/SJJPA with the goal of maximizing systemwide ridership while balancing operations and maintenance costs. The integrated service concept includes up to 12 San Joaquins round-trip trains per day in Merced (CHSRA 2020).

ES.2 Project Goal

The overall goal of the Project is to link the San Joaquin service to downtown Merced and the proposed integrated Merced HSR Station to be served by HSR, ACE, and San Joaquin service to allow for efficient transfers and rail service in the Central Valley.

ES.3 Project Objectives

The primary objectives of the Project are to create a seamless cross-platform transfer between the San Joaquins intercity service and the Merced-Bakersfield HSR EOS and future Phase I HSR service, to increase intercity passenger rail ridership, to reduce vehicle miles traveled, to improve regional air quality, and to reduce greenhouse gas (GHG) emissions. These objectives are outlined below.

- **Integrate and create a seamless connection between the San Joaquins intercity service and the Merced-Bakersfield HSR EOS and future Phase I HSR service in Merced.** Relocating the San Joaquins station in Merced would align with the planned HSR station and allow passengers to transfer between services on a shared platform.
- **Enhance San Joaquins intercity service to better serve regional markets.** Integrating the San Joaquins with the HSR system would improve the connection of regional markets between the San Francisco Bay Area (Bay Area)/Sacramento and the northern San Joaquin Valley and increase ridership and service benefits.
- **Reduce traffic congestion, improve regional air quality, and reduce GHG emissions.** The Project would improve intercity passenger rail service between the San Joaquin Valley, Sacramento region, and Bay Area, providing a transportation alternative to the automobile that reduces GHG emissions.

ES.4 Project Description

The Project would include a new track connection from the BNSF corridor to the proposed integrated Merced HSR Station in downtown Merced between O and R Streets that would allow for a cross-platform transfer between the San Joaquins and HSR to create an integrated station serving HSR, ACE, and San Joaquins passengers. The Project includes the construction of the track connection; it does not include the construction of the rest of the proposed integrated Merced HSR Station. Upon completion of the Project, the San Joaquins would abandon the existing Merced station and terminate service at the proposed integrated Merced HSR Station. Connections south of Merced would be provided via HSR. In addition, existing Merced station bus connections would be made at the proposed integrated Merced HSR Station.

In addition, the Project would include a connection into the approved ACE Merced Layover and Maintenance Facility, which would be shared with ACE operations and service. The proposed integrated Merced HSR Station and the approved ACE Merced Layover and Maintenance Facility are critical components of the overall Project integration.

The Project would consist of the following:

- New passenger rail connection for the San Joaquins from BNSF north of State Route (SR) 59, running along the SR 59 corridor and immediately west of the ACE/UPRR corridor, to the southern terminus at the proposed integrated Merced HSR Station.
- Shifting the ACE UPRR spur track that accesses industrial area north of SR 59.
- New access to the approved ACE Merced Layover and Maintenance Facility for San Joaquins trains.

- Modification of the approved ACE Merced Layover and Maintenance Facility to include new and upgraded tracks for San Joaquins, joint use of the facility by both ACE and San Joaquins trains for maintenance activities and required equipment and parking for SJJPA maintenance staff. The footprint of the facility would not be expanded.
- New aerial guideway on the west side of the ACE/UPRR corridor that would connect into the east side of the HSR platform (which would be shared with the San Joaquins) at the proposed integrated Merced HSR Station, creating an elevated integrated platform with HSR.
- The Project would include a combination of new track, track relocation, track upgrades, a new UPRR industrial spur bridge, a new aerial guideway structure, and new at-grade crossings at Cooper Avenue and the intersection of SR 59 and 16th Street.

The SJJPA will serve as the lead agency under the California Environmental Quality Act (CEQA). If the Project receives federal funding, it is anticipated that the Project will comply with the requirements of the National Environmental Policy Act (NEPA), as necessary.

In addition, three project variants could be reasonably approved as part of the Project: Variant H1: On-Site Green Hydrogen Production and Green Hydrogen Transported via Rail, Variant H2: Off-Site Green or Grey Hydrogen Transported via Truck, and Variant H3: Off-site Green or Grey Hydrogen Transported via Rail. These Project features are identified as variants because they may or may not be included by SJJPA as part of the Project. They are included as variants so that they can be incorporated into the Project at the time of the state conversion of the San Joaquins trainsets to hydrogen.

ES.5 Environmental Impacts and Mitigation Measures

This EIR analyzes the construction impacts, operational impacts, and cumulative impacts for each separate environmental topic. A detailed discussion of the potential impacts of the Project are presented in Chapter 3, *Environmental Impact Analysis*, and cumulative impacts are presented in Chapter 4, *Cumulative Impacts*. Table ES-1 at the end of this Executive Summary presents a summary of the impacts of the Project, proposed mitigation measures, and each impact's level of significance after mitigation. The environmental impacts are identified and classified as "Significant," "Potentially Significant," "Less than Significant," or "No Impact." According to State CEQA Guidelines Section 15382, a significant impact is "… a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project…" State CEQA Guidelines Section 15126.4 (a)(1) also states that an EIR "…shall describe feasible mitigation measures which could minimize significant adverse impacts…" Mitigation measures are identified for all impacts labeled as "Significant" or "Potentially Significant" where feasible mitigation measures have been identified. Please note that in Tables ES-1, the term "significant" refers to the level of impact and the term "considerable" refers to the Project's contribution to a cumulative impact.

As discussed in Chapter 3, *Environmental Impact Analysis*, and summarized in Table ES-1 at the end of this Executive Summary, the Project would result in significant or potentially significant impacts without implementation of mitigation measures for the following topics: aesthetics (Variant H1); biological resources; cultural resources; tribal cultural resources; geology, soils, seismicity, and paleontological resources; hazards and hazardous materials; hydrology and water quality; land use and planning; construction noise and vibration; public services and utilities and service systems; safety and security; and transportation. The Project would result in less-than-significant impacts with implementation of the mitigation measures recommended in this EIR for the following topics: aesthetics (Variant H1); biological resources; cultural resources; tribal cultural resources; geology, soils, seismicity, and paleontological resources; hazards and hazardous materials; hydrology and water quality; land use and planning; construction vibration; public services and utilities and service systems; safety and security; and transportation. The Project would result in less-than-significant impacts for the following topics and no mitigation measures would be required: mineral resources, aesthetics (Project, Variant H2, Variant H3), air quality and greenhouse gas emissions, energy, operational noise and vibration, and recreation. The Project would result in no impact for the following environmental topics: agricultural and forestry resources, population and housing, and wildfire.

ES.6 Significant and Unavoidable Environmental Impacts

CEQA requires that an EIR identify any significant environmental effects that cannot be avoided should a project be implemented. Many impacts identified for the Project would either be less than significant or mitigated to a less-than-significant level with implementation of identified mitigation measures, as discussed in Chapter 3, *Environmental Impact Analysis,* and summarized in Table ES-1 at the end of this executive summary. Impacts related to the following topics would remain significant and unavoidable with the implementation of mitigation.

- **Construction Noise**. As described in Section 3.12, *Noise and Vibration*, construction work could occur during the nighttime. Even with implementation of Mitigation Measure NOI-1.1: Implement a Construction Noise Control Plan, the impact of temporary construction-related noise on nearby noise sensitive receptors could be a significant and unavoidable impact during construction of the Project, in particular where heavy construction would occur at night near residences.

- **Cumulative Construction Noise.** As described in Chapter 4, *Cumulative Impacts*, the potential exists for a significant cumulative noise impact to occur during construction because there could be other cumulative projects simultaneously under construction adjacent to the Project. Even with implementation of Mitigation Measure NOI-1.1: Implement a Construction Noise Control Plan, noise impacts would not necessarily be reduced at all times during construction to a less-than-significant level, particularly with the likelihood of substantial nighttime construction for the Project. Because there could be other cumulative projects simultaneously under construction adjacent to the Project, the Project could result in a considerable contribution to a cumulative noise impact during construction.

ES.7 Alternatives Screening Process and Other Alternatives Considered and Dismissed

In accordance with CEQA and the CEQA Guidelines, specifically Section 15126.6, an EIR must describe a reasonable range of alternatives to a project, or the location of a project, that could attain most of the project's basic objectives while avoiding or substantially lessening any of the significant environmental effects of the project. The range of alternatives required in an EIR is governed by a "rule of reason" that requires the EIR to set forth only those alternatives necessary to permit a reasoned choice. CEQA states that an EIR should not consider alternatives "whose effects cannot be ascertained and whose implementation is remote and speculative."

SJJPA considered a wide range of alternatives suggested during the scoping process and then conducted a three-part screening evaluation to select the alternatives to be analyzed in this EIR. Alternatives were also identified through input from the public, agencies, and stakeholders during scoping. Appendix 1.0-1, *Merced Intermodal Track Connection Scoping Memorandum*, contains the scoping report detailing the scoping process, including a summary of alternatives suggested during the scoping process. Alternatives determined to be infeasible, to not avoid or substantially reduce one or more significant impacts of the Project, or to not meet all or most of the Project's objectives were dismissed from further analysis.

Based on the screening process results, the following two alternatives are analyzed in Chapter 6, *Alternatives*:

- **No Project Alternative.** The No Project Alternative is provided in this EIR to compare the impacts of the Project with what would be reasonably expected to occur in the foreseeable future if the Project were not approved and no additional construction would occur within the Project corridor (CEQA Guidelines Section 15126.6 [e][2]).
- **North of SR 59 BNSF/Downtown Connection Alternative.** This alternative would move the proposed connection from the BNSF corridor to the UPRR corridor farther north of downtown Merced compared to the proposed connection along SR 59 under the Project. New track would be constructed through agricultural land and apparent Franklin County Water District wastewater treatment ponds east of Drake Ave on a north-south alignment with a new bridge over Fahrens Creek leading to the western part of the business park. Within the southern portion of the approved ACE Merced Layover and Maintenance Facility, the alignment would follow the curve of Ashby Road, cross over SR 99 and the UPRR corridor near Miles Court, and then run parallel to the UPRR tracks as it approaches downtown Merced. The alignment would transition from an at-grade alignment to an aerial guideway as it curves around Ashby Road so that it is aerial when it crosses SR 99 and UPRR tracks and then continuing to the east side of the HSR platform at the proposed integrated Merced HSR Station, similar to the Project. With this alternative, access to the approved ACE Layover and Maintenance Facility would change compared to the Project because there would be no relocated ACE/UPRR industrial spur track along SR 59 and the access line would terminate up near the BNSF/San Joaquins line instead of finishing that curve and heading towards SR 59. This alternative would have the same improvements to the approved ACE Layover and Maintenance Facility as the Project. This alternative would have the same operational service level and similar levels of ridership as the Project.

ES.8 Comparison of Alternatives and the Environmentally Superior Alternative

The State CEQA Guidelines require a comparison of alternatives analyzed in an EIR and identification of an "environmentally superior alternative." CEQA Guidelines Section 15126.6(e)(2) require an EIR to identify an "environmentally superior alternative" from among the alternatives considered to the proposed Project. The guidelines also state that if the environmentally superior alternative is the No Project Alternative, then the EIR must also identify an environmentally superior alternative among the other alternatives. As such, from a technical CEQA perspective, an EIR cannot identify a proposed Project as the "environmentally superior alternative" even if the proposed Project has better environmental performance than all the alternatives. As discussed below the Project would be environmentally superior to any other alternative.

Chapter 6, *Alternatives*, presents an analysis of the environmental impacts of the No Project Alternative and the North of SR 59 BNSF/Downtown Connection Alternative. Chapter 6 also provides a tabular comparison of the key environmental impact differences between the alternatives.

The Project as well as the alternatives considered would provide benefits, such as VMT reduction and reducing regional air pollutants and GHG emissions that would not be realized under the No Project Alternative. While the No Project Alternative would avoid or lessen the construction impacts of the Project and the North of SR 59 BNSF/Downtown Connection Alternative, it is not considered the "environmentally superior alternative" because it would have lower ridership and thus lower air quality and GHG emissions reduction benefits.

The "environmentally superior alternative" is the North of SR 59 BNSF/Downtown Connection Alternative. The differences in environmental impacts between the No Project Alternative, the North of SR 59 BNSF/Downtown Connection, and the Project are summarized in Table 6-2. There are some environmental tradeoffs between this alternative and the Project, but the Project is environmentally superior to the "environmentally superior alternative" for the following reasons:

- The construction footprint is smaller, resulting in less construction impacts related to aesthetics, air quality, GHG emissions, cultural resources, and utilities.
- The Project avoids displacing wastewater treatment ponds and unique farmland that the North of SR 59 BNSF/Downtown Connection Alternative would displace.

Taking these factors into account, the Project would be environmentally superior for all relevant environmental factors that differ between the Project and the "environmentally superior alternative" except for construction noise. Since construction noise would be a temporary effect, whereas the Project's environmental benefits would be primarily related to permanent long-term effects such as land use consistency, potential for transit-oriented development, and emissions reductions, the Project would be environmentally superior to the "environmentally superior alternative."

ES.9 Issues of Controversy and Issues to be Resolved

California Environmental Quality Act (CEQA) Guidelines Section 15124 specifies that the draft EIR summary identify "areas of controversy" known to the lead agency, including issues raised by agencies and the public.

The scoping process for this EIR was formally initiated on January 5, 2023, when SJJPA submitted a Notice of Preparation (NOP) to the California State Clearinghouse. The purpose of the NOP is to solicit participation from relevant agencies and from the public in determining the scope of an EIR. The scoping period ended February 19, 2023. An in person public scoping meeting was held on January 26, 2023, between 6:00 p.m. and 8:00 p.m. at the Merced Senior Community Center. Appendix 1.0-1, *Merced Intermodal Track Connection Scoping Memorandum*, contains the scoping report detailing the scoping process, including the notification, and scoping activities undertaken. A summary of the areas of controversy based on the comments received during the scoping period is provided below. The topics that would result in physical impacts under CEQA are addressed in the EIR analysis.

ES.9.1 Issues of Controversy

The known issues of potential controversy identified to date by members of the public and stakeholders are described below.

Project Features and Operations

- Discontinuation of use of the existing Amtrak San Joaquins Station on 24th Street.
- California High-Speed Rail Authority's plan to close G Street and a suggested underpass to allow traffic to flow.

Environmental Effects

- Compromise or restriction of UPRR's access to current and future customers, including customers in the industrial park in Merced, effects to freight rail operations and capacity and the potential to prevent the ability to grade separate existing at-grade rail crossings.
- Construction and operational effects to Razzari Auto Centers and potential displacement of other residents and businesses
- Plans by California High-Speed Rail Authority to relocate the Senior Center and Boys and Girls Club.
- Growth due to the Project (changing Merced from "small town" to "big town").
- Potential effects to the surrounding neighborhoods including flood risk between SR 59 and Bear Creek and the potential for railroad berms to impede flood flows.
- Potential increased noise from trains and the maintenance facility.
- Potential increased traffic congestion on SR 59 and 16th Street.

Potential Alternatives

- Moving the San Joaquins trains from the BNSF line to the Union Pacific line between Stockton and Merced.
- Ending San Joaquin service at Stockton given ACE service plans for extension of service from Stockton to Merced.
- Avoidance of UP property and ROW

ES.9.2 Issues to be Resolved

The following issues remain to be resolved:

- Consideration of Comments on this Draft EIR—SJJPA will consider and respond to substantive comments on this draft EIR in the final EIR scheduled for completion in late 2024.

- Certification of the EIR and Project Adoption—SJJPA will need to consider the final EIR, once prepared, and decide whether to certify the document. If certified, then the SJJPA Board would need to decide whether to approve the Project as is or to adopt an alternative.
- Design of the Project—The final design of the Project will be completed following the environmental review process.
- Regulatory Permitting—Permits from a wide range of local, state, and federal agencies would need to be obtained in order to implement the Project.
- National Environmental Policy Act Compliance—If the Project receives federal funding, it is anticipated that the Project will comply with the requirements of NEPA, as necessary.
- Funding— The Project has received funding to complete CEQA, NEPA, and preliminary engineering up to 30 percent. The Project has been identified as a critical project by the State to provide connectivity to the HSR, but requires additional funding to fund completion of design and construction.

1 **Table ES-1. Summary of Environmental Impacts and Required Mitigation Measures**

Impact	Significance before Mitigation	Mitigation	Significance after Mitigation
3.1 Effects Found Not to Be Significant			
Agricultural and Forestry Resources	No impact	None required	--
Mineral Resources	Less-than-significant impact	None required	--
Population and Housing	No impact	None required	--
Wildfire	No impact	None required	--
3.2 Aesthetics			
Impact AE-1. Construction of the Project would not have a substantial adverse effect on a scenic vista.	Less-than-significant impact	None required	--
Impact AE-2. Construction of the Project would not substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway.	No impact	None required	--
Impact AE-3. In non-urbanized areas, construction of the Project would not substantially degrade the existing visual character or quality of public views[1] of the site and its surroundings. If the project is in an urbanized area, construction of the project would not conflict with applicable zoning and other regulations governing scenic quality.	Less-than-significant impact	None required	--
Impact AE-4. In non-urbanized areas, construction of the Project would not create a new source of substantial light or glare that would adversely affect day or nighttime views in the area.	Less-than-significant impact	None required	--

Impact	Significance before Mitigation	Mitigation	Significance after Mitigation
Impact AE-5. Operation of the Project would not have a substantial adverse effect on a scenic vista.	Less-than-significant impact	None required	--
Impact AE-6. Operation of the Project would not substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway.	No impact	None required	--
Impact AE-7. In non-urbanized areas, operation of the Project would not substantially degrade the existing visual character or quality of public views[2] of the site and its surroundings. If the project is in an urbanized area, operation of the project would not conflict with applicable zoning and other regulations governing scenic quality.	Less-than-significant impact	None required	--
Impact AE-8. In non-urbanized areas, operation of the Project would not create a new source of substantial light or glare that would adversely affect day or nighttime views in the area.	Less-than-significant impact (Project) Potentially significant impact (Variant H1)	Project: None required Variant H1: AES-1.1: Tree Planting and Establishment	Project: -- Variant H1: Less-than-significant impact
Impact C-AE-1. Construction and operation of the Project, in combination with other foreseeable projects in the surrounding area, would not result in a significant impact on aesthetics.	Less than significant cumulative impact	None required	--
3.3 Air Quality and Greenhouse Gas Emissions			
Impact AQ-1. Construction and operation of the Project would not conflict with or obstruct implementation of the applicable air quality plan	Less-than-significant impact	None required	--
Impact AQ-2a. Construction of the Project would not result in a cumulatively considerable net increase of any criteria	Less-than-significant impact	None required	--

Impact	Significance before Mitigation	Mitigation	Significance after Mitigation
pollutant for which the Project region is in nonattainment under an applicable federal or state ambient air quality standard.			
Impact AQ-2b. Operation of the Project would not result in a cumulatively considerable net increase of any criteria pollutant for which the Project region is in nonattainment under an applicable federal or state ambient air quality standard.	Less-than-significant impact (beneficial)	None required	--
Impact AQ-3a. Construction or operation of the Project would not expose sensitive receptors to health risks from increased exposure to substantial criteria pollutant concentrations.	Less-than-significant impact Regional criteria pollutants, Project construction Localized particulate matter, Project construction Localized carbon monoxide, Project operations Less-than-significant impact (beneficial) Regional criteria pollutants, Project operations Localized particulate matter, Project operations	None required	--
Impact AQ-3b. Construction of the Project would not expose sensitive receptors to health risks from increased exposure to substantial diesel particulate matter concentrations.	Less-than-significant impact	None required	--
Impact AQ-3c. Operation of the Project would not expose sensitive receptors to	Less-than-significant impact	None required	--

Impact	Significance before Mitigation	Mitigation	Significance after Mitigation
health risks from increased exposure to substantial diesel particulate matter concentrations.			
Impact AQ-3d. Construction of the Project would not expose sensitive receptors to substantial increased risk of contracting Valley fever or exposure to asbestos-containing material.	Less-than-significant impact	None required	--
Impact AQ-4. Construction or operation of the Project would not result in other emissions (such as those leading to odors) adversely affecting a substantial number of people.	Less-than-significant impact	None required	--
Impact AQ-5. Construction and operation of the Project would not generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment.	Less-than-significant impact	None required	--
Impact AQ-6. Construction and operation of the Project would not conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs.	Less-than-significant impact	None required	--
Impact C-AQ-1. Construction and operation of the Project would not contribute considerably to a significant cumulative impact on air quality or GHG emissions.	Significant cumulative impact	None	Less than considerable contribution (beneficial during operation)
3.4 Biological Resources			
Impact BIO-1. Construction of the Project would not have a substantial adverse effect, either directly or through habitat modifications, on any plant species identified as a candidate, sensitive, or special-status species in local or regional	Less-than-significant impact	None required	--

Impact	Significance before Mitigation	Mitigation	Significance after Mitigation
plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service.			
Impact BIO-2. Construction of the Project could have a substantial adverse effect, either directly or through habitat modifications, on wildlife or fish species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife, U.S. Fish and Wildlife Service, or National Marine Fisheries Service.	Potentially significant impact	BIO-2.1: Conduct a Worker Environmental Training Program for Construction Personnel BIO-2.2: Install Fencing to Protect Sensitive Biological Resources BIO-2.3: Retain a Designated Biologist to Conduct Monitoring prior to Construction during Fence Installation and during all Construction Activities BIO-2.4: Avoidance, Minimization, and Compensatory Measures for Valley Elderberry Longhorn Beetle BIO-2.5: Avoidance and Minimization Measures for Western Pond Turtle BIO-2.6: Avoidance and Minimization Measures for Nesting Birds during Construction Activities BIO-2.7: Avoidance and Minimization Measures for Swainson's Hawk BIO-2.8: Compensate for Swainson's Hawk Foraging Habitat Loss BIO-2.9: Avoidance and Minimization Measures for Burrowing Owl BIO-2.10: Compensate for Burrowing Owl Habitat Loss BIO-2.11: Avoidance and Minimization Measures for Tricolored Blackbird BIO-2.12: Avoidance and Minimization Measures for Roosting Bats BIO-2.13: Avoidance, Minimization, and Compensatory Measures for Monarch Butterfly BIO-2.14: Implement Seasonal Restrictions for In-Water Work	Less-than-significant impact
Impact BIO-3. Construction of the Project could have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or	Potentially significant impact	BIO-3.1: Avoidance and Minimization Measures for Sensitive Natural Communities, Including Ruderal Riparian Habitat	Less-than-significant impact

Impact	Significance before Mitigation	Mitigation	Significance after Mitigation
regional plans, policies, regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service		BIO-3.2: Compensate for Loss of Ruderal Riparian Habitat BIO-3.3: Prevent the Introduction or Spread of Invasive Plant Species	
Impact BIO-4. Construction of the Project could have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means.	Potentially significant impact	BIO-4.1: Avoidance and Minimization Measures for Wetlands and Drainages during Construction BIO-4.2: Compensate for Impacts on Jurisdictional Wetlands and Nonwetland Waters of the United States (aquatic resources) and the state prior to Impacts during Construction	Less-than-significant impact
Impact BIO-5. Construction of the Project could conflict with local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance	Potentially significant impact	BIO-5.1: Compensate for Tree Removal during Construction	Less-than-significant impact
Impact BIO-6. Operation of the Project would not have a substantial adverse effect, either directly or through habitat modifications, on any plant species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service.	Less-than-significant impact	None required	--
Impact BIO-7. Operation of the Project could have a substantial adverse effect, either directly or through habitat modifications, on wildlife or fish species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife, U.S. Fish and Wildlife Service, or National Marine Fisheries Service.	Potentially significant impact	Project: BIO-7.1: Avoidance and Minimization Measures for Nesting Birds during Operation and Maintenance Activities BIO-7.2: Avoidance and Minimization Measures for Roosting Bats during Operation and Maintenance Activities BIO-7.3: Conduct Pre-Activity Survey for Special-Status Wildlife Species Prior to Conducting Maintenance Activities	Less-than-significant impact

Impact	Significance before Mitigation	Mitigation	Significance after Mitigation
		Variant H1: BIO-7.4: Avoidance and Minimization Measures for Birds during Operation of the Solar Facility	
Impact BIO-8. Operation of the Project could have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service.	Potentially significant impact	BIO-3.1: Avoidance and Minimization Measures for Sensitive Natural Communities, including Ruderal Riparian Habitat BIO-3.3: Prevent the Introduction or Spread of Invasive Species	Less-than-significant impact
Impact BIO-9. Operation of the Project would not have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means.	Less-than-significant impact	None required	--
Impact BIO-10. Operation of the Project could interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors or impede the use of native wildlife nursery sites.	Potentially significant impact	BIO-10.1: Model Hydraulics of New Bridge before Construction and Design Bridge to Accommodate Fish Migration	Less-than-significant impact
Impact BIO-11. Operation of the Project could conflict with local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.	Potentially significant impact	BIO-7.1: Avoidance and Minimization Measures for Nesting Birds during Operation and Maintenance Activities BIO-7.2: Avoidance and Minimization Measures for Roosting Bats during Operation and Maintenance Activities BIO-7.3: Conduct Pre-Activity Surveys for Special-Status Wildlife Species Prior to Conducting Maintenance Activities	Less-than-significant impact

Impact	Significance before Mitigation	Mitigation	Significance after Mitigation
Impact BIO-12. Operation of the Project would not conflict with the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan.	No impact	None required	--
Impact C-BIO-1. Construction and operation of the Project would not contribute considerably to a significant cumulative impact on sensitive biological resources.	Significant cumulative impact	BIO-2.1: Conduct a Worker Environmental Training Program for Construction Personnel BIO-2.2: Install Fencing to Protect Sensitive Biological Resources BIO-2.3: Retain a Designated Biologist to Conduct Monitoring prior to Construction during Fence Installation and during all Construction Activities BIO-2.4: Avoidance, Minimization, and Compensatory Measures for Valley Elderberry Longhorn Beetle BIO-2.5: Avoidance and Minimization Measures for Western Pond Turtle BIO-2.6: Avoidance and Minimization Measures for Nesting Birds during Construction Activities BIO-2.7: Avoidance and Minimization Measures for Swainson's Hawk BIO-2.8: Compensate for Swainson's Hawk Foraging Habitat Loss BIO-2.9: Avoidance and Minimization Measures for Burrowing Owl BIO-2.10: Compensate for Burrowing Owl Habitat Loss BIO-2.11: Avoidance and Minimization Measures for Tricolored Blackbird BIO-2.12: Avoidance and Minimization Measures for Roosting Bats BIO-2.13: Avoidance, Minimization, and Compensatory Measures for Monarch Butterfly BIO-2.14: Implement Seasonal Restrictions for In-Water Work	Less than considerable contribution

Impact	Significance before Mitigation	Mitigation	Significance after Mitigation
		BIO-3.1: Avoidance and Minimization Measures for Sensitive Natural Communities, including Ruderal Riparian Habitat BIO-3.2: Compensate for Loss of Ruderal Riparian Habitat BIO-3.3: Prevent the Introduction or Spread of Invasive Plant Species BIO-4.1: Avoidance and Minimization Measures for Wetlands and Drainages during Construction BIO-4.2: Compensate for Impacts on Jurisdictional Wetlands and Nonwetland Waters of the United States (aquatic resources) and the state prior to Impacts during Construction BIO-5.1: Compensate for Tree Removal during Construction BIO-7.1: Avoidance and Minimization Measures for Nesting Birds during Operation and Maintenance Activities BIO-7.2: Avoidance and Minimization Measures for Roosting Bats during Operation and Maintenance Activities BIO-7.3: Conduct Pre-Activity Survey for Special-Status Wildlife Species Prior to Conducting Maintenance Activities BIO-10.1: Model Hydraulics of New Bridge before Construction and Design Bridge to Accommodate Fish Migration	
3.5 Cultural Resources			
Impact CUL-1. Construction of the Project would not cause a substantial adverse change in the significance of a historical resource pursuant to Section 15064.5.	Less-than-significant impact	None required	--

Impact	Significance before Mitigation	Mitigation	Significance after Mitigation
Impact CUL-2. Construction of the Project could cause a substantial adverse change in the significance of a previously unrecorded archaeological resource pursuant to Section 15064.5.	Potentially significant impact	CUL-2.1: Stop Work if Archaeological Material or Features Are Encountered During Ground-Disturbing Activities	Less-than-significant impact
Impact CUL-3. Construction of the Project could disturb previously undiscovered human remains, including those interred outside of dedicated cemeteries.	Potentially significant impact	CUL-3.1: Comply with State Laws Relating to Human Remains	Less-than-significant impact
Impact CUL-4. Operation of the Project would not cause a substantial adverse change in the significance of a historical resource pursuant to Section 15064.5.	No impact	None required	--
Impact CUL-5. Operation of the Project could cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5.	Potentially significant impact	CUL-2.1: Stop Work if Archaeological Material or Features Are Encountered during Ground-Disturbing Activities	Less-than-significant impact
Impact CUL-6. Operation of the Project could disturb human remains, including those interred outside of dedicated cemeteries.	Potentially significant impact	CUL-3.1: Comply with State Laws Relating to Human Remains	Less-than-significant impact
Impact C-CUL-1. Construction and operation of the Project would not contribute considerably to a significant cumulative impact on cultural resources.	Significant cumulative impact	CUL-2.1: Stop Work if Archaeological Material or Features Are Encountered during Ground-Disturbing Activities CUL-3.1: Comply with State Laws Relating to Human Remains	Less than considerable contribution
3.6 Tribal Cultural Resources			
Impact TCR-1. Construction of the Project could cause a substantial adverse change in the significance of a tribal cultural resource.	Potentially significant impact	TCR-1.1: Stop Work if Tribal Cultural Resources Are Encountered during Ground-Disturbing Activities CUL-2.1: Stop Work if Archaeological Material or Features Are Encountered during Ground-Disturbing Activities CUL-3.1: Comply with State Laws Relating To Human Remains	Less-than-significant impact

Impact	Significance before Mitigation	Mitigation	Significance after Mitigation
Impact TCR-2. Operation of the Project could cause a substantial adverse change in the significance of a tribal cultural resource.	Potentially significant impact	TCR-1.1: Stop Work if Tribal Cultural Resources Are Encountered during Ground-Disturbing Activities CUL-2.1: Stop Work if Archaeological Material or Features Are Encountered during Ground-Disturbing Activities CUL-3.1: Comply with State Laws Relating to Human Remains	Less-than-significant impact
Impact C-TCR-1. Construction and operation of the Project would not contribute considerably to a significant cumulative impact on tribal cultural resources.	Significant cumulative impact	CUL-2.1: Stop Work if Archaeological Material or Features Are Encountered during Ground-Disturbing Activities CUL-3.1: Comply with State Laws Relating to Human Remains TCR-1.1: Stop Work if Tribal Cultural Resources Are Encountered during Ground-Disturbing Activities	Less than considerable contribution
3.7 Energy			
Impact EN-1. Construction of the Project would not result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources during Project construction.	Less-than-significant impact	None required	--
Impact EN-2. Operation of the Project would not result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during Project operation.	Less-than-significant impact (beneficial)	None required	--
Impact EN-3. Construction and operation of the Project would not conflict with or obstruct a state or local plan for renewable energy or energy efficiency.	Less-than-significant impact	None required	--
Impact C-EN-1. Construction and operation of the Project, in combination with other foreseeable projects in the surrounding area,	Less than significant cumulative impact	None required	--

Impact	Significance before Mitigation	Mitigation	Significance after Mitigation
would not result in a significant cumulative impact on energy resources.			
3.8 Geology, Soils, Seismicity, and Paleontological Resources			
Impact GEO-1. Construction of the Project would not directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving seismic hazards from surface fault rupture, strong seismic ground shaking, liquefaction, seiches, landslides, or subsidence and settlement, and erosion.	Less-than-significant impact	None required	--
Impact GEO-2. Construction of the Project would not result in substantial soil erosion or the loss of topsoil.	Less-than-significant impact	None required	--
Impact GEO-3. Construction and operation of the Project may be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the Project, but would not result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse.	Less-than-significant impact	None required	--
Impact GEO-4. Construction of the Project would be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994) creating substantial direct or indirect risks to life or property.	Less-than-significant impact	None required	--
Impact GEO-5. Construction and operation of the Project may occur on soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater.	No impact	None required	--
Impact GEO-6. Construction of the Project could directly or indirectly destroy a unique paleontological resource or site.	Potentially significant impact	GEO-6.1: Monitor for Discovery of Paleontological Resources, Evaluate Found Resources, and Prepare and Follow a Recovery Plan for Found Resources	Less-than-significant impact

Impact	Significance before Mitigation	Mitigation	Significance after Mitigation
Impact GEO-7. Operation of the Project would not directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving surface fault rupture, strong seismic ground shaking, liquefaction, seiches, landslides, subsidence and settlement, expansive soils, corrosive soils, and erosion.	Less-than-significant impact	None required	--
Impact GEO-8. Operation of the Project would not result in substantial soil erosion or the loss of topsoil.	Less-than-significant impact	None required	--
Impact GEO-9. Operation of the Project would not be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property.	Less-than-significant impact	None required	--
Impact GEO-10. Operation of the Project would not directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.	No impact	None required	--
Impact C-GEO-1. Construction of the Project would not contribute considerably to a significant cumulative impact on geology, seismicity, soils, and unique paleontological/geologic resources. Operation of the Project, in combination with other foreseeable projects in the surrounding area, would not result in a significant cumulative impact on geology, seismicity, soils, and unique paleontological/geologic resources.	Construction: Significant cumulative impact (paleontology only); Less than significant cumulative impact (geology, seismicity, and soils) Operation: Less than significant cumulative impact	GEO-6.1: Monitor for Discovery of Paleontological Resources, Evaluate Found Resources, and Prepare and Follow a Recovery Plan for Found Resources	Construction: Less than considerable contribution Operation: --
3.9 Hazards and Hazardous Materials			
Impact HAZ-1. Construction of the Project would not create a significant hazard to the	Less-than-significant impact	None required	--

Impact	Significance before Mitigation	Mitigation	Significance after Mitigation
public or the environment through the routine transport, use, or disposal, or accidental release of hazardous materials.			
Impact HAZ-2. Construction of the Project could create a significant hazard to the public or the environment involving reasonably foreseeable upset conditions or the disturbance of existing hazardous materials.	Potentially significant impact	HAZ-2.1: Site Management Plan HAZ-2.2: Conduct a Hazardous Building Materials Survey Prior to Demolition Activities	Less-than-significant impact
Impact HAZ-3. Construction of the Project could be affected by being located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment.	Potentially significant impact	HAZ-2.1: Site Management Plan	Less-than-significant impact
Impact HAZ-4. Construction and operation of the Project could emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within 0.25 mile of an existing or proposed school.	Potentially significant impact	HAZ-2.1: Site Management Plan HAZ-2.2: Conduct a Hazardous Building Materials Survey prior to Demolition Activities	Less-than-significant impact
Impact HAZ-5. Construction and operation of the Project could impair or physically interfere with an adopted emergency response plan or emergency evacuation plan.	Potentially significant impact	TR-1.1: Transportation Management Plan (TMP) for Project Construction	Less-than-significant impact
Impact HAZ-6. Construction and operation of the Project would not expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires.	No impact	None required	--
Impact HAZ-7. Operation of the Project would not create a significant hazard to the public or the environment through the	Less-than-significant impact	None required	--

Impact	Significance before Mitigation	Mitigation	Significance after Mitigation
routine transport, use, or disposal of hazardous materials.			
Impact HAZ-8. Operation of the Project would not create a significant hazard to the public or the environment involving reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment.	No impact	None required	--
Impact HAZ-9. Operation of the Project would not result in potential impacts associated with being located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, create a significant hazard to the public or the environment.	No impact	None required	--
Impact HAZ-10. The Project would not be located within an airport land use plan area or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, result in a safety hazard or excessive noise for people residing or working in the area.	Less-than-significant impact	None required	--
Impact C-HAZ-1. Construction and operation of the Project would not contribute considerably to a significant cumulative impact from hazardous materials.	Significant cumulative impact	HAZ-2.1: Site Management Plan HAZ-2.2: Conduct a Hazardous Building Materials Survey prior to Demolition Activities TR-1.1: Transportation Management Plan (TMP) for Project construction	Less than considerable contribution
3.10 Hydrology and Water Quality			
Impact HYD-1. Construction of the Project would not violate water quality standards or WDRs or otherwise substantially degrade surface or groundwater quality.	Less-than-significant impact	None required	--
Impact HYD-2. Construction of the Project would not substantially decrease	Less-than-significant impact	None required	--

Impact	Significance before Mitigation	Mitigation	Significance after Mitigation
groundwater supplies or interfere substantially with groundwater recharge such that the Project may impede sustainable groundwater management of the basin.			
Impact HYD-3. Construction of the Project 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. Construction of the Project would not 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 on-site or off-site, create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems, or provide substantial additional sources of polluted runoff.	Less-than-significant impact	None required	--
Impact HYD-4. In a flood hazard area, construction of the Project would not risk release of pollutants due to Project inundation.	Less-than-significant impact	None required	--
Impact HYD-5. Construction of the Project would not conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan.	Less-than-significant impact	None required	--
Impact HYD-6. Operation of the Project would not violate water quality standards or WDRs or otherwise substantially degrade surface water or groundwater quality.	Less-than-significant impact	None required	--

Impact	Significance before Mitigation	Mitigation	Significance after Mitigation
Impact HYD-7. Operation of the Project would not substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the Project may impede sustainable groundwater management of the basin.	Less-than-significant impact	None required	--
Impact HYD-8. Operation of the 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. Operation of the Project 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 on-site or off-site, create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems, or provide substantial additional sources of polluted runoff.	Potentially significant impact	HYD-8.1: Perform Detailed Hydraulic Evaluations and Modify Designs for Facilities Within Flood Zones if Required to Reduce Potential Flooding Impacts HYD-8.2: Model Hydraulics of New Bridges Before Construction and Design Bridges to Avoid Increased Flooding and Accommodate Fish Migration	Less-than-significant impact
Impact HYD-9. In a flood hazard, operation of the Project would not risk release of pollutants due to Project inundation.	Less-than-significant impact	None required	--
Impact HYD-10. Operation of the Project would not conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan.	Less-than-significant impact	None required	--
Impact C-HYD-1. Construction and operation of the Project would not contribute considerably to a significant cumulative impact on hydrology and water quality.	Significant cumulative impact	HYD-8.1: Perform Detailed Hydraulic Evaluations and Modify Designs for Facilities Within Flood Zones if Required to Reduce Potential Flooding Impacts	Less than considerable contribution

Impact	Significance before Mitigation	Mitigation	Significance after Mitigation
		HYD-8.2: Model Hydraulics of New Bridges Before Construction and Design Bridges to Avoid Increased Flooding and Accommodate Fish Migration	
3.11 Land Use and Planning			
Impact LU-1. Construction of the Project would not physically divide an established community.	Potentially significant impact	TR-1.1: Transportation Management Plan (TMP) for Project construction	Less-than-significant impact
Impact LU-2. Construction of the Project would not conflict with an applicable land use plan, policy, or regulation of an agency with jurisdiction over the improvements for the purpose of avoiding or mitigating an environmental effect.	Less-than-significant impact	None required	--
Impact LU-3. Operation of the Project would not physically divide an established community.	Less-than-significant impact	None required	--
Impact LU-4. Operation of the Project would not conflict with an applicable land use plan, policy, or regulation of an agency with jurisdiction over the improvements for the purpose of avoiding or mitigating an environmental effect.	No impact	None required	--
Impact C-LU-1. Construction and operation of the Project, in combination with other foreseeable projects in the surrounding area, would not result in a significant cumulative impact on land use and planning.	Less than significant cumulative impact	None required	--
3.12 Noise and Vibration			
Impact NOI-1. Construction of the Project could generate a substantial temporary increase in ambient noise levels in the vicinity of the Project in excess of FTA thresholds.	Potentially significant impact	NOI-1.1: Implement a Construction Noise Control Plan	Significant and unavoidable impact

Impact	Significance before Mitigation	Mitigation	Significance after Mitigation
Impact NOI-2. Construction of the Project would not generate excessive groundborne vibration or groundborne noise levels.	Potentially significant impact	NOI-2.1: Implement a Construction Vibration Control Plan	Less-than-significant impact
Impact NOI-3. Operation of the Project would not generate a substantial temporary increase in ambient noise levels in the vicinity of the Project in excess of FTA thresholds.	Less-than-significant impact	None required	--
Impact NOI-4. Operation of the Project would not generate excessive groundborne vibration or groundborne noise levels.	Less-than-significant impact	None required	--
Impact C-NOI-1. Construction of the Project would contribute considerably to a significant cumulative impact on noise and vibration. Operation of the Project would not contribute considerably to a significant cumulative impact on noise and vibration.	Significant cumulative impact	NOI-1.1: Implement a Construction Noise Control Plan NOI-2.1: Implement a Construction Vibration Control Plan	Cumulatively considerable contribution (construction) Less than considerable contribution (operation)
3.13 Public Services and Utilities and Service Systems			
Impact PS-1. Construction of the Project could increase fire protection, emergency responders, and law enforcement service ratios, response times, or other performance objectives but, with mitigation, would not result in the need for new or physically altered fire protection or law enforcement facilities.	Potentially significant impact	TR-1.1: Transportation Management Plan (TMP) for Project construction	Less-than-significant impact
Impact PS-2. Operation of the Project would not increase fire protection, emergency responders, and law enforcement service ratios, response times, or other performance objectives and would not result in the need for new or physically altered fire protection or law enforcement facilities.	Less-than-significant impact	None required	--

Impact	Significance before Mitigation	Mitigation	Significance after Mitigation
Impact USS-1. Construction of the Project would require or result in the relocation or construction of new or expanded water, wastewater treatment or stormwater drainage, electric power, natural gas, or telecommunications facilities; the construction or relocation of such utilities would not cause significant environmental effects.	Potentially significant impact	USS-1.1: Implement Utility Relocation Plan	Less-than-significant impact
Impact USS-2. There would be sufficient water supplies available to serve the Project during construction and reasonably foreseeable future development during normal, dry, and multiple dry years.	Less-than-significant impact	None required	--
Impact USS-3. Construction of the Project would not result in a determination by the wastewater treatment provider, which serves or may serve the Project, that it does not have adequate capacity to serve the Project's projected demand in addition to the provider's existing commitments.	Less-than-significant impact	None required	--
Impact USS-4. Construction of the Project would not generate solid waste in excess of state or local standards or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals; and/or violate federal, state, and local management and reduction statutes and regulations related to solid waste	Less-than-significant impact	None required	--
Impact USS-5. Operation of the Project would require or result in the relocation or construction of new or expanded water, wastewater treatment or stormwater drainage, electric power, natural gas, or telecommunications facilities; the	Less-than-significant impact	None required	--

Impact	Significance before Mitigation	Mitigation	Significance after Mitigation
construction or relocation of such utilities during operations would not cause significant environmental effects.			
Impact USS-6. There would be sufficient water supplies available to serve the Project during operations and reasonably foreseeable future development during normal, dry, and multiple dry years.	Less-than-significant impact	None required	--
Impact USS-7. Operation of the Project would not result in a determination by the wastewater treatment provider, which serves or may serve the project, that it does not have adequate capacity to serve the project's projected demand in addition to the provider's existing commitments.	Less-than-significant impact	None required	--
Impact USS-8. Operation of the Project would not generate solid waste in excess of state or local standards or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals; and/or violate federal, state, and local management and reduction statutes and regulations related to solid waste.	Less-than-significant impact	None required	--
Impact C-PSU-1. Construction and operation of the Project, in combination with other foreseeable projects in the surrounding area, would not result in a significant cumulative impact on public services or utilities. Construction of the Project would not contribute considerably to a significant cumulative impact on construction of new or relocated utilities.	Construction (Construction of New or Relocated Utilities): Significant cumulative impact Construction and Operation (all other topics): Less than significant cumulative impact	TR-1.1: Transportation Management Plan (TMP) for Project construction	Less than considerable contribution (Construction of New or Relocated Utilities)

Impact	Significance before Mitigation	Mitigation	Significance after Mitigation
3.14 Recreation			
Impact REC-1. Construction of the Project would not increase the use of existing neighborhood and regional parks or other recreational resources such that substantial physical deterioration of the facility could occur or be accelerated.	Less-than-significant impact	None required	--
Impact REC-2. Construction of the Project would not include recreational facilities or require the construction or expansion of recreational resources that might have an adverse physical effect on the environment.	Less-than-significant impact	None required	--
Impact REC-3. Operation of the Project would not increase the use of existing neighborhood and regional parks or other recreational resources such that substantial physical deterioration of the facility could occur or be accelerated.	Less-than-significant impact	None required	--
Impact REC-4. Operation of the Project would not include recreational facilities or require the construction or expansion of recreational resources that might have an adverse physical effect on the environment.	No impact	None required	--
Impact C-REC-1. Construction and operation of the Project, in combination with other foreseeable projects in the surrounding area, would not result in a significant cumulative impact on recreational resources.	Less than significant cumulative impact	None required	--
3.15 Safety and Security			
Impact SAF-1. Construction of the Project would be located within an airport land use plan area, within 2 miles of a public airport or public-use airport, and within the vicinity of a private airstrip, but would not result in a	Less-than-significant impact	None required	--

Impact	Significance before Mitigation	Mitigation	Significance after Mitigation
safety hazard or excessive noise for people residing or working in the study area.			
Impact SAF-2. Construction of the Project could impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plans	Potentially significant impact	SAF-1.1: Emergency Service Coordination TR-1.1: Transportation Management Plan (TMP) for Project Construction	Less-than-significant impact
Impact SAF-3. Construction of the Project would not increase exposure of people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires and the Project is not located in or near state responsibility areas or lands classified as high or very high fire hazard severity zones so would not result in any of the associated consequences of being in such a zone.	Less-than-significant impact	None required	--
Impact SAF-4. Construction of the Project would not increase hazards to workers, passengers, or adjacent human and environmental receptors along rail routes due to a design feature (e.g., sharp curves or dangerous intersections) or increase in passenger train movements.	No impact	None required	--
Impact SAF-5. Operation of the Project would be located within an airport land use plan area, within 2 miles of a public airport or public-use airport, and within the vicinity of a private airstrip, but would not result in a safety hazard or excessive noise for people residing or working in the study area	Less-than-significant impact	None required	--
Impact SAF-6. Operation of the Project would not impair implementation of or physically interfere with an adopted	Less-than-significant impact	None required	--

Impact	Significance before Mitigation	Mitigation	Significance after Mitigation
emergency response plan or emergency evacuation plan.			
Impact SAF-7. Operation of the Project would not increase exposure of people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires and the Project is not located in or near state responsibility areas or lands classified as high or very high fire hazard severity zones so would not result in any of the associated consequences of being in such a zone.	Less-than-significant impact	None required	--
Impact SAF-8. Operation of the Project would not increase hazards to workers, passengers, or adjacent human and environmental receptors along rail routes due to a design feature (e.g., sharp curves or dangerous intersections) or increase in passenger train movements.	Less-than-significant impact	None required	--
Impact C-SAF-1. Construction and operation of the Project would not contribute considerably to a significant cumulative impact on safety and security.	Significant cumulative impact	SAF-1.1: Emergency Service Coordination TR-1.1: Transportation Management Plan (TMP) for Project Construction	Less than considerable contribution
3.16 Transportation			
Impact TR-1. Construction of the Project could conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadways, bicycle, and pedestrian facilities.	Potentially significant impact	TR-1.1: Transportation Management Plan (TMP) For Project Construction TR-1.2: Mainline Railway Disruption Control Plan for Project Construction TR-1.3: Passenger Railway Disruption Control Plan for Project Construction	Less-than-significant impact
Impact TR-2. Construction of the Project would not conflict or be inconsistent with CEQA Guidelines Section 15064.3, subdivision (b)(2).	Less-than-significant impact	None required	--

Impact	Significance before Mitigation	Mitigation	Significance after Mitigation
Impact TR-3. Construction of the Project could substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment).	Potentially significant impact	TR-1.1: Transportation Management Plan (TMP) for Project Construction	Less-than-significant impact
Impact TR-4. Construction of the Project could result in inadequate emergency access.	Potentially significant impact	TR-1.1: Transportation Management Plan (TMP) for Project Construction	Less-than-significant impact
Impact TR-5. Operation of the Project would not conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadways, bicycle and pedestrian facilities.	Less-than-significant impact	None required	--
Impact TR-6. Operation of the Project would not conflict or be inconsistent with CEQA Guidelines Section 15064.3, subdivision (b)(2).	Beneficial impact	None required	--
Impact TR-7. The Project would not substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment).	Less-than-significant impact	None required	--
Impact TR-8. Operation of the Project would not result in inadequate emergency access.	Less-than-significant impact	None required	--
Impact C-TR-1. Construction and operation of the Project would not contribute considerably to a significant cumulative impact on transportation.	Significant cumulative impact	TR-1.1: Transportation Management Plan (TMP) for Project construction TR-1.2: Mainline railway disruption control plan for Project construction TR-1.3: Passenger railway disruption control plan for Project construction	Less than considerable contribution

Chapter 1
Introduction

1.1 Overview

The Merced Intermodal Track Connection (MITC) Project (Project) would include a new track connection from the Burlington Northern Santa Fe (BNSF) corridor to the proposed integrated Merced High-Speed Rail (HSR) Station in downtown Merced between R and O Streets, in addition to a new platform that would allow for a cross-platform transfer between the San Joaquins and HSR. The Project only includes the construction of the track connection; it does not include the construction of the proposed integrated station. The limits of the Project are in Merced County and almost entirely within the city limits of Merced. The San Joaquin Joint Powers Authority (SJJPA) will serve as the lead agency under the California Environmental Quality Act (CEQA). If the Project receives federal funding, it is anticipated that the Project will comply with the requirements of the National Environmental Policy Act (NEPA), as necessary.

The Project would consist of the following:

- New passenger rail connection for the San Joaquins from the BNSF north of State Route (SR) 59 to the southern terminus at the proposed integrated station
- New aerial guideway that would connect into the east side of the high-speed rail (HSR) platform (which would be shared with the San Joaquins) at the proposed integrated station, creating an elevated integrated platform with HSR
- Modification of the approved Altamont Corridor Express (ACE) Merced Layover and Maintenance Facility

This environmental impact report (EIR) analyzes the impacts associated with these facilities.

In addition to the Project, SJJPA has identified three variants that assume different approaches for fueling future hydrogen-powered trains in response to the state's zero emission goals (as discussed in Section 2.8, *Variants to the Project*). The variants would primarily occur within the same environmental footprint as the Project[1] and have the same objectives, background, and development controls, but with specific differences. The variants are a slightly different version of the Project in the event SJJPA desires to consider them for approval. The final decision as to whether to adopt the Project, a variant, and/or an alternative will be made after completion of the final environmental impact report (EIR) for this Project. This chapter provides information regarding operations and maintenance activities, construction activities, potential right-of-way (ROW) and easement needs, costs and revenues, and required permits and approvals.

Overall, eight daily roundtrips would be operated by SJJPA, including five daily roundtrips from Oakland to Merced and two daily roundtrips from Sacramento to Merced, and one between Natomas and Merced. Implementation of the Project would connect the San Joaquins intercity service with the future HSR service at the proposed integrated Merced HSR Station. Upon the opening of the

[1] Variant H1 would have additional footprint requirements for solar panels that are beyond the environmental footprint of the Project.

Merced-Bakersfield HSR Early Operating Segment (EOS), San Joaquins intercity service from Merced to Bakersfield would be terminated.

Alternatives to the Project are analyzed at a lesser level of detail in Chapter 6, *Alternatives*. Chapter 6 analyzes the following two alternatives:

- No Project Alternative
- North of SR 59 BNSF/Downtown Connection Alternative

1.2 Background

SJJPA manages the San Joaquins intercity service between Bakersfield and Oakland and between Bakersfield and Sacramento. SJJPA contracts with the San Joaquin Regional Rail Commission (SJRRC) to provide day-to-day management of the service and contracts with Amtrak to operate the service. The California Department of Transportation (Caltrans) provides the funding to operate the service and owns the rolling stock.

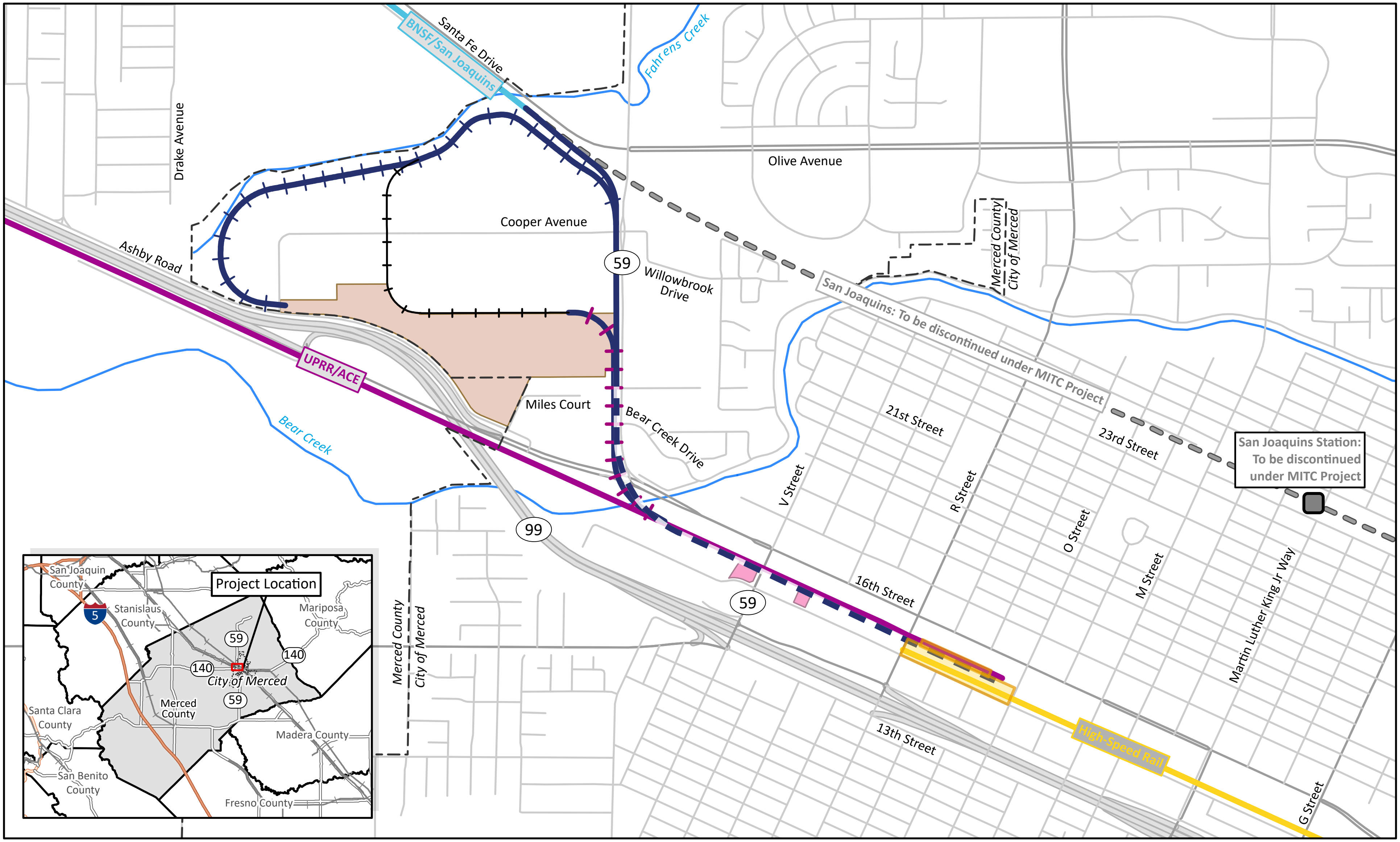
SJJPA does not own the tracks on which the San Joaquins operate, but instead has entered into passenger rights agreements with both BNSF and Union Pacific Railroad (UPRR) to operate on portions of their respective tracks. The San Joaquins shares tracks with freight trains dispatched by both UPRR and BNSF within their respective ROW.

SJJPA has been working with SJRRC, California High-Speed Rail Authority (CHSRA), Caltrans, California State Transportation Agency (CalSTA), the City of Merced, Merced County Association of Governments (MCAG), and the Early Train Operator (ETO) for the California HSR Project to integrate the San Joaquins and the ACE passenger rail services with the HSR service to Merced, as shown in Figure 1-1. Currently SJRRC operates ACE commuter rail service between San Jose and Stockton, with an extension to Merced having secured CEQA clearance in December 2021.

To integrate the San Joaquins and ACE rail services with the Merced-Bakersfield HSR EOS and future Phase I HSR service, CHSRA, CalSTA, Caltrans, the City of Merced, SJJPA, and SJRRC are planning for a proposed integrated station in downtown Merced that will connect three services:

- ACE Passenger Rail Service
- HSR Service
- San Joaquins Intercity Service

Implementing the Project would allow direct transfers from San Joaquins intercity service to HSR at the proposed integrated Merced HSR Station in downtown Merced. The San Joaquins would offer intercity service between the Bay Area/Sacramento and northern San Joaquin Valley. The Project would provide a cross-platform transfer between the San Joaquins and HSR for passengers traveling between the Bay Area/Sacramento and Madera, Fresno, Kings/Tulare, Bakersfield, and southern California (via Thruway Bus connection).



- Existing UPRR/Approved ACE
- Proposed High-Speed Rail
- Existing BNSF/San Joaquins
- UPRR Industrial Spur Track
- City of Merced Boundary
- Proposed Integrated Merced High-Speed Rail Station
- Approved ACE Merced Layover and Maintenance Facility

MITC Project
- San Joaquins: Elevated Track
- San Joaquins: At-grade Track
- MITC San Joaquins Layover and Maintenance Access Line
- Relocated ACE/UPRR Industrial Spur Track
- San Joaquins: To Be Discontinued under MITC Project
- Proposed Parking Facilities

Data Source: City of Merced, Merced County, AECOM

0 1,000 2,000 Feet

N

MITC

Figure 1-1
Project Location
Merced Intermodal Track Connection Project

L:\DCS\Projects_TRN\60690716_MITC_CEQA_NEPA_PE\900_CAD_GIS\920_GIS\Maps\ProjectDescription\ProjectDescription.aprx\Project Location

1.3 Project Goal

The overall goal of the Project is to link the San Joaquin service to downtown Merced and the proposed integrated Merced HSR Station to be served by HSR, ACE, and San Joaquin service to allow for efficient transfers and rail service in the Central Valley.

1.4 Project Objectives

The primary objectives of the Project are to create a seamless cross-platform transfer between the San Joaquins intercity service and the Merced-Bakersfield HSR EOS and future Phase I HSR service, to increase intercity passenger rail ridership, to reduce vehicle miles traveled, to improve regional air quality, and to reduce greenhouse gas (GHG) emissions. These objectives are outlined below.

- **Integrate and create a seamless connection between the San Joaquins intercity service and the Merced-Bakersfield HSR EOS and future Phase I HSR service in Merced.** Relocating the San Joaquins station in Merced would align with the planned HSR station and allow passengers to transfer between services on a shared platform.
- **Enhance San Joaquins intercity service to better serve regional markets.** Integrating the San Joaquins with the HSR system would improve the connection of regional markets between the San Francisco Bay Area (Bay Area)/Sacramento and the northern San Joaquin Valley and increase ridership and service benefits.
- **Reduce traffic congestion, improve regional air quality, and reduce GHG emissions.** The Project would improve intercity passenger rail service between the San Joaquin Valley, Sacramento region, and Bay Area, providing a transportation alternative to the automobile that reduces GHG emissions.

1.5 Environmental Review Process

1.5.1 California Environmental Quality Act

CEQA applies to all discretionary activities proposed to be implemented by California public agencies, including state, regional, county, and local agencies (California Public Resources Code [Public Res. Code] 21000 et seq.). CEQA requires agencies to estimate and evaluate the environmental impacts of their actions, avoid or reduce significant environmental impacts when feasible, and consider the environmental implications of their actions prior to making a decision. CEQA also requires agencies to inform the public and other relevant agencies and consider their comments in the evaluation and decision-making process. The State CEQA Guidelines are the primary source of rules and interpretations of CEQA (Public Res. Code 21000 et seq.; 14 California Code of Regulations 1500 et seq.).

1.5.2 Purpose of this Environmental Impact Report

The purpose of this EIR is to provide the information necessary for SJJPA to make an informed decision about the MITC Project and to supply the information necessary to support related permit applications and review processes.

This Draft EIR has been prepared in compliance with CEQA to achieve the following goals.

- Identify potential direct, indirect, and cumulative environmental impacts.
- Describe feasible mitigation measures intended to avoid or reduce potentially significant impacts to a less-than-significant level.
- Disclose the environmental analyses, including potential impacts and mitigation measures, for public and agency review and comment.
- Discuss potential alternatives to the Project that meet the project's goal and objectives, are feasible, and would avoid or reduce identified significant impacts.

One of the purposes of CEQA is to provide an opportunity for the public and relevant agencies to review and comment on projects that might affect the environment. Scoping activities are discussed in Section 1.6, *Scope and Content of this Environmental Impact Report*. SJJPA will provide a public review period for this Draft EIR 45 days from its release for comment. SJJPA will also conduct public meetings to receive comments during the comment period. Once the public review period is complete, SJJPA will prepare a final EIR that includes all the comments received on the Draft EIR, responses to all comments, and any necessary revisions to the Draft EIR. CEQA requires the SJJPA decision-making body to review and consider the information in the EIR before making a decision on the Project.

1.6 Scope and Content of this Environmental Impact Report

Scoping refers to the process used to assist the lead agency in determining the focus and content of an EIR. Scoping solicits input on the potential topics to be addressed in the EIR, the range of alternatives, and possible mitigation measures. Scoping is also helpful in establishing methods of assessment and in selecting the environmental effects to be considered in detail.

1.6.1 Notice of Preparation and Scoping Meetings

The scoping process for this EIR was formally initiated on January 5, 2023, when SJJPA submitted an NOP to the California State Clearinghouse; federal, regional, and local elected officials; and federal, state, and local agencies, including the planning and community development directors in Merced County, and the cities where the Project would be located; and the interested public. The purpose of the NOP is to solicit participation from relevant agencies and from the public in determining the scope of an EIR. The scoping period ended February 19, 2023.

An in-person public scoping meeting was held on January 26, 2023, between 6:00 p.m. and 8:00 p.m. at the Merced Senior Community Center. The meeting was set up as a public open house with informational display tables and a PowerPoint presentation led by SJJPA staff. Appendix 1.0-1, *Scoping Memorandum*, contains the scoping report detailing the scoping process, including the notification, and scoping activities undertaken. Written comments received during the scoping process are also included in Appendix 1.0-1.

1.6.2 Consultation and Coordination

Appendix 1.0-2, *Public and Agency Coordination,* provides a list of local and regional agencies, community organizations, and stakeholders with whom SJJPA has met throughout the development of the Project as well as meetings held during the time period that this Draft EIR was developed. Meeting dates and topics presented during these meetings are provided.

The alternatives analysis process for this Draft EIR utilized preliminary planning and environmental/engineering information to identify feasible and practicable alternatives to carry forward for environmental review and preliminary engineering. Chapter 2, *Project Description,* describes the Project and Chapter 5, *Alternatives,* describes the alternatives considered, the evaluation criteria that were applied and used to determine which alternatives to analyze in this Draft EIR, and which alternatives were considered but rejected for further analysis.

In addition to consultation and coordination meetings, the Project webpage (https://sjjpa.com/mitc/) was developed within the SJJPA website. This webpage contained the most current announcements and informational materials.

1.6.3 Resource Topics

Consistent with Appendix G of the CEQA Guidelines, this Draft EIR evaluates the potential impacts of the Project for the following resource areas.

- Aesthetics
- Air quality and greenhouse gas emissions
- Biological resources
- Cultural resources
- Tribal cultural resources
- Energy
- Geology, soils, seismicity, and paleontological resources
- Hazards and hazardous materials
- Hydrology and water quality
- Land use and planning
- Noise and vibration
- Public services and utilities and service systems
- Recreation
- Safety and security
- Transportation

The following topics are also analyzed in this Draft EIR.

- Effects found not to be significant
  - Agricultural and forestry resources
  - Mineral resources
  - Population and housing
  - Wildfire
- Cumulative impacts
- Significant and unavoidable impacts
- Significant irreversible changes in the environment
- Growth inducement
- Alternatives to the Project

1.7 Notification and Circulation of Draft EIR

CEQA requires the lead agency (SJJPA) to prepare an EIR that reflects the independent judgment of the agency regarding the impacts of a project, the level of significance of the impacts both before and after mitigation, and mitigation measures proposed to reduce the impacts. A Draft EIR is circulated to responsible agencies, trustee agencies with resources affected by the project, and interested agencies and individuals. The purposes of public and agency review of a Draft EIR include sharing expertise, disclosing agency analyses, checking accuracy, detecting omissions, discovering public concerns, and soliciting counterproposals.

This Draft EIR has been released for a 45-day public review period. The public was advised of the availability of this Draft EIR through notices placed in local newspapers, sent by email and direct mailings, and announced through the Project webpage (https://sjjpa.com/mitc/) and social media.

A Notice of Availability (NOA) was posted with the California State Clearinghouse and at the county clerk/recorder's office for Merced County. In addition, the NOA was published in the following newspaper:

- Merced Sun-Star

The Draft EIR and the documents incorporated by reference are available on the Project webpage (https://sjjpa.com/mitc/). A printed copy of the Draft EIR and the documents incorporated by reference are available for public viewing at the SJJPA offices at 949 East Channel Street in Stockton, California during normal office hours (Monday through Friday 4:00 a.m. to 8:45 p.m.). Electronic versions of the Draft EIR are available upon request at the SJJPA offices as well. In addition, a printed copy of the Draft EIR is also available for public viewing at the following locations:

- City of Merced, City Clerk's Office
  678 West 18th Street, 1st Floor
  Merced, CA 95340
  Office hours: Monday through Friday from 8:00 a.m. to 5:00 p.m.
  (closed during the 12:00 p.m. to 1:00 p.m. lunch hour)

- Merced County Library
  2100 O Street
  Merced, CA 95340
  Library hours: Monday from 10:00 a.m. to 6:00 p.m., Tuesday and Wednesday from 10:00 a.m. to 8:00 p.m., Thursday from 10:00 a.m. to 6:00 p.m., and Friday and Saturday from 10:00 a.m. to 5:00 p.m.
  (electronic versions of the Draft EIR are also available upon request at this location)

Reviewers of this Draft EIR should focus on the sufficiency of the document in identifying and analyzing the possible impacts on the environment and ways in which the significant effects of the Project might be avoided or mitigated. Comments are most helpful when they suggest additional specific alternatives or mitigation measures that would provide better ways to avoid or mitigate significant environmental effects.

SJJPA will hold one open house meeting to provide information about the Draft EIR and respond to general questions about the environmental analysis. A presentation summarizing the Project and the Draft EIR will be provided, and staff will be available to answer questions of a general nature. All formal comments on the Draft EIR must be submitted in writing or verbally to a court reporter at the open house meeting or via mail or email (see below for details) for consideration.

Comments on this Draft EIR must be received by SJJPA no later than 5:00 p.m. on the last day of the Draft EIR public review period (August 31, 2024), and can be submitted by any of the following methods:

- **Mail**: San Joaquin Joint Powers Authority
  Attn: MITC Project
  949 East Channel Street
  Stockton, CA 95202

- **Email**: Information@MITCProject.org; please include "MITC Project" in the subject line.

1.8 Environmental Impact Report Organization

This Draft EIR is organized into the following chapters and appendices.

- *Executive Summary* provides a summary of the key information and conclusions in the EIR.
- Chapter 1, *Introduction*, provides a brief overview of the Project; the Project objectives; an overview of the environmental review process; and the scope, content, and organization of the Draft EIR.
- Chapter 2, *Project Description*, provides a comprehensive description of the improvements associated with the Project.

- Chapter 3, *Environmental Impact Analysis*, provides an evaluation of the Project impacts on the environmental resource topics outlined above. Each resource-specific section discusses the environmental setting, regulatory setting, and any impacts and mitigation measures.
- Chapter 4, *Cumulative Impacts*, provides a discussion of cumulative impacts.
- Chapter 5, *Other CEQA-Required Analysis*, provides a discussion of significant environmental impacts that cannot be avoided, significant irreversible changes in the environment, and growth-inducing impacts.
- Chapter 6, *Alternatives,* provides a description of the No Project Alternative, an explanation of the development of alternatives, an evaluation of alternatives considered but dismissed from further consideration, and analysis of a range of alternatives to the Project.
- Chapter 7, *List of Preparers*, provides a list of firms and staff who contributed to the preparation of this Draft EIR.
- Chapter 8, *References*, provides a list of the printed references and personal communication cited in this Draft EIR.
- Appendices:
    - Appendix 1.0-1: *Merced Intermodal Track Connection Scoping Memorandum*
    - Appendix 1.0-2: *Public and Agency Coordination*
    - Appendix 2.0-1: *Merced Intermodal Track Connection Environmental Footprint*
    - Appendix 2.0-2: *Merced Intermodal Track Connection 15% Preliminary Engineering Plans*
    - Appendix 2.0-3: *Merced Intermodal Track Connection Ridership and Revenue Technical Memorandum*
    - Appendix 2.0-4: *Merced Intermodal Track Connection Capital Cost Technical Memorandum*
    - Appendix 2.0-5: *Merced Intermodal Track Connection Operations and Maintenance Cost Technical Memorandum*
    - Appendix 3.0-1: *Regional Plans and Local General Plans*
    - Appendix 3.3-1: *Air Quality, Greenhouse Gas, and Health Risk Assessment Supporting Documentation*
    - Appendix 3.4-1: *Rare Plant Survey Technical Memorandum*
    - Appendix 3.4-2: *Preliminary Aquatic Resources Delineation Report*
    - Appendix 3.4-3: *Special-Status Species Tables*
    - Appendix 3.5-1: *Historical Resources Inventory and Evaluation Report*
    - Appendix 3.5-2: *Archaeological Resources Study Report* (confidential and not for public release)
    - Appendix 3.9-1*: Supporting Hazards and Hazardous Materials Information*

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Chapter 2
Project Description

The Merced Intermodal Track Connection (MITC) Project (Project) would include a new track connection from the Burlington Northern Santa Fe (BNSF) corridor to the proposed integrated Merced High-Speed Rail (HSR) Station in downtown Merced between O and R Streets, in addition to a new platform that would allow for cross-platform transfer between the San Joaquins passenger rail and HSR. The Project only includes the construction of the track connection; it does not include the construction of the proposed integrated Merced HSR Station. The San Joaquin Joint Powers Authority (SJJPA) will serve as the lead agency under the California Environmental Quality Act (CEQA). If the Project receives federal funding, it is anticipated that the Project will comply with the requirements of the National Environmental Policy Act (NEPA), as necessary.

The Project would consist of the following:

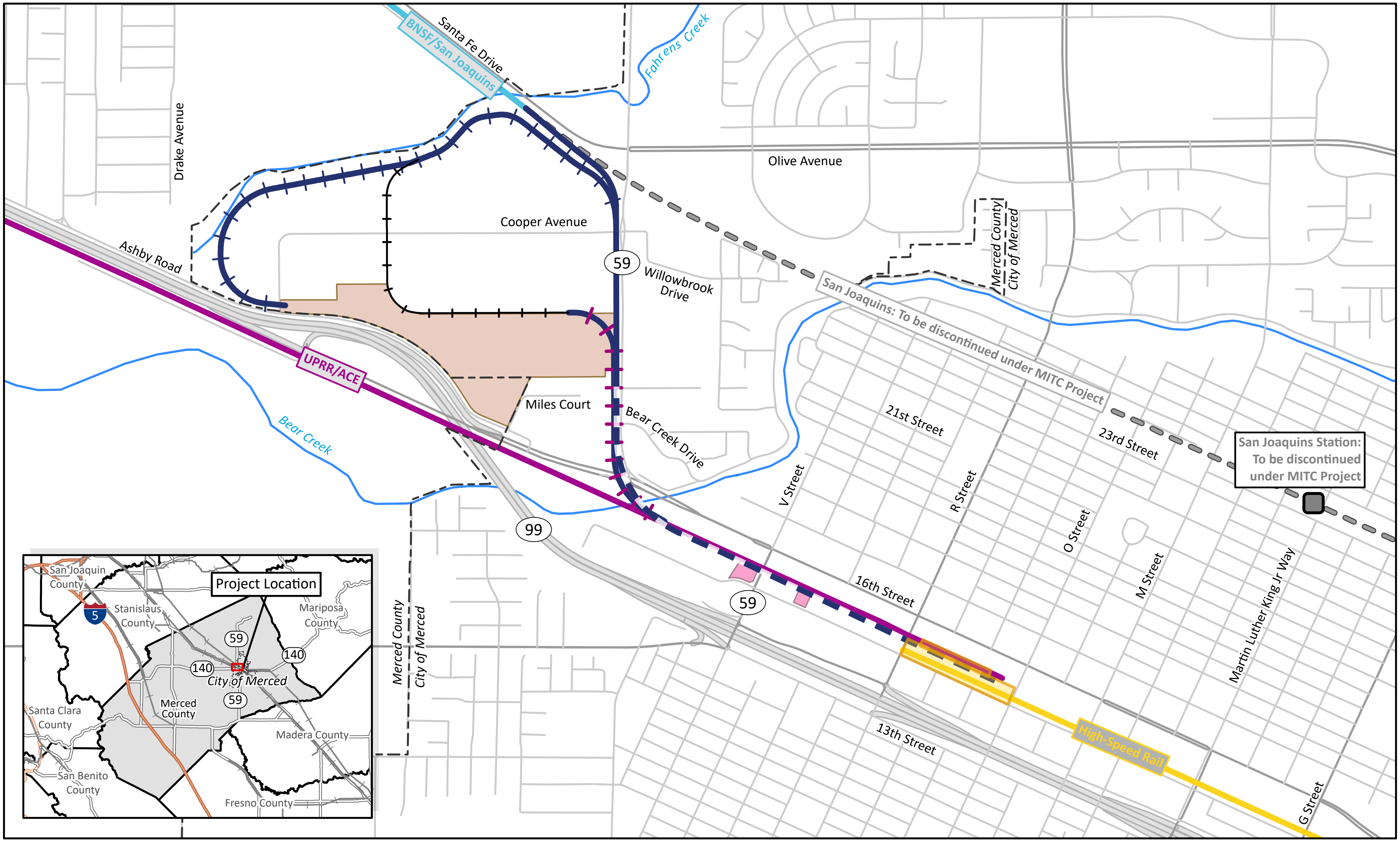
- New passenger rail connection for the San Joaquins from BNSF north of State Route (SR) 59 to the southern terminus at the proposed integrated Merced HSR Station
- New aerial guideway that would connect into the east side of the HSR platform (which would be shared with the San Joaquins) at the proposed integrated Merced HSR Station, creating an elevated integrated platform with HSR
- Modification of the approved Altamont Corridor Express (ACE) Merced Layover and Maintenance Facility

In addition to the Project, SJJPA has identified three variants that assume different approaches for fueling future hydrogen-powered trains in response to the state's zero emission goals (as discussed in Section 2.8, *Variants to the Project*). The variants would primarily occur in the same environmental footprint as the Project[1] and have the same objectives, background, and development controls, but with specific differences. The variants are a slightly different version of the Project in the event SJJPA desires to consider them for approval. The final decision as to whether to adopt the Project, a variant, and/or an alternative will be made after completion of the final environmental impact report (EIR) for this Project. This chapter provides information regarding operations and maintenance activities, construction activities, potential right-of-way (ROW) and easement needs, costs and revenues, and required permits and approvals.

2.1 Project Location and Limits

Figure 2-1 shows the limits of the Project, which are in Merced County and almost entirely within the city limits of Merced. A small portion of the limits of the Project near Ashby Road and Miles Court is outside the city limits of Merced within Merced County. The new track for the Project would run from the BNSF corridor just north of where it crosses Snelling Highway (SR 59) to a station platform at the proposed integrated Merced HSR Station located between O and R Streets in downtown Merced, parallel to 16th Street.

[1] Variant H1 would have additional footprint requirements for solar panels that are beyond the environmental footprint of the Project.



- Existing UPRR/Approved ACE
- Proposed High-Speed Rail
- Existing BNSF/San Joaquins
- UPRR Industrial Spur Track
- City of Merced Boundary
- Proposed Integrated Merced High-Speed Rail Station
- Approved ACE Merced Layover and Maintenance Facility

MITC Project

- San Joaquins: Elevated Track
- San Joaquins: At-grade Track
- MITC San Joaquins Layover and Maintenance Access Line
- Relocated ACE/UPRR Industrial Spur Track
- San Joaquins: To Be Discontinued under MITC Project
- Proposed Parking Facilities

0 1,000 2,000 Feet

N

MITC

Figure 2-1
Project Location
Merced Intermodal Track Connection Project

Data Source: City of Merced, Merced County, AECOM

2.2 Background

SJJPA manages the San Joaquins intercity service between Bakersfield and Oakland and between Bakersfield and Sacramento. SJJPA contracts with the San Joaquin Regional Rail Commission (SJRRC) to provide day-to-day management of the service and contracts with Amtrak to operate the service. The California Department of Transportation (Caltrans) provides funding to operate the service and owns the rolling stock.

SJJPA does not own the tracks on which the San Joaquins operates, but instead has entered into passenger rights agreements with both BNSF and UPRR to operate on portions of their respective tracks. The San Joaquins shares tracks with freight trains dispatched by both UPRR and BNSF within their respective ROWs.

SJJPA has been working with SJRRC, California High-Speed Rail Authority (CHSRA), Caltrans, California State Transportation Agency (CalSTA), the City of Merced, Merced County Association of Governments (MCAG), and the Early Train Operator (ETO) for the California HSR Project to integrate the San Joaquins and the ACE passenger rail services with the Merced-Bakersfield HSR Early Operating Segment (EOS), as shown on Figure 2-1. Currently, SJRRC operates ACE passenger rail service between San Jose and Stockton, with an extension to Merced having secured CEQA clearance in December 2021.

To integrate the San Joaquins and ACE passenger rail services with the Merced-Bakersfield HSR EOS and future Phase I HSR service, CHSRA, CalSTA, Caltrans, the City of Merced, SJJPA, and SJRRC are planning for the proposed integrated Merced HSR Station that will connect three services:

- **ACE Passenger Rail Service**: SJRRC is in the planning process of extending ACE passenger rail service to Merced between O and R Streets (which would become part of the proposed integrated Merced HSR Station). As mentioned above, SJRRC completed the CEQA environmental clearance of the ACE service to Merced in December 2021.
- **HSR Service**: The 2012 Record of Decision for the California HSR Merced to Fresno section approved an HSR station northwest of G Street and 16th Street in Merced (CHSRA 2012). CHSRA has completed an environmental reevaluation for the relocation of the station from the currently proposed site at G Street to the proposed integrated Merced HSR Station between O and R Streets.
- **San Joaquins Intercity Service**: The Project proposes infrastructure improvements to connect the San Joaquins intercity service to the proposed integrated Merced HSR Station. This will result in connecting the San Joaquins intercity service to the Merced-Bakersfield HSR EOS (and future Silicon Valley to Central Valley and Phase I HSR service) in downtown Merced by creating a direct link between BNSF and the proposed integrated Merced HSR Station.

The Project is included in the SJJPA 2024 Business Plan Update, which was approved by the SJJPA Board of Directors (SJJPA 2024). The Project includes a new track connection from the BNSF corridor to the proposed integrated Merced HSR Station, in addition to a new platform, that will allow for a cross-platform transfer between the San Joaquins and HSR. The Project only includes the construction of the connecting track to the planned HSR station; it does not include the construction of station elements. The rest of the proposed integrated Merced HSR Station (with the exception of the ACE track and platform) is included in the HSR project.

CHSRA is planning to construct the Merced-Bakersfield HSR EOS by 2030-2033 and to extend the HSR service to the Bay Area after 2030-2033 (referred to as Silicon Valley to Central Valley HSR). HSR is planned to provide faster, more reliable, and more frequent service than the San Joaquins currently provides between Merced and Bakersfield. When the Merced-Bakersfield HSR EOS is operational, the San Joaquins intercity service between Merced and Bakersfield will be replaced by the HSR service and SJJPA will terminate the San Joaquins intercity service in Merced. SJJPA is expected to be the operating agency for the Merced-Bakersfield HSR EOS.

Implementing the Project would allow direct transfers from San Joaquins intercity service to HSR at the proposed integrated Merced HSR Station in downtown Merced. The San Joaquins would offer intercity service between the Bay Area/Sacramento and northern San Joaquin Valley. The Project would provide a cross-platform transfer between the San Joaquins and HSR for passengers traveling between the Bay Area/Sacramento and Madera, Fresno, Kings/Tulare, Bakersfield, and Southern California (via Thruway Bus connection).

The ETO for CHSRA developed the *Central Valley Segment System Management & Operations Interim Financial Plan* in support of the CHSRA business plans (CHSRA 2020). The report emphasizes the importance of the connections from ACE and San Joaquins to HSR, including:

> "In conclusion, interim HSR services between Merced – Bakersfield creates significant value, when connected to the total existing corridor (including ACE, San Joaquins, and bus network). The development of an integrated service concept with optimized connections results in improved services and reduction in travel time for the passenger."

The *Central Valley Segment System Management & Operations Interim Financial Plan* outlines an integrated service concept evaluated jointly with CHSRA and SJRRC/SJJPA with the goal of maximizing systemwide ridership while balancing operations and maintenance costs. The integrated service concept includes up to 12 San Joaquins roundtrip trains per day in Merced (CHSRA 2020).

2.3 Proposed Alignment, Station Connection, and Layover and Maintenance Facility Modification

The Project, shown on Figure 2-1, would include a new track connection from the BNSF corridor to the proposed integrated Merced HSR Station in downtown Merced between O and R Streets that would allow for a cross-platform transfer between the San Joaquins and HSR to create an integrated station serving HSR, ACE, and San Joaquins passengers. The Project includes the construction of the track connection; it does not include the construction of the rest of the proposed integrated Merced HSR Station. Upon completion of the Project, the San Joaquins would abandon the existing Merced station and terminate service at the proposed integrated Merced HSR Station. Connections south of Merced would be provided via HSR. In addition, existing Merced station bus connections would be made at the proposed integrated Merced HSR Station.

In addition, the Project would include a connection into the approved ACE Merced Layover and Maintenance Facility, which would be shared with ACE operations and service. The proposed integrated Merced HSR Station and the approved ACE Merced Layover and Maintenance Facility (discussed in Section 2.3.1, *Proposed Alignment and Station Connection*) are critical components of the overall Project integration. The footprint (required area of development) of the approved ACE Merced Layover and Maintenance Facility is not analyzed as part of the Project. The footprint was environmentally cleared in the ACE service expansion (discussed in Section 2.3.2, *Proposed Modifications to the Approved ACE Merced Layover and Maintenance Facility*). However, elements required to support the Project within the previously cleared and approved footprint are included in the analysis.

The Project would consist of the following:

- New passenger rail connection for the San Joaquins from BNSF north of SR 59, running along the SR 59 corridor and immediately west of the ACE UPRR corridor, to the southern terminus at the proposed integrated Merced HSR Station.
- Shifting the ACE UPRR spur track that accesses industrial area north of SR 59.
- New access to the approved ACE Merced Layover and Maintenance Facility for San Joaquins trains.
- Modification of the approved ACE Merced Layover and Maintenance Facility to include new and upgraded tracks for San Joaquins, joint use of the facility by both ACE and San Joaquins trains for maintenance activities and required equipment and parking for SJJPA maintenance staff. The footprint of the facility would not be expanded.
- New aerial guideway on the west side of the ACE/UPRR corridor that would connect into the east side of the HSR platform (which would be shared with the San Joaquins) at the proposed integrated Merced HSR Station, creating an elevated integrated platform with HSR.

The Project would include a combination of new track, track relocation, track upgrades, a new UPRR industrial spur bridge, a new aerial guideway structure, and new at-grade crossings at Cooper Avenue and the intersection of SR 59 and 16th Street. The environmental footprint of the Project is illustrated in Appendix 2.0-1, *Merced Intermodal Track Connection Environmental Footprint*. In addition, Appendix 2.0-2, *Merced Intermodal Track Connection 15% Preliminary Engineering Plans*, contains track plans and section drawings, structure plans, roadway plans, utility plans, station plans, and ROW plans for these improvements.

2.3.1 Proposed Alignment and Station Connection

The Project only includes the construction of the track connection to the proposed integrated Merced HSR Station and does not include the construction of the rest of the proposed integrated Merced HSR Station. CHSRA is proposing to relocate the previously approved Merced station from its previously approved at-grade location between G Street and Martin Luther King Jr. Way to the new location on an elevated structure between O and R Streets in downtown Merced (CHSRA 2023). Figure 2-2 shows a rendering of the proposed integrated Merced HSR Station, which was proposed by the City of Merced in 2016 and was supported by CHSRA, CalSTA, and SJJPA. CHSRA completed an environmental reevaluation of the new station location and the guideway extension. As part of the Project, the proposed aerial guideway would connect directly to the proposed integrated Merced HSR Station. As a result, individuals would be able to make cross-platform transfers from the San Joaquins to HSR and vice versa.

Note: The Project only includes the construction of the track connection from the BNSF corridor to the proposed integrated Merced HSR Station; it does not include the construction of the rest of the proposed integrated Merced High-Speed Rail Station.

Figure 2-2
Proposed Integrated Merced High-Speed Rail Station
Merced Intermodal Track Connection Project

MITC

CHSRA is responsible for constructing the proposed integrated Merced HSR Station. Although construction of the integrated station and the San Joaquins track connection can be done separately, it is a goal of the Project to construct both the HSR and SJJPA components at the same time.

To meet future parking demands generated by the Project based on ridership projections (as discussed in Section 2.4.2, *Ridership*), approximately 162 parking spaces would be required. As shown in Figure 2-1, approximately 114 parking stalls would be located at the northwest corner of V Street/Auto Center Drive intersection, and approximately 48 stalls would be located on the parcel occupied by the Central Valley Collision Center. The Project would include exploring the use of an autonomous shuttle between the locations of the proposed parking stalls and the proposed integrated Merced HSR Station, given the distance between the two.

2.3.1.1 Proposed San Joaquins Track Improvements

Shown on Figure 2-1, the new passenger rail connection for the San Joaquins would consist of the following:

- New aerial guideway from the west side of the proposed integrated Merced HSR Station (between O and R Streets) continuing parallel to the ACE UPRR corridor, spanning Bear Creek and the 16th Street/SR 59 intersection
- New at-grade track on SR 59 to the BNSF corridor, crossing Cooper Avenue

The Project would include the following improvements (described east to west), as listed in Table 2-1 and Table 2-2:

- Construction of a new aerial guideway, including track, starting at the southeast end of the shared integrated platform. The proposed aerial guideway would be approximately 6,100 feet long (1.2 miles) and transition to at-grade west of SR 59 and north of 16th Street, adjacent to the approved ACE Merced Layover and Maintenance Facility. The aerial guideway also includes an approximately 800-foot pocket track[2] northwest of the proposed integrated Merced HSR Station (Figure 2-3).
- Construction of a new retained fill structure[3] to facilitate the transitioning of the aerial track down to at-grade adjacent to SR 59 and north of 16th Street, extending north from the aerial guideway for approximately 700 feet. The proposed retaining wall conflicts with the business access directly off of SR 59, south of Cooper Avenue. The Project would work with the property owner to upgrade the secondary access off Cooper Avenue to the primary access location.
- Construction of approximately 2,400 feet of new at-grade track extending north from the retained fill structure connecting to the BNSF corridor with a turnout adjacent to Santa Fe Drive at milepost (MP) 1058.
- Shift of approximately 1,300 feet of the existing BNSF corridor to accommodate the connection of the San Joaquins track, extending from the connection point south to just north of the SR 59 at-grade crossing.

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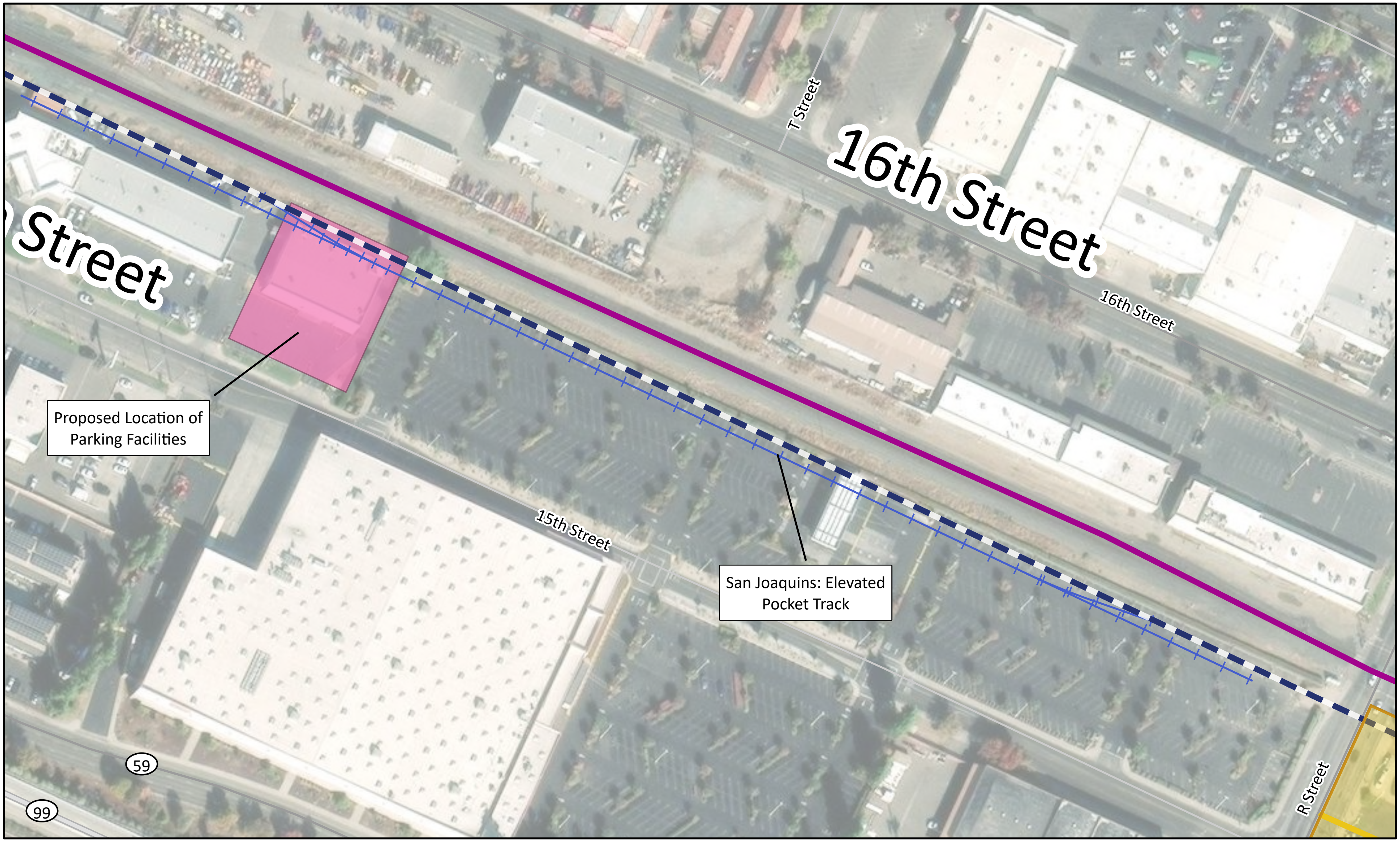
[2] A pocket track is used to take the train off the main line so that it can reverse direction without disruption to service. The length of the proposed pocket track would accommodate one train.

[3] A *retained fill structure* would hold earthen materials in place to provide a stable surface for track and bridge abutment.

- Construction of a new single track at-grade crossing of Cooper Avenue at the intersection with SR 59 (Figure 2-4).
- Storm drainage for the aerial guideway would include a combination of connection into the city's drainage system and drainage to basins under the guideway. The north section of the alignment that parallels SR 59 would include capturing drainage on the guideway and transferring it to basins under the guideway via piping in the columns. The south section of the alignment would include capturing drainage on the guideway and transferring it to the City storm drain system via piping in the columns.
- Drainage for the at-grade sections of the alignment would be accommodated with linear ditches along the alignment.



Proposed Integrated Merced High-Speed Rail Station
High-Speed Rail
Existing UPRR/Approved ACE

MITC Project

San Joaquins: Elevated Track
San Joaquins: Elevated Pocket Track
Proposed Parking Facilities

Figure 2-3
Proposed Aerial Guideway Pocket Track
Merced Intermodal Track Connection Project

Data Source: City of Merced, Merced County, AECOM

0 100 200 Feet

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MITC

MITC Project

- San Joaquins: At-grade Track
- San Joaquins: Layover and Maintenance Access Line
- San Joaquins: To be discontinued under MITC Project

Data Source: City of Merced, Merced County, AECOM

0 100 200 Feet

Figure 2-4
Proposed Cooper Avenue At-Grade Crossing
Merced Intermodal Track Connection Project

MITC

L:\DCS\Projects_TRN\60690716_MITC_CEQA_NEPA_PE\900_CAD_GIS\920_GIS\Maps\ProjectDescription\ProjectDescription.aprx\Cooper Avenue

Table 2-1. Proposed New At-Grade Crossing

Existing Roadway (east to west)	Modifications
Cooper Avenue/SR 59	• Install concrete crossing panels[4] where the new San Joaquins track alignment crosses the roadway. • Install railroad crossing signals and guard gates at both approaches. • Install stop bars[5] at the eastbound approach. • Install a signal house[6]
Cooper Avenue/Safeway Crossing	• Install concrete crossing panels where the new San Joaquins track alignment crosses the roadway. • Install railroad crossing signals and guard gates at both approaches. • Install stop bars at the eastbound approach. • Install a signal house

Source: AECOM
SR = State Route

Table 2-2. Proposed Aerial Guideway

Location	Guideway Structure
West of SR 99 to CHSRA Merced Station	• Width of guideway: 19 feet 4 inches for main alignment, 20 feet 10 inches for alignment along the curve crossing UPRR and 34 feet 4 inches for the section along the pocket track. • Length of guideway: 6,132 feet • Supporting structures: 8-foot diameter cast-in-drilled-hole pile foundations, 6' support columns and 6 foot 6 inch by 6 foot bent caps the width of the guideway

Source: AECOM
CHSRA = California High-Speed Rail Authority, SR = State Route, UPRR = Union Pacific Railroad

2.3.1.2 Proposed ACE UPRR Industrial Spur Improvements

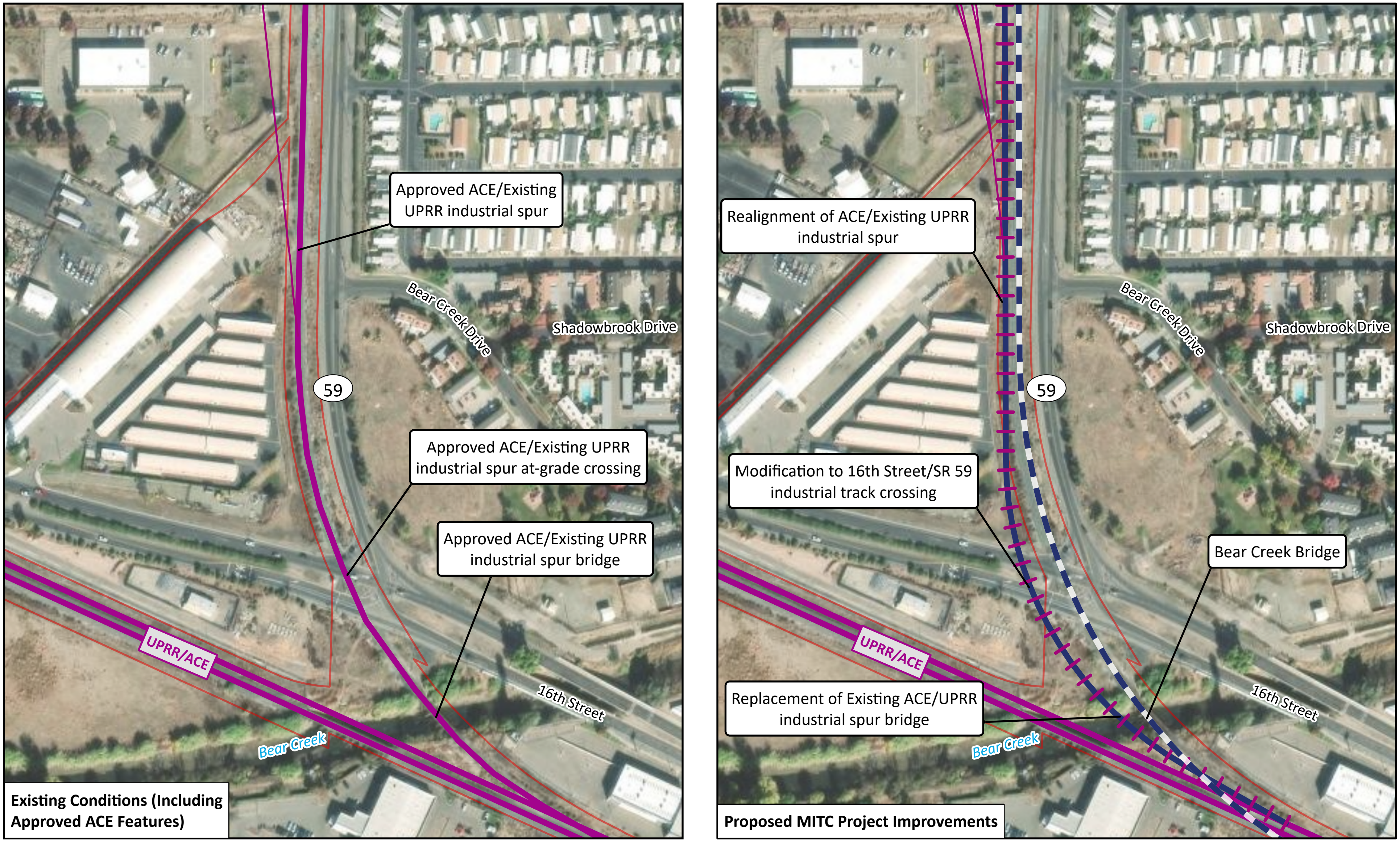
As shown on Figure 2-5 and detailed in Table 2-3 and Table 2-4, to accommodate the proposed San Joaquins track, the Project would include the following improvements to the existing ACE UPRR industrial spur:

- Realignment of approximately 3,200 feet of ACE UPRR industrial spur from the UPRR mainline at MP 149.53 into the industrial park. For this location, the shifting would include construction of a new industrial spur in the proposed location adjacent to the existing track and removal of the old track.
- Replacement of the existing ACE UPRR industrial spur bridge crossing Bear Creek, which would include construction of a new bridge followed by demolition of the existing bridge.
- Modification of the 16th Street / SR 59 intersection due to the realignment of the industrial track crossing.

[4] *Crossing panels* are installed so that the track lies flush with the roadway.

[5] A *stop bar* is placed near an at-grade crossing to warn drivers and pedestrians of an approaching railroad crossing.

[6] A *signal house* stores the electrical devices used to operate the at-grade crossing signals.



Existing UPRR/Approved ACE

UPRR Right of Way

MITC Project

Relocated ACE/UPRR Industrial Spur Track

San Joaquins: Elevated Track

Approved ACE Merced Layover and Maintenance Track

Data Source: City of Merced, Merced County, AECOM

Figure 2-5

Existing Conditions and Proposed Improvements at the Existing UPRR Industrial Spur Improvements

Merced Intermodal Track Connection Project

0 100 200 Feet

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MITC

Table 2-3. Proposed ACE UPRR Industrial Spur At-Grade Crossing Modifications

Existing Roadway (east to west)	Modifications
16th Street/SR 59	• Install concrete crossing panels where the new spur track alignment crosses the roadway. • Relocate railroad crossing signals and guard/gates at both approaches. • Install stop bars at both approaches. • Install a signal house to safely coordinate and route trains.

Source: AECOM
SR = State Route

Table 2-4. Proposed ACE UPRR Industrial Spur Bridge Structure

Location	Bridge Structure
MP 149.40 Bear Creek	• Install a single-track concrete bridge with steel bracing, east of the existing single-track bridge. • Width of bridge: 20 feet • Length of bridge: 115 feet, four-span structure consisting of four equal 29-foot spans • Supporting structures: two abutments at each end of bridge and three piers located between the span sections; three supporting piers would be placed in Bear Creek

Source: AECOM
MP = milepost

2.3.2 Proposed Modifications to the Approved ACE Merced Layover and Maintenance Facility

The location of an ACE maintenance facility was analyzed and approved as part of the SJRRC *ACE Ceres-Merced Extension EIR* (SJJPA 2021)*.* Per the *ACE Ceres-Merced Extension EIR*, the approved ACE Merced Layover and Maintenance Facility would support train layovers, storage, maintenance, and operations associated with the future extension of the ACE service to Merced. The layover facility would be constructed north of downtown Merced in the industrial area north of SR 99 and west of SR 59. The approved ACE Merced Layover and Maintenance Facility will include the following:

- Four storage tracks, approximately 1,500 feet each, in an industrial area north of SR 59
- Train wash facility
- 140,000 square foot maintenance building
- Parking lot for employees and visitors

The approved ACE Merced Layover and Maintenance Facility is proposed to be a shared facility that serves both the San Joaquins and ACE. The approved ACE Merced Layover and Maintenance Facility will require new access for the San Joaquins trains, modified access for the planned and approved ACE service, and improvements to the proposed facility. Existing layover and maintenance facilities in Oakland and Stockton would be utilized for preventive and heavy maintenance. Activities at the new facility in Merced would include refueling, maintenance, cleaning, and storage.

The Project would include the following modifications to the approved ACE Merced Layover and Maintenance Facility:

- Construction of approximately 6,300 feet of layover and maintenance track within the approved ACE Merced Layover and Maintenance Facility to expand the layover capacity for the San Joaquins trains
- Construction of up to 100 parking spaces to accommodate San Joaquins operations and maintenance staff

2.3.2.1 San Joaquins Access Improvements

As shown on Figure 2-6, the Project would include the following access improvements for the San Joaquins trains at the approved ACE Merced Layover and Maintenance Facility:

- Construction of approximately 730 feet of new at-grade layover and maintenance access track connecting the new San Joaquins track to the existing UPRR industrial spur track just north of Cooper Avenue for access to the approved ACE Merced Layover and Maintenance Facility
- Potential refresh of rail ballast and ties with new layover and maintenance access track along approximately 4,900 feet of the existing UPRR industrial spur track
- Removal of approximately 250 feet of the existing UPRR industrial spur track for access to the approved ACE Merced Layover and Maintenance Facility
- Construction of approximately 1,250 feet of new layover and maintenance access track connecting the industrial spur into the west end of the approved ACE Merced Layover and Maintenance Facility
- Construction of a new single track at-grade crossing of Cooper Avenue, north of Ashby Road

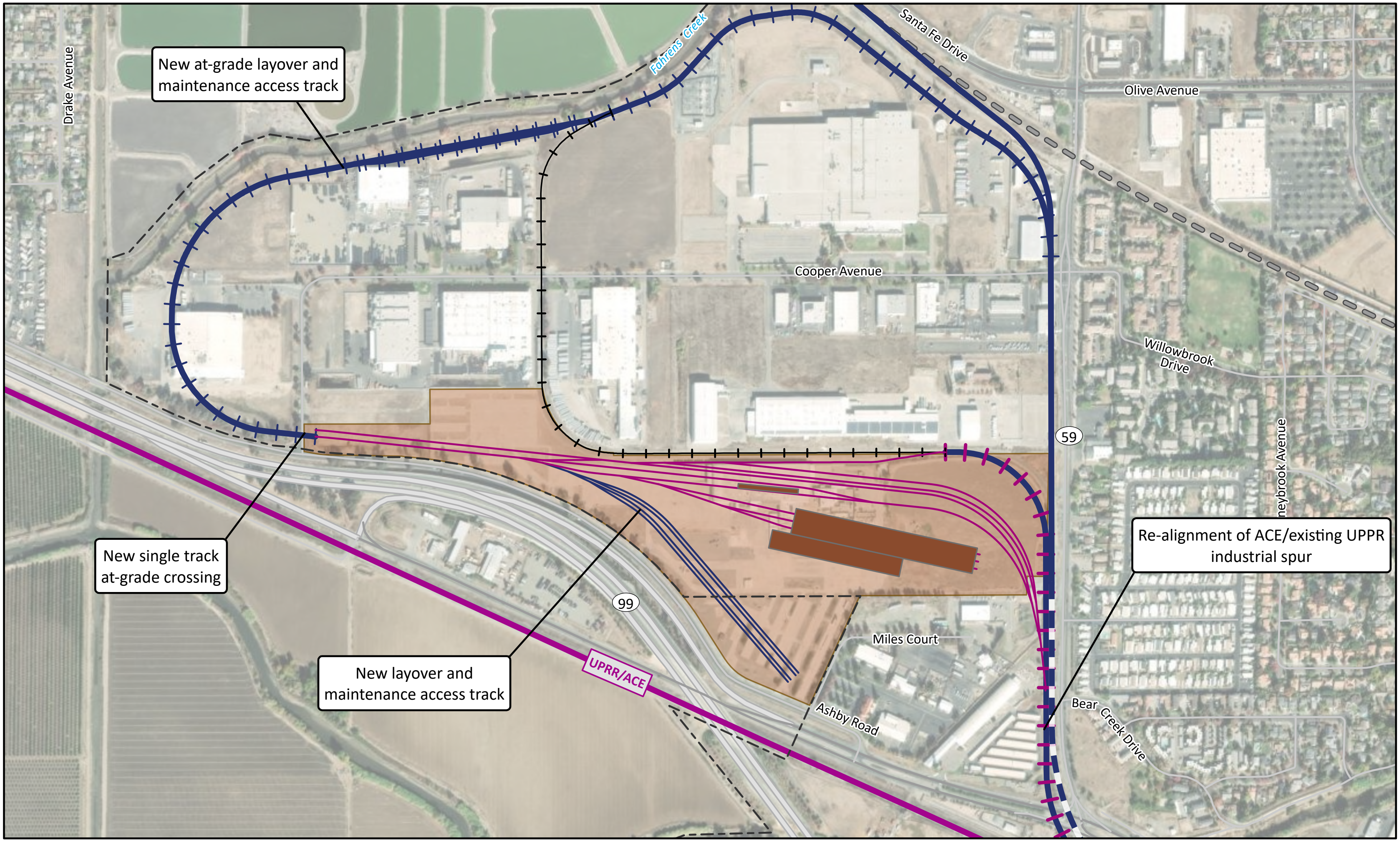
2.4 Operations and Maintenance

2.4.1 Conceptual Service Plan

Figure 2-7 shows the planned eight daily roundtrips to be operated by SJJPA, including five daily roundtrips from Oakland to Merced and two daily roundtrips from Sacramento to Merced, and one between Natomas and Merced. Implementation of the Project would connect the San Joaquins intercity service with the future HSR service at the proposed integrated Merced HSR Station (as discussed in Section 2.3.1, *Proposed Alignment and Station Connection*). Upon the opening of the Merced-Bakersfield HSR EOS, San Joaquins intercity service from Merced to Bakersfield would be terminated.

It is anticipated that the service plan for the eight daily roundtrips would be integrated with the future HSR schedule. Table 2-5 and Table 2-6 depict the conceptual service plans for operation of the Project in the northbound and southbound directions, respectively.

Chapter 4, *Cumulative Impacts*, analyzes the Project's contribution to significant cumulative impacts to determine whether that contribution would be considerable. One of the projects considered in the cumulative impacts analysis is a service plan that includes up to 12 daily roundtrips to Merced.



Existing UPRR/Approved ACE
City of Merced Boundary
Approved ACE Merced Layover and Maintenance Facility
Approved Maintenance and Wash Building
Approved Parking Lot
Approved ACE Merced Layover and Maintenance Track
UPRR Industrial Spur Track

MITC Project
San Joaquins: Elevated Track
San Joaquins: At-grade Track
San Joaquins: Layover and Maintenance Access Line
Relocated ACE/UPRR Industrial Spur Track
San Joaquins: To Be Discontinued under MITC Project
San Joaquins Layover and Maintenance Track

Data Source: City of Merced, Merced County, AECOM

Figure 2-6
Proposed Modifications to the Approved ACE Merced Layover and Maintenance Facility
Merced Intermodal Track Connection Project

0 500 1,000 Feet
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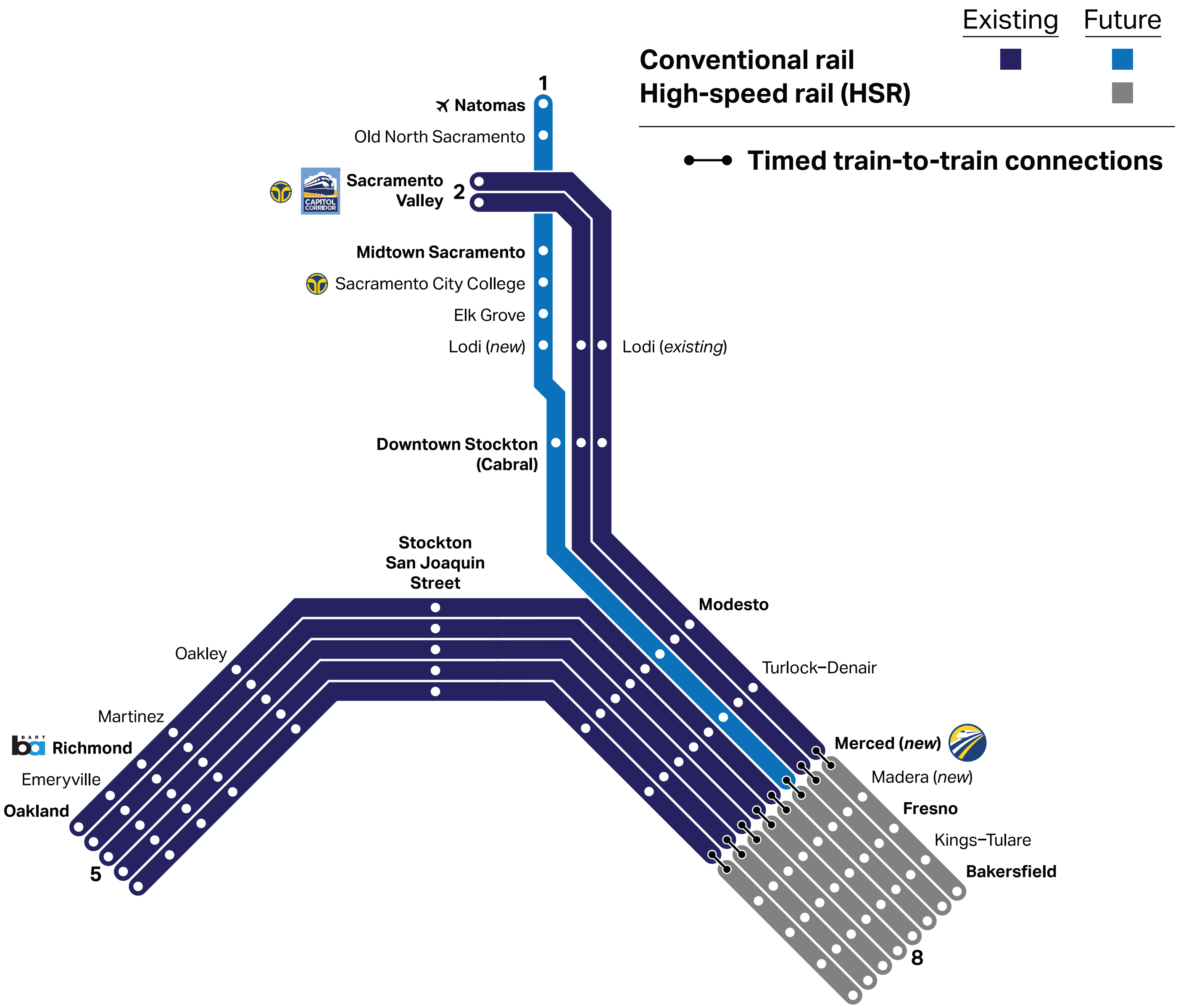

Figure 2-7
San Joaquins 8-Train Service
Merced Intermodal Track Connection Project

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Table 2-5. San Joaquins Eight-Train Northbound Service (Merced to Oakland/Sacramento)

	Train							
Station	**J01**	**S01**	**J05**	**J07**	**J09**	**N01**	**J03**	**S03**
Merced	8:46 (a.m.)	10:46	12:46 (p.m.)	2:46	4:46	5:45	6:46	8:46
Turlock-Denair	9:13	11:13	1:13	3:13	5:13	6:13	7:13	9:13
Modesto	9:26	11:26	1:26	3:26	5:26	6:26	7:26	9:26
Downton Stockton (Cabral)		11:55				6:55		9:55
Stockton San Joaquin Street	9:53		1:53	3:53	5:53		7:53	
Lodi		12:11				7:09		10:11
Sacramento Valley		12:52						10:52
Elk Grove						7:33		
Sacramento City College						7:42		
Midtown Sacramento						7:48		
Old North Sacramento						7:53		
Natomas						8:02		
Oakley	10:22		2:22	4:22	6:22		8:22	
Martinez	10:54		2:54	4:54	6:54		8:54	
Richmond	11:23		3:23	5:23	7:23		9:23	
Emeryville	11:34		3:34	5:34	7:34		9:34	
Oakland	11:43		3:43	5:43	7:43		9:43	

Source: AECOM

Table 2-6. San Joaquins Eight-Train Southbound Service (Oakland/Sacramento to Merced)

	Train							
Station	**S02**	**J04**	**J06**	**NO2**	**J08**	**J10**	**S04**	**J12**
Oakland		7:59	9:59		11:59	1:59 (PM)		5:59
Emeryville		8:10	10:10		12:10	2:10		6:10
Richmond		8:21	10:21		12:21	2:21		6:21
Martinez		8:51	10:51		12:51	2:51		6:51
Oakley		9:21	11:21		1:21	3:21		7:21
Natomas				11:44				
Old North Sacramento				11:55				
Midtown Sacramento				11:58				
Sacramento City College	6:55 (AM)			12:02			4:55	
Elk Grove				12:12				
Lodi	7:34			12:37			5:34	
Stockton San Joaquin Street		9:48	11:48		1:48	3:48		7:48
Downtown Stockton Cabral	7:51			12:51			5:51	
Modesto	8:20	10:20	12:20	1:20	2:20	4:20	6:20	8:20
Turlock-Denair	8:33	10:33	12:33	1:33	2:33	4:33	6:33	8:33
Merced	9:00	11:00	1:00	2:00	3:00	5:00	7:00	9:00

Source: AECOM

2.4.2 Ridership

The San Joaquins currently provides service from Bakersfield to Oakland, and from Bakersfield to Sacramento. No additional improvements are proposed to existing San Joaquins facilities as a result of the Project. However, where applicable, this EIR analyzes operations impacts of the Project due to increased ridership at existing San Joaquins stations north of Merced. Table 2-7 shows the San Joaquins projected annual ridership in 2030 and 2040 with and without implementation of the Project. Compared to the ridership under No Project conditions, discussed in Chapter 6, *Alternatives*, ridership would increase by approximately 50,000 in 2030 and approximately 56,000 in 2040.[7] Appendix 2.0-3, *Merced Intermodal Track Connection Ridership and Revenue Memorandum,* includes additional information regarding ridership.

[7] The ridership model assumes a 2030 start date for HSR operations. Although it is more likely that HSR will begin operations sometime between 2030 and 2033, the incremental ridership increases between 2030 and 2033 would not demand additional project improvements beyond what is proposed as part of the MITC Project.

Table 2-7. Annual San Joaquins Ridership with Operation of the Project

Year	No Project Conditions[a]	Project Conditions	
		Forecasted Annual Riders	Net New Annual Riders
2030[b]	996,600	1,204,500	207,900
2040	1,085,200	1,311,900	226,700

Source: Appendix 2.0-3, *Merced Intermodal Track Connection Ridership and Revenue Technical Memorandum.*
[a] No integration with the proposed integrated Merced HSR station
[b] Assumed year of HSR EOS operations

2.4.3 Energy Consumption

The primary sources of energy used to operate the existing San Joaquins trains and at maintenance and station facilities are renewable diesel fuel and electricity. Existing renewable diesel fuel consumption is approximately 2,822,357 gallons per year (based on 2022 data). Operations at the existing station required approximately 54,500 kilowatt hours (kWh) of electricity in 2022.

With operation of the Project, the San Joaquins diesel trains would require approximately the same amount of fuel per year. Since May 2023, all San Joaquins trains have been using renewable diesel. In addition, the SJJPA is committed to supporting the state in its goal of converting its intercity passenger rail fleet to zero-emission (ZE) trains by 2035. Section 2.8, *Variants to the Project*, provides additional information and analysis of three project variants that support the state's ZE goal.

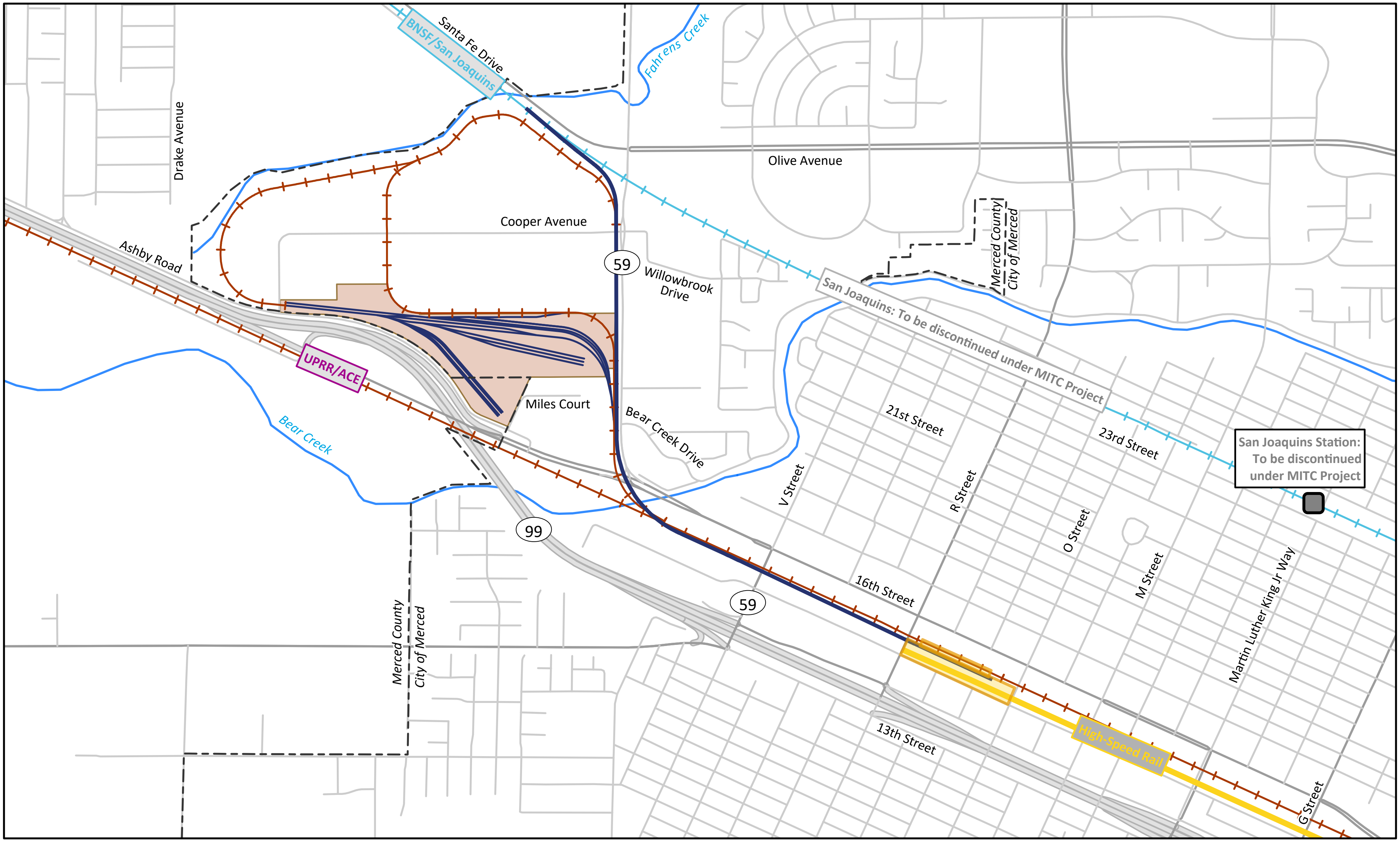
Operation of the Project, including the Project's electrical use at the proposed integrated Merced HSR Station and at the approved ACE Merced Layover and Maintenance Facility, would require approximately 342,750 kWh of electricity per year. The Project would require the use of wayside power at the proposed integrated Merced HSR Station for one train per day averaging approximately one hour.[8] Section 3.7, *Energy*, provides a detailed analysis of energy demand associated with operation of the Project.

2.4.4 Maintenance Activities

2.4.4.1 Track Maintenance

Shown in Figure 2-8, the proposed San Joaquins track and aerial guideway between the existing BNSF ROW and the proposed integrated Merced HSR Station would not be the responsibility of BNSF or UPRR. As a result, the maintenance-of-way (MOW) would be the responsibility of SJJPA. Additionally, SJJPA would share in the maintenance of the track within the approved ACE Merced Layover and Maintenance Facility.

[8] *Wayside power* is temporary power provided to a locomotive while a locomotive is stationary at a station, eliminating idling of the engine. The Project only includes the use of wayside power; it does not include the construction of the wayside power infrastructure at the proposed integrated Merced HSR Station.



City of Merced Boundary

Proposed Integrated Merced High-Speed Rail Station

Approved ACE Merced Layover and Maintenance Facility

Maintenance of Way

UPRR

BNSF

SJJPA/SJRRC

High-Speed Rail

0 1,000 2,000 Feet

N

MITC

Figure 2-8
SJJPA Maintenance of Way
Merced Intermodal Track Connection Project

Data Source: City of Merced, Merced County, AECOM

SJJPA does not own the tracks on which the San Joaquins currently operates; instead, SJJPA has entered into trackage rights agreements with host railroads (both BNSF and UPRR) to operate on portions of their respective tracks. MOW is the responsibility of the host railroad. In general, MOW includes ongoing maintenance of track (e.g., tie replacement, switch greasing, ballast recontouring), track structures, bridges, drainage features, signal apparatus, and other signal infrastructure.

Maintenance activities on existing industrial track that the proposed San Joaquins trains would utilize to access the approved ACE Merced Layover and Maintenance Facility would be performed through trackage rights agreements with UPRR.

Maintenance activities are both ongoing responses to daily issues and planned preventive maintenance. Maintenance of bridges would include routine removal of woody debris, sediment, and other materials that accumulate near the piers of the bridges. Host railroads would have other maintenance activities that are required, specific to the features located in the corridor. Maintenance activities also include tree pruning and removal, annual vegetation trimming, and herbicide application.

2.4.4.2 Station Maintenance

The proposed integrated Merced HSR Station would be owned and operated by CHSRA. Similar to track maintenance, it is anticipated that SJJPA would enter into a station use agreement with CHSRA and would not be responsible for maintenance of the facility. Typical maintenance activities include trash pickup, landscaping, painting, minor concrete work, and light bulb replacement. Contractors are hired for more extensive maintenance activities, such as major concrete work, platform extension, and paving. Certain stations have specific agreements with the local jurisdictions regarding maintenance activities that would be the responsibility of the local jurisdiction.

Maintenance of parking at new stations would vary depending on the nature of ownership of the underlying land and future agreements between SJJPA and local jurisdictions.

2.4.4.3 Fleet Maintenance

SJJPA’s existing fleet maintenance activities for the San Joaquins are conducted at the Amtrak Oakland Maintenance Facility (OMF). The recently implemented Venture Car trainsets are maintained at the Stockton Regional Maintenance Facility (RMF). Regular train maintenance consists of daily inspections of equipment (as required by the Federal Railroad Administration), cleaning, and servicing activities such as fueling, filling of sand boxes, emptying of toilet tanks, and replenishing of fluids, supplies, and consumables (including trail crew supplies). Train washing can occur up to several times per week or as required for any special event trains. Preventive and periodic maintenance, including light and heavy repairs of passenger coaches and locomotives, are conducted as needed. With operation of the Project, maintenance activities would continue at both the OMF and Stockton RMF until all existing train sets are converted to the Venture Car trainset. The approved ACE Merced Layover and Maintenance Facility would support train layovers, storage, light maintenance. For heavy maintenance and repairs, trains would be cycled back to the OMF.

2.5 Construction

Appendix 2.0-1, *Merced Intermodal Track Connection Environmental Footprint*, and Appendix 2.0-2, *Merced Intermodal Track Connection 15% Preliminary Engineering Plans* include conceptual details regarding the areas of disturbance associated with the Project and, alternative facilities, potential utility conflicts and whether the utility would be protected or relocated, and construction staging areas and access for the proposed or alternative facilities. Temporary construction easements are shown on sheets 26 through 31 of Appendix 2.0-2, *Merced Intermodal Track Connection 15% Preliminary Engineering Plans,* and shown on Figure 2-9 through Figure 2-11. A description of the construction activities that could be undertaken and the estimated construction durations based on conceptual engineering are provided in the following subsections.

2.5.1 Construction Methods

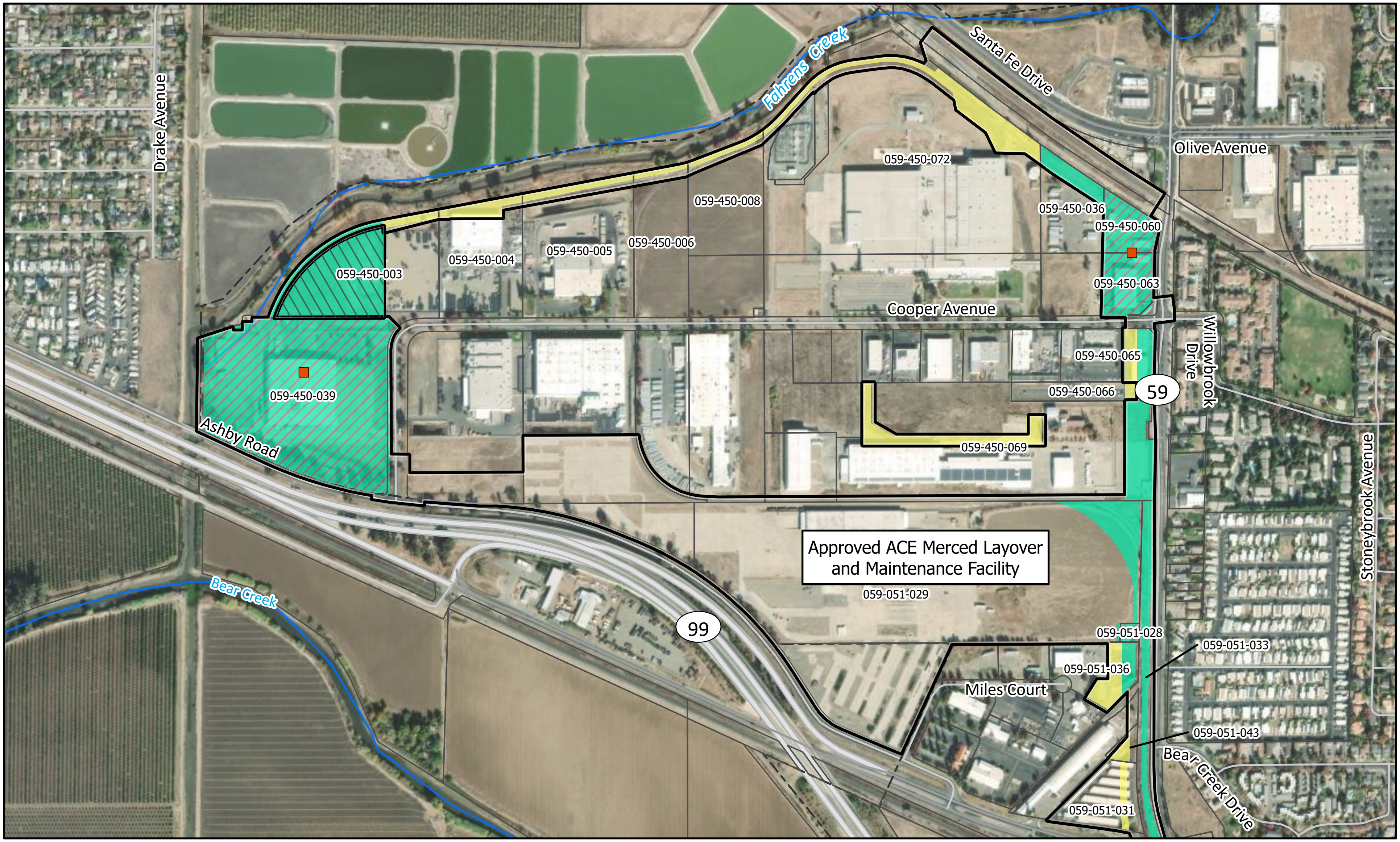
2.5.1.1 Trackwork

Construction of new track or upgrades to existing track would include grading for the track subgrade with graders and excavators and the placement of subballast and ballast. Concrete ties are then laid out. Continuous Welded Rail (1,000-foot-long rail strings) are welded together and clipped to ties. The ballast is tamped with on-track machinery along with the final adjustments to the alignment and profile. Construction of a new track would occur in segments; once the subgrade, ballast, and mainline track are installed for one segment, construction would continue down the alignment. The duration of construction activities for a new track generally lasts approximately a few days to a week for a given location.

Track construction could conflict with existing utility lines, and these lines would be relocated or protected. Appendix 2.0-2, *Merced Intermodal Track Connection 15% Preliminary Engineering Plans*, pages 34 through 45, depict the potential utility conflicts and whether the utility would be protected or relocated.

Ground disturbance associated with the construction of the Project would include the following:

- O to 5 feet below ground surface (bgs) for at-grade track
- More than 20 feet bgs for aerial guideway foundations
- 10 to 15 feet bgs for trackway retained fill foundations
- 0 to 5 feet bgs for parking areas
- 10 to 15 feet bgs for bridge abutments
- More than 20 feet bgs for bridge piers



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City of Merced Boundary
Parcel
MITC Environmental Footprint
Variant H1 Additional Environmental Footprint

Right-of-Way Need
Acquisition (Partial)
Acquisition (Full)
Temporary Construction Easement
Business Relocation

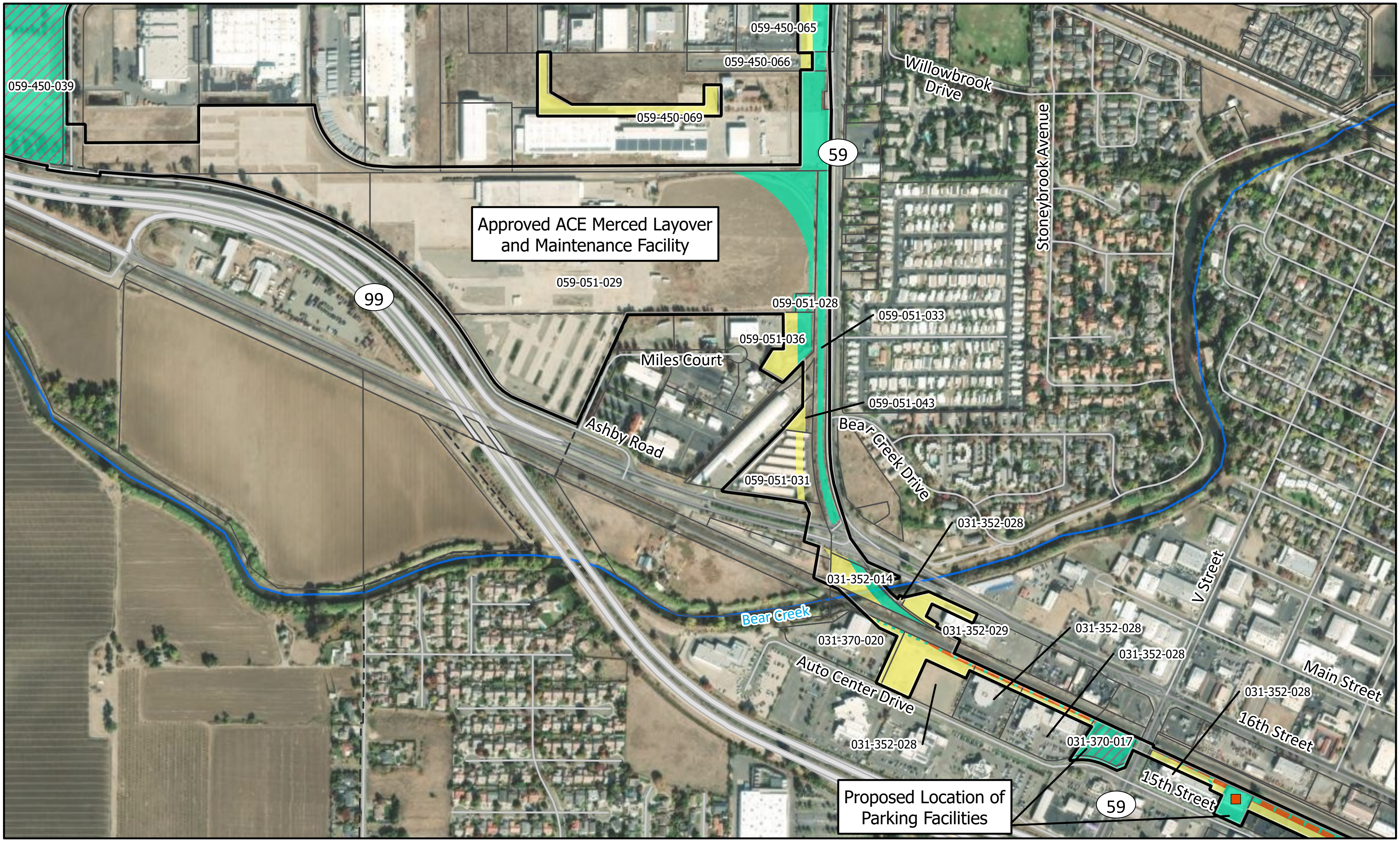
Figure 2-9
Project Right-of-Way and Easement Needs - North
Merced Intermodal Track Connection Project

0 500 1,000 Feet

N

MITC

Data Source: AECOM, Maxar, ESRI



City of Merced Boundary
Parcel

Footprint

MITC Environmental Footprint

Right-of-Way Need

Acquisition (Partial)
Acquisition (Full)
Aerial Easement
Temporary Construction Easement
Business Relocation

Figure 2-10

Project Right-of-Way and Easement Needs - Center

Merced Intermodal Track Connection Project

0 500 1,000 Feet

N

MITC

Data Source: AECOM, Maxar, ESRI

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City of Merced Boundary
Parcel
Proposed Integrated Merced High-Speed Rail Station
MITC Environmental Footprint

Right-of-Way Need

Acquisition (Partial)
Acquisition (Full)
Aerial Easement
Temporary Construction Easement
Business Relocation

Figure 2-11
Project Right-of-Way and Easement Needs - South
Merced Intermodal Track Connection Project

Data Source: AECOM, Maxar, ESRI

0 500 1,000
Feet

N

MITC

2.5.1.2 Bear Creek Bridge

The typical bridge (track over waterway) (as shown on page 62 in Appendix 2.0-2, *Merced Intermodal Track Connection 15% Preliminary Engineering Plans*) consists of a combination of short spans supported on driven steel H-pile bents[9] with precast concrete bent caps. Structures that require longer spans to avoid obstacles or provide adequate opening to pass design flows would likely be supported on cast-in-place reinforced concrete (RC) pier caps and columns extended from RC cast-in-drilled-hole (CIDH) pile shafts. The short spans consist of either precast concrete slab beams or double-cell box girders, and the longer spans would typically consist of either single-cell precast concrete box girders, steel-plate girders, steel-plate through-girders, or a steel through-truss.

Table 2-8 summarizes the piles that would be installed for the industrial track bridge over Bear Creek, including the number of piles that would be installed in water and on land, and the method that would be used to install the piles.

The permanent impact from installation of Bear Creek Bridge would be 1.4 square feet per H-pile. As shown in Table 2-8, nine H-piles would be placed within the water of Bear Creek; therefore, construction of the bridge over Bear Creek would result in a permanent impact of 12.6 square feet in the creek.

Pile driving would be required for the installation of the Bear Creek Bridge. Pile driving would occur on land and in water. During the pile driving, five piles would be installed per day, with 500 strikes per pile, and a 5-second interval between strikes.

Table 2-8. Construction Details for the Proposed Bear Creek Bridge

No.	Pile type	Number of Piles	On Land or in Water?	Installation Method	Approximate Distance from Water's Edge (feet)	Days of Construction
1	Abutment – H-pile	3	Land	Impact	10	0.5 day
2	H-pile	3	Water	Impact	N/A	0.5 day
3	H-pile	3	Water	Impact	N/A	0.5 day
4	H-pile	3	Water	Impact	N/A	0.5 day
5	Abutment – H-pile	3	Land	Impact	10	1.5 day

Source: AECOM
N/A = not applicable

The foundations for the piles outside the waterway are typically accessed by temporary dirt roads with the construction equipment working in a temporary construction easement that extends about 50 feet from the edges of the bridge deck on both sides.

Pier foundations within the waterway, consisting of short spans on H-pile bents, would be constructed in a top-down, span-by-span process with a crane on the back span reaching out to build the next pier and place the next span.

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[9] *H-piles* are structural beams that are dimensionally square, driven into the soil for deep foundation applications to support large buildings and bridges.

A typical construction sequence for the bridge (track over water) is as follows:

- Prepare temporary construction access road(s)
- Drive steel H-piles for abutments on each side of the waterway
- Place precast concrete abutment wingwalls
- Drive steel H-piles for standard railroad trestle bents
- Place precast concrete bent caps and field weld connections to the piles
- Place precast beams with attached curbs and sidewalks
- Install deck waterproofing, ballast, and track
- Restore vegetation

Typical equipment used in the bridge construction may include the following:

- Excavator with bucket or breaker
- Bulldozer with blade or ripper
- Backhoe
- Loader
- Dump truck
- Crane with pile driving rig
- Trucks with flatbed trailers and large crane(s) to haul, pick, and place precast concrete structures

Based on similar projects, construction of the Bear Creek Bridge could last approximately 3 months, depending on the access and in-water work windows.

2.5.1.3 Aerial Guideway

The aerial guideway (as shown on pages 46 through 61 in Appendix 2.0-2, *Merced Intermodal Track Connection 15% Preliminary Engineering Plans*) consists of a 676-foot section of retained fill that would bring the alignment up to begin the 6,132-foot aerial guideway. The guideway would include precast concrete box girders supported by precast bent caps on cast-in-place columns and piers.

Table 2-9 summarizes the piles that would be installed for the aerial guideway, including the proximity of the piles to Bear Creek where applicable, and the method that would be used to install the piles.

Table 2-9. Construction Details for the Proposed Aerial Guideway

No.	Pile type	Number of Piles	On Land or In Water?	Installation Method	Approximate Distance from Water's Edge (feet)	Days of Construction
1	Abutment	6	Land	Drilled	N/A	1.0 day
2-24	CIDH[10]	1 each	Land	Drilled	N/A	10 days each
25-26	CIDH	1 each	Land	Drilled	20	10 days each
27-33	CIDH	2 each	Land	Drilled	N/A	15 days each
34-51	CIDH	1 each	Land	Drilled	N/A	10 days each
52-66	CIDH	2 each	Land	Drilled	N/A	15 days each
67-68	CIDH	1 each	Land	Drilled	N/A	10 days each

Source: AECOM
CIDH = Cast-In-Drilled-Hole
N/A = not applicable.

A typical construction sequence for the aerial guideway is as follows:

- Prepare construction area including access roads
- Drill and cast CIDH piers
- Form and cast columns
- Place precast concrete bent caps
- Place precast concrete box girders
- Place precast concrete ballast curbs and walkways
- Place precast beams with attached curbs and sidewalks
- Place cast-in-place deck
- Install drainage
- Install signaling
- Install ballast and track
- Restore vegetation

Typical equipment used in the bridge construction may include the following:

- Excavator with bucket or breaker
- Bulldozer with blade or ripper
- Backhoe
- Loader
- Dump truck

[10]Cast-In-Drilled-Hole (CIDH) piles are commonly used in the construction of bridge structures and refer to a construction method in which the reinforced concrete piles are cast in drilled holes to predetermined elevations using a heavy wall steel casing to prevent caving.

- Crane with CIDH drill rig
- Trucks with flatbed trailers and large crane(s) to haul, pick, and place rebar cages, pile casings, column forms, girders, etc.
- Concrete trucks and pump trucks for cast-in-place concrete

Based on similar projects, construction of the aerial guideway could last approximately 30 months, depending on the access and work windows.

2.5.1.4 Modifications to At-Grade Crossings

Modifications to at-grade crossings to support new track generally require clearing and grubbing for the installation of concrete crossing panels where the new mainline track crosses the roadway; relocation of railroad crossing signals, guards or gates, and signal houses; and installation of stop bars. Based on similar projects, construction associated with modified at-grade crossings would last approximately 7 to 15 working days, with an average of 9 working days.

2.5.2 Construction Schedule and Durations

The beginning of Project operations would coincide with CHSRA's plan to construct and operate the Merced to Bakersfield HSR EOS by 2030-2033. Table 2-10 identifies the duration for construction of each Project element. The construction durations presented are not sequential; construction could occur simultaneously at several locations. The durations noted below are for actual construction activity. These Project elements would require permitting, contractor selection, and final design prior to construction, and thus, the total duration could be longer than the construction durations noted in the table.

Table 2-10. Construction Durations

Project Element	Construction Duration (months)
New San Joaquins alignment from BNSF to the proposed integrated Merced HSR Station	30
Realignment of the ACE UPRR industrial spur	12
San Joaquins access and improvements to the approved ACE Merced Layover and Maintenance Facility	24
Total	36

Source: AECOM

2.6 Right-of-Way and Easement Needs

Implementation of the Project would require acquisition of ROW, as well as temporary construction and permanent aerial easements. Appendix 2.0-1, *Merced Intermodal Track Connection Environmental Footprint*, and Appendix 2.0-2, *Merced Intermodal Track Connection 15% Preliminary Engineering Plans,* pages 63 through 69, include conceptual details regarding the areas of disturbance associated with the Project, including Project ROW requirements and easements. Table 2-11 and Figure 2-9 through Figure 2-11 show the Project ROW requirements and easements, including:

- Twenty-three temporary construction easements (i.e., a parcel would be restored upon completion of Project construction and delivered back to the property owner)
- Twenty partial property acquisitions (i.e., a segment of a parcel would be acquired)
- Five full property acquisitions (i.e., an entire parcel would be acquired)
- Five aerial easements (i.e., an above ground easement over parcels affected by the proposed aerial guideway)

No residential properties would be impacted by the Project easements and ROW requirements. It is anticipated that three businesses would be displaced by the Project easements and ROW requirements, as shown in Figure 2-9 through Figure 2-11. In addition, it is anticipated that the Project easements and ROW requirements would require demolition of the buildings and structures occupied by the businesses to be displaced as well as a small number of other buildings and structures (e.g., those that are not occupied by businesses). The Project will comply with the California Relocation Act (California Government Code Section 7260 et seq.) which requires state and local governments to provide relocation assistance and benefits for displacements on public projects. If federal funding is received, relocation of displaced businesses would comply with the Uniform Relocation Assistance and Real Property Acquisition Act of 1970, as amended (Uniform Act), 42 U.S.C. § 4601 et seq., and its implementing regulations at 49 CFR Part 24, which would take precedence over the state requirements. The act ensures that persons displaced as a direct result of federal or federally-assisted projects are treated fairly, consistently and equitably.

Table 2-11. Project Right-of-Way and Easement Needs

Parcel (APN)	Ownership	Temporary Construction Easement (sq ft)	Partial Acquisition (sq ft)[a]	Full Acquisition (sq ft)	Aerial Easement (sq ft)
031-172-009	Merced 1485 LLC	21,500	27,600	-	6,300
031-172-010	Redevelopment Agency of City of Merced	58,550	23,168	-	
031-190-008	Rede Wholesale Corporation	90,782	16,220	-	18,972
031-352-014	Union Pacific Railroad Co	31,200	20,200	-	-
031-352-028	City of Merced	3,400	100	-	-
031-352-029	Razzari Timothy F & Billie K Co-Trustees	27,000	-	-	-
031-370-006	Razzari Timothy F & Billie K Co-Trustees	16,200	2,000	-	7,000
031-370-017	Smith Ronald W & Ann E Trustees	-	-	52,900	-
031-370-018	Razzari Timothy F & Billie K Co-Trustees	76,400	2,400	-	3,700
031-370-019	Razzari Timothy F & Billie K Co-Trustees	9,400	1,250	-	4,250
031-370-020	Gaestel Robert J & Bette C Trustees	4,500	850	-	-
059-051-028	City of Merced	-	-	10,300	-
059-051-029	1785 Ashby LLC	-	78,500	-	-
059-450-046	1785 Ashby LLC	8,800	-	-	-
059-051-031	Iacarino John Albert & Stern	14,200	15,300	-	-
059-051-033	Union Pacific Railroad Co	-	80,000	-	-
059-051-036	H&H Properties A Partnership	38,500	18,200	-	-
059-051-043	Stl Merced LLC	12,200	9,200	-	-
059-450-003	Cooper Leasing 9 LLC	13,500	253,000	-	-
059-450-004	Bear Creek Land Company LP	30,000	-	-	-

Parcel (APN)	Ownership	Temporary Construction Easement (sq ft)	Partial Acquisition (sq ft)[a]	Full Acquisition (sq ft)	Aerial Easement (sq ft)
059-450-005	White Oak Investors	26,500	-	-	-
059-450-006	W&S Whitegage Fund LP	10,000	-	-	-
059-450-008	W&S Whitegage Fund LP	13,600	-	-	-
059-450-036	Singh Amritpal	-	36,500	-	-
059-450-039	Safeway Manufacturing	-	-	806,000	-
059-051-033	UPRR COMPANY	-	80,000	-	-
H059-450-060	SJR LLC	-	-	75,000	-
059-450-063	SJR LLC	-	-	90,000	-
059-450-065	Merced County Office of Education	18,700	29,100	-	-
059-450-066	Merced County Office of Education	6,500	7,000	-	-
059-450-069	Prudential Properties LP	125,000	76,000	-	-
059-450-072	QG Printing II LLC	109,900	-	-	-

Source: AECOM

Notes:

[a] Based on the anticipated Project construction activities in the vicinity of active businesses (e.g., the Razzari-owned businesses along Auto Center Drive and 16th Street), it is not anticipated that full property acquisitions of these parcels would be required as part of the Project and the businesses on these parcels would continue to operate during Project construction and operation, although there may be temporary impacts related to the use of the back lots at the parcels by the Project. Coordination between the Project and the property owners would continue through the design and construction phase of the Project and would limit construction activities during operating hours. Although trains speeds would be slower approaching and departing the planned HSR station, design elements on the aerial guideway will be analyzed during the final design phase to minimize the potential of airborne debris caused by train operations.

2.7 Costs and Revenues

2.7.1 Capital Costs

As shown in Table 2-12, capital costs associated with the Project could cost approximately $366 million for infrastructure improvements, depending on coordination with the host railroads (UPRR and BNSF). Capital costs associated with the Project are presented in more detail in Appendix 2.0-4, *Merced Intermodal Track Connection Capital Cost Technical Memorandum.*

Table 2-12. Construction Cost Estimates

	Construction Cost (Year of Expenditure)[a]
Project[b]	$366,252,299

Source: Appendix 2.0-4, *Merced Intermodal Track Connection Capital Cost Technical Memorandum.*

[a] Year of expenditure assumes 3-year construction beginning in 2027.

[b] The Project would use the approved ACE Merced Layover and Maintenance Facility. Costs for revisions to the approved ACE Merced Layover and Maintenance Facility to accommodate the Project are included in the Project's costs.

2.7.2 Operating and Maintenance Costs and Revenues

As shown in Table 2-13, existing annual operations and maintenance costs are estimated at approximately $127 million (2024 dollars). With operation of the Project, annual operations and maintenance costs are estimated to be approximately $89 million.

Table 2-13. Summary of Annual Projected Operations and Maintenance Costs

	Existing Cost	No Project Cost	Project Cost
Total	$126,823,710	$88,518,561	$89,018,561

Source: AECOM

As shown in Table 2-14, it is anticipated that Project revenue in 2030 and 2040 would be approximately $21 million and $23 million, respectively. Compared to No Project conditions in 2030 and 2040, the anticipated Project revenue would increase by approximately $3.6 million and $3.9 million, respectively. Operations and maintenance costs and revenues are presented in more detail in Appendix 2.0-5, *Merced Intermodal Track Connection Operations and Maintenance Cost Technical Memorandum*.

Table 2-14. San Joaquins System Revenue

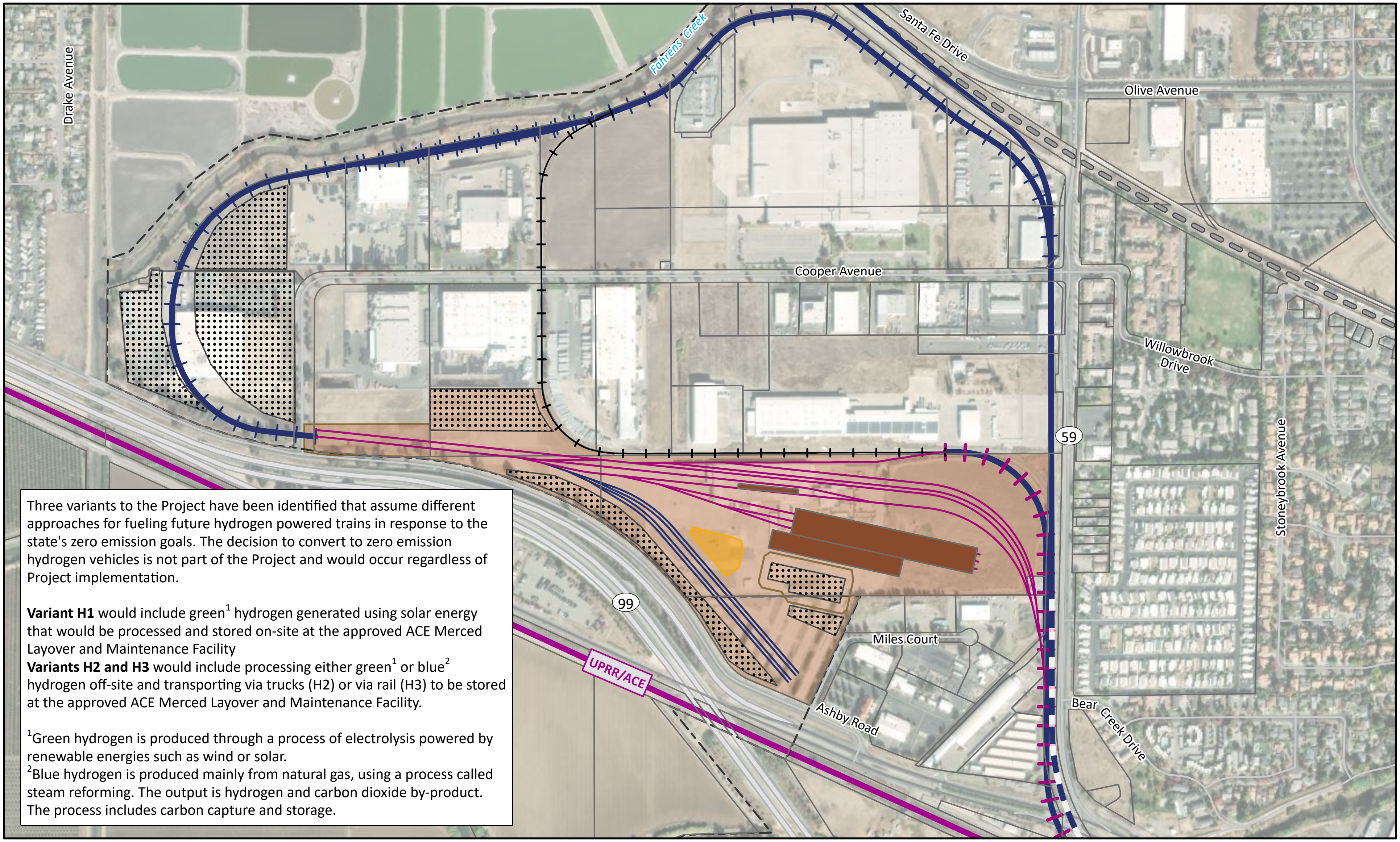
	2030 No Project Revenue	2030 Project Revenue	2040 No Project Revenue	2040 Project Revenue
Total	$17,660,400	$21,318,700	$19,216,200	$23,201,500

Source: AECOM

2.8 Variants to the Project

In April 2023, the California Air Resources Board (CARB 2024) approved the In-Use Locomotive Regulation, with the goal of achieving diesel emissions and increasing the use of zero-emission (ZE) technology. In response to the state's zero emission goals, the Caltrans Operations and Maintenance, Division of Rail and Maintenance is planning to convert its full fleet of intercity locomotives to zero emission hydrogen vehicles by 2035. Caltrans recently entered into an agreement with Stadler Rail USA to procure four 4-car zero emission multiple unit (ZEMU) trainsets to be utilized on San Joaquins corridor. Caltrans also exercised an option to procure six additional trainsets. These six additional trainsets will be utilized in other parts of California. These trainsets are powered by hydrogen fuel cell technology, which allows for zero emissions operation. The ZEMU's are scheduled to be completed and ready for testing in late 2026/early 2027 (SJJPA 2024). SJJPA is committed to working closely with the state throughout the transition to ZEMU trainsets.

With respect to the adopted CARB regulation and the Caltrans hydrogen conversion plan, three project variants that could be reasonably approved as part of the Project are described below and shown on Figure 2-12. These Project features are identified as variants because they may or may not be included by SJJPA as part of the Project. They are included as variants so that they can be incorporated into the Project at the time of the state conversion of the San Joaquins trainsets to hydrogen. The variants are not "alternatives" within the meaning of CEQA. The variants are considered potential alterations to the Project described in this chapter.



Three variants to the Project have been identified that assume different approaches for fueling future hydrogen powered trains in response to the state's zero emission goals. The decision to convert to zero emission hydrogen vehicles is not part of the Project and would occur regardless of Project implementation.

Variant H1 would include green[1] hydrogen generated using solar energy that would be processed and stored on-site at the approved ACE Merced Layover and Maintenance Facility
Variants H2 and H3 would include processing either green[1] or blue[2] hydrogen off-site and transporting via trucks (H2) or via rail (H3) to be stored at the approved ACE Merced Layover and Maintenance Facility.

[1]Green hydrogen is produced through a process of electrolysis powered by renewable energies such as wind or solar.
[2]Blue hydrogen is produced mainly from natural gas, using a process called steam reforming. The output is hydrogen and carbon dioxide by-product. The process includes carbon capture and storage.

Existing UPRR/Approved ACE
City of Merced Boundary
Approved ACE Merced Layover and Maintenance Facility
Approved Maintenance and Wash Building
Approved Parking Lot
Approved ACE Layover and Maintenance Track
UPRR Industrial Spur Track

MITC Project
San Joaquins: Elevated Track
San Joaquins: At-grade Track
San Joaquins: Layover and Maintenance Access Line
Relocated ACE/UPRR Industrial Spur Track
San Joaquins: To Be Discontinued under MITC Project
San Joaquins Layover Track

Project Variants
Hydrogen Processing (H1) and Storage (H1, H2, H3)
Solar Panels (H1)

Data Source: City of Merced, Merced County, AECOM, Maxar, ESRI

Figure 2-12
Project Variants
Merced Intermodal Track Connection Project

0 500 1,000 Feet

N

MITC

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For the purposes of this analysis, Project variants assume fueling capacity to serve the planned eight daily roundtrips to be operated by SJJPA identified in Section 2.4.1, *Conceptual Service Plan*. Although the variants assume fueling capacity for eight daily roundtrips, it should be noted that fueling may also occur at the OMF and San Joaquins Sacramento facility.

- **Variant H1: On-Site Green Hydrogen Production and Green Hydrogen Transported via Rail** – Green hydrogen[11] generated using solar energy would be processed and stored on-site at the approved ACE Merced Layover and Maintenance Facility for the purpose of fueling future hydrogen powered trains. Approximately 28 acres could be used for photovoltaic (solar) panels, hydrogen processing, and fuel storage, including maintenance and parking rooftops, as shown on Figure 2-8. Of those 28 acres, approximately 13 acres would be located within the approved ACE Merced Layover and Maintenance Facility, approximately 11.5 acres would be located on parcels that would be acquired to accommodate the proposed San Joaquins facility access line northwest of the approved ACE Merced Layover and Maintenance Facility, and approximately 3.5 acres would be located outside of the environmental footprint of the Project. The required equipment and infrastructure for this variant would be located within approximately the same environmental footprint as the Project with the exception of the 3.5 additional acres, as illustrated in Appendix 2.0-1, *Merced Intermodal Track Connection Environmental Footprint*. Table 2-15 lists the parcel outside the UPRR and BNSF ROW that would be affected by Variant H1**.**

Table 2-15. Variant H1 Right-of-Way and Easement Needs

Parcel (APN)	Ownership	Area (Acres)	Reason for Acquisition or Easement
059-450-003	Cooper Leasing 9 LLC	5.81*	Fee Take

Source: AECOM
*The Variant H1 solar panels would be installed on 3.5 acres of the 5.8 acres proposed for acquisition.
APN = Assessor Parcel Number

Table 2-16 shows the solar energy generation, hydrogen production, and water usage for Variant H1. The data shown in Table 2-16 assumes maximum solar output for the available area described above for solar generation. During peak generation (MWpk), an average of approximately 600 kilograms (kg) of hydrogen fuel could be produced daily on-site for Variant H1. This assumes an average solar generation of approximately 34 megaWatts hours per day (MWh) and approximately 6,200 liters or 1,638 gallons of water used per day. The on-site generated fuel could be used for up to three daily roundtrips to Natomas identified in Section 2.4.1, *Conceptual Service Plan*. To fuel the remaining five daily roundtrips, Variant H1 assumes that the remaining green hydrogen would be transported via train to the approved ACE Merced Layover and Maintenance Facility. To fuel the planned eight daily roundtrips to be operated by SJJPA identified Section 2.4.1, *Conceptual Service Plan*, a daily average of 1,600 kilograms of hydrogen would be stored on site. The required equipment and infrastructure for fuel storage would be located within the same environmental footprint as the Project. Additional studies would be required to identify concise power generation, maximum hydrogen generation, water usage and additional requirements related to spacing and safety.

[11] *Green hydrogen* is produced through a process of electrolysis powered by renewable energies such as wind or solar.

Table 2-16. Solar Energy Generation, Hydrogen Production, and Water Usage for Variant H1

	PV Generation Potential (MWh) per 6.97 MWpk			Hydrogen Production (kg)			Process Water Requirement (l)		
Month	**Average Day**	**Max. Day**	**Min. Day**	**Average Day**	**Max. Day**	**Min. Day**	**Average Day**	**Max. Day**	**Min. Day**
January	16.9	35.1	2.3	306.3	637.6	41.2	3,063.0	6,376.3	412.1
February	26.1	38.3	7.6	473.7	695.8	137.3	4,737.0	6,957.6	1,373.3
March	34.1	46.5	8.4	619.9	845.9	151.8	6,199.3	8,459.0	1,518.1
April	41.4	49.8	21.6	753.1	906.1	392.6	7,531.2	9,061.3	3,925.9
May	43.9	52.5	19.7	797.2	953.6	358.9	7,971.9	9,535.8	3,588.9
June	46.6	52.5	34.8	846.6	954.1	631.9	8,466.0	9,540.9	6,319.0
July	44.9	52.1	19.0	816.8	947.8	346.2	8,167.9	9,477.6	3,462.1
August	44.4	49.0	27.8	808.1	891.0	505.1	8,080.7	8,910.3	5,051.1
September	39.2	47.8	16.4	711.8	868.7	297.9	7,117.8	8,686.8	2,979.1
October	31.9	43.9	13.7	580.7	797.3	249.7	5,806.7	7,973.2	2,497.2
November	23.2	37.4	3.2	421.2	679.9	57.6	4,211.9	6,798.7	576.4
December	16.7	29.2	3.9	303.4	530.7	70.9	3,034.0	5,306.7	708.8
Annual Average	34.1	44.5	14.9	619.9	809.0	270.1	6,199.0	8,090.4	2,701.0

Source: AECOM
MWh = Megawatt per hour, MWpk = Megawatt peak, kg = kilograms, I = Liters

- **Variant H2: Off-Site Green or Grey Hydrogen Transported via Truck** – Either green hydrogen (Variant H2A) or grey hydrogen[12] (Variant H2B) would be processed off-site and transported via trucks to be stored at the approved ACE Merced Layover and Maintenance Facility for the purpose of fueling future hydrogen-powered trains. The required equipment and infrastructure for this variant would be located within the same environmental footprint as the Project. A daily average of approximately 1,600 kg of hydrogen fuel would be required on-site to fuel the planned eight daily roundtrips to be operated by SJJPA identified in Section 2.4.1, *Conceptual Service Plan.*

- **Variant H3: Off-site Green or Grey Hydrogen Transported via Rail** – Either green hydrogen (Variant H3A) or grey hydrogen (Variant H3B) would be processed off-site and transported via rail to be stored at the approved ACE Merced Layover and Maintenance Facility for the purpose of fueling future hydrogen-powered trains. The required equipment and infrastructure for this variant would be located within the same environmental footprint as the Project. A daily average of approximately 1,600 kg of hydrogen fuel would be required on-site to fuel the planned eight daily roundtrips to be operated by SJJPA identified in Section 2.4.1, *Conceptual Service Plan.*

The variants would not change the basic characteristics of the Project, and have the same objectives, background, and development controls. Similar to the Project, the approved ACE Merced Layover

[12] *Grey hydrogen* is produced mainly from natural gas or methane, using a process called steam reforming, which brings together natural gas and heated water in the form of steam. The output is hydrogen, but carbon dioxide is also produced as a by-product.

and Maintenace Facility would be utilized for refueling, maintenance, cleaning, and storage of the zero-emission trainsets. The approved ACE Merced Layover and Maintenance Facility has not yet been designed. In support of the state's zero emission goal, the facility will be designed and constructed to accommodate hydrogen vehicle maintenance and fueling. Heavier maintenace for these zero-emission trainsets would occur at the Stockton RMF, once the facility is retroffited to allow for fueling and maintenance of ZEMU trainsets.

Rather, the variants would change the design of the Project in discrete ways, as described above. The variants are a slightly different version of the Project that are evaluated in the event SJJPA desires to consider them for approval. The capital and operations cost per variant are shown in Table 2-17 and Table 2-18. The final decision as to whether to adopt the Project, the Project with a variant, and/or an alternative will be made after completion of the final EIR for this Project.

Table 2-17. Capital Cost Increase by Variant

	Variant H1	Variant H2a	Variant H2b	Variant H3a	Variant H3b
Total	$26,680,000	$1,500,000	$1,500,000	$1,500,000	$1,500,000

Source: Appendix 2.0-4, *Merced Intermodal Track Connection Capital Cost Technical Memorandum.*

Table 2-18. Annual Projected Operations and Maintenance Costs Increase by Variant

Variant	Cost
Variant H1	$9,500,000
Variant H2a	$12,680,000
Variant H2b	$11,220,000
Variant H3a	$11,512,000
Variant H3b	$10,052,000

Source: Appendix 2.0-5, *Merced Intermodal Track Connection Operations and Maintenance Cost Technical Memorandum.*

2.9 Permits and Approvals

Table 2-19 lists the anticipated permits and approvals that could be required. SJJPA would coordinate with local, regional, and state agencies to ensure that permits and approvals are received.

Table 2-19. Anticipated Permits, Funding, and Other Approvals

Agency	Funding, Approval, or Permit
Federal Agencies	
California High-Speed Rail Authority	National Environmental Policy Act (NEPA) review if federal funding is proposed
Federal Railroad Administration (FRA)	NEPA review if federal funding is proposed and CHSRA is not federal lead
National Marine Fisheries Service (NMFS)	Concurrence of effects on listed fish species under the federal Endangered Species Act (ESA) Section 7 consultation process; issuance of a biological opinion

Agency	Funding, Approval, or Permit
U.S. Army Corps of Engineers (USACE)	Permit for effects on wetlands and other waters of the United States under Section 404 of the Clean Water Act (CWA)
U.S. Coast Guard	Potential bridge permit for new structures crossing over Bear Creek (if determined navigable)
U.S. Fish and Wildlife Service (USFWS)	Concurrence of effects on listed terrestrial wildlife and plant species under ESA Section 7 consultation process: issuance of a biological opinion (if necessary)
State Agencies	
California State Transportation Authority (CalSTA)	Potential source of funding
California Department of Fish and Wildlife (CDFW)	Permits for the placement of structures affecting waterways under Section 1602 streambed alteration agreement: incidental take permits for effects on listed state wildlife and plant species under the California Endangered Species Act Section 2081
California Department of Toxic Substances (DTSC)	Review of worker health and safety plan
California Department of Transportation (Caltrans)	Encroachment permit for encroachment on state roadways and highways
California Public Utilities Commission (CPUC)	Approvals required for rail crossing improvements
California State Lands Commission (SLC)	Approval required for structures crossing Bear Creek (if determined to be within SLC jurisdiction)
Regional Water Quality Control Board—Central Valley	Permit under the CWA Section 401 water quality certification/waste discharge requirements for placement of structures affecting waterways and under the Porter-Cologne Water Quality Control Act
San Joaquin Valley Air Pollution Control District (SJVAPCD)	Permits for authority to construct and to operate emergency generators at the approved ACE Merced Layover and Maintenance Facility
State Historic Preservation Office (SHPO)	Concurrence of effects on historic resources under Section 106 of the National Historic Preservation Act consultation process; potential development of a memorandum of agreement
State Water Resources Control Board (State Water Board)	General construction activity storm water permit under Section 402 National Pollutant Discharge Elimination System (NPDES)
Regional Agencies and Transportation Agencies	
San Joaquin Joint Powers Authority (SJPPA)	Certification of CEQA environmental document; project proponent; project funding
Merced Council of Governments	Funding coordination
Central Valley Flood Protection Board	Encroachment Permit
Local Agencies[a]	
Merced County	Encroachment permit for construction in county ROW; use and building permits for improvements outside rail ROW

Agency	Funding, Approval, or Permit
City of Merced	Encroachment permit for construction in city ROW; use and building permits for improvements outside rail ROW
Other Parties	
Union Pacific Railroad (UPRR) and BNSF Railroad	Project approval: right of entry permit(s) for work conducted within UPRR ROW; design and installation permits/construction maintenance agreements for structures and facilities

[a.] UPRR and BNSF are not subject to the land use jurisdiction of local governments.
ACE = Altamont Corridor Express
CEQA = California Environmental Quality Act
ROW = right-of-way

Chapter 3

Environmental Impact Analysis

Introduction

Organized by environmental resource area, this chapter provides an integrated discussion of the regulatory setting, environmental setting, and impact analyses (including mitigation measures for potentially significant impacts) associated with the construction, operation, and maintenance of the Project and variants.

This analysis is based on the following materials:

- Section 2.4, *Operations and Maintenance*; Section 2.5, *Construction*; Section 2.6, *Right-of-Way and Easement Needs*; and Section 2.8, *Variants to the Project*; in Chapter 2, *Project Description*
- Appendix 2.0-1: *Merced Intermodal Track Connection Environmental Footprint*
- Appendix 2.0-2: *Merced Intermodal Track Connection 15% Preliminary Engineering Plans*
- Appendix 2.0-3: *Merced Intermodal Track Connection Ridership and Revenue Memo*

The analysis presented in this section uses a "reasonable worst-case" (i.e., the greatest level of impact) approach to analyzing potential impacts. The environmental footprint that has been identified for the Project represents the greatest level of impact that could occur. In certain areas, the environmental footprint may be reduced in the future; however, because it is not known where the environmental footprint could be reduced, this analysis considers the reasonable worst-case scenario.

Chapter Organization

This chapter is organized into the following environmental resource sections:

- 3.1, *Effects Found Not to Be Significant*
- 3.2, *Aesthetics*
- 3.3, *Air Quality and Greenhouse Gas Emissions*
- 3.4, *Biological Resources*
- 3.5, *Cultural Resources*
- 3.6, *Tribal Cultural Resources*
- 3.7, *Energy*
- 3.8, *Geology, Soils, Seismicity, and Paleontological Resources*
- 3.9, *Hazards and Hazardous Materials*
- 3.10, *Hydrology and Water Quality*
- 3.11, *Land Use and Planning*

- 3.12, *Noise and Vibration*
- 3.13, *Public Services and Utilities and Service Systems*
- 3.14, *Recreation*
- 3.15, *Safety and Security*
- 3.16, *Transportation*

Each environmental resource section in this chapter includes the following information.

- **Introduction**—Presents an overview of the environmental resource and cross-references related issues addressed elsewhere in the environmental impact report (EIR).
- **Regulatory Setting**—Identifies the federal, state, regional, and local laws, as well as regulations, ordinances, and policies that are relevant to each environmental resource area and would be applicable to the construction, operation, and maintenance of the Project. Appendix 3.01-1, *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 Project would be located.
- **Environmental Setting**—Provides an overview of the existing physical considerations of an environmental resource in the area at the time of, or prior to, the publication of the Notice of Preparation, which could be affected by implementation of the Project. A specific study area is identified for each environmental resource as the extent of a study area varies with each resource. The *study area* is defined as the limits of an area in which impacts could be expected to occur for each environmental resource. The environmental setting provides the basis of analysis of potential impacts related to each resource.
- **Impact Analysis**—Describes the methodology used for the analysis, the criteria used to determine the significance of potential impacts, and corresponding discussion of impacts associated with the Project. For each potential impact, the analysis makes a significance determination (i.e., no impact, less than significant, potentially significant, less than significant with mitigation, or significant and unavoidable). If required to reduce a potentially significant impact, feasible mitigation measures are identified. The *Methods for Analysis* section describes the contents of the impact analysis discussion in further detail.

A discussion how the Project would contribute to cumulative impacts is discussed separately in Chapter 4, *Cumulative Impacts*.

Approach to Impact Analysis

Significance Criteria

The significance criteria used in this EIR to define the level at which an impact would be considered significant in accordance with the California Environmental Quality Act (CEQA) are presented under the subheading *Thresholds of Significance* in each environmental resource section. In accordance with Section 15022(a) of the CEQA Guidelines, the SJJPA uses significance criteria based on CEQA Guidelines Appendix G; factual or scientific information and data; and regulatory standards of federal, state, regional, and local jurisdictions in which Project facilities are proposed.

Impact Identification and Levels of Significance

Each environmental resource section identifies and lists impacts sequentially. For example, BIO-1 denotes the presentation of the first impact in Section 3.4, *Biological Resources*. An impact statement precedes the discussion of each impact and provides a summary of the impact topic. In addition, the potential impacts related to construction of the Project and variants are generally discussed before the potential impacts related to operation of the Project and variants.

The level of significance associated with an impact is determined by comparing the environmental effects of constructing, operating, and maintaining the Project or the variants, with the existing environmental conditions, and applying the identified significance threshold. This EIR uses a variety of terms to describe the levels of significance of impacts identified within the environmental analysis. Each impact is categorized as one of the following.

- **No impact**—The Project would not cause any adverse change in the environment.
- **Less-than-significant impact**—The Project would not cause a substantial adverse change in the environment as the specified standard of significance would not be exceeded; thus, no mitigation measures are required. An impact is considered *beneficial* if it would result in the improvement of an existing physical condition of the environment. Beneficial impacts are identified within this *less-than-significant impact* significance category.
- **Potentially significant impact—**The Project would cause a substantial adverse change in the physical conditions of the environment in excess of the specified standard. This is typically the level of significance of an impact prior to the application of feasible mitigation measures.
- **Less than significant impact with mitigation**—The Project would cause a substantial adverse change in the physical conditions of the environment in excess of the specified standard of significance; however, one or more feasible mitigation measures would reduce environmental effects to levels below the specified standard of significance.
- **Significant and unavoidable impact**—The Project would cause a substantial adverse change in the physical condition of the environment; there is no feasible mitigation available or, even with implementation of feasible mitigation measures, the Project would cause a significant adverse effect on the environment in excess of the specified standard of significance.

Mitigation Measures

CEQA Guidelines Section 15126.4(a)(1) states that an EIR "shall describe feasible measures which could minimize significant adverse impacts." Mitigation measures identified in this EIR were developed during the analysis and are designed to reduce, minimize, or avoid potential environmental impacts associated with the Project. Mitigation measures, if needed, are numbered sequentially to correspond to the impacts they address. For example, Mitigation Measure BIO-2.1 refers to the first mitigation measure for Impact BIO-2 in Section 3.4, *Biological Resources*.

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3.1 Effects Found Not to Be Significant

Section 15128 of the CEQA Guidelines notes that "an EIR [environmental impact report] shall contain a statement briefly indicating the reasons that various possible significant effects of a project were determined not to be significant and were therefore not discussed in detail in the EIR." The Project would not result in any environmental impacts related to agricultural and forestry resources, mineral resources, population and housing, and wildfire. Therefore, these issues are not discussed further in this EIR but are briefly summarized below.

3.1.1 Agricultural and Forestry Resources

The Altamont Corridor Express (ACE) Ceres to Merced Extension EIR concluded that project would result in a significant and unavoidable impact on the conversion of Important Farmlands to nonagricultural use (SJRRC 2021). Specifically, the approved ACE Merced Layover and Maintenance Facility was determined to result in the permanent conversion of 11.1 acres of Important Farmlands to nonagricultural use. No other Important Farmlands would be converted by the MITC Project (CDC 2018). Therefore, the Project would have no impact on agricultural resources.

No portion of the environmental footprint of the Project includes forestland, timberland, or timberland zoned Timberland Production (CDFW 2015). The Project would not be located in or intersect forestlands within identified timberland production zones, which are lands dedicated to timber growing for a 10-year period. The Project would be generally located within or adjacent to the existing Burlington Northern Santa Fe (BNSF) and Union Pacific Railroad (UPRR) tracks where forestry resources would not likely occur. In addition, no land adjacent to or in the vicinity of the environmental footprint of the Project is zoned for or used for timberland or forestland. Therefore, the Project would not conflict with any existing zoning or forestland or timberland use or involve any changes to the environment that could result in the conversion of forestland or timberland and there would be no impact on forestland or timberland.

3.1.2 Mineral Resources

The Surface Mining and Reclamation Act of 1975 is the California state legislation that protects Mineral Resource Zones (MRZs). Part of the purpose of the act is to classify mineral resources and transmit the information to local governments that regulate land uses in each region of the state. Local governments are responsible for designating lands that contain regionally significant mineral resources in local general plans to conserve resources in areas with intensive competing land uses. The law resulted in the preparation of mineral land classification maps, which delineate MRZs 1 through 4 for aggregate resources (i.e., sand, gravel, stone).

The environmental footprint of the Project is in an area that has been zoned by the state as both MRZ-3, an area containing known or inferred concrete aggregate resources of undetermined mineral resource significance (sand and gravel) and MRZ-4, areas where geological information is inadequate to assign to any other mineral resource zone category (CDC 2021). The area surrounding the environmental footprint of the Project does not contain any mineral resources that are currently being extracted in the area. The California Department of Conservation, Division of Mine Reclamation Mines Online mapper, which shows mines that are regulated under the Surface Mining and Reclamation Act, does not include any mines that are in the environmental footprint of the

Project (CDC 2016). In addition, the environmental footprint of the Project has not been designated as a locally important mineral resource recovery site in the General Plan, any specific plan, or other land use plan. Therefore, the Project would have a less-than-significant impact on the loss of availability of a known statewide or regionally important mineral resource, or a locally important mineral resource recovery site.

3.1.3 Population and Housing

The Project would be consistent with the envisioned local growth and development policies of the City of Merced that is outlined in the 2030 Merced Vision General Plan (Merced City Planning Commission 2012). These policies support enhanced passenger rail service and promote land use development patterns that enhance the use of public transit. Given the policy direction from the City of Merced, the Project would be supportive of local development plans, and potential future population that may be associated with the Project would not be substantial or unplanned. Therefore, the Project would have no impact on unplanned population growth.

The environmental footprint of the Project is illustrated in Appendix 2.0-1, *Merced Intermodal Track Connection Environmental Footprint*. The Project would be generally located within or adjacent to the existing BNSF and UPRR tracks. As discussed in Section 2.6, *Right-of-Way and Easement Need*s, and shown on Figures 2-9 through 2-11 in Chapter 2, *Project Description*, it is anticipated that that five full property acquisitions would be required and three permanent businesses would be displaced by the Project easements and right-of-way requirements. It is not anticipated that the Project would displace any residential units that may require replacement housing. Therefore, the Project would have no impact on residential displacement.

3.1.4 Wildfire

The environmental footprint of the Project is in a developed, urban environment. The topography of the environmental footprint of the Project and surrounding area is relatively flat. There is no extensive wildland vegetation cover within the environmental footprint of the Project or in the surrounding area. According to the California Department of Forestry and Fire Protection, the entire city, including the environmental footprint of the Project, is outside a very high fire hazard severity zone (CDFFP 2023). The nearest very high fire hazard severity zone is approximately 20 miles east of the environmental footprint of the Project, in Mariposa County. Therefore, the Project would have no impact with respect to exacerbating wildfire risks.

3.2 Aesthetics

3.2.1 Introduction

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

Cumulative impacts on aesthetics, in combination with planned, approved, and reasonably foreseeable projects, are discussed in Chapter 4, *Cumulative Impacts.*

3.2.2 Regulatory Setting

This section summarizes the federal, state, regional, and local regulations related to aesthetics and visual quality that are applicable to the Project.

3.2.2.1 Federal

There are no applicable federal plans, policies, or regulations related to aesthetics and visual quality.

3.2.2.2 State

California Environmental Quality Act

The California Environmental Quality Act (CEQA) establishes that it is the policy of the state to take all action necessary to provide the people of the state "with…enjoyment of aesthetic, natural, scenic and historic environmental qualities" (California Public Resources Code Section 21001(b)). CEQA requires state and local agencies to identify the significant environmental impacts of their actions, including potential significant aesthetic and visual impacts, and to avoid or mitigate those impacts, when feasible.

California Department of Transportation Scenic Highway Program

The California Department of Transportation (Caltrans) manages the California State Scenic Highways Program, which was created by the State Legislature in 1963. The state laws governing the Scenic Highways Program are included in the California Streets and Highways Code, Sections 260 through 263. The purpose of the Scenic Highways Program is to protect and enhance the natural scenic beauty of California highways and adjacent corridors through special conservation treatment. The program includes a system of highways that are either eligible for designation as scenic highways or have been officially designated as a scenic highway. The status of a proposed state scenic highway changes from eligible to officially designated when the local governing body applies to Caltrans for scenic highway approval, adopts a Corridor Protection Program, and receives notification that the highway has been officially designated as a scenic highway.

California Public Utilities Commission

The California Public Utilities Commission (CPUC) has safety and security regulatory authority over transit agencies in California. Rules established by the CPUC are called General Orders (GOs). The following GOs are relevant to the Project.

- GO 88-B: Rules for Altering Public Highway-Rail Crossings
- GO 118-A: Construction, Reconstruction and Maintenance of Walkways, and Control of Vegetation Adjacent Thereto

3.2.2.3 Regional and Local

City and county plans—including general plans, downtown master plans, community plans, and specific plans—address aesthetics and visual quality. Policies and regulations include design guidelines and designated scenic corridors/routes and identify areas of particular scenic value.

Appendix 3.0-1 of this Environmental Impact Report (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 Project improvements would be located. Section 15125(d) of the 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 Project would be consistent with the plans of relevant jurisdictions. 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. The Project would be generally consistent with the applicable goals, policies, and objectives related to aesthetics identified in Appendix 3.0-1.

2030 Merced County General Plan

The *2030 Merced County General Plan* serves as the County's blueprint for future land use, development, preservation, and resource conservation decisions until 2030 (Merced County 2013). The *2030 Merced County General Plan* was reviewed for goals, objectives and policies that may be applicable to the Project. The following polices are directly related to the Project:

- **Policy LU-1.1.** Direct urban development to areas within adopted urban boundaries of cities, Urban Communities, and Highway Interchange Centers in order to preserve productive agriculture, limit urban sprawl, and protect natural resources.
- **Policy LU-4.4.** Require efficient and environmentally sound development, which minimizes impacts on sensitive habitat/species, protects water quality and supply, and provides adequate circulation, within Rural Centers.
- **Policy LU-5.B.1.** Develop, maintain, and implement urban design guidelines and uniform policies in new or updated community plans that emphasize the individual character of each community**.**
- **Policy LU-5.B.10.** Maximize use of passive and active solar and/or wind energy resources, and require incorporation of green building design and technology into new development within Urban Communities.
- **Policy NR-4.1.** Promote the preservation of agricultural land, ranch land, and other open space areas as a means of protecting the County's scenic resources.

- **Policy NR-4.2.** Coordinate with Caltrans, during the review of proposed structures and activities located adjacent to State-designated scenic highways, to ensure that scenic vistas and local scenic values are not significantly degraded.
- **Policy NR-4.3.** Require that siting and design of buildings protect, improve, and enhance the scenic quality of the built and natural environments and take full advantage of scenic resources through site orientation, building setbacks, preservation of viewsheds, height limits, and the use of appropriate construction materials and exterior modulation.

Merced Vision 2030 General Plan

The *Merced Vision 2030 General Plan* contains goals and policies for future development in the City of Merced (City of Merced 2012). As with the County plan, the *Merced Vision 2030 General Plan* was reviewed for goals, objectives, and policies that may be applicable to the Project. The following policies are directly related to the Project:

- **Policy UE-1.1.** Designate areas for new urban development that recognize the physical characteristics and environmental constraints of the planning area.
    - **Implementing Action UE-1.1.e.** Explore techniques to preserve areas of significant agricultural soils, aircraft noise and safety zones, buffers between cities, scenic areas, flood plains, endangered species habitats, etc. from incompatible urban development.
- **Policy T-1.6.** Minimize adverse impacts on the environment from existing and proposed road systems.
    - **Implementing Action T-1.6a.** Continue working to minimize environmental impacts associated with heavily travelled transportation corridors, such as high noise levels and stop and go traffic situations (which contribute heavily to air pollution problems).
- **Policy OS-1.3.** Promote the protection and enhancement of designated scenic routes.
    - **Implementing Action OS-1.3b.** Preserve the designated scenic corridors. The Scenic Corridors are as follows.
        - North and South Bear Creek Drive within the City limits.
        - N Street from 16th Street to the Merced County Courthouse.
        - 21st Street from the Merced County Courthouse to Glen Avenue.
        - M Street from Black Rascal Creek to Bellevue Road.
        - West 28th Street from M Street to G Street.
        - Lake Road from Yosemite Avenue to Lake Yosemite.
        - R Street (extended) from Black Rascal Creek to Bellevue Road.
        - Olive Avenue East of McKee Road.
        - M Street from 18th Street to Bear Creek.
        - Campus Parkway.
        - Bellevue Road from Lake Road to G Street.

- **Implementing Action 1.3.c.** Utilize established guidelines for the review of projects proposed within a designated Scenic Corridor. The following guidelines apply to the review of applications for development in vicinity of a designated Scenic Corridor:
  - Utility lines should be placed underground whenever feasible.
  - Signing should be carefully controlled to ensure that it does not detract from the scenic beauty of the corridor. Specific guidelines for signing along these corridors should be established.
  - Limit the intrusion of future land uses which may detract from the scenic quality of the corridor.
  - Unsightly mechanical and utility structures shall be screened from view by use of planting, grading, and fencing.
  - Heights and setbacks of buildings should be regulated to avoid obstructing important scenic views.
  - Every effort should be made to preserve and properly maintain existing stands of trees and other plant materials of outstanding value.
  - Structures on private and public properties visible from the corridor should be maintained in good condition (free of trash, weeds, etc.).
  - Architectural and landscape design should result in an attractive appearance and a harmonious relationship with the surrounding environment.

- **Policy OS-4.1.** Preserve open space areas which are necessary to maintaining public health and safety.
  - **Implementing Action OS-4.1b.** Utilize areas along railroad rights-of-way and under high-voltage power transmission lines as open space. These areas could be used as greenways and open space areas which would provide scenic buffers from potential health hazards in addition to providing visual (and noise in the case of railroads) buffers to surrounding areas. These areas could also be developed with storm water retention basins, groundwater recharge basins, or used as part of the municipal water or other utility systems where the risk of public exposure to health hazards could be minimized.
- **Policy OS-5.2.** Protect soil resources from the erosive forces of wind and water.
  - **Implementing Action 5.2c.** Maintain adequate vegetation along the banks of urban streams and storm water drainage channels. The erosive force of storm water can cause damage to stream channel banks that have been cleared of their vegetative cover. Where it is necessary to remove natural vegetation along stream channels to improve storm water flows, “rip-rap” (rocks, concrete, etc.) should be applied to reduce erosion and sedimentation hazards.

City of Merced Municipal Code

Chapter 14.12, *Trees, Shrubs, and Plants,* of the City of Merced Municipal Code contains local regulations for the removal, trimming, and planting of trees, shrubs, and other plants. It also stipulates permitting requirements for such activities. Section 14.12.040 includes the following:

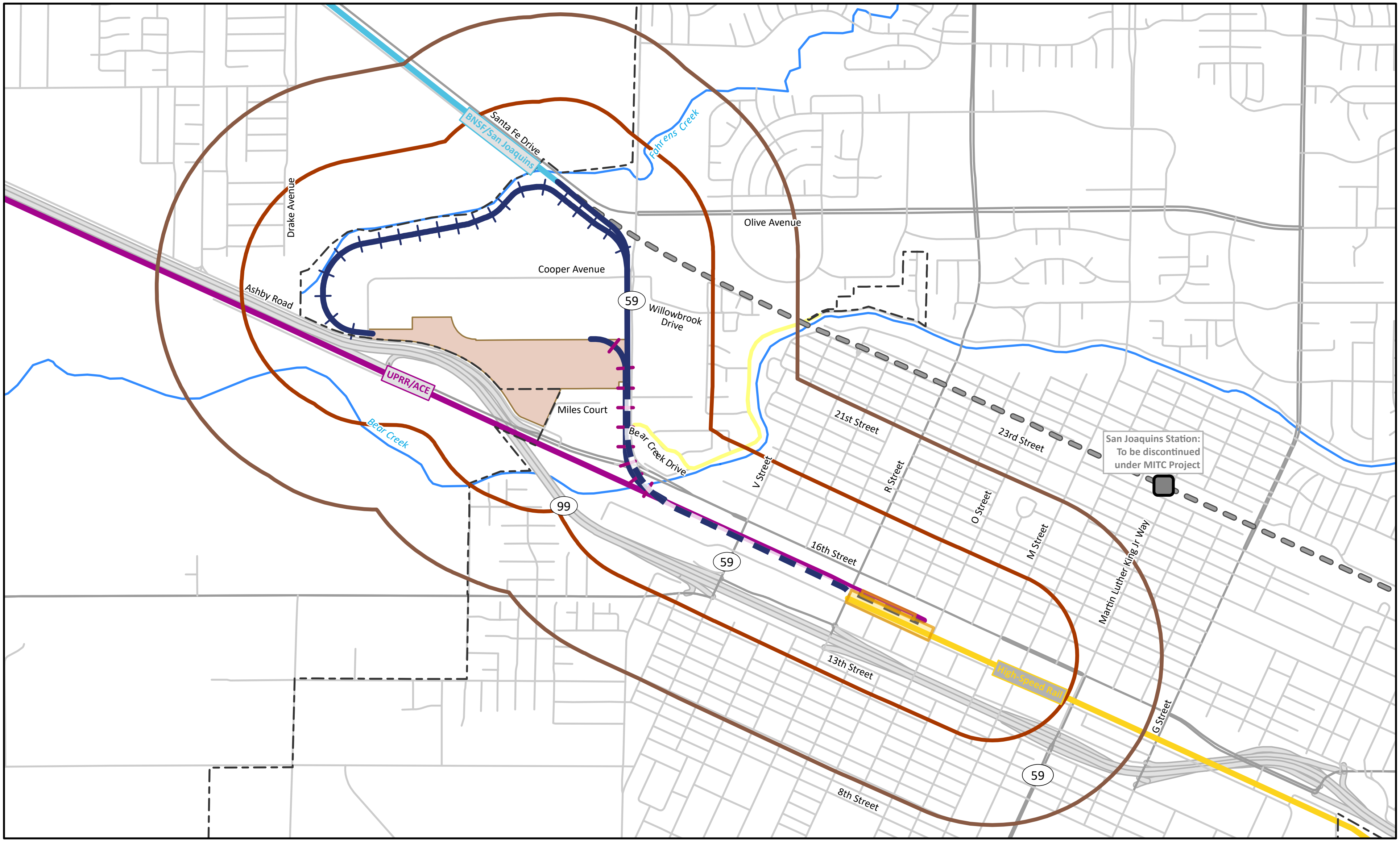
- **Section 14.12.040.** Cutting, trimming, or planting permit required. No person shall cut, trim, prune, plant, spray, remove, injure or interfere with any tree, shrub or plant upon any street, park, pleasure ground, boulevard, alley or public place of the city, without the prior permission and approval therefor from the director. The director is authorized to grant such permission in his discretion and, where necessary, subject to the condition that the removed tree will be replaced by an official tree in conformity with the master plan. No such permission shall be valid for a longer period than thirty days after its date of issuance.

3.2.3 Environmental Setting

This section describes the environmental setting related to aesthetics for the Project.

3.2.3.1 Resource Study Area

The resource study area (RSA), shown on Figure 3.2-1, is the area in which all environmental investigations specific to aesthetics and visual quality are conducted to determine the resource characteristics and potential project impacts. The RSA for direct and indirect impacts encompasses a 0.5-mile distance from the Project footprint in rural areas and a 0.25-mile distance from the Project footprint in urbanized areas. Where elevated or more expansive views are present or where there are prominent and regionally important visual and scenic features, such as mountains, large iconic structures, or water features, middle ground views (up to 3 miles from the Project footprint) and background views (beyond 3 miles from the Project footprint) are discussed as contributing visual elements to the RSA.



Existing UPRR/Approved ACE
Proposed High-Speed Rail
Existing BNSF/San Joaquins
Proposed Integrated Merced High-Speed Rail Station
Approved ACE Merced Layover and Maintenance Facility
City of Merced Boundary
0.5-mile Buffer
0.25-mile Buffer

MITC Project

San Joaquins: Elevated Track
San Joaquins: At-grade Track
San Joaquins: Layover andMaintenance Access Line
ACE Relocated Spur
San Joaquins: To Be Discontinued
North Bear Creek Drive Scenic Corridor

0 1,000 2,000 Feet

N

Data Source: City of Merced

Figure 3.2-1
Aesthetics Resource Study Area
Merced Intermodal Track Connection Project

3.2.3.2 Existing Visual Resources

The Project site is located within the San Joaquin Valley in Merced County and directly adjacent to the City of Merced's western boundary. The southern and western portions of the city are relatively flat, whereas the northern portion is defined by gently rolling hills. The conifer forests and snow-capped mountains of the Sierra Nevada Mountains are visible from State Route 99 (SR 99), which is located south of the Project alignment. In addition, the northern, western, and eastern areas contain four creeks and their corresponding watersheds: Bear Creek, Black Rascal Creek, Fahrens Creek, and Cottonwood Creek. Lake Yosemite is located 3 miles northeast of the city and is bordered by University of California Merced.

The RSA for the Project is within a topographically flat area that is characterized by a primarily built-out urban environment where the dominant visual features include existing industrial facilities, overhead power lines, smaller commercial and residential structures, freight tracks, and grassy parcels. High-density residential areas are located to the east of the Project site within the central portion of the city, and the industrial and commercial corridor is adjacent to SR 59 and 16th Street, along the existing railroad right-of-way (ROW). Trees and typical landscaping are present throughout the residential areas.

Scenic Vistas

The term "scenic vista" generally refers to visual access to, or the visibility of, a particular sight from a given vantage point or corridor. The subjects of valued or recognized views may be focal (meaning specific individual resources) or panoramic (meaning broad geographic area). Panoramic views are typically associated with scenic vistas that provide a sweeping geographic orientation. Examples of panoramic views include urban skylines, valleys, mountain ranges, or large bodies of water. Examples of focal views include public art/signs and notable buildings and structures. The nature of a view may be unique, such as a view from an elevated vantage point or particular angle.

The *Merced Vision 2030 General Plan* identifies 11 scenic corridors within the city. This includes North Bear Creek Drive, which intersects SR 59 adjacent to the Project site (City of Merced 2012). However, it should be noted that the segment of North Bear Creek Drive near the Project site is detached Bear Creek, which is the natural resource that gives the road its scenic quality. In addition, as previously discussed, distant and intermittent views of the Sierra Nevada Mountains to the north are present within the RSA; however, these vistas may be minimally visible along the Project alignment due to orientation and the built-out urban landscape (i.e., intervening structures, trees and landscaping, and utility poles). In addition, the perspective and visibility may change depending on various factors, such as elevation, bad air days, or weather.

Scenic Resources within State Scenic Highway Corridors

Scenic resources refer to natural or manmade features of high aesthetic quality. Such features can include landscaping, heritage trees, or natural trees and landforms, as well as buildings and other structures with aesthetic value. Pursuant to CEQA Guidelines Appendix G, this area of consideration includes specific mention of such natural or manmade features when they are located within the view field of a state scenic highway.

No designated state scenic highways are within the RSA. The nearest designated state scenic highways are Interstate 5 (I-5), which is located approximately 40 miles west of the Project and

State Route 140 (SR 140) after it intersects with SR 49 approximately 40 miles northeast of the Project (Caltrans 2022). The Project is not within the viewshed of either of these scenic highways.

Overview of Visual Character and Land Uses

The majority of the RSA lies within the City of Merced; however, the northwestern portion of the RSA crosses into Merced County. The RSA is primarily located along two commercial corridors, 16th Street and Snelling Highway (SR 59). The existing setting can be characterized by abrupt transitions between residential, commercial, and industrial/manufacturing uses.

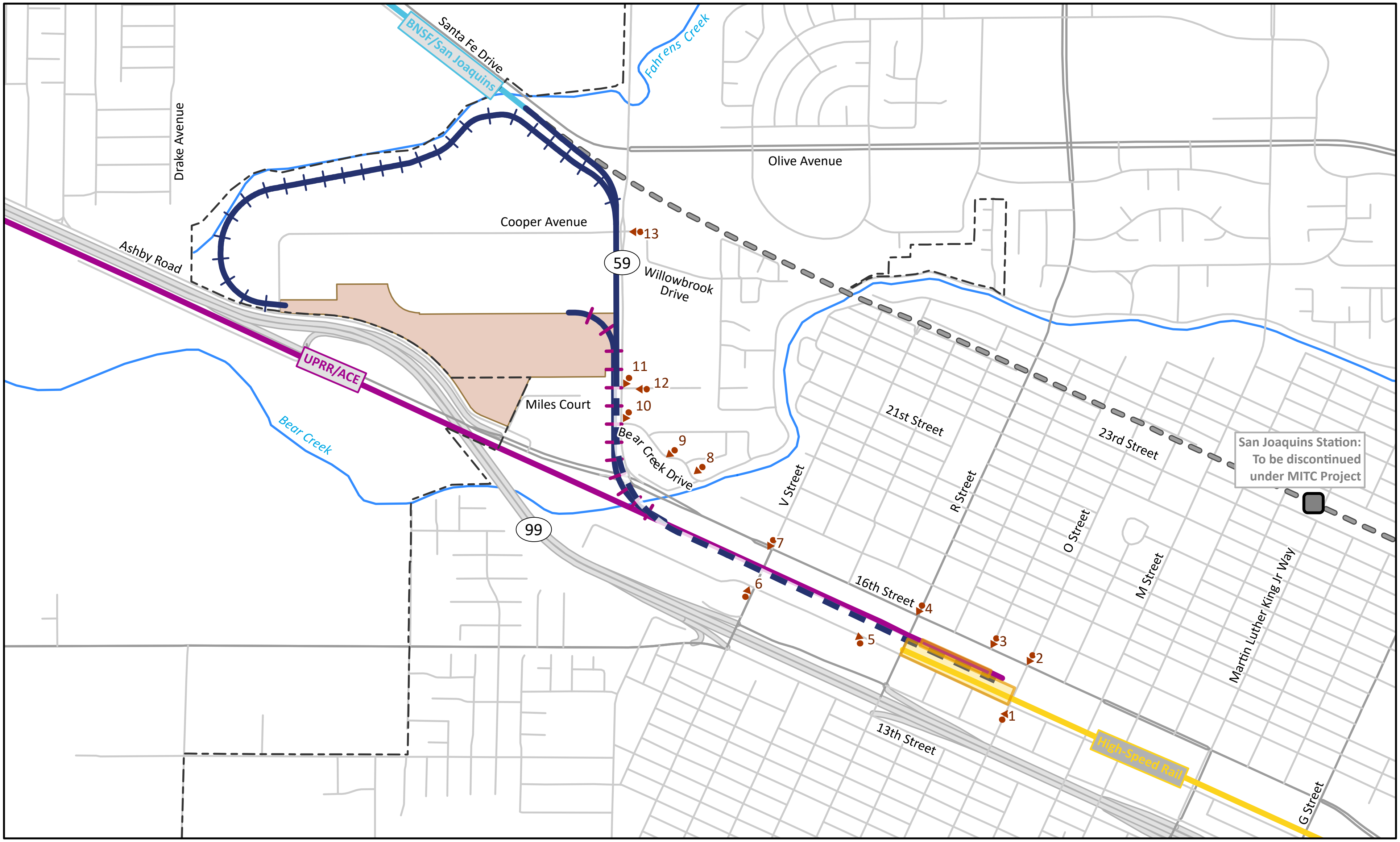
16th Street is a prominent five-lane commercial corridor that runs in the northwest-southeast direction through the city, parallel to the Union Pacific Railroad (UPRR) ROW and Main Street. Commercial uses along the Project corridor are dominated by car sales and maintenance, food-related establishments, older commercial developments, and parking areas. SR 59 and 16th Street intersect shortly after crossing Bear Creek in the western portion of the RSA. Commercial signage, fencing, overhead utilities, and landscaping also contribute to the visual environment.

The RSA follows the existing UPRR industrial spur that deviates from the main line of the UPRR, which crosses Bear Creek and continues north adjacent to SR 59, before turning west into an existing industrial park. SR 59 provides separation in the visual environment between the manufacturing/industrial land uses to the west of SR 59, and the primarily high-density residential neighborhoods to the east of SR 59. Overall, the industrial area is disjointed and detracts from the nearby residential setting, resulting in low visual character in this portion of the RSA.

Representative Views

The visual character of the Project alignment, adjacent land uses, and potential visual resources is described in detail in the following sections from east to west. Visual resources in a visual setting or view may include unique views, views identified as being important in local plans or codes (i.e., protected views), views from designated scenic highways, or cultural modifications. Cultural modifications may include designated historic buildings or structures, or locally and architecturally significant buildings or structures. The Project RSA is in a developed urban area. As a result, scenic views in urban areas would be primarily defined as views of unique buildings or architectural features, long scenic vistas, and unique landscaping.

Figure 3.2-2 to Figure 3.2-16 highlight thirteen viewpoints chosen to represent adjacent land uses and the views looking towards the location of proposed Project elements. These locations depict the overall visual character of the RSA as viewed by local residents, employees and patrons, pedestrians, and passing motorists.



Existing UPRR/Approved ACE
Proposed High-Speed Rail
Existing BNSF/San Joaquins
Proposed Integrated Merced High-Speed Rail Station
Approved ACE Merced Layover and Maintenance Facility
City of Merced Boundary

MITC Project
San Joaquins: Elevated Track
San Joaquins: At-grade Track
San Joaquins: Layover andMaintenance Access Line
ACE Relocated Spur
San Joaquins: To Be Discontinued

View Direction

0 1,000 2,000 Feet

N

Data Source: City of Merced

Figure 3.2-2
Project Area Representative Views
Merced Intermodal Track Connection Project

Proposed Integrated Merced High-Speed Rail Station Area

Figure 3.2-3 shows a pedestrian and motorist's view from O Street looking northeast toward the existing UPRR ROW from 15th Street. An existing small-scale industrial building and the Merced Senior Community Center are visible, as well as street medians, street trees, railroad crossing gates, overhead power transmission lines, and parking areas. In addition, the rooftop signage at the Tioga apartment building is also visible in the distance. 15th Street is a major commercial thoroughfare in the RSA.

Figure 3.2-4 shows a resident's, pedestrian's, and motorist's view looking southwest toward the commercial uses adjacent to the existing UPRR ROW. A commercial shopping center and various restaurants are located along 16th Street, north of the existing UPRR ROW. Street medians, poles, traffic signals, and street trees and landscaping are also visible. 16th Street is also a major commercial thoroughfare in the RSA.

Visual clutter can be caused by structures such as traffic signals, overhead power transmission lines, and poles, which detract from certain views. The existing overhead power transmission lines, poles, and railroad crossing gates increase the visual clutter in the view. There are no visual resources in the proposed integrated Merced High-Speed Rail (HSR) Station area of the RSA. In addition, there are no unique views of the local mountains and no protected views.

Figure 3.2-3: Looking Northeast along O Street from the 15th Street Intersection

Figure 3.2-4: Looking Southwest along O Street from the 16th Street Intersection

O Street to V Street

Figure 3.2-5 shows the segment from O Street to V Street. Primarily small-scale industrial and commercial buildings are located adjacent to the existing UPRR ROW that travels through this area. The view represents a pedestrian's and motorist's view looking southwest from P Street toward the existing UPRR ROW, adjacent car washes, and parking areas. Mature trees, palm trees, and other landscaping are visible adjacent to the commercial uses.

Near the intersection of 16th Street and R Street, small commercial and automotive repair uses dominate the visual environment. Figure 3.2-6 shows a pedestrian's and motorist's view looking southwest toward the small commercial and automotive repair uses located along 16th Street. The existing street lighting, poles, and traffic signals dominate the view, which presents visual clutter.

An older commercial shopping center and large Costco Warehouse are located along 15th Street to the south of the UPRR ROW. Figure 3.2-7 shows a pedestrian's and motorist's view looking northwest toward the existing Costco parking lot and gas station. Small-scale commercial and industrial uses are visible in the background view beyond the UPRR ROW. Mature trees and other landscaping are also visible adjacent to the commercial uses.

This segment does not provide any visual resources, unique views of the local mountains, or protected views.

Figure 3.2-5: Looking Southwest Along P Street from the 16th Street Intersection

1 

2 **Figure 3.2-6: Looking Southwest Along R Street from the 16th Street Intersection**

3

Figure 3.2-7: Looking Northwest at the Existing Costco Gas Station and Parking Areas

V Street to Bear Creek

As previously discussed, the existing UPRR ROW in this area is located adjacent to primarily small-scale industrial and commercial buildings. Figure 3.2-8 shows a pedestrian's and motorist's view looking northeast from the intersection of V Street and 15th Street toward the UPRR ROW. The area south of the UPRR ROW beyond V Street is dominated primarily by commercial buildings dedicated to automobile sales, including signage, street trees of varying heights, railroad crossing gates, street lighting, and lighting in adjacent parking areas. This is a view typically seen by pedestrians, patrons, and employees of commercial businesses in this area of the RSA.

A commercial shopping center and gas station border 16th Street and V Street north of the UPRR ROW. Figure 3.2-9 shows a pedestrian's and motorist's view looking southwest toward the existing UPRR ROW. The gas station and tall signs dedicated to the adjacent commercial uses are visible, as well as freight trains in the existing UPRR ROW, traffic signals, railroad crossing gates, and existing mature trees and landscaping. The existing traffic signals and street lighting increase the visual clutter in the view.

This segment does not provide any visual resources, unique views of the local mountains, or protected views.

Figure 3.2-8: Looking Northeast Along V Street from the Auto Center Drive Intersection

Figure 3.2-9: Looking Southwest at the UPRR ROW from the Corner of 16th Street and V Street

Bear Creek to Willowbrook Drive

Adjacent to Bear Creek, the UPRR industrial spur splits from the main UPRR ROW and travels in a north-south orientation parallel to SR 59 before shifting to an east-west orientation adjacent to the industrial area west of SR 59. As discussed previously and shown on Figure 3.2-1, the *Merced Vision 2030 General Plan* identifies North and South Bear Creek Drive as a scenic corridor in the city.

Figure 3.2-10 shows a resident's, pedestrian's, and motorist's view of the entrance to Bear Creek Court. The 16th Street bridge is located in the background of this view, as well as overhead power lines, and existing commercial structures to the southeast. Mature trees, other landscaping, and street signs are also visible. As shown on Figure 3.2-8, Bear Creek Court is an unpaved roadway that is under construction, and roadway barriers are present to block off construction areas.

An area of small-scale single-family and multi-family residences is located along Bear Creek Drive and Stephan Gray Park. Figure 3.2-11 shows a pedestrian's, recreationalist's, and motorist's view looking southwest from Stephan Gray Park toward the numerous mature trees, picnic tables, fencing, and grassy open space areas in Stephan Gray Park. As shown on Figure 3.2-9, the existing overhead power transmission lines and poles increase the visual clutter in the background view. Stephan Gray Park is of visual interest due to open green space, mature trees, and other landscaping. However, the park is not identified as a protected visual resource by local general plans, planning and zoning codes, or other regulations.

Figure 3.2-10: Looking Southwest from the Bear Creek Drive/Court Intersection

Figure 3.2-11: Looking Southwest from Stephen Gray Park

Figure 3.2-12 shows a pedestrian's and motorist's view looking southwest from the intersection of Bear Creek Drive and SR 59. The existing spur track of the UPRR ROW runs on top of a large earthen berm parallel to SR 59 and dominates the visual environment in this view. Street signs, fencing, and mature trees are visible adjacent to SR 59. The tops of mature trees are also visible in the background of this view, beyond the spur track. The existing street signage, overhead power transmission lines, and poles increase the visual clutter in the view.

The North Bear Creek Drive scenic corridor is located in this area of the RSA. However, as noted above, the segment of North Bear Creek Drive adjacent to the Project site is detached from Bear Creek Itself, and therefore lacks scenic quality. Additionally, no unique views of the local mountains, Bear Creek, or other protected views are present.

Figure 3.2-12: Looking Southwest from the Intersection of Bear Creek Drive and SR 59

Bear Creek Drive to Cooper Avenue

North of Bear Creek Drive, the existing UPRR industrial spur is located adjacent to industrial uses on the east and single-family residences on the west.

Figure 3.2-13 shows a resident's, pedestrian's, and motorist's view looking south from the entrance of the Riviera Holiday Mobile Estates. Figure 3.2-14 shows a similar view looking west from the Riviera Holiday Mobile Estates. The one-story mobile homes and associated ornamental landscaping are visible in both views. Similar to the views previously discussed, the existing UPRR industrial spur ROW runs on top of a large earthen berm parallel to SR 59 in this view. Fencing and ornamental landscaping are visible in this view. A large billboard and the tops of mature trees are also visible in the background view, beyond the spur track. The existing street signage, overhead power transmission lines, and poles increase the visual clutter in the view.

Figure 3.2-13: Looking South from the Entrance of Riviera Holiday Mobile Estates

Figure 3.2-14: Looking West from Riviera Holiday Mobile Estates

Figure 3.2-15 shows a pedestrian's, resident's, and motorist's view looking west along Willowbrook Drive toward industrial buildings across SR 59. Well-maintained two-story apartment buildings, street trees, and mature landscaping are visible in the foreground, with overhead power transmission lines and traffic signals visible in the middle-ground. Dominating the background of the view are industrial buildings and mature trees. Figure 3.2-16 shows a resident's, pedestrian's, and motorist's view looking north along SR 59 from the intersection of Willowbrook Drive. The view also includes well-maintained two-story apartment buildings, street trees, overhead power transmission lines, and traffic signals. Industrial buildings, fencing, and mature trees are also visible in the background of this view.

Traffic signals, overhead power transmission lines, and poles increase the visual clutter in this area of the RSA, which detract from certain views. There are no visual resources in the Bear Creek Drive to Cooper Avenue segment of the RSA. In addition, there are no unique views of the local mountains, Bear Creek, or other protected views.

Along Cooper Avenue, existing industrial and commercial buildings of varying heights and density are visible from the roadway. This is the site of the approved ACE Merced Layover and Maintenance Facility. There is also limited roadside landscaping, including grass and mature trees. Cooper Avenue intersects with Ashby Road, which also has views of existing industrial and commercial buildings. There are no views of SR 99 from Ashby Road, as retaining walls block such views. Additionally, there are no visual resources visible from Cooper Avenue or Ashby Road.

Figure 3.2-15: Looking West from Willowbrook Drive

Figure 3.2-16: Looking North from the Intersection of Willowbrook Drive and SR 59

3.2.3.3 Existing Light and Glare

Due to the urbanized nature of the RSA, a moderate level of ambient nighttime light and daytime glare already exists. Nighttime lighting sources include streetlights, vehicle headlights, and interior and exterior building illumination, including light fixtures on nearby residential, commercial, and industrial uses. Glare is mostly a daytime occurrence and associated with buildings with exterior façades largely or entirely comprised of highly reflective glass or mirror-like materials.

3.2.4 Impact Analysis

This section describes the environmental impacts of the Project on aesthetics. This section also 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.

3.2.4.1 Methods for Analysis

Methods

The methodology approach presented herein draws upon the guidance outlined in the *Guidelines for the Visual Impact Assessment of Highway Projects* (2015) published by the Federal Highway Administration (FHWA), a guidance document commonly used by transportation agencies to assess potential visual impacts of public transit projects. The methods used to evaluate impacts on visual quality and aesthetics are described below.

- The visual environment and existing landscape characteristics in the RSA are defined and documented. The visual environment is evaluated for both the existing condition and for the future planned condition.
- Applicable planning documents (general plans, planning, and zoning codes, etc.) are reviewed for pertinent policy and guidance information.
- Major viewer groups are identified, and anticipated viewer responses are documented.
- Typical views and key observation points (KOPs) for the visual assessment are identified, based on the responses of representative viewers.
- After review of the project description, engineering plans, and renderings, the type and degree of visual changes expected to result in the RSA are documented.
- Appropriate mitigation measures are identified if a significant impact is identified.

Several variables affect the degree of visibility, visual contrast, and the project's impacts, including the scale and size of facilities, distance and viewing angle, color, texture, and influences of adjacent scenery or land uses. Even where visible, viewer response and sensitivity vary depending on viewer attitudes and expectations. Viewer sensitivity is distinguished among project viewers in recreational, residential, commercial, and industrial areas, with the first considered to have relatively high sensitivity, the second to have moderate sensitivity, and the latter two to have low sensitivity. Activities can either encourage a viewer to observe the surrounding area more closely (scenic driving) or discourage close observation (commuting in heavy traffic). All viewer elements are considered when evaluating expected viewer response.

Visual Resources

Visual resources include those items typically found in the natural environment (e.g., land, water, vegetation, animals); the cultural environment (e.g., buildings, infrastructure, structures, iconic artifacts and art); or the project environment (e.g., highway geometrics, grading, constructed elements, vegetative cover, ancillary visual elements, and atmospheric conditions). The cohesion or variation in form and the level of upkeep or deterioration of these environments are part of the process in the identification of visual resources.

Visual Character

Visual character may include the following defined attributes, and is used to describe, not evaluate:

- Form: visual mass and shape
- Line: edges or linear definition

- Color: reflective brightness (i.e., light, and dark) and hue (i.e., red, green)
- Texture: surface coarseness
- Dominance: position, size, or contrast
- Scale: apparent size as it relates to the surroundings
- Diversity: a variety of visual patterns
- Continuity: uninterrupted flow of form, line, color, or textural pattern

Visual Quality

Visual quality is the value that viewers place on their relationship—their experience—with the visual resources in their environment. For example, it is the sense of harmony viewers perceive viewing the resources that compose the natural environment; the order they perceive viewing the resources that compose the cultural environment; and the coherence they perceive viewing the resources that compose the project environment.

Primary viewer groups (e.g., residents, motorists, transit users, pedestrians and bicyclists, recreationalists, people who work in the area) were identified by observing the surrounding land uses and circulation patterns. Their perception of visual resources is influenced by physical constraints— topography, land cover (i.e., vegetation and structures), and temporary presence of typical atmospheric conditions (i.e., smoke, dust, fog, and precipitation). In addition, the extent to which a visual resource is visible is constrained by the physiological limits of human sight—location, proximity, and lighting.

Typically, visual sensitivity varies with the type of viewer groups and is based on the visibility of the visual resource, distance to the visual resource, relative elevation of the viewers compared to the visual resource, and frequency and duration of views. Residents and recreationalists of parklands or other public space may be the most sensitive to changes to the visual environment because their activities are enhanced by the presence of visual resources. These viewer groups are likely to be very aware of and concerned about their views and are likely to have expectations of the visual environment. Users and employees of commercial, industrial, and office facilities are less sensitive to changes in the visual environment because these users generally do not utilize these facilities for their visual and aesthetic values. Motorists and bicyclists on streets generally have lower expectations and sensitivity than other viewer groups due to the speed at which they travel through the environment.

3.2.4.2 Thresholds of Significance

The CEQA Guidelines Appendix G (14 Cal. Code Regs. 15000 et seq.) identifies significance criteria to be considered for determining whether a project could have significant impacts on aesthetics.

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

- Have a substantial adverse effect on a scenic vista.
- Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings in a state scenic highway.

- In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings. (Public views are those that are experienced from a publicly accessible vantage point.) If the project is in an urbanized area, conflicts with applicable zoning and other regulations governing scenic quality would apply.
- Create a new source of substantial light or glare that would adversely affect day or nighttime views in the area.

3.2.4.3 Impacts and Mitigation Measures

Impact AE-1	Construction of the Project would not have a substantial adverse effect on a scenic vista.
Level of Impact	**Less-than-significant impact**

Project

Impact Characterization

Project construction would result in changes to views that would be noticeable by motorists, pedestrians, and residents in the Project area. Motorists would primarily experience fleeting views of construction activities while driving along the roadways along and adjacent to the Project alignment. Pedestrians would primarily experience views of construction activities while walking along public sidewalks and near businesses adjacent to the Project alignment, and some residents would have private views of the Project construction from their windows. In addition, designated construction areas along the alignment would experience additional truck traffic compared to existing conditions, with trucks moving materials on- and off-site, and work crews and construction equipment moving around the sites and between the Project components.

Impact Details and Conclusions

The RSA is characterized by a primarily urban environment featuring a variety of commercial, industrial, and residential development, including passive open space areas and transportation uses. As discussed in Section 3.2.2.3, the *Merced Vision 2030 General Plan* identifies 11 scenic corridors within the city. This includes North Bear Creek Drive, which is located adjacent to the Project site (City of Merced 2012). However, as noted above, the segment of North Bear Creek Drive within the RSA is not particularly scenic. In addition, long range views of the Sierra Nevada Mountains to the north may also be visible from certain locations within the RSA.

Construction activities would require equipment such as construction barriers and sound walls, cranes, and other appurtenances that would be visible during much of the approximately 36-month construction period, which could begin as early as 2028. Construction activities would include similar equipment to other construction projects in the city. The construction barriers and sound walls would include a privacy screen. In addition, the designated construction areas along the alignment would experience additional truck traffic compared to existing conditions, with trucks moving materials on- and off-site, and work crews and construction equipment moving around the sites and between the Project components.

Changes to views during the construction phase would be noticeable by motorists, pedestrians, and residents in the Project area. Motorists would primarily experience fleeting views of construction activities while driving along the roadways along and adjacent to the Project alignment. However, because of the continuous movement of traffic, views from public roadways are not considered an important view location for scenic views across the urban environment. In addition, passing drivers are considered to have a low sensitivity to any visual changes as they are likely passing through the RSA to reach their destinations and do not necessarily have a personal investment in these views.

Pedestrians would primarily experience views of construction activities while walking along public sidewalks and near businesses adjacent to the Project alignment. Some residents would have private views of the Project construction from their windows. However, public and panoramic views of the Sierra Nevada Mountains to the north would continue to be available to pedestrians and residents through street corridors and would not be impacted by construction activities. Further, because construction activities are temporary in nature, construction activities would not result in a substantial adverse effect on a scenic vista. Therefore, construction of the Project would not substantially affect designated scenic vistas or views of other prominent visual resources, and impacts would be less than significant.

Variant H1

Impact Characterization

Variant H1 would process hydrogen on-site and would require the development of approximately 28 acres for the use of photovoltaic (solar) panels, hydrogen processing, and fuel storage. The area that would be developed is primarily within the footprint of the approved ACE Merced Layover and Maintenance Facility (Figure 2-6 in Chapter 2, *Project Description*).

Impact Details and Conclusions

With Variant H1, additional construction would be required in order to build the proposed photovoltaic panels, hydrogen processing, and fuel storage. However, the approved ACE Merced Layover and Maintenance Facility will undergo construction regardless of the selected variant. Therefore, the differences under Variant H1 would be discreet when compared to the Project as a whole, as well as the other proposed construction in the area, and the impacts would be less than significant.

Variant H2

Impact Characterization

Under Variant H2, hydrogen would be processed off-site and delivered via truck. Compared to Variant H1, Variant H2 would only require the additional development of a hydrogen storage facility within the footprint of the approved ACE Merced Layover and Maintenance Facility (Figure 2-6 in Chapter 2, *Project Description*). It would not require photovoltaic panels or other hydrogen processing equipment.

Impact Details and Conclusions

Variant H2 would only require the addition of a hydrogen storage facility within the footprint of the approved ACE Merced Layover and Maintenance Facility. Construction of this feature is anticipated to be discrete and would not lead to additional visual impacts. Therefore, the impacts would be less than significant.

Variant H3

Impact Characterization

As with Variant H2, Variant H3 would import hydrogen produced off-site, and would only require the additional development of a hydrogen storage facility within the footprint of the approved ACE Merced Layover and Maintenance Facility. The sole difference between these two variants is that hydrogen produced off-site would be imported via rail instead of truck, which would not require any additional infrastructure compared to Variant H2.

Impact Details and Conclusions

Since Variant H3 would only require the additional development of a hydrogen storage facility within the footprint of the approved ACE Merced Layover and Maintenance Facility, as with Variant H2, the impacts would be less than significant.

Impact AE-2	Construction of the Project would not substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway.
Level of Impact	**No impact**

Project

Impact Characterization

Project construction would not result in substantial damage to scenic resources within a state scenic highway.

Impact Details and Conclusions

As discussed in Section 3.2.3, *Environmental Setting*, no state- or county-designated scenic highways or eligible state scenic highways are in the RSA. The closest officially designated state scenic highway is I-5, which is located approximately 40 miles west of the Project, and SR 140, which is located approximately 40 miles northeast of the Project. The Project is not within the viewshed of either of these scenic highways.

Because no state scenic highways are in the RSA, the Project would have no impact on scenic resources within a state scenic highway. Therefore, construction of the Project would not substantially damage scenic resources within a state scenic highway, and no impact would occur.

Variant H1

Impact Characterization

Project construction with Variant H1 would not result in substantial damage to resources within a state scenic highway.

Impact Details and Conclusions

Because no state scenic highways are in the RSA, Variant H1 would not change the impact determination above. Therefore, no impact would occur.

Variant H2

Impact Characterization

Project construction with Variant H2 would not result in substantial damage to resources within a state scenic highway.

Impact Details and Conclusions

Because no state scenic highways are located in the RSA, Variant H2 would not change the impact determination above. Therefore, no impact would occur.

Variant H3

Impact Characterization

Project construction with Variant H3 would not result in substantial damage to resources within a state scenic highway.

Impact Details and Conclusions

Because no state scenic highways are in the RSA, Variant H3 would not change the impact determination above. Therefore, no impact would occur.

Impact AE-3	In non-urbanized areas, construction of the Project would not substantially degrade the existing visual character or quality of public views[1] of the site and its surroundings. If the project is in an urbanized area, construction of the project would not conflict with applicable zoning and other regulations governing scenic quality.
Level of Impact	**Less-than-significant impact**

Project

Impact Characterization

As defined by CEQA Guidelines Section 15387, the RSA is located in an urbanized area within the City of Merced. Chapter 6 of the City of Merced's General Plan, *Merced Vision 2030,* provides goals and guidelines for urban design within the city, including a focus on transit-ready development.

Construction equipment and activities would be visible throughout the construction phase of the Project, which would result in a visual change from existing condition. Motorists would primarily experience fleeting views of construction activities while driving along the roadways along and adjacent to the Project alignment. Pedestrians would primarily experience views of construction activities while walking along public sidewalks and near businesses adjacent to the Project alignment, and some residents would have private views of the Project construction from their windows. Overall, the Project construction would potentially stand out as a memorable or remarkable feature in the landscape due to its scale, which would have a temporary impact on visual character and quality of the RSA and its surroundings compared to existing conditions. However, construction is not anticipated to conflict with the applicable zoning or regulations.

[1] Public views are those that are experienced from a publicly accessible vantage point.

Impact Details and Conclusions

The Project and its construction would take place primarily within areas zoned Commercial, Light Industrial, and Heavy Industrial, as discussed in Section 3.11.3, *Environmental Setting*. There are also some adjacent areas zoned for Planned Development and Low Density Residential.

Construction activities for the Project would include the addition of construction equipment, vehicles, signs, staging, and personnel within the RSA. Construction activities would result in site disturbances; partial or full demolition of existing structures; use and movement of heavy construction equipment; import and export of materials; and removal of vegetation, use of erosion devices, and installation of piles, columns, and piers. Construction would also require the temporary use of staging and laydown areas to stockpile and prepare materials and store and maintain equipment and vehicles. During the construction phase, temporary lighting would be installed, and the RSA would be fenced off with a chain-linked fence and construction noise barriers, resulting in a visual change from existing conditions. This would help to minimize the visual nuisance and ensure that the visual character and quality of the immediate area is not substantially degraded during construction.

As stated in Section 3.11.4, *Impact Analysis*, the Project and variants would be compliant with the *2030 Merced County General Plan* (Merced County 2013) and Merced County Unified Development Ordinance, as the Project would conform to the applicable land uses and zoning ordinances for Merced County. Additionally, the Project would be consistent with the City of Merced's General Plan, *Merced Vision 2030,* and its zoning ordinance, by furthering the former's goals and conforming to the latter's regulations.

Project construction will conform to the regulations of both the County and City's zoning ordinances. The following best management practices would be implemented during construction whenever feasible and would reduce temporary visual impacts: erosion control devices, such as silt fences, would be removed as soon as the area is stabilized; stockpile areas would be neatly organized and covered depending on weather events; and stockpiled areas would be located in less visibly sensitive areas.

Overall, construction would represent a temporary change in the visual quality and character of the RSA, similar to other construction projects in the city. Impacts from construction activities would be temporary, and post-construction views of Project-related construction activities, equipment, stockpiles, and fencing would be removed once construction is completed. As stated above, the Project would conform to the applicable zoning ordinances and general plan policies governing land use. Therefore, the Project would not conflict with applicable zoning and other regulations governing scenic quality and impacts during construction would be less than significant.

Mitigation Measures

No mitigation would be required.

Significance with Application of Mitigation Measures

As described above, impacts would be less than significant and no mitigation would be required.

Variant H1

Impact Characterization

Variant H1 would require the additional construction of approximately 28 acres of photovoltaic panels, hydrogen processing, and fuel storage. If this variant is selected, construction would be slightly intensified.

Impact Details and Conclusions

Variant H1 was included in the study of applicable zoning ordinances and land use policies. It would not conflict with either the City or County's zoning ordinances or land use policies. Therefore, the impact of construction of Variant H1 would be less than significant.

Variant H2

Impact Characterization

Variant H2 would require the additional construction of one hydrogen fuel storage facility within the footprint of the approved ACE Merced Layover and Maintenance Facility.

Impact Details and Conclusions

The proposed fuel storage facility under Variant H2 would not substantially intensify construction, and it would not conflict with the applicable zoning ordinances or land use policies. Therefore, the impact of construction of Variant H2 would be less than significant.

Variant H3

Impact Characterization

Variant H3 would construct the same hydrogen fuel storage facility as Variant H2.

Impact Details and Conclusions

As with Variant H2, the impact of construction under Variant H3 would be less than significant.

Impact AE-4	In non-urbanized areas, construction of the Project would not create a new source of substantial light or glare that would adversely affect day or nighttime views in the area.
Level of Impact	**Less-than-significant impact**

Project

Impact Characterization

Project construction would result in additional lighting that has the potential to create a new source of substantial light or glare that would adversely affect day or nighttime views in the area.

Impact Details and Conclusions

Because the Project is located in an urbanized area, there is a substantial amount of existing lighting and glare. The existing sources of light and glare in the RSA consist of mainly exterior building lights, lighted signs, streetlights, roadways, signal lights, and parking area lights, as well as roadway lighting and safety lighting. Shading sources include buildings, other structures, utilities, and vegetation.

Construction activities would primarily occur during daytime hours. Some activities may require work outside of daytime hours (e.g., concrete pours, activities to close street lanes). If limited construction activities occur outside of daytime hours, lighting would be directed toward the construction areas, and minimal spillover lighting is anticipated. Construction would result in additional lighting at staging and station, junction, and tower construction areas. This would require sufficient lighting for construction crews; however, the lighting equipment would be hooded and shielded to minimize spillover effects and glare. Construction would not significantly increase the ambient light levels in the vicinity because construction duration would be short and temporary, would be confined to localized sites, and would not constitute a substantial source of light or glare. Therefore, the Project would have a less than significant impact related to light and glare during construction.

Variant H1

Impact Characterization

Construction of Variant H1 would require the additional development of approximately 28 acres of photovoltaic panels, hydrogen processing, and fuel storage. This may result in additional temporary lighting if construction of these features requires nighttime work.

Impact Details and Conclusions

While Variant H1 would require additional construction, it is not anticipated to substantially increase the amount of light and glare in the RSA, even if some portion of the work takes place at night. This work would take place within the footprint of the approved ACE Merced Layover and Maintenance Facility, where other construction would take place regardless of the chosen variant. Therefore, the impacts would be less than significant.

Variant H2

Impact Characterization

In contrast to Variant H1, Variant H2 would only require the construction of a new hydrogen storage facility. This facility would be sited adjacent to the approved maintenance and wash building and would have a relatively small footprint.

Impact Details and Conclusions

Due to the subtle nature of the additional construction proposed under Variant H2, the impacts would be less than significant.

Variant H3

Impact Characterization

As with Variant H2, Variant H3 would only require the construction of a new hydrogen storage facility. This facility would be sited adjacent to the approved maintenance and wash building and would have a relatively small footprint.

Impact Details and Conclusions

As with Variant H2, the impact would be less than significant.

Impact AE-5	Operation of the Project would not have a substantial adverse effect on a scenic vista.
Level of Impact	**Less- than-significant impact**

Project

Impact Characterization

Operation of the Project would represent a change in views within the RSA, which is primarily an urban environment with limited long-range views of the Sierra Nevada Mountains to the north. North and South Bear Creek Drive, which is a designated scenic corridor, is located adjacent to the Project site, and has the potential to be impacted during Project operation.

Impact Details and Conclusions

Operation of the Project would represent a change in views compared to existing conditions. Shown on Figure 3.2-17 to Figure 3.2-21, four Key Observation Points (KOP) were identified. These locations include sensitive viewers that have the potential to be visually impacted by the Project.

As previously discussed, the RSA is characterized by a primarily urban environment featuring a variety of commercial, industrial, agricultural, and residential development, including passive open space areas and transportation uses. In addition, as discussed in Section 3.2.2.3, the *Merced Vision 2030 General Plan* identifies North and South Bear Creek Drive, which is located adjacent to the Project site, as a scenic corridor within the city (City of Merced 2012). In addition, long-range views of the Sierra Nevada Mountains to the north may also be visible from certain locations within the RSA.

While the Project would include tall visual elements such as the proposed aerial guideway and its support columns, views of other scenic or panoramic views would continue to be visible from more prominent view locations, such as park areas, or other sections along local streets. In addition, the Project would comprise a very small portion of the broad urban view field. As such, the Project as viewed from public areas would not block prominent views of notable visual features.

Overall, the Project would not significantly block scenic or panoramic views, such as views of the North and South Bear Creek Drive scenic corridor or long-range views of the Sierra Nevada Mountains. The simulated views of the Project, shown on Figure 3.2-18 to Figure 3.2-21, illustrate that views considered to be scenic locally would not be substantially impacted. Therefore, the Project would not block any designated scenic views, alter a designated scenic area, or block panoramic views. As such, operation of the Project would not substantially affect scenic vistas or other panoramic views, and impacts would be less than significant.

Variant H1

Impact Characterization

Variant H1 would require the additional development of 28 acres of photovoltaic panels, hydrogen processing storage, primarily within the footprint of the approved ACE Merced Layover and Maintenance Facility. These proposed features would be typical of the RSA's existing visual character at the facility footprint, which is characterized by industrial and commercial land uses. The proposed features under Variant H1 would be primarily visible from Cooper Avenue and Ashby Road, where visual quality is unremarkable, and within the context of existing industrial and commercial land uses. They would connotate infill development that would not appear out of place and would not substantially alter existing visual character or quality.

Impact Details and Conclusions

The proposed features under Variant H1 would not significantly block scenic or panoramic views and would be fairly discrete within the approved ACE Merced Layover and Maintenance Facility. Therefore, the impacts would be less than significant.

Variant H2

Impact Characterization

Variant H2 would not require hydrogen processing on-site and would only require the additional development of a hydrogen storage facility. This facility would be sited adjacent to the approved maintenance and wash building (Figure 2-6) and would appear contiguous within the context of the approved facility.

Impact Details and Conclusions

The proposed hydrogen storage facility under Variant H2 would not affect scenic or panoramic views in the RSA. Therefore, the impacts would be less than significant.

Variant H3

Impact Characterization

The potential impact under Variant H3 would be the same as Variant H2. This variant would also require the additional development of a hydrogen storage facility adjacent to the approved maintenance and wash building.

Impact Details and Conclusions

As with Variant H2, Variant H3 would not affect scenic or panoramic views in the RSA. Therefore, the impacts would be less than significant.

Impact AE-6	Operation of the Project would not substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway.
Level of Impact	**No impact**

Project

Impact Characterization

Operation of the Project would not result in substantial damage to scenic resources within a state scenic highway.

Impact Details and Conclusions

As previously discussed, no state- or county-designated scenic highways or eligible state scenic highways are located in the RSA. As such, the Project would not damage any scenic resources within a state scenic highway. Therefore, operation of the Project would not substantially damage scenic resources within a state scenic highway, and no impact would occur.

Variant H1

Impact Characterization

Operation of the Project with Variant H1 would not result in substantial damage to resources within a state scenic highway.

Impact Details and Conclusions

Because no state scenic highways are located in the RSA, Variant H1 would not change the impact determination above. Therefore, no impact would occur.

Variant H2

Impact Characterization

Operation of the Project with Variant H2 would not result in substantial damage to resources within a state scenic highway.

Impact Details and Conclusions

Because no state scenic highways are located in the RSA, Variant H2 would not change the impact determination above. Therefore, no impact would occur.

Variant H3

Impact Characterization

Operation of the Project with Variant H3 would not result in substantial damage to resources within a state scenic highway.

Impact Details and Conclusions

Because no state scenic highways are located in the RSA, Variant H3 would not change the impact determination above. Therefore, no impact would occur.

Impact AE-7	In non-urbanized areas, operation of the Project would not substantially degrade the existing visual character or quality of public views[2] of the site and its surroundings. If the project is in an urbanized area, operation of the project would not conflict with applicable zoning and other regulations governing scenic quality.
Level of Impact	**Less-than-significant impact**

Project

Impact Characterization

The Project would result in visual changes due to the elevated, bulky, concrete railway structures and additional railway infrastructure. As such, operation of the Project has the potential to conflict with applicable zoning and other regulations governing scenic quality.

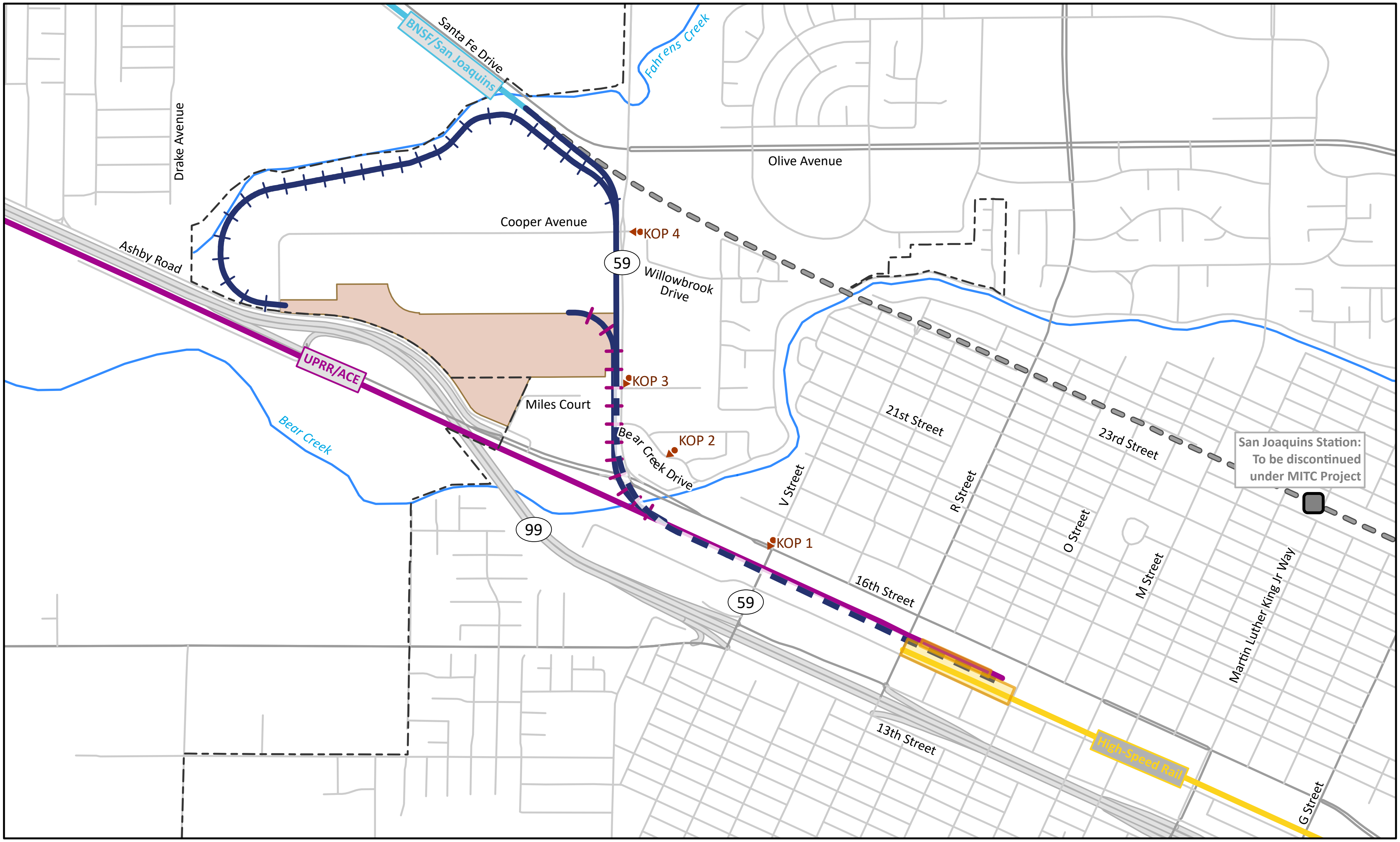
Impact Details and Conclusions

As defined by CEQA Guidelines Section 15387, the RSA is located in an urbanized area within the City of Merced. Thus, a significant impact under CEQA could occur if the Project conflicts with applicable zoning and other regulations governing scenic quality during operations.

To assess the potential visual changes that would result from the operation of the Project, four KOPs were specifically selected to depict the Project's visual changes. Visual simulations from these KOPs were prepared to provide a before and after comparison of the visual effects that would result from the Project. The KOPs are representative of direct views within the RSA; simulations from the same locations show how these views would change as a result of the implementation of the Project. The simulated views represent conceptual design and are not intended to represent the final Project design. The locations of the KOPs are shown on Figure 3.2-17.

The *Merced Vision 2030 General Plan* and zoning ordinance do not regulate scenic quality other than building height and general aesthetics. The Project would mostly operate at-grade or within the existing public or UPRR ROW. Certain elements that would be located on properties outside of the public ROW (e.g., mechanical equipment) would comply with applicable zoning and design requirements, including undergoing mandated design review where applicable and coordinating with local jurisdictions during preliminary and final design. Therefore, operation of the Project would not conflict with local zoning ordinances pertaining to scenic quality and impacts would be less than significant.

[2] Public views are those that are experienced from a publicly accessible vantage point.



Existing UPRR/Approved ACE

Proposed High-Speed Rail

Existing BNSF/San Joaquins

Proposed Integrated Merced High-Speed Rail Station

Approved ACE Merced Layover and Maintenance Facility

City of Merced Boundary

MITC Project

San Joaquins: Elevated Track

San Joaquins: At-grade Track

San Joaquins: Layover and Maintenance Access Line

ACE/UPRR Spur Track

San Joaquins: To be discontinued under MITC Project

Key Observation Point (view direction)

Data Source: City of Merced

0 1,000 2,000 Feet

Figure 3.2-17
Key Observation Points
Merced Intermodal Track Connection Project

MITC

Overall, the operation of the Project would represent a visual change compared to existing conditions. However, the Project is in a primarily urbanized area that provides a mix of architectural styles and land uses. As discussed throughout the KOP analysis below, viewers in the RSA—such as pedestrians, residents, commuters, and patrons and employees of commercial businesses—would have a low to moderate sensitivity to this visual change.

As shown on Figure 3.2-18, KOP 1 shows a pedestrian's and motorist's view from V Street looking southwest toward the existing UPRR ROW from 16h Street. Existing small-scale commercial buildings and signage are visible, along with sidewalks, streetscape, railroad crossing gates, and parking areas. Long-range views consist of additional commercial building and signage, and an SR 99 overpass. This is a view typically seen by patrons and employees of nearby commercial businesses in the RSA, as well as pedestrians and bicyclists. There are no visual resources within this area, and there are no unique views of the local mountains, and no protected views.

The primary visual change attributed to the Project is the new aerial guideway adjacent to the existing UPRR ROW. The elevated structure would stand approximately 40 feet tall (top of guardrail) constructed of concrete, and similar to the existing elevated segments of the San Joaquins rail.

The proposed changes in this area are anticipated to be somewhat noticeable but would be typical for the existing mixed urban and industrial environment. Elevated concrete railway structures crossing commercial thoroughfares are typically more visually tolerable commercial areas. These features, while conspicuous, would be congruent with other railway infrastructure in the area.

The view from KOP 1 represents a visual change compared to existing conditions and would block views to the northeast for motorists and pedestrians. However, while these features, particularly the aerial guideway, would be highly visible, they would not substantially obstruct views of the to the north, because the flat topography of the area and surrounding industrial and commercial development already prevent clear views of the horizon. Due to the urban nature of the RSA, and the visual presence of the existing freight tracks within the UPRR ROW, the Project would not represent a substantial visual change from the existing environment.

In addition, the Project would be generally consistent with the local policies regarding visual character and quality, and the alteration of the setting with the new visual element would not substantially degrade the existing visual character or quality of public views of the site and its surroundings.

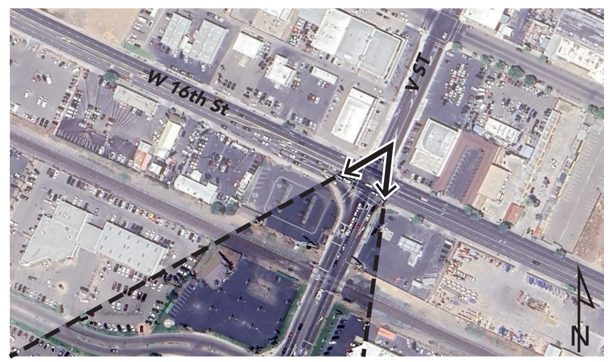
As shown on Figure 3.2-19, KOP 2 shows a pedestrian and recreationalist's view looking southwest from Stephan Gray Park toward the mature trees, picnic tables, fencing, and grassy open space areas within the park. In this area, long-range views of overhead power transmission lines and mature trees are also visible. This is also a view typically seen by pedestrians and residents in the area. There are no visual resources within this area, and there are no unique views of the local mountains or Bear Creek, and no protected views.

KOP 2 shows the primary visual change is the addition of the new aerial guideway. Viewer groups, including residents in this area, would notice the visual changes associated with the Project due to its proximity to residential homes.

KOP 1 - V Street

KOP 1 - Before Project

KOP 1 - After Project



Assumptions for Key Observation Point (KOP)

- 16th & V Street (1607 V St) – Looking southwest

Figure 3.2-18

Visual Impact Assessment

Merced Intermodal Track Connection Project

KOP 2 - Stephen Gray Park

KOP 2 - Before Project

KOP 2 - After Project

Assumptions for Key Observation Point (KOP)

- Stephen Gray Park (1755 W N Bear Creek Dr) – Looking west/south west

Graphics … projectnumber (date) initials

Figure 3.2-19

Visual Impact Assessment

Merced Intermodal Track Connection Project

MITC

As noted in Section 3.2.2.3, the *Merced Vision 2030 General Plan* identifies 11 scenic corridors within the city, including the North Bear Creek Drive scenic corridor, shown on Figure 3.2-1. The City's General Plan states under Policy 1.3 that the City should utilize established guidelines for the review of projects proposed within a designated scenic corridor. The Project would be developed adjacent to this scenic corridor and would be generally consistent with the local policies regarding visual character and quality, including Policy 1.3. In addition, the RSA is primarily urbanized and the viewer groups in this area are accustomed to the use of the existing railroad ROW by freight trains. The Project's features would not substantially obstruct views of Bear Creek to the south, because the surrounding residential development, fencing, and mature landscaping already prevent clear views of Bear Creek.

As shown on Figure 3.2-20, existing views at KOP 3 show a pedestrian's and resident's view looking south from the entrance of the Riviera Holiday Mobile Estates. Existing views at KOP 3 from pedestrians and residents consist mainly of one-story mobile homes, fencing, overhead power lines, ornamental landscaping, and large trees within the residential community. In addition, the existing spur track of the UPRR ROW is also visible, which travels along a large earthen berm parallel to SR 59. Long-range views include the tops of mature trees and a large billboard that is visible beyond the spur track. This is a view typically seen by residents in this area of the RSA, as well as pedestrians. There are no visual resources within this area, and there are no unique views of the local mountains or Bear Creek, and no protected views.

KOP 3 shows views from residents and pedestrians looking south from the entrance of the Riviera Holiday Mobile Estates with the visual simulation of the Project. As shown in the visual simulation, the aerial guideway is visible in this location as it transitions from aerial to at-grade adjacent to the entrance of the Riviera Holiday Mobile Home Estates. Viewer groups, including residents in this area, would notice the visual changes associated with the Project due to its proximity to residential homes.

The RSA is primarily urbanized and the viewer groups in this area are accustomed to the use of the existing railroad ROW by freight trains and adjacent industrial uses. However, the scale and intensity of development related to the Proposed Project would noticeably alter the visual character of this area.

The Project is at-grade as it crosses Cooper Avenue and would require the acquisition of Merced County Office of Education building located in the northwest segment of the intersection. The Project track and safety features, including rail crossing gates, signals and a signal house would be visible. These features would be congruent with other railway infrastructure in the area. the Project would be generally consistent with the local policies regarding visual character and quality, and the alteration of the setting with the new visual element would not substantially degrade the existing visual character or quality of public views of the site and its surroundings.

As shown on Figure 3.2-21, KOP 4 shows a pedestrian's and motorist's view from Willowbrook Drive looking west toward the SR 59/ Cooper Avenue intersection. Light poles, mature trees and landscaping, and light industrial buildings are within the short-range view. Long-range views consist mature trees and additional buildings in the industrial area. This is a view typically seen by motorists, cyclist and pedestrians exiting the residential area accessed via Willowbrook Drive. There are no visual resources within this area, there are no unique views of the local mountains, and no protected views.

KOP 3 - Riviera Holiday Estates

KOP 3 - Before Project

KOP 3 - After Project

Assumptions for Key Observation Point (KOP)

- Riviera Entrance (2500 N State Hwy 59) – Looking south

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Figure 3.2-20

Visual Impact Assessment

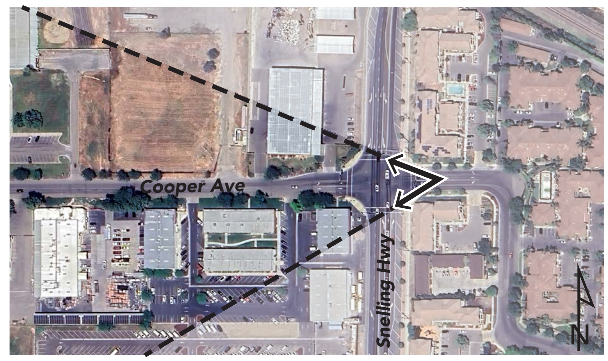
Merced Intermodal Track Connection Project

MITC

KOP 4 - Willowbrook Drive

KOP 4 - Before Project

KOP 4 - After Project



Assumptions for Key Observation Point (KOP)

- Willowbrook Drive (3028 Willowbrook Dr) – Looking west

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Figure 3.2-21
Visual Impact Assessment
Merced Intermodal Track Connection Project

Figure 3.2-20 also shows views looking northwest with the visual simulation of the Project. As shown in the visual simulation, the primary visual change is the addition of the new aerial guideway. The elevated structure would consist of concrete, similar to the existing elevated segments of the San Joaquins rail.

The Proposed Project would be generally consistent with the local policies regarding visual character and quality, Furthermore, the Proposed Project would not block long range views of any prominent visual features.

The Project would also incorporate design elements to limit impacts to views of the scenic corridor, including screening unsightly mechanical and utility structures, preserving, and properly maintaining existing stands of trees, and limiting the height of structures to avoid obstructing important scenic views.

Overall, the Project would be generally consistent with the local policies regarding visual character and quality, and the alteration of the setting with the new visual element would not substantially degrade the existing visual character or quality of public views of the site and its surroundings and impacts would be less than significant.

Variant H1

Impact Characterization

Variant H1 would develop approximately 28 acres of photovoltaic panels, hydrogen processing, and fuel storage within the footprint of the approved ACE Merced Layover and Maintenance Facility.

Impact Details and Conclusions

None of the additional features proposed under Variant H1 would be visible from the KOPs discussed above. Regardless, these features would be constructed on land zoned primarily Commercial, Light Industrial, and Heavy Industrial, and would not conflict with the applicable zoning ordinances and land use polices. Additionally, the proposed features would be typical for land with such uses, and would therefore not appear visually intrusive. Therefore, the impacts would be less than significant.

Variant H2

Impact Characterization

Variant H2 would not construct photovoltaic panels and would only construct a hydrogen fuel storage facility within the footprint of the approved ACE Merced Layover and Maintenance Facility.

Impact Details and Conclusions

Since the added features under Variant H2 would be limited to one fuel storage facility within an existing commercial and industrial area, it is not anticipated to substantially impact visual character or quality. Therefore, the impacts would be less than significant.

Variant H3

Impact Characterization

Variant H3 would not construct photovoltaic panels and would only construct a hydrogen fuel storage facility within the footprint of the approved ACE Merced Layover and Maintenance Facility, as with Variant H2.

Impact Details and Conclusions

Since the added features under Variant H3 would be limited to one fuel storage facility within an existing commercial and industrial area, it is not anticipated to substantially impact visual character or quality. Therefore, the impacts would be less than significant.

Impact AE-8	In non-urbanized areas, operation of the Project would not create a new source of substantial light or glare that would adversely affect day or nighttime views in the area.
Level of Impact	**Less-than-significant impact**

Project

Impact Characterization

Operation of the Project would result in additional lighting that has the potential to create a new source of substantial light or glare that would adversely affect day or nighttime views in the area.

Impact Details and Conclusions

As previously discussed, the RSA is urbanized and has a high level of existing ambient lighting. During operation, the Project would be lit to provide adequate lighting for maintenance activities and ensure a safe environment. New light sources would include security lighting and point sources of lighting at the proposed integrated Merced HSR Station that would contribute to the overall ambient nighttime lighting conditions in the RSA. However, the lighting would be comparable to existing lighting within the commercial and industrial area adjacent to the proposed station. The lighting would also comply with applicable lighting regulations that would be verified during the permitting process, and would be hooded and angled away from adjacent land uses. The increase in light that would be generated by the Project would not adversely affect day or nighttime views in the area. Therefore, the Project would have a less than significant impact related to light and glare during operation.

Variant H1

Impact Characterization

In addition to the project features discussed above, Variant H1 would also construct approximately 28 acres of photovoltaic panels, hydrogen processing, and fuel storage. The proposed photovoltaic panels could create a new source of daytime glare, depending on their reflectivity and angle. This glare may be visible to travelers on SR 99 and the adjacent Ashby Road.

Impact Details and Conclusions

The photovoltaic panels proposed under Variant H1 could create a new source of light and glare. It is anticipated that they would only be visible for a short period of time for travelers on SR 99 and Ashby Road. However, this glare could produce a hazard to travelers on SR 99 and Ashby Road, even if seen only for short intervals. Therefore, the impacts could be potentially significant.

Mitigation Measures

Mitigation Measure AES-1.1: Tree Planting and Establishment

In order to mitigate the potential glare impact of the proposed solar panels under Variant H1, trees will be planted along the southern perimeter of the approved ACE Merced Layover and Maintenance Facility. The type of trees and establishment period will be determined during the Project's detailed design phase.

Significance with Application of Mitigation Measures

With the application of Mitigation Measure AES-1.1, the potential impact of glare from the proposed solar panels under Variant 1 would be sufficiently mitigated to a less than significant level.

Variant H2

Impact Characterization

Variant H2 would not include photovoltaic panels or hydrogen processing. It would only construct a hydrogen storage/fueling facility adjacent to the approved maintenance and wash building.

Impact Details and Conclusions

Whether or not the proposed storage/fueling facility under Variant H2 would be lit is inconsequential relative to the existing and proposed lighting in the area. Therefore, the impacts would be less than significant.

Variant H3

Impact Characterization

The potential impacts under Variant H3 are the same as Variant H2, as this variant would only construct a hydrogen storage/fueling facility.

Impact Details and Conclusions

As with Variant H2, the impacts would be less than significant.

3.3 Air Quality and Greenhouse Gas Emissions

3.3.1 Introduction

This section describes the regulatory and environmental setting for air quality and greenhouse gas (GHG) emissions in the vicinity of the Project. It also describes the impacts on air quality and GHGs that would result from the Project and mitigation measures that would reduce significant impacts, where feasible and appropriate. Appendix 3.3-1 of this environmental impact report (EIR), *Air Quality, Greenhouse Gas, and Health Risk Assessment Supporting Documentation*, contains additional technical information for this section.

The Project infrastructure would be constructed and operated in Merced County in the San Joaquin Valley Air Basin (SJVAB). For the purposes of this analysis, localized air quality conditions are considered within 1,000 feet of the MITC environmental footprint (see Figure 3.3-2). Regional air quality conditions are considered throughout the SJVAB. Operation of the Project would increase ridership on ACE and San Joaquins through the adjacent San Francisco Bay Area Air Basin (SFBAAB) and Sacramento Valley Air Basin (SVAB). This increased ridership will reduce driving in these air basins, contributing to emissions reductions. Thus, in addition to the regional air quality analysis conducted for the SJVAB, which assesses the net change in Project generated emissions and benefits, this section also presents air quality benefits that will be achieved in the SFBAAB and SVAB from reductions in vehicle miles traveled (VMT) and automobile trips throughout these geographies. The SFBAAB and SVAB are collectively referred to as the expanded air quality study area.

Climate change is a global problem, and GHGs are global pollutants. Thus, GHG impacts are inherently cumulative, and GHG emissions are considered across the entire state and global atmosphere. The GHG analysis evaluates emissions generated by Project infrastructure in Merced County and emissions benefit achieved across the SJVAB, SFBAAB, and SVAB from reduced VMT and trips.

Cumulative impacts on air quality and GHG emissions, in combination with planned, approved, and reasonably foreseeable projects, are discussed in Chapter 4, *Cumulative Impacts*.

3.3.2 Regulatory Setting

This section summarizes the federal, state, regional, and local regulations related to air quality and GHG emissions applicable to the Project. Relevant regulatory agencies include the U.S. Environmental Protection Agency (USEPA), California Air Resources Board (CARB), and local air districts. There are 38 air districts in California, with the San Joaquin Valley Air Pollution Control District (SJVAPCD) having local authority in the SJVAB. The Bay Area Air Quality Management District (BAAQMD) and the Sacramento Metropolitan Air Quality Management District (SMAQMD) have local air quality jurisdiction over portions of the Project service areas in the SFBAAB and SVAB, respectively, as shown in Figure 3.3-1. The figure also shows the air basin boundaries for the SJVAB, SFBAAB, and SVAB.

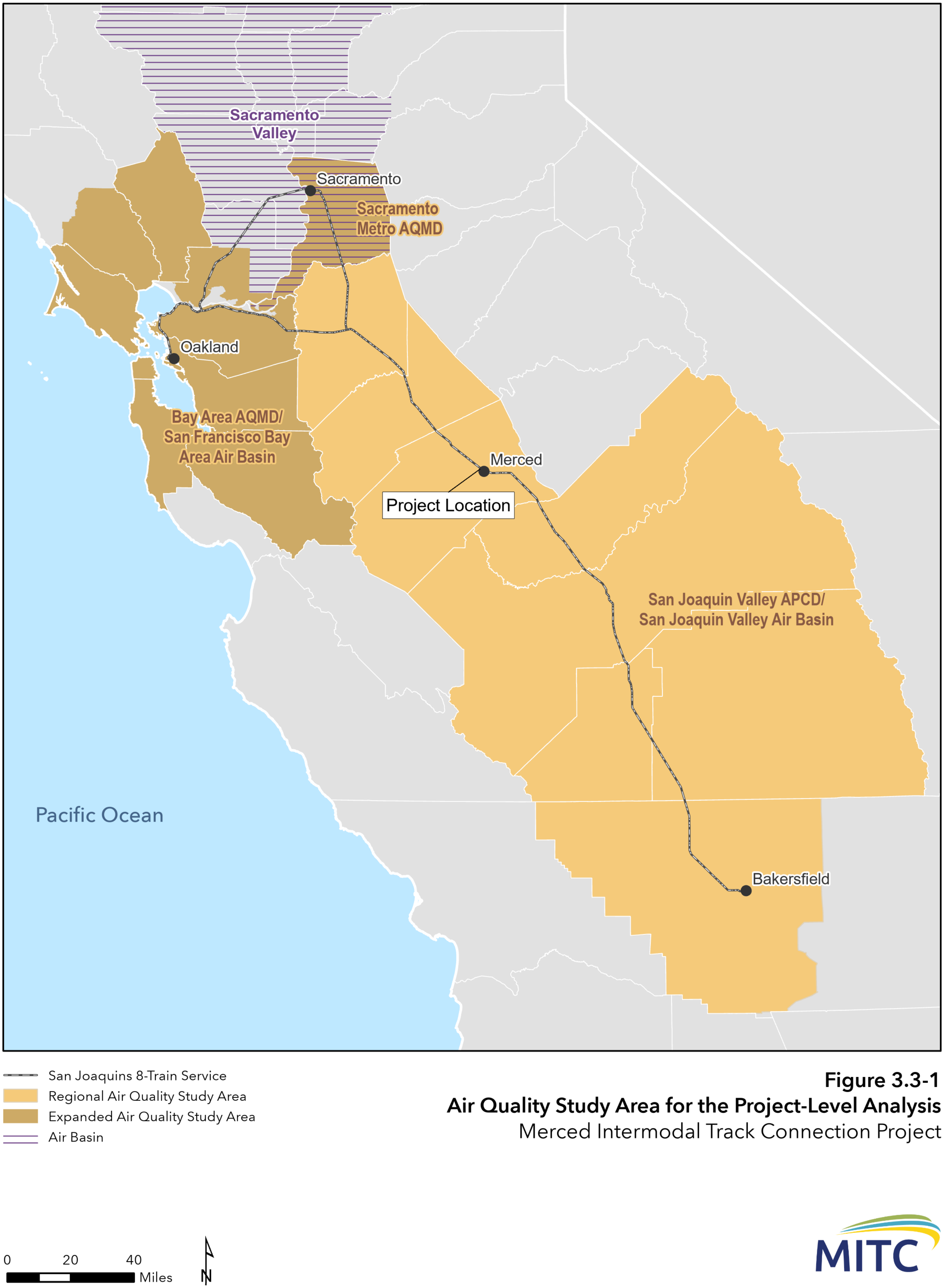

Figure 3.3-1
Air Quality Study Area for the Project-Level Analysis
Merced Intermodal Track Connection Project

3.3.2.1 Federal

Clean Air Act and Ambient Air Quality Standards

The federal Clean Air Act (CAA), promulgated in 1963 and amended several times thereafter, including the 1990 CAA amendments, establishes the framework for modern air pollution control in the United States. CAA directs USEPA to establish federal air quality standards, known as national ambient air quality standards (NAAQS), and specifies future dates for achieving compliance. USEPA has set NAAQS for six "criteria" pollutants: ozone, carbon monoxide (CO), particulate matter (PM) of 10 microns in diameter and smaller (PM10) and 2.5 microns in diameter and smaller (PM2.5), sulfur dioxide (SO_2), nitrogen dioxide (NO_2), and lead (Pb). NAAQS are divided into primary and secondary standards; the former are set to protect human health with an adequate margin of safety, the latter to protect environmental values, such as plant and animal life. Table 3.3-1 summarizes NAAQS currently in effect for each criteria pollutant. The California ambient air quality standards (CAAQS) (discussed in Section 3.3.2.2, *State*) are also provided for reference.

Table 3.3-1. Federal and State Ambient Air Quality Standards

Criteria Pollutant and Average Time	California Standards	National Standards [a]	
		Primary	Secondary
Ozone—1-hour	0.09 ppm	None [b]	None [b]
Ozone—8-hour	0.070 ppm	0.070 ppm	0.070 ppm
Particulate Matter (PM10)—24-hour	50 μg/m³	150 μg/m³	150 μg/m³
Particulate Matter (PM10)—Annual mean	20 μg/m³	None	None
Fine Particulate Matter (PM2.5)—24-hour	None	35 μg/m³	35 μg/m³
Fine Particulate Matter (PM2.5)—Annual mean	12 μg/m³	9.0 μg/m³	15 μg/m³
Carbon Monoxide—8-hour	9.0 ppm	9 ppm	None
Carbon Monoxide—1-hour	20 ppm	35 ppm	None
Nitrogen Dioxide—Annual mean	0.030 ppm	0.053 ppm	0.053 ppm
Nitrogen Dioxide—1-hour	0.18 ppm	0.100 ppm	None
Sulfur Dioxide—Annual mean [c]	None	0.030 ppm	None
Sulfur Dioxide—24-hour [c]	0.04 ppm	0.014 ppm	None
Sulfur Dioxide—3-hour	None	None	0.5 ppm
Sulfur Dioxide—1-hour	0.25 ppm	0.075 ppm	None
Lead—30-day average	1.5 μg/m³	None	None
Lead—Calendar quarter	None	1.5 μg/m³	1.5 μg/m³
Lead—3-month average	None	0.15 μg/m³	0.15 μg/m³
Sulfates—24-hour	25 μg/m³	None	None
Visibility-Reducing Particles—8-hour	– [d]	None	None
Hydrogen Sulfide—1-hour	0.03 ppm	None	None
Vinyl Chloride—24-hour	0.01 ppm	None	None

Source: California Air Resources Board 2016.

ppm= parts per million; μg/m³ = micrograms per cubic meter; NAAQS = national ambient air quality standards; SO_2 = sulfur dioxide; CAAQS = California ambient air quality standards.

[a] National standards are divided into primary and secondary standards. Primary standards are intended to protect public health, whereas secondary standards are intended to protect public welfare and the environment.

[b] The federal 1-hour standard of 12 parts per hundred million was in effect from 1979 through June 15, 2005. The revoked standard is referenced because it was employed for such a long period and is a benchmark for state implementation plans.

[c] The annual and 24-hour NAAQS for SO_2 only apply for 1 year after designation of the new 1-hour standard to those areas that were previously in nonattainment for 24-hour and annual NAAQS.

[d] CAAQS for visibility-reducing particles is defined by an extinction coefficient of 0.23 per kilometer – visibility of 10 miles or more due to particles when relative humidity is less than 70percent.

The CAA also mandates that the state submit and implement a state implementation plan (SIP) for local areas not meeting those standards. The SIP must include pollution control measures that demonstrate how the standards will be met by the dates specified in CAA.

Locomotive Emission Standards

In March 2008, USEPA adopted a three-part emissions standard program that will reduce criteria pollutant emissions from diesel locomotives. The regulation tightens emission standards for existing, remanufactured locomotives, and sets exhaust emission standards for newly built locomotives of model years 2011 through 2014 (Tier 3) and 2015 and beyond (Tier 4). The regulation is expected to reduce PM emissions from locomotive engines by as much as 90 percent and nitrogen oxide (NO_X) emissions by as much as 80 percent when fully implemented.

Vehicle Emission Standards

The National Highway Traffic Safety Administration (NHTSA) and USEPA set corporate average fuel economy (CAFE) standards for passenger cars and for light trucks (collectively, light-duty vehicles), and separately sets fuel consumption standards for medium- and heavy-duty trucks and engines. The existing CAFE standards require an industry-wide fleet average of approximately 49 miles per gallon for passenger cars and light trucks in model year 2026, by increasing fuel efficiency by 8 percent annually for model years 2024 and 2025, and 10 percent annually for model year 2026. Phase 2 of the “Greenhouse Gas Emissions Standards and Fuel Efficiency Standards for Medium- and Heavy-Duty Engines and Vehicles” applies to model years 2019 through 2027 medium- and heavy-duty vehicles.

On April 12, 2023, USEPA proposed two new federal vehicle standards that will build on the existing CAFE and Phase 2 standards. The “Multi-Pollutant Emissions Standards for Model Years 2027 and Later Light-Duty and Medium Duty Vehicles” proposes more stringent emission standards for light-duty and medium-duty vehicles for model years 2027 through 2032 and accelerates the deployment of electric and clean vehicles. The “Greenhouse Gas Standards for Heavy-Duty Vehicles—Phase 3” establishes fleet mix performance standards for vocational vehicles (e.g., delivery trucks) and trucks typically used to haul freight.

On August 17, 2023, NHTSA published updated CAFÉ standards for passenger cars and light trucks and fuel efficiency standards for model years 2027 through 2031 that increase at a rate of 2 percent per year for passenger cars and 4 percent per year for light trucks. The proposal also includes new fuel efficiency standards for heavy-duty pickup trucks and vans for model years 2030 through 2035 that increase at a rate of 10 percent per year.

Mobile Source Air Toxics and Hazardous Air Pollutants Regulation

While NAAQS do not exist for mobile source air toxics or hazardous air pollutants, USEPA regulates these pollutants through rules and emission control programs. In February 2007, USEPA implemented a rule (Control of Hazardous Air Pollutants from Mobile Sources, February 9, 2007) to limit the benzene content of gasoline and reduce toxic emissions from passenger vehicles and gas cans. USEPA is also developing programs that would provide additional benefits (further controls) for small off-road gasoline engines, diesel locomotives, and marine engines. These regulatory controls will complement existing USEPA programs that reduce risk in local communities, including the Clean School Bus USA, the Voluntary Diesel Retrofit Program, Best Workplaces for Commuters, and the National Clean Diesel Campaign.

Executive Action on Greenhouse Gas Emissions

There is currently no federal law or legislatively mandated national GHG reduction target. However, several federal executive orders (EO) have recently been signed by President Joe Biden related to GHG emissions and climate resiliency. EO 13990, signed in January 2021, set a national goal to achieve a 50 to 52 percent reduction from 2005 levels in economy-wide net GHG pollution in 2030. EO 14057, signed in December 2021, requires federal agencies to develop strategic processes for achieving, among other things, carbon-free electricity by 2030 and 100 percent zero-emission (ZE) vehicle acquisitions by 2035. President Joe Biden has also signed two bills—Infrastructure Investment and Jobs Act (2021) and Inflation Reduction Act (2022)—that provide funding for infrastructure improvements that will reduce GHG emissions and bolster resilience to climate change.

3.3.2.2 State

California Clean Air Act and Ambient Air Quality Standards

In 1988, the California Legislature adopted the California CAA, which established a statewide air pollution control program. The California CAA requires all air districts in the state to endeavor to meet CAAQS by the earliest practical date. Unlike the federal CAA, the California CAA does not set precise attainment deadlines. Instead, the California CAA establishes increasingly stringent requirements for areas that will require more time to achieve the standards. CAAQS are generally more stringent than NAAQS and incorporate additional standards for sulfates, hydrogen sulfide, visibility-reducing particles, and vinyl chloride. CAAQS and NAAQS are listed together in Table 3.3-1.

CARB and local air districts bear responsibility for achieving California's air quality standards, which are to be achieved through district-level air quality management plans to be incorporated into the SIP. In California, USEPA has delegated authority to prepare SIPs to CARB, which, in turn, has delegated that authority to individual air districts. CARB traditionally has established state air quality standards, maintaining oversight authority in air quality planning, developing programs for reducing emissions from motor vehicles, developing air emission inventories, collecting air quality and meteorological data, and approving SIPs.

The California CAA substantially adds to the authority and responsibilities of air districts. The California CAA designates air districts as lead air quality planning agencies, requires air districts to prepare air quality plans, and grants air districts authority to implement transportation control measures. The California CAA also emphasizes the control of "indirect and area-wide sources" of air pollutant emissions. An indirect source is a facility or land use that attracts or generates motor vehicle traffic. The California CAA gives local air pollution control districts explicit authority to regulate indirect sources of air pollution and to establish traffic control measures.

State Tailpipe Emission Standards

CARB established a series of increasingly strict emission standards for new off-road diesel equipment, on-road diesel trucks, and harbor craft. Construction equipment used for the Project, including heavy-duty trucks and off-road construction equipment, will be required to comply with the standards applicable to the model year of manufacture.

CARB has established emissions standards for on-road vehicles as well and is responsible for the certification and production audit of new passenger vehicles and heavy-duty vehicles. Vehicles are not legal for sale in California until CARB-certified. Violation of the requirement for certification can subject the vehicle manufacturers and/or selling dealers to enforcement actions including a fine of up to $37,500 per vehicle.

In-Use Locomotive Regulation

CARB approved the In-Use Locomotive Regulation in April 2023 to reduce diesel-powered emissions and increase the use of ZE technology. The regulation requires locomotive operators to fund their own trust account based on the emissions created by their equipment. The funds must be used to procure cleaner (e.g., Tier 4) and ZE locomotives. The regulation also mandates that beginning in 2030, only locomotives less than 23 years old will be allowed to operate in California. Passenger locomotives and Class I and III switchers with a build date of 2030 and later, and Class I line haul locomotives with a build date of 2035 and later, must operate in a ZE configuration. The regulation prohibits all locomotives with automatic shutoff devices from idling longer than 30 minutes, unless otherwise exempt.

Carl Moyer Memorial Air Quality Standards Attainment Program

The Carl Moyer Memorial Air Quality Standards Attainment Program (Carl Moyer Program) is a voluntary program that offers grants to owners of heavy-duty vehicles and equipment. The program is a partnership between CARB and the local air districts throughout the state to reduce air pollution emissions from heavy-duty engines. Locally, the air districts administer the Carl Moyer Program.

Toxic Air Contaminant Regulation

California regulates toxic air contaminants (TAC) (equivalent to hazardous air pollutants at the federal level) primarily through the Toxic Air Contaminant Identification and Control Act (Tanner Act) of 1983 and the Air Toxics Hot Spots Information and Assessment Act of 1987 (Hot Spots Act). In the early 1980s, CARB established a statewide comprehensive air toxics program to reduce exposure to air toxics. The Tanner Act created California’s program to reduce exposure to air toxics. The Hot Spots Act supplements the Tanner Act by requiring a statewide air toxics inventory, notification of people exposed to a significant health risk, and facility plans to reduce these risks. In August 1998, CARB identified diesel particulate matter (DPM) from diesel-fueled engines as TACs.

Air Pollution and Health and Equity Regulation

California has advanced several policies and regulations to address and center health and equity as part of public planning. Many of these regulations have a nexus with air quality. Senate Bill (SB) 535 recognizes that environmental pollution has had a disproportionate effect on disadvantaged communities, and requires these areas be prioritized for emission reduction projects funded by California's cap-and-trade program. Assembly Bill (AB) 1550 expanded funding prioritization from cap-and-trade proceeds to include low-income communities. AB 617 requires the state to monitor and report criteria pollutant and TAC emissions for certain stationary sources. The bill also requires development of a statewide plan to reduce these emissions in communities that experience a high cumulative exposure burden. In response to AB 617, CARB developed the Community Air Protection Program, which includes air monitoring and emissions reductions programs, initially focused on ten designated communities throughout California.

Greenhouse Gas Regulation

California has adopted statewide legislation addressing various aspects of climate change and GHG emissions mitigation. Much of this legislation establishes a broad framework for the state's long-term GHG reduction and climate change adaptation program, as summarized below.

State Legislative Reduction Targets

SB 32 requires the state to reduce emissions to 40 percent below the 1990 level by 2030. AB 1279 requires California to achieve net-zero GHG emissions (i.e., reach a balance between the GHGs emitted and removed from the atmosphere) no later than 2045 and to achieve and maintain net-negative GHG emissions from then on. It also mandates an 85 percent reduction in statewide anthropogenic GHG emissions (from 1990 levels) by 2045. AB 1279 requires state agencies aim to achieve net-zero GHG emissions resulting from their operations no later than 2035, or as soon as feasible thereafter.

The state's plan to reach these targets are presented in periodic scoping plans. CARB (2017) adopted the *2017 Climate Change Scoping Plan* in November 2017 to meet the GHG reduction requirement set forth in SB 32. It proposes continuing the major programs of the previous scoping plan, including cap-and-trade regulation; low carbon fuel standards; more efficient cars, trucks, and freight movement; Renewables Portfolio Standard; and reducing methane (CH_4) emissions from agricultural and other wastes. CARB (2022a) completed the *2022 Scoping Plan Update* in November 2022 to identify a technologically feasible, cost-effective and equity-focused path to achieve carbon neutrality by 2045, pursuant to AB 1279. The plan also assesses the state's progress toward meeting the GHG emissions reduction goal called for in SB 32.

Vehicle Efficiency and Zero-Emissions Standards

AB 1493 (Pavley I) required CARB to develop and implement regulations to reduce automobile and light truck GHG emissions. These stricter emissions standards were designed to apply to automobiles and light trucks beginning with model year 2009. Additional strengthening of the Pavley standards (referred to previously as Pavley II and now referred to as the Advanced Clean Cars measure) was adopted for vehicle model years 2017 through 2025 in 2012. Together, the two standards are expected to increase average fuel economy to roughly 54.5 miles per gallon in 2025.

In August 2022, the CARB Board members voted to approve the Advanced Clean Cars II proposal, which will dramatically reduce emissions from passenger cars for model years 2026 through 2035. The requires an increasing proportion of new vehicles to be ZE vehicles, with the goal of 100 percent ZE vehicles for new vehicles sold by 2035.

CARB also adopted the Advanced Clean Truck Regulation to accelerate a large-scale transition of ZE medium- and heavy-duty vehicles. The regulation requires the sale of ZE medium- and heavy-duty vehicles as an increasing percentage of total annual California sales from 2024 to 2035. By 2035, ZE truck/chassis sales would need to be 55 percent of Class 2b and 3 truck sales, 75 percent of Class 4 through 8 straight truck sales, and 40 percent of truck tractor sales. By 2045, every new medium- and heavy-duty truck sold in California will be ZE. Large employers including retailers, manufacturers, brokers, and others are required to report information about shipments and shuttle services to better ensure that fleets purchase available ZE trucks.

Low Carbon Fuel Standard

Governor Schwarzenegger set forth the low carbon fuel standard for California in 2007 under EO S-01-07. The EO requires the carbon intensity of California's transportation fuels to be reduced by at least 20 percent by 2030.

Sustainable Land Use Planning and Vehicle Miles Traveled

SB 375 provides a planning process that coordinates land use planning, regional transportation plans (RTP), and funding priorities to help California meet the GHG reduction goals. SB 375 requires that the RTPs developed by metropolitan planning organizations include a sustainable communities strategy (SCS). The goal of the SCS is to reduce regional VMT through land use planning and consequent transportation patterns. CARB first released the regional targets in September 2010 and updated them in March 2018.

SB 743 required revisions to the California Environmental Quality Act (CEQA) Guidelines that establish new impact analysis criteria for the assessment of a project's transportation impacts. The intent behind SB 743 and revising the CEQA Guidelines was to integrate and better balance the needs of congestion management, infill development, active transportation, and GHG emissions reduction.

Electricity Generation and Building Efficiency

The state passed legislation that requires increasing use of renewables to produce electricity for consumers. Specifically, California utilities are required to generate 44 percent of their electricity from renewables by 2024 (SB 100), 50 percent by 2026 (SB 100), 52 percent by 2027 (SB 100), 60 percent by 2030 (SB 100), 90 percent by 2035 (SB 1020), 95 percent by 2040 (SB 1020), and 100 percent by 2045 (SB 100/SB 1020). SB 1020 also requires state agencies to rely on 100 percent renewable energy and zero-carbon resources to serve their own facilities by 2035.

California has also adopted aggressive energy efficiency standards for new buildings and is continuously updating the standards. In 2008, the California Building Standards Commission adopted the Nation's first "green" building standards, which included standards for many aspects of the built environment apart from energy efficiency. The existing standards were adopted on August 1, 2022, and became effective January 1, 2023.

3.3.2.3 Regional and Local

Air Quality Management Districts

Regional and local air districts throughout California have the following general responsibilities:

- Implementing air quality regulations, including developing plans and control measures for stationary sources of air pollution to meet the NAAQS and CAAQS
- Implementing permit programs for the construction, modification, and operation of sources of air pollution
- Coordinating with local transportation planning agencies on mobile emissions inventory development, transportation control measure development and implementation, and transportation conformity
- Enforcing air pollution statutes and regulations governing stationary sources. With CARB oversight, the air districts also administer local regulations.

SJVAPCD (2015a) and the relevant local air quality management districts in the expanded air quality study area (see Figure 3.3-1) have adopted advisory emission thresholds to assist CEQA lead agencies in determining the level of significance of a project's emissions. They have also adopted air quality plans to improve air quality, protect public health, and protect the climate.

Construction and operation of new facilities in SJVAPCD may be subject to the following district rules. This list of rules may not be complete and additional SJVAPCD rules may apply as specific Project components are identified.

- **Rule 2010 (Permits Required)**. This rule requires any person constructing, altering, replacing, or operating any source operation that emits, may emit, or may reduce emissions to obtain an Authority to Construct or a Permit to Operate.
- **Rule 2201 (New and Modified Stationary Source Review)**. This rule requires that sources not increase emissions above the specified thresholds.
- **Rule 2280 (Portable Equipment Registration)**. This rule requires portable equipment used at project sites for less than 6 consecutive months be registered with SJVAPCD.
- **Rule 2303 (Mobile Source Emission Reduction Credits)**. This rule encourages joint business ventures and establishes procedures by which emission reduction credits from mobile sources may be certified.
- **Rule 4201 and Rule 4202 (Particulate Matter Concentration and Emission Rates)**. These rules provide PM emission limits for sources operating in the district.
- **Rule 4102 (Nuisance)**. This rule protects the health and safety of the public by prohibiting discharge of air contaminants that cause injury, detriment, nuisance or annoyance to any considerable number of persons.
- **Rule 9510 (Indirect Source Review)**. This rule outlines mitigation requirements for construction and operational emissions that exceed certain thresholds. The rule applies to any transportation project in which construction emissions equal or exceed 2 tons of NO_X or PM10 per year.

- **Rule 4641 (Cutback, Slow Cure, and Emulsified Asphalt, Paving and Maintenance Operations)**. This rule limits volatile organic compound emissions by restricting the application and manufacturing of certain types of asphalt for paving and maintenance operations.
- **Regulation VIII (Fugitive PM10 Prohibitions)**. This set of rules outlines requirements for control measures for fugitive dust emission sources.

Project activities in the expanded air quality study area are limited to avoided emissions from on-road vehicles. Thus, there are no applicable local air quality management district rules or regulations.

Metropolitan Planning Organizations

The Merced County Association of Governments (MCAG) is the local metropolitan planning organization for Merced County. MCAG is a joint-powers authority composed of Merced County and the Cities of Atwater, Dos Palos, Merced, Los Banos, Livingston, and Gustine. MCAG responsibilities include solving regional problems, such as those related to transportation, solid waste, and air quality. Relevant metropolitan planning organizations in the expanded air quality study area include the Stanislaus Council of Governments (StanCOG), San Joaquin Council of Governments (SJCOG), Sacramento Area Councill of Governments (SACOG), Butte County Association of Governments (BCAG), and Metropolitan Transportation Commission (MTC). These MPOs are responsible for transportation planning within their local jurisdiction.

Climate Action Plans

The City of Merced adopted a Climate Action Plan (CAP) in October 2012. The CAP identifies public outreach and education, incentives, capital projects, and volunteer actions to reduce GHG emissions to 1990 levels by 2020 (City of Merced 2012). The city has not updated its CAP with goals beyond 2020. Several cities and counties in the expanded air quality study area have adopted or are in the process of developing CAPs, GHG reduction plans, or equivalent documents aimed at reducing local GHG emissions. Many of these plans include actions to reduce VMT and associated transportation emissions through increased transit service.

County and City General Plans

The SJJPA, as a state joint powers agency, proposes improvements within and outside the Union Pacific Railroad (UPRR) and BNSF Railway (BNSF) rights-of-way. The Interstate Commerce Commission Termination Act (ICCTA) affords railroads that engage in interstate commerce considerable flexibility in making necessary improvements and modifications to rail infrastructure, subject to the requirements of the Surface Transportation Board. ICCTA broadly preempts state and local regulation of railroads; this preemption extends to the construction and operation of rail lines. As such, activities within the UPRR and BNSF rights-of-way are clearly exempt from local building and zoning codes as well as other land use ordinances. Project activities outside of the UPRR and BNSF rights-of-way, however, would be subject to regional and local plans and regulations. Though ICCTA broadly preempts state and local regulation of railroads, SJJPA intends to obtain local agency permits for construction of facilities that fall outside the UPRR and BNSF rights-of-way, even though SJJPA has not determined whether such permits are legally necessary or required.

Appendix 3.0-1 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 Project improvements would be located. Section 15125(d) of the 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 Project would be consistent with the plans of relevant jurisdictions.[1] The Project would be generally consistent with the applicable goals, policies, and objectives related to air quality identified in Appendix 3.0-1.

3.3.3 Environmental Setting

This section describes the environmental setting related to air quality and GHG emissions for the Project. The information presented in this section was obtained from many sources, including the following.

- SJVAPCD's (2015a) *Guide for Assessing and Mitigating Air Quality Impacts*.
- CARB's (2023a) and USEPA's (2023a) air quality data statistics and air monitoring websites.
- CARB's (2023b) and USEPA's (2023b) attainment maps for state and national ambient air quality standards.
- CARB's (2019) California Emissions Projection Analysis Model (2019v1.03).
- California Office of Environmental Health Hazard Assessment's (OEHHA) (2023) CalEnviroScreen 4.0.

3.3.3.1 Pollutants of Concern

Criteria Pollutants

Criteria pollutants are a group of six common air pollutants for which the federal and state governments have set NAAQS and CAAQS, respectively (refer to Table 3.3-1). Criteria pollutants are defined as ozone, CO, Pb, NO_2, SO_2, PM10, and PM2.5. Ozone is considered a regional pollutant because its precursors affect air quality on a regional scale; NO_X and reactive organic gases (ROG) react photochemically to form ozone, and this reaction occurs at some distance downwind of the emissions source. Pollutants such as CO, NO_2, SO_2, and Pb are considered local pollutants that tend to accumulate in the air locally. PM is both a local and regional pollutant.

Concentrations of criteria pollutants are commonly used indicators of ambient air quality for which acceptable levels of exposure can be determined. The ambient air quality standards for these pollutants are set with an adequate margin of safety for public health and the environment (CAA Section 109). Epidemiological, controlled human exposure, and toxicology studies evaluate potential health and environmental effects of criteria pollutants and form the scientific basis for new and revised ambient air quality standards.

[1] 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.

Table 3.3-2 provides a description of sources and health effects of the six criteria pollutants. The primary criteria pollutants generated by the Project are ozone precursors (NO_X and ROG), CO, PM, and SO_2.[2,3] Additional narrative on sources and health effects of these pollutants follows the table.

Table 3.3-2. Sources and Potential Health and Environmental Effects of Criteria Pollutants

Pollutant	Primary Sources	Potential Effects
Ozone	Formed by a chemical reaction between ROG and NO_X in the presence of sunlight. Primary sources of ROG and NO_X are vehicle exhaust, industrial combustion, gasoline storage and transport, solvents, paints, and landfills.	Inflammation of the mucous membranes and lung airways; wheezing; coughing and pain when inhaling deeply; decreased lung capacity; aggravation of lung and heart problems. Reduced crop yield and damage to plants, rubber, some textiles, and dyes.
Particulate matter (PM)	Power plants, steel mills, chemical plants, unpaved roads and parking lots, wood-burning stoves and fireplaces, equipment, and vehicles.	Irritation of the airways, coughing, or difficulty breathing; aggravated asthma; development of chronic bronchitis; irregular heartbeat; nonfatal heart attacks; and premature death in people with heart or lung disease. Impairs visibility (haze).
Carbon monoxide (CO)	A component of combustion engine exhaust that is formed when carbon in fuel is not burned completely.	Reduced ability of blood to deliver oxygen to vital tissues, affecting the cardiovascular and nervous system. Impaired vision and dizziness that can lead to unconsciousness or death.
Nitrogen dioxide (NO_2)	Motor vehicles, electric utilities, and other sources that burn fuel.	Aggravation of lung and heart problems. Precursor to ozone and acid rain. Contributes to global warming and nutrient overloading, which deteriorates water quality. Brown discoloration of the atmosphere.
Sulfur dioxide (SO_2)	Petroleum refineries, cement manufacturing, metal processing facilities, locomotives, large ships, and fuel combustion in diesel engines.	Aggravation of lung and heart problems. Converts to sulfuric acid, which can damage marble, iron, and steel. Damage to crops and natural vegetation. Impaired visibility.
Lead (Pb)	Metal refineries, smelters, battery manufacturers, iron and steel producers, use of leaded fuels by racing and aircraft industries.	Anemia; damage to the kidneys, liver, brain, reproductive and nervous systems, and other organs; and neurological problems, including learning deficits and lowered IQ. Affects animals, plants, and aquatic ecosystems.

Source: California Air Pollution Control Officers Association n.d.
ROG = reactive organic gases; NO_X = nitrogen oxides; IQ = intelligence quotient.

Ozone

Ozone, or smog, is a photochemical oxidant that is formed when ROGs and NO_X (both by-products of the internal combustion engine) react with sunlight. ROGs are compounds made up primarily of hydrogen and carbon atoms. Internal combustion associated with motor vehicle usage is the major

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[2] Pb is also a criteria pollutant, and there are state standards for sulfates, hydrogen sulfide, vinyl chloride, and visibility-reducing particles. However, these pollutants are typically associated with industrial sources, which are not included as part of the Project. Accordingly, they are not evaluated further.

[3] Most emissions of NO_X are in the form of nitric oxide (NO). Conversion to NO_2 occurs in the atmosphere as pollutants disperse downwind. Accordingly, NO_2 is not considered a local pollutant of concern for the Project and is not evaluated further.

source of hydrocarbons. Other sources of ROGs are emissions associated with the use of paints and solvents, the application of asphalt paving, and the use of household consumer products such as aerosols. The two major forms of NO_X are NO and NO_2. NO is a colorless, odorless gas formed from atmospheric nitrogen and oxygen when combustion takes place under high temperature and/or high pressure. NO_2 is a reddish-brown irritating gas formed by the combination of NO and oxygen. The concentrations of NO_2 and NO in the air varies overtime with the amount of direct emissions and atmospheric conditions, which can either promote or reduce their chemical reaction. In addition to serving as an integral participant in the formation of ozone and other pollutants, NO_X also directly acts as an acute respiratory irritant and increases susceptibility to respiratory pathogens by impairing the immune system.

Ozone poses a higher risk to those who already suffer from respiratory diseases (e.g., asthma), children, older adults, and people who are active outdoors. Exposure to ozone at certain concentrations can make breathing more difficult, cause shortness of breath and coughing, inflame and damage the airways, aggravate lung diseases, increase the frequency of asthma attacks, and cause chronic obstructive pulmonary disease. Studies show associations between short-term ozone exposure and nonaccidental mortality, including deaths from respiratory issues. Studies also suggest long-term exposure to ozone may increase the risk of respiratory-related deaths (USEPA 2022a). The concentration of ozone at which health effects are observed depends on an individual's sensitivity, level of exertion (i.e., breathing rate), and duration of exposure. Studies show large individual differences in the intensity of symptomatic responses, with one study finding no symptoms to the least responsive individual after a 2-hour exposure to 400 parts per billion of ozone and a 50 percent decrease in forced airway volume in the most responsive individual. Although the results vary, evidence suggests that sensitive populations (e.g., asthmatics) may be affected on days when the 8-hour maximum ozone concentration reaches 80 parts per billion (USEPA 2022a). In addition to human health effects, ozone has been tied to crop damage, typically in the form of stunted growth, leaf discoloration, cell damage, and premature death (USEPA 2022b).

Carbon Monoxide

CO is a colorless, odorless, toxic gas produced by incomplete combustion of carbon substances, such as gasoline or diesel fuel. In the study area, high CO levels are of greatest concern during the winter, when periods of light winds combine with the formation of ground-level temperature inversions from evening through early morning. These conditions trap pollutants near the ground, reducing the dispersion of vehicle emissions. Moreover, motor vehicles exhibit increased CO emissions rates at low air temperatures. The primary adverse health effect associated with CO is interference with normal oxygen transfer to the blood, which may result in tissue oxygen deprivation. Exposure to CO at high concentrations can also cause fatigue, headaches, confusion, dizziness, and chest pain (CARB 2023c).

There are no ecological or environmental effects from ambient CO (CARB 2023c).

Particulate Matter

PM pollution consists of very small liquid and solid particles floating in the air, which can include smoke, soot, dust, salts, acids, and metals. PM that is 10 microns or less in aerodynamic diameter, about 1/7th the thickness of a human hair, is referred to as PM10. Particulate matter that is 2.5 microns or less in aerodynamic diameter, roughly 1/28th the diameter of a human hair, is referred to as PM2.5. Major sources of PM10 include vehicles and equipment; wood-burning stoves and fireplaces; dust from construction, landfills, and agriculture; wildfires and brush/waste burning;

industrial sources; windblown dust from open lands; and atmospheric chemical and photochemical reactions. PM2.5 results from fuel combustion (i.e., in vehicles, equipment, power generation, and industrial facilities), residential fireplaces, and wood stoves. PM also forms when gases emitted from industries and motor vehicles, such as SO_2, NO_X, and ROG, undergo chemical reactions in the atmosphere.

Particulate pollution can be transported over long distances and may adversely affect the human respiratory system, especially for people who are naturally sensitive or susceptible to breathing problems. Numerous studies have linked PM exposure to premature death in people with preexisting heart or lung disease, nonfatal heart attacks, irregular heartbeat, aggravated asthma, decreased lung function, and increased respiratory symptoms. Studies show that long-term exposure to PM2.5 was associated with increased risk of mortality, ranging from 6 to 13 percent increased risk per 10 micrograms per cubic meter of PM2.5 (CARB 2010). Studies also show an approximate 0.5 percent increase in overall mortality for every 10 micrograms per cubic meter increase in PM10 measured the day before death (USEPA 2005).

Depending on their composition, both PM10 and PM2.5 can also affect water quality and acidity, deplete soil nutrients, damage sensitive forests and crops, affect ecosystem diversity, and contribute to acid rain (USEPA 2022c).

Sulfur Dioxide

SO_2 is generated by burning fossil fuels, industrial processes, and natural sources, such as volcanoes. The major adverse health effects associated with SO_2 exposure pertain to the upper respiratory tract. Controlled human and epidemiological studies show that exposure to SO_2 near the 1-hour NAAQS of 0.075 parts per million can exacerbate asthma, including bronchoconstriction accompanied by symptoms of respiratory irritation such as wheezing, shortness of breath, and chest tightness. These symptoms can be more pronounced during exercise or physical activity. Exposure at elevated levels of SO_2 (above 1 parts per million) may result in increased incidence of pulmonary symptoms and disease, decreased pulmonary function, and increased risk of mortality, especially among the elderly and people with cardiovascular disease or chronic lung disease (CARB 2023d).

In addition to potential human health impacts, SO_2 deposition contributes to soil and surface water acidification and acid rain (CARB 2023d).

Toxic Air Contaminants

Although NAAQS and CAAQS have been established for criteria pollutants, no ambient standards exist for TACs. Many pollutants are identified as TACs because of their potential to increase the risk of developing cancer or because of their acute or chronic health risks. For TACs that are known or suspected carcinogens, CARB has consistently found that there are no levels or thresholds below which exposure is risk-free. Individual TACs vary greatly in the risks they present. At a given level of exposure, one TAC may pose a hazard that is many times greater than another. TACs are identified and their toxicity is studied by OEHHA. The primary TACs of concern associated with the Project are DPM and asbestos.

DPM is generated by diesel-fueled equipment and vehicles. CARB estimates that DPM emissions are responsible for about 70 percent of the total ambient air toxics risk (CARB 2000). Short-term exposure to DPM can cause acute irritation (e.g., eye, throat, bronchial), neurophysiological symptoms (e.g., lightheadedness, nausea), and respiratory symptoms (e.g., coughing, phlegm). The

International Agency for Research on Cancer (2012) has classified diesel engine exhaust as "carcinogenic to humans, based on sufficient evidence that exposure is associated with an increased risk for lung cancer."

Asbestos is the name given to several naturally occurring fibrous silicate minerals. Before the adverse health effects of asbestos were identified, asbestos was widely used as insulation and fireproofing in buildings, and it can still be found in some older buildings. It is also found in its natural state in ultramafic rock (i.e., igneous and metamorphic rock with low silica content) that has undergone partial or complete alteration to serpentine rock (or serpentinite) and often contains chrysotile asbestos. The inhalation of asbestos fibers into the lungs can result in a variety of adverse health effects, including inflammation of the lungs, respiratory ailments (e.g., asbestosis, which is scarring of lung tissue that results in constricted breathing), and cancer (e.g., lung cancer and mesothelioma, which is cancer of the linings of the lungs and abdomen) (USEPA 2018). According to the California Department of Conservation (2000:1-7), naturally occurring asbestos is not found within the MITC environmental footprint.

Valley Fever

Valley fever, also called coccidioidomycosis, is not an air pollutant, but a disease caused by inhaling *Coccidioides immitis* (*C. immitis*) fungus spores. The spores are found in certain types of soil and become airborne when the soil is disturbed. After the fungal spores have settled in the lungs, they change into a multicellular structure called a spherule. Valley fever symptoms generally occur within 2 to 3 weeks of exposure. Approximately 60 percent of Valley fever cases are mild and display flu-like symptoms or no symptoms at all. Among those who are exposed and seek medical treatment, the most common symptoms are fatigue, cough, chest pain, fever, rash, headache, and joint aches. *C. immitis* is endemic to the SJVAB (U.S. Geological Survey 2000).

Greenhouse Gases

The principal anthropogenic (human-made) GHGs contributing to global warming are carbon dioxide (CO_2), CH_4, nitrous oxide (N_2O), and fluorinated compounds, including sulfur hexafluoride, hydrofluorocarbons (HFCs), and perfluorocarbons. Water vapor, the most abundant GHG, is not included in this list because its natural concentrations and fluctuations far outweigh its anthropogenic sources.

The primary GHGs of concern associated with the Project are CO_2, CH_4, N_2O, and HFCs. The following sections discuss principal characteristics of these pollutants. Sulfur hexafluoride and perfluorocarbons are not discussed because these gases are primarily generated by industrial and manufacturing processes, which are not part of the Project.

Methods have been set forth to describe emissions of GHGs in terms of a single gas to simplify reporting and analysis. The most accepted method to compare GHG emissions is the global warming potential (GWP) methodology defined in Intergovernmental Panel on Climate Change (IPCC) reference documents. IPCC defines the GWP of various GHG emissions on a normalized scale that recasts all GHG emissions in terms of carbon dioxide equivalent (CO_2e), which compares the gas in question to that of the same mass of CO_2 (CO_2 has a GWP of 1 by definition).

Table 3.3-3 lists the GWP of CO_2, CH_4, N_2O, and HFCs and their lifetimes in the atmosphere. The GWPs are from the IPCC's fourth assessment report, consistent with statewide GHG emissions reporting protocol (CARB 2023e).

Table 3.3-3. Lifetimes and Global Warming Potentials of Key Greenhouse Gases

Greenhouse Gas	Global Warming Potential (100 years)	Lifetime (years)
CO_2	1	–
CH_4	25	12
N_2O	298	114
HFCs	124–14,800	1–270

Source: California Air Resources Board 2023e.
CO_2 = carbon dioxide; CH_4 = methane; N_2O = nitrous oxide; HFCs = hydrofluorocarbons.

All GWPs used for CARB's GHG inventory, and to assess attainment of the state's GHG reduction targets, are considered over a 100-year timeframe (as shown in Table 3.3-3). However, CARB recognizes the importance of short-lived climate pollutants (SLCP) and reducing these emissions to achieve the State's overall climate change goals. SLCPs have atmospheric lifetimes on the order of a few days to a few decades, and their relative climate-forcing impacts, when measured in terms of how they heat the atmosphere, can be tens, hundreds, or even thousands of times greater than that of CO_2 (CARB 2017). Recognizing their short-term lifespan and warming impact, SLCPs are measured in terms of CO_2e using a 20-year time period. The use of GWPs with a time horizon of 20 years better captures the importance of the SLCPs and gives a better perspective on the speed at which SLCP emissions controls will affect the atmosphere relative to CO_2 emissions controls. The SLCP Reduction Strategy addresses the three primary SLCPs—CH_4, HFC gases, and anthropogenic black carbon. CH_4 has a lifetime of 12 years and a 20-year GWP of 72. HFC gases have lifetimes of 1.4 to 52 years and 20-year GWPs of 437 to 6,350. Anthropogenic black carbon has a lifetime of a few days to weeks and a 20-year GWP of 3,200 (CARB 2017).

Carbon Dioxide

CO_2 accounts for more than 80 percent of all GHG emissions emitted in California (CARB 2023f). CO_2 enters the atmosphere through fossil fuels (oil, natural gas, and coal) combustion, solid waste decomposition, plant and animal respiration, and chemical reactions (e.g., manufacture of cement). CO_2 is also removed from the atmosphere (or "sequestered") when it is absorbed by plants as part of the biological carbon cycle.

Methane

CH_4, the main component of natural gas, is the second most abundant GHG and has a GWP of 25 (CARB 2023f). Sources of anthropogenic emissions of CH_4 include growing rice, raising cattle, using natural gas, landfill outgassing, and mining coal. Certain land uses also function as both a source and sink for CH_4. For example, wetlands are a terrestrial source of CH_4, whereas undisturbed, aerobic soils act as a CH_4 sink (i.e., they remove CH_4 from the atmosphere).

Nitrous Oxide

Anthropogenic sources of N_2O include agricultural processes (e.g., fertilizer application), nylon production, fuel-fired power plants, nitric acid production, and vehicle emissions. N_2O also is used in rocket engines, racecars, and as an aerosol spray propellant. Natural processes, such as nitrification and denitrification, can also produce N_2O, which can be released to the atmosphere by diffusion.

Hydrofluorocarbons

HFCs are human-made chemicals used in commercial, industrial, and consumer products and have high GWPs. HFCs are generally used as substitutes for ozone-depleting substances in automobile air conditioners and refrigerants. In the transportation sector, HFCs from refrigeration and air conditioning units represented about 3 percent of total on-road emissions in California in 2020 (CARB 2022b).

3.3.3.2 Global Climate Change

The process known as the *greenhouse effect* keeps the atmosphere near Earth's surface warm enough for the successful habitation of humans and other life forms. The greenhouse effect is created by sunlight that passes through the atmosphere. Some of the sunlight striking Earth is absorbed and converted to heat, which warms the surface. The surface emits a portion of this heat as infrared radiation, some of which is re-emitted back toward the surface by GHGs in the atmosphere, and some of which results in warming of the atmosphere. Human activities that generate GHGs increase the amount of infrared radiation absorbed by the atmosphere, thus enhancing the greenhouse effect, and amplifying the warming of Earth.

Increases in fossil fuel combustion and deforestation have exponentially increased concentrations of GHGs in the atmosphere since the Industrial Revolution (IPCC 2018). Rising atmospheric concentrations of GHGs in excess of natural levels result in increasing global surface temperatures—a process commonly referred to as *global warming*. Higher global surface temperatures, in turn, result in changes to Earth's climate system, including increased ocean temperature and acidity, reduced sea ice, variable precipitation, and increased frequency and intensity of extreme weather events (IPCC 2018). Large-scale changes to Earth's system are collectively referred to as *climate change.*

The IPCC was established by the World Meteorological Organization and United Nations Environment Programme to assess scientific, technical, and socioeconomic information relevant to understanding climate change, its potential impacts, and options for adaptation and mitigation. The IPCC estimates that human-induced warming reached approximately 1 degree Celsius above preindustrial levels in 2017, increasing at 0.2 degrees Celsius per decade (IPCC 2018). Global warming is more likely than not to reach (or exceed) 1.5 degrees Celsius in the near term (2021-2040). Estimates for longer-term warming range from 1.4 degrees Celsius to 4.4 degrees Celsius, depending on the emissions scenario (IPCC 2023). Large increases in global temperatures could have substantial significant impacts on the natural and human environments worldwide and in California.

3.3.3.3 Regional Climate and Meteorology

The primary factors that determine air quality are the locations of air pollutant sources and the amount of pollutants emitted from those sources. Meteorological and topographical conditions are also important—atmospheric conditions, such as wind speed, wind direction, and air temperature gradients interact with the physical features of the landscape to determine the movement and dispersal of air pollutants.

California is divided into 15 air basins based on geographic features that create distinctive regional climates. As noted in Section 3.3.1, *Introduction*, the MITC environmental footprint is in the SJVAB and increases in ridership achieved by the Project will result in avoided automobile VMT and trips throughout the SJVAB, SFBAAB, and SVAB (see Figure 3.3-1). The following section discusses climate and meteorological information associated with these three air basins.

San Joaquin Valley Air Basin (SJVAB)

The SJVAB is bounded by the Sierra Nevada to the east, the Coast Ranges to the west, the SVAB to the north, and the Tehachapi Mountains to the south. The SJVAB contains all of San Joaquin, Stanislaus, Merced, Madera, Fresno, Kings, and Tulare Counties, as well as a portion of Kern County (17 California Code of Regulations [Cal. Code Regs.] § 60107).

The SJVAB has a Mediterranean climate that is characterized by hot, dry summers and cool, rainy winters. Summer high temperatures often exceed 100 degrees Fahrenheit. During the summer, winds in the SJVAB most frequently blow from the northwesterly direction. Although marine air generally flows into the basin from the Delta, the surrounding mountain ranges restrict air movement through and out of the valley. Several days in the winter are marked by stagnation events during which winds are weak and transport of pollutants is limited.

The vertical dispersion of air pollutants in the SJVAB is limited by a persistent temperature inversion. Due to differences in air density, the air above and below the inversion does not mix. Air pollutants tend to collect under an inversion, leading to higher concentrations of emitted pollutants. Precipitation and fog tend to reduce some pollutant concentrations, but atmospheric moisture can also increase pollution levels, including PM. Because wintertime conditions are favorable to fog formation, PM concentrations tend to be greatest during the winter. Conversely, ozone needs sunlight for its formation, and clouds and fog block the required radiation. Accordingly, ozone levels are generally greatest in the summer and typically peak in the afternoon (SJVAPCD 2015a).

San Francisco Bay Area Air Basin (SFBAAB)

The SFBAAB contains all of Napa, Contra Costa, Alameda, Santa Clara, San Mateo, San Francisco, and Marin Counties, as well as portions of Sonoma and Solano Counties (17 Cal. Code Regs. § 60101). Climate within the SFBAAB is characterized by moderately wet winters and dry summers. Winter rains, which occur in the months of December through March, account for about 75% of the average annual rainfall.

Climate is affected by marine air flow and the basin's proximity to the San Francisco Bay Area. Bay breezes push air onshore during the daytime and draw air offshore at night. During the summer months, the bay helps to cool the warm onshore flows, while it warms the air during the winter months. This mediating effect keeps temperatures relatively consistent throughout the year. In the easternmost portion of the SFBAAB that boarders San Joaquin County, the bay wind patterns can concentrate and carry air pollutants from other cities to the region, adding to the mix of pollutants that are emitted locally (BAAQMD 2023).

Sacramento Valley Air Basin (SVAB)

The SVAB is bounded on the north by the Cascade Range, on the south by the SJVAB, on the east by the Sierra Nevada, and on the west by the Coast Ranges. The SVAB contains all of Tehama, Glenn, Butte, Colusa, Yolo, Sutter, Yuba, Sacramento, and Shasta Counties, as well as portions of Solano and Placer Counties (17 Cal. Code Regs. § 60106).

The SVAB has a Mediterranean climate characterized by hot, dry summers and cool, rainy winters. During winter, the north Pacific storm track intermittently dominates Sacramento Valley weather, and fair-weather alternates with periods of extensive clouds and precipitation. Periods of dense and persistent low-level fog, which is most prevalent between storms, are also characteristic of winter weather in the valley. The frequency and persistence of heavy fog in the valley diminish with the approach of spring. The average yearly temperature range for the Sacramento Valley is 20 °F to 115 degrees Fahrenheit, with summer high temperatures often exceeding 90 degrees Fahrenheit and winter low temperatures occasionally dropping below freezing.

In general, the prevailing winds are moderate in strength and vary from moist clean breezes from the south to dry land flows from the north. The mountains surrounding the SVAB create a barrier to airflow that can trap air pollutants under certain meteorological conditions. The highest frequency of air stagnation occurs in the autumn and early winter when large high-pressure cells collect over the Sacramento Valley. The lack of surface wind during these periods and the reduced vertical flow caused by less surface heating reduces the influx of outside air and allows air pollutants to become concentrated in a stable volume of air. The surface concentrations of pollutants are highest when these conditions are combined with temperature inversions (warm air over cool air), which trap pollutants near the ground.

The ozone season (May through October) in the Sacramento Valley is characterized by stagnant morning air or light winds with the Delta sea breeze arriving in the afternoon out of the southwest. Usually, the evening breeze transports the airborne pollutants to the north out of the Sacramento Valley. During about half of the days from July to September, however, a phenomenon called the Schultz eddy prevents this from occurring. Instead of allowing the prevailing wind patterns to move north carrying the pollutants out, the Schultz eddy causes the wind pattern to circle back to the south. Essentially, this phenomenon causes the air pollutants to be blown south toward the Sacramento Valley and Yolo County. This phenomenon has the effect of exacerbating the pollution levels in the area and increases the likelihood of violating federal or state standards. The Schultz eddy normally dissipates around noon when the Delta sea breeze arrives (Yolo-Solano Air Quality Management District 2007).

3.3.3.4 Existing Air Quality Conditions

Ambient Criteria Pollutant Concentrations

Existing air quality conditions for the MITC environmental footprint can be characterized by local monitoring data. CARB collects ambient air quality data through a network of air monitoring stations throughout the state. The Merced-South Coffee Avenue is the nearest station to the MITC environmental footprint, approximately 2 miles south of the southern terminus of the Project.

Table 3.3-4 presents the results of the ambient monitoring at the Merced-South Coffee Avenue, where available, for the most recent 3 years (2019 to 2021). During this time, monitored NO_2 concentrations did not exceed any federal or state standards. However, the state and federal standards for ozone and PM2.5 were exceeded. No data are available for CO or PM10. The ambient air quality standards define clean air and represent the maximum amount of pollution that can be present in outdoor air without any harmful effects on people and the environment. Existing violations of the ozone and PM2.5 ambient air quality standards indicate that certain individuals exposed to these pollutants may experience certain health effects, including increased incidence of cardiovascular and respiratory ailments.

Table 3.3-4. Localized Air Quality Concentrations for the Past Three Years Measured at the Merced-S Coffee Avenue Station

Pollutant Standards	2019	2020	2021
Ozone			
Maximum 1-hour concentration (ppm)	0.087	0.100	0.099
Maximum 8-hour concentration (ppm)	0.076	0.087	0.089
Measured number of days standard exceeded			
CAAQS 1-hour (>0.09 ppm)	0	2	2
CAAQS 8-hour (>0.070 ppm)	6	20	24
NAAQS 8-hour (>0.070 ppm)	6	21	21
Nitrogen Dioxide			
National maximum 1-hour concentration (ppm)	38.7	38.5	38.2
State maximum 1-hour concentration (ppm)	38	38	38
Annual average concentration (ppm)	6	6	-
Measured number of days standard exceeded			
CAAQS 1-hour (0.18 ppm)	0	0	0
NAAQS 1-hour (0.10 ppm)	0	0	0
Fine Particulate Matter (PM2.5)			
National maximum 24-hour concentration (μg/m^3)	35.5	117.4	77.3
National second-highest 24-hour concentration (μg/m^3)	29.5	116.9	64.4
State maximum 24-hour concentration (μg/m^3)	35.5	117.4	77.3
State second-highest 24-hour concentration (μg/m^3)	29.5	116.9	64.4
Annual average concentration (μg/m^3)	9.1	14.7	11.2
Measured number of days standard exceeded			
NAAQS 24-hour (>35 μg/m^3)	1	23	13
NAAQS/CAAQS annual (>12 μg/m^3) [a]	No	Yes	No

Sources: California Air Resources Board 2023a.

CAAQS = California ambient air quality standards; NAAQS = national ambient air quality standards; μg/m^3 = micrograms per cubic meter; ppm = parts per million; > = greater than; – = not applicable or there was insufficient or no data available to determine the value.

[a] USEPA lowered the annual NAAQS to 9.0 μg/m^3 on February 7, 2024 (see Table 3.3-1). However, the 2012 standard of 12 μg/m^3 was in effect during the 2019 to 2021 monitoring period, and is thus used as the standard by which violations of the PM2.5 annual NAAQS time are assessed.

Attainment Status

Local monitoring data (Table 3.3-4) are used to designate areas as nonattainment, maintenance, attainment, or unclassified for the NAAQS and CAAQS. The four designations are further defined as:

- Nonattainment—assigned to areas where monitored pollutant concentrations consistently violate the standard in question
- Maintenance—assigned to areas where monitored pollutant concentrations exceeded the standard in question in the past but are no longer in violation of that standard

- Attainment—assigned to areas where pollutant concentrations meet the standard in question over a designated period
- Unclassified—assigned to areas where data are insufficient to determine whether a pollutant is violating the standard in question

Table 3.3-5 summarizes the attainment status of Merced County in the SJVAB with regard to the NAAQS and CAAQS.

Table 3.3-5. Federal and State Attainment Status of Merced County

Pollutant	Federal Attainment Status (NAAQS)	State Attainment Status (CAAQS)
Ozone	Nonattainment (extreme)	Nonattainment
PM2.5	Nonattainment (serious)	Nonattainment
PM10	Maintenance (serious)	Nonattainment
CO	Attainment	Attainment
NO_2	Attainment	Attainment
Pb	Attainment	Attainment
SO_2	Attainment	Attainment

Sources: California Air Resources Board 2023b; U.S. Environmental Protection Agency 2023b

CAAQS = California ambient air quality standards; CO = carbon monoxide; NAAQS = national ambient air quality standards; NO_2 = nitrogen dioxide; Pb = lead; PM2.5 = particulate matter 2.5 microns or less in diameter; PM10 = particulate matter 10 microns or less in diameter; SO_2 = sulfur dioxide.

The attainment status of counties throughout the SFBAAB and SVAB varies, with more urbanized locations experiencing worsened ambient air quality conditions. Most of the SFBAAB is designated nonattainment for the federal ozone and PM2.5 standards. Sacramento County in the SVAB is nonattainment for these federal standards and maintenance for the federal PM10 standard. Parts of the northern portion of the SVAB are nonattainment for the federal ozone standard and maintenance for federal PM2.5 standard. Designations for the state standards are similar to the federal designations. (California Air Resources Board 2023b; U.S. Environmental Protection Agency 2023b.)

Environmental Burdens

OEHHA maintains the California Communities Environmental Health Screening Tool (CalEnviroScreen), which provides relative rankings of census tracts based on 21 environmental, health, demographic, and socioeconomic indicators (e.g., ozone concentrations, groundwater threats, education levels). Ranking scores are provided for each indicator, which are also combined to provide an overall ranking score for the census tract. The scores are not a measure of health risk; rather, they reflect the relative pollution burden and vulnerabilities in one census tract compared to other census tracts in the state. Scores are given on a scale of 0 to 100, with larger numbers representing areas with relatively high existing pollution burdens and population sensitivities.

Most of the MITC environmental footprint is in census tract 6047001005, which has a CalEnviroScreen percentile score of 95. This score indicates that the census tract experiences higher pollution and secondary effects than the rest of the state. The three most burdened pollution indicators are ambient PM2.5, DPM, and pesticides. Population vulnerabilities also contribute to the relatively high overall percentile score. CalEnviroScreen indicates that the census tract is heavily affected by unemployment, cardiovascular disease, and poverty, with unemployment and cardiovascular disease each having an individual indicator score of 97 (OEHHA 2023). Based on these conditions, the census tract is an SB 535 designated disadvantaged community and AB 1550 low-income community (CARB 2023g).[4]

Regionally, census tracts throughout the SJVAB generally experience greater environmental burdens than the rest of the state. Burdens are likewise greater in the urbanized areas of the SFBAAB and SVAB. (OEHHA 2023.) SB 535 disadvantaged community and AB 1550 low-income community follow similar geographic patters, with designations in the SFBAAB concentrated in the East Bay and designations in the SVAB throughout the Sacramento metropolitan area and Yuba City (CARB 2023g).

3.3.3.5 Emissions Inventories

Criteria Pollutants

A criteria pollutant inventory is an accounting of the total emissions from all sources in a geographic area over a specified period. Emission inventories are used in air quality planning and can provide a general indication of existing air quality in an area. CARB maintains an annual emissions inventory for each county and air basin in the state. The inventories for SJVAB, SFBAAB, and SVAB consist of data submitted to CARB by local air districts, plus estimates for certain source categories, which are provided by CARB staff. Table 3.3-6 summarizes the most recent (2017) criteria pollutant inventories for SJVAB, SFBAAB, and SVAB.

Table 3.3-6. Criteria Pollutant Emissions Inventory (2017) for the SJVAB, SFBAAB, and SVAB (tons per day)

Air Basin	ROG	NO_X	CO	SO_2	PM10	PM2.5
SJVAB	1,129	250	2,491	16	437	212
SFBAAB	501	210	2,118	30	205	135
SVAB	1,277	137	847	5	183	66

Source: California Air Resources Board 2019.
CO = carbon monoxide; NO_X = nitrogen oxides; PM2.5 = particulate matter 2.5 microns or less in diameter; PM10 = particulate matter 10 microns or less in diameter; ROG = reactive organic gases; SO_2 = sulfur dioxide; SJVAB = San Joaquin Valley Air Basin.

Greenhouse Gases

Like criteria pollutant inventories, a GHG inventory is a quantification of all GHG emissions and sinks in a selected physical and/or economic boundary. GHG inventories can be performed on a large scale (i.e., for global and national entities) or on a small scale (i.e., for a building or person). Although many processes are difficult to evaluate, several agencies have developed tools to quantify emissions from certain sources. Table 3.3-7 outlines the most recent global, national, and statewide, GHG inventories.

[4] Disadvantaged communities are defined as the census tracts ranking in the top 25th percentile for environmental burdens and socioeconomic conditions (i.e., CalEnviroScreen score of 75 or higher). Low-income communities are defined as the census tracts that are either at or below 80 percent of the statewide median income, or at or below the threshold designated as low-income by the California Department of Housing and Community Development's state income limits.

Table 3.3-7. Global, National, and State GHG Emissions Inventories

Year and Area	CO_2e (metric tons)
2010 Global	52,000,000,000
2021 United States	6,340,200,000
2020 California	369,200,000

Sources: Intergovernmental Panel on Climate Change 2014; U.S. Environmental Protection Agency 2023c; California Air Resources Board 2023h.
CO_2e = carbon dioxide equivalent.

3.3.3.6 Sensitive Receptors

The NAAQS and CAAQS apply at publicly accessible areas, regardless of whether those areas are populated. For the purposes of air quality analysis, *sensitive land uses* are defined as locations where human populations, especially children, seniors, and sick persons, are located and where there is reasonable expectation of continuous human exposure according to the averaging period for the air quality standards (e.g., 24-hour, 8-hour, and 1-hour). *Sensitive receptors* include residences, medical facilities, nursing homes, schools and schoolyards, daycare centers, and parks and playgrounds. Analyses performed by CARB indicate that providing a separation of at least 1,000 feet from diesel sources and high-traffic areas would reduce exposure to air contaminants and decrease asthma symptoms in children (CARB 2005). This CARB study demonstrates that DPM concentrations and resultant health effects decline as a function of distance from the emissions source.

Table 3.3-8 and Figure 3.3-2 show the number of receptors by receptor type within 1,000 feet of the MITC environmental footprint and existing Merced Station. The table also identifies the nearest receptor to Project infrastructure for each type. As shown in Table 3.3-8, residential land uses are the dominant receptor type within 1,000 feet of the MITC environmental footprint and existing Merced Station. Other receptor types include recreational, educational, and senior-related care. There are no medical facilities in the study area.

Table 3.3-8. Sensitive Receptors within 1,000 Feet of the MITC Environmental Footprint and Existing Merced Station

Receptor Type	Number in Study Area	Nearest Distance (feet) to Project
Residential—High Density	89	102
Residential—Medium Density	25	146
Residential—Single Family	77	97
Residential—Mobile Home	320	105
Educational—Public School	3	944
Recreational—Park	2	259
Senior Center	1	453
Church [a]	3	130

[a] Churches are not generally considered sensitive receptors. However, the facilities are identified because they could include an on-site daycare and play yard.

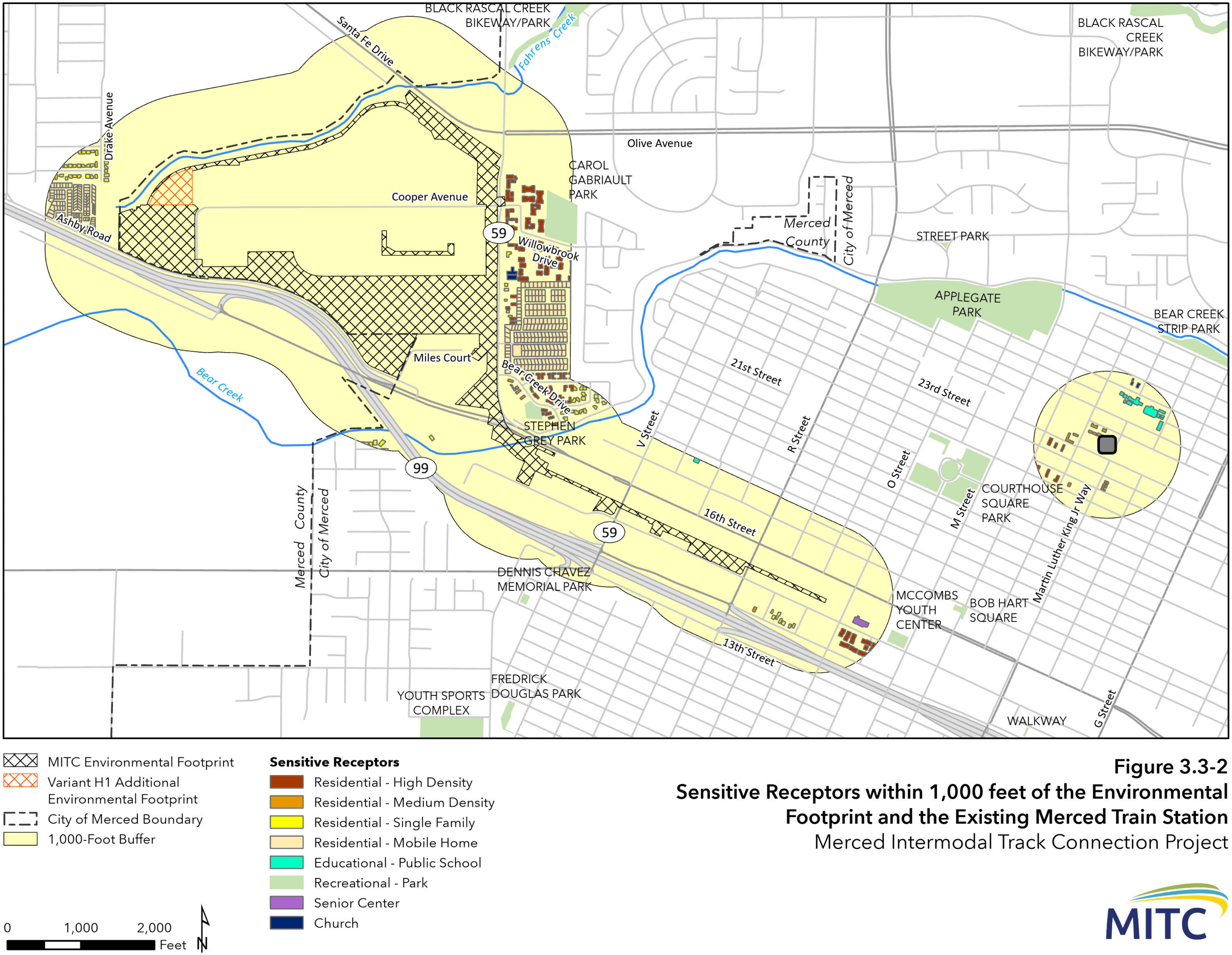


Figure 3.3-2
Sensitive Receptors within 1,000 feet of the Environmental Footprint and the Existing Merced Train Station
Merced Intermodal Track Connection Project

MITC

3.3.4 Impact Analysis

This section describes the environmental impacts of the Project on air quality and GHG emissions. This section also 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.

3.3.4.1 Methods for Analysis

Methods

Air quality and GHG impacts associated with construction and operation of the Project were evaluated and quantified using standard and accepted software tools, techniques, and emission factors. The methodology is described in this section and model outputs are provided in Appendix 3.3-1, *Air Quality, Greenhouse Gas, and Health Risk Assessment Supporting Documentation*.

Mass Emission Modeling

Project Construction

Construction activities for the Project would occur solely in and under the jurisdiction of the SJVAPCD. Construction activities in the SJVAPCD would generate criteria pollutant and ozone precursors (ROG, NO_X, CO, PM10, PM2.5, and SO_2) and GHGs (CO_2, CH_4, N_2O, and HFCs) that would result in short-term effects on ambient air quality. Emissions would originate from off-road equipment exhaust, employee and haul truck vehicle exhaust (on-road vehicles), locomotive exhaust (freight deliveries), site grading, earth moving, paving, and demolition. These emissions would be temporary (i.e., limited to the construction period) and would cease when construction activities are complete.

Construction emissions from all sources except locomotive exhaust were quantified using the California Emissions Estimator Model (CalEEMod), version 2022. Emissions estimates were based on a combination of Project-specific engineering inputs and model default emission factors. Consistent with SJVAPCD (2015a:119) guidance, the emissions modeling accounts for compliance with SJVAPCD Regulation VIII, which is required by law (refer to Section 3.3.2.3, *Regional and Local*). CalEEMod does not estimate emissions from locomotive exhaust. Emissions from locomotive exhaust were quantified using emission factors and standards from USEPA (2009, 2023d). Daily locomotive movement and idling time required for construction deliveries were provided by the Project engineering team (AECOM pers. comm.). Refer to Appendix 3.3-1, *Air Quality, Greenhouse Gas, and Health Risk Assessment Supporting Documentation*, for the Project-specific engineering inputs.

The analysis accounts for all emissions directly and indirectly generated by construction activities for which the San Joaquin Joint Powers Authority (SJJPA) has practical control and program responsibility. Emissions generated upstream (e.g., material manufacturing) and downstream (e.g., recycling) of construction, otherwise known as "lifecycle emissions," are not included in the analysis, consistent with guidance from the California Natural Resources Agency (2018:41–42). While the origin of most raw materials is not known, and thus a lifecycle analysis would be speculative, "embodied" emissions of cement have been studied in various literature. Embodied emissions generally refer to those generated by the lifecycle of a material or product (e.g., cement), and thus are a component of a traditional lifecycle analysis. Accordingly, for the purposes of disclosure, embodied carbon emissions of cement and aggregate manufacturing were quantified using emissions factors from Marceau et al. (2007:Tables E1b and G1b). These emissions would be generated upstream of construction and through activities for which SJJPA has no practical control. The estimated embodied carbon emissions are therefore disclosed for informational purposes only.

Project Operations

Operation of the Project would increase intercity passenger rail ridership on San Joaquins and Altamont Corridor Express (ACE)[5] between the San Joaquin Valley, Sacramento Region, and Bay Area. The infrastructure improvements implemented under the Project would not change the intensity or frequency of passenger train activities (including San Joaquins and ACE locomotive movement, idling, and station and maintenance facility operations) relative to the future No Project condition (refer to Chapter 2, *Project Description*, for a description of the No Project condition). In other words, the future locomotive fleet mix and service operating hours across San Joaquins and ACE would be the same with or without the Project. However, in the MITC environmental footprint and with implementation of the Project, the location of San Joaquins emissions would shift to the new track connection and into the integrated station. The intercity passenger rail connection created by the Project would also change the location and need for connecting bus transit in Merced. Emissions implications associated with each of these sources were modeled for the following three conditions, as described below: (1) existing (2022);[6] (2) first year of full operation (2032)[7] with and without the Project; and (3) horizon (2040) year with and without the Project. In addition, emissions benefits achieved by increased passenger rail ridership, which results in a corresponding reduction in automobile VMT and trips, were quantified.

Locomotive Operations

As noted above, the Project would not increase San Joaquins or ACE movement, or idling hours compared to future operating conditions without the Project. However, the location of San Joaquins operations would shift within the MITC environmental footprint. Project variants (i.e., Variant H1, Variant H2, and Variant H3) and a No Project Hydrogen Variant are also being analyzed in this EIR that consider future penetration of San Joaquins hydrogen (i.e., ZE) locomotives, as discussed under *Hydrogen Variants*. San Joaquins operating emissions were therefore quantified to support the health risk assessment (HRA), which considers the source location of emissions relative to sensitive receptors (refer to *Health Risk Assessment* for further discussion), and to enable a comparison between the diesel and hydrogen fuel options being considered by the Project and Project variants, respectively. Emissions from ACE operation are not assessed because neither the Project nor Project variants would change the service location or service operating conditions (including locomotive fuel type).

Table 3.3-9 summarizes the daily San Joaquins operating hours under existing (2022), opening (2032), and horizon (2040) year conditions. The future service schedule assumes five daily roundtrips from Oakland to Merced, two daily roundtrips from Sacramento to Merced, and one daily

[5] The increase in ACE ridership is minor and a result of some passengers transferring from San Joaquins trains (no change in ridership to ACE trains at Merced).

[6] For the purpose of this analysis, existing conditions are 2022 because the preparation of this EIR began in 2023 and 2022 is the most recent year for which complete data is available.

[7] The projected start for operational service is between 2030 to 2033. This analysis uses 2032 for the first year of full operations, which falls within this period.

roundtrip from Natomas to Merced. Hours are presented for locomotive movement and idling by engine tier. The opening (2032) and horizon (2040) year analyses assume all locomotives would operate Tier 4 certified engines fueled by renewable diesel. This assumption is conservative given that an increasing percentage of ZE locomotives will operate statewide, due in part to regulatory mandates required by the In-Use Locomotive Regulation (see Section 3.3.2.2, *State*) and SJJPA's commitment to work with the state to transition to ZE trainsets as soon as practicable. As noted above and discussed below under *Hydrogen Variants*, use of hydrogen locomotives is assessed under the Project variants.

Table 3.3-9. Daily San Joaquins Locomotive Operating Hours (hours/day)

Condition	Movement		Station Idling [a]		Maintenance Idling [b]	
	Tier 3	Tier 4	Tier 3	Tier 4	Tier 3	Tier 4
Existing (2022)	23.3	60.9	0.5	1.3	3.0	7.5
Opening (2032) and Horizon (2040) Project/No Project	0.0	44.7	0.0	8.0 [c]	0.0	12.0

Source: AECOM pers. comm.

[a] Station idling occurs at the existing Merced station under existing and future No Project conditions. Under the future Project condition, station idling would move to the proposed integrated Merced HSR Station.

[b] Maintenance idling occurs at the existing Bakersfield layover tracks under existing conditions. Under future conditions with or without the Project, maintenance idling would move to ACE Merced Layover and Maintenance Facility.

[c] Subsequent to preparation of this analysis, it was determined that the Project would require the use of wayside power at the proposed integrated Merced HSR Station, as discussed in Section 2.4.3, *Energy Consumption*, in Chapter 2, *Project Description*. This would result in a minor decrease in diesel locomotive idling compared to the scenario that was modeled. Thus, the analysis of diesel emissions from locomotive idling presented in this analysis is conservative.

Diesel locomotive engine power is controlled by "notched" throttles. Idling, braking, and moving the locomotive is conducted by placing the throttle in one of several available "notch" settings. A locomotive's duty cycle is a description of how much, on average, the locomotive spends in each notch setting while operating. ROG, NO_X, CO, and PM emissions generated by locomotive operations were estimated using USEPA's (2009) locomotive emissions standards and default assumptions for an average locomotive duty cycle (USEPA 1998).[8] The emission standards are defined per unit of activity (in grams per horsepower-hour) by engine tier (e.g., Tier 4). Sulfur oxide (SO_X) emissions were calculated based on a diesel fuel density of 3,200 grams per gallon (USEPA 2009) and a sulfur content of 15 parts per million. GHG emissions (CO_2, CH_4, and N_2O) were quantified using emission factors from USEPA (2023d). Daily criteria pollutant and GHG emissions were annualized assuming 365 operating days per year.

Locomotives idle while loading passengers at stations, when at the end of the line, and while warming up after receiving routine maintenance. San Joaquins locomotives currently layover and receive maintenance in Bakersfield, but this service will shift to the ACE Merced Layover and Maintenance Facility following its completion by 2030-2033.[9] Under the Project, station idling will move from the existing Merced station to the new integrated downtown Merced station. Idling

[8] As noted in Chapter 2, *Project Description*, all locomotives are planned to use renewable diesel by 2030. However, because the future No Project and Project locomotives were modeled with Tier 4 engines (refer to Table 3.3-9), the use of renewable diesel would not result in any further direct criteria pollutant reductions from the locomotive exhaust stacks.

[9] For the purposes of analysis, it is assumed the ACE Merced Layover and Maintenance Facility will be completed in 2032.

emissions at all locations were quantified using USEPA's locomotive emissions standards and factors (USEPA 1998, 2023d).

All station and maintenance idling would occur in the SJVAB. Locomotive movement hours would occur between the San Joaquin Valley, Sacramento Region, and Bay Area. Emissions quantified for locomotive movement were apportioned to the SJVAB, SFBAAB, and SVAB based on the number of service miles within each air basin.

Station and Facility Operations

Station and maintenance facility operations can generate criteria pollutant and ozone precursors and GHG emissions from utility consumption (e.g., electricity, water), solid waste generation, employee and delivery vehicle exhaust, stationary sources (e.g., emergency generators), and area sources (e.g., routine building upkeep). As discussed in Chapter 2, *Project Description*, the Project only includes the track connection and the San Joaquins platform at the proposed integrated Merced HSR Station, which will be maintained and operated by California High-Speed Rail. Likewise, the ACE Merced Layover and Maintenance Facility has been analyzed and approved as part of the San Joaquin Regional Rail Commission *ACE Ceres-Merced Extension EIR* (SJRCC 2021). The modifications proposed by the Project and the future servicing of additional trains would not change facility operations and associated emissions relative to what was disclosed in the *ACE Ceres-Merced Extension EIR* and would occur under the future No Project condition.

While the magnitude of future station and maintenance facility operational activities would not materially change between future Project and No Project conditions, the location of the buildings would change among existing and future conditions, as described under *Locomotive Operations*. Likewise, the intensity of future operational activities would increase compared to existing conditions. Accordingly, similar to San Joaquins operations, station and maintenance facility emissions were quantified to fully disclose emissions under each of the analysis conditions and also to support the HRA. Emissions were estimated using CalEEMod version 2022 and the assumptions presented in Table 3.3-10. All emissions would occur in the SJVAB.

Table 3.3-10. Air Quality Inputs for Annual Station and Maintenance Facility Operations [a]

Condition	Utilities				Daily VMT [b]	Generator
	Electricity	Natural Gas	Waste	Water		
Existing (2022)	54,500 kWh	0 therms	6 tons	0 gallons	134	-
Opening (2032) and Horizon (2040) Project/No Project	397,250 kWh (Project) [c] 424,500 kWh (No Project) [d]	11,700 therms	39 tons	1,098,300 gallons	287	769 HP tested up to 17 hours

Source: AECOM pers. comm.

[a] Data are combined for annual station and maintenance facility operation. Operational station activities would occur at the existing Merced station under existing and future No Project conditions. Under the future Project condition, operational station activities would move to the proposed integrated Merced HSR Station. Operational maintenance activities would occur at the existing Bakersfield layover tracks under existing conditions and at the ACE Merced Layover and Maintenance Facility under future Project and No Project conditions.

[b] Employee, vendor, on-site, and delivery trips.

[c] As noted above, subsequent to preparation of this analysis, it was determined that the Project would require the use of wayside power at the proposed integrated Merced HSR Station. This would result in a minor increase in the amount of operational electricity compared to the scenario that was modeled.

[d] The No Project would consume slightly more electricity than the Project due to continued operation of the less-efficient existing Merced station.

Bus Bridge

Under future No Project conditions, a bus bridge would be provided to transfer high-speed rail (HSR) passengers from the proposed integrated Merced HSR Station to the existing Merced station for connecting San Joaquins service. Based on the ridership forecast and distance between the two stations, the bus bridge would operate 80 daily trips and result in 88 daily VMT (AECOM pers. comm.). Resulting emissions were quantified using calendar year average bus emission factors for Merced County obtained from EMFAC2021. With the Project, the bus bridge would no longer be provided.

Connecting Bus Transit

Merced's Regional Transit System, known as the "The Bus", provides local public transit for all of Merced County. The Bus currently stops at the existing Merced station and the Merced Transpo Center, which is adjacent to the proposed integrated Merced HSR Station. With the Project, it is assumed that the stop at the existing Merced Station would no longer be serviced, eliminating 95 daily weekday stops and 20 weekend stops as shown on The Bus schedules(The Bus, 2024). Elimination of the Merced Station stop would reduce bus idling but would not materially change VMT because the number of trips and overall route milage would remain unchanged.

Increases in passenger rail ridership with buildout of the integrated station under future No Project and Project conditions would have corresponding effects on the demand for connecting bus service at the Merced Transpo Center stop (15th and P Street). Based on future planned frequencies and route distances, an additional seven daily trips are expected across routes that connect to the Merced Transpo Center, resulting in 172 daily VMT (AECOM pers. comm.).

Emissions from changes in bus idling at the existing Merced station and connecting transit service to the Merced Transpo Center under future with and without Project conditions were quantified using calendar year average bus emission factors for Merced County obtained from EMFAC2021.

Reduced Vehicle Miles Traveled and Trips

Operation of the Project would improve intercity passenger rail service between the San Joaquin Valley, Sacramento Region, and Bay Area, providing a transportation alternative to the automobile that reduces VMT and trips (AECOM 2024). Total annual avoided VMT and trips under existing (2022), opening (2032), and horizon (2040) year conditions were calculated by AECOM. The analysis accounts for increased ridership across San Joaquins and ACE (including passenger transfers from connecting transit, such as HSR). The avoided VMT and trips were apportioned to the SJVAB, SFBAAB, and SVAB based on the number of passenger boardings at each station and the average travel distance within each air basin from the station (AECOM 2024). Emissions reductions achieved by reduced VMT and trips were estimated using emission factors obtained from EMFAC2021. The web-version of EMFAC was run to obtain vehicle-weighted emission factors for light-duty automobile, light-duty truck, and medium-duty vehicles. Aggregated vehicle speeds and model years were assumed. Refer to Appendix 3.3-1, *Air Quality, Greenhouse Gas, and Health Risk Assessment Supporting Documentation*, for the vehicle data and emission factors used in the analysis.

Total Net Operational Emissions

The air quality impact analysis evaluates total operational emissions in the SJVAB inclusive of the emission components discussed in this section. San Joaquins locomotive operations, station and facility operations, bus bridge (No Project only), and connecting bus transit are emissions sources.

Avoided automobile VMT and trips decrease daily emissions. The difference between emissions generated by San Joaquins operations, station and facility operations, bus bridge (No Project only), and connecting bus transit, and reductions achieved by avoided automobile VMT and trips in the SJVAB represents the total net operational emissions under each analysis condition for the regional air quality analysis.

Operational air quality benefits from avoided automobile VMT and trips in the SFBAAB and SVAB are separately presented. Because all Project infrastructure would be constructed and operated in the SJVAB, there are no new Project emission sources in the SFBAAB and SVAB. The Project likewise would not change the intensity or frequency of existing passenger rail operations in the expanded air quality study area. However, as discussed under *Locomotive Operations*, emissions from San Joaquins locomotives were quantified and included in the analysis to enable a comparison between the diesel and hydrogen fuel options being considered by the Project and Project variants, respectively. Thus, the analysis for the expanded air quality study area considers the difference between emissions generated by San Joaquins movement in each air basin and emission reductions achieved by reduced VMT and trips.

Because GHGs are global pollutants and the climate change study area includes the state and global atmosphere, operational GHG emissions are not separately evaluated among air basins. Thus, the GHG impact analysis combines total net operational emissions across the SJVAB, SFBAAB, and SVAB.

Hydrogen Variants

The three Project variants that include operation of San Joaquins hydrogen trains are being evaluated in this EIR. As discussed above and in Chapter 2, *Project Description*, SJJPA is committed to transitioning to ZE trainsets as soon as practicable, although the timeframe for full fleet conversion depends on many factors. Based on current procurements and technologies, the opening (2032) year analysis accounts for operation of three San Joaquins hydrogen trains. The horizon (2040) year analysis evaluates two transition scenarios. The first scenario conservatively assumes no additional ZE trainsets will be deployed, and the three opening year hydrogen trains would continue to operate under 2040 conditions. The second scenario assumes full ZE deployment with operation of eight San Joaquins hydrogen trains. While the precise future ZE transition schedule is not yet defined, the two horizon (2040) year scenarios evaluate the minimum and maximum ZE penetration for the Project variant conditions. Henceforth, this chapter refers to the three-train and eight-train hydrogen deployment scenarios as “limited” and “full,” respectively.

Hydrogen fuel cell locomotives do not produce any direct emissions (the only byproducts of hydrogen combustion are water and heat). Utilizing hydrogen fuel would therefore reduce San Joaquins combustion emissions relative to the Project, which would use renewable diesel in all trains. The hydrogen variants would not change station and maintenance facility operations (except for water consumption, as noted below), the need for connecting bus transit, or the reduction in automobile VMT and trips relative to the Project analysis. Variant H1 would require construction of a solar field and consume an additional 1,648 gallons of water annually to support on-site hydrogen production.[10] Variant H2 and Variant H3 would require haul trips and freight rail trips, respectively, to transport hydrogen produced off-site to the ACE Merced Layover and Maintenance Facility. Variant H1 under the full hydrogen deployment scenario would also require off-site hydrogen transport by haul truck.

[10] The amount of on-site hydrogen production would be limited to support three trains and thus would not change under the limited or full hydrogen deployment scenarios.

The air quality and GHG analysis of the three Project variants accounts for the direct reduction in San Joaquins combustion emissions from the use of hydrogen fuel. Construction emissions for the on-site solar facility under Variant H1 were quantified using CalEEMod, version 2022. CalEEMod was also used to quantify GHG emissions from additional water consumption under Variant H1. EMFAC2021 was used to quantify off-site hydrogen fuel transport emissions under Variant H1 (full hydrogen deployment scenario only) and Variant H2. Freight rail emissions from off-site hydrogen fuel transport under Variant H3 were quantified using USEPA's locomotive emissions standards and factors (USEPA 1998, 2023d). The off-site hydrogen is likely to be sourced from one or more processing facilities, although the specific location is currently unknown. For the purposes of this analysis, potential transportation requirements for off-site hydrogen were estimated based on the location of existing hydrogen production facilities throughout California. The analysis considers the maximum transport distance of the locations assessed, which is from Palm Springs to the ACE Merced Layover and Maintenance Facility. Emissions occurring from the transport of fuel between Palm Springs and Merced were assigned to regional air basins based on the percent of roadway miles (assuming a direct travel route) (Variants H1 and H2) or freight rail miles (Variant H3) in each air basin.[11] Potential transportation requirements for off-site hydrogen are discussed further in Appendix 3.3-1, *Air Quality, Greenhouse Gas, and Health Risk Assessment Supporting Documentation*. Modeled emissions results for each variant were combined with emissions estimated for the Project.

While hydrogen does not result in any direct combustion emissions in fuel cell locomotives, it can be produced using different energy inputs and techniques, which can result in considerably different GHG emissions from the production and transport of the fuel. These emissions would occur "upstream" of the Project variants, and as discussed under *Project Construction*, are not included in the impact analysis for this EIR. However, given that the three Project variants differ in terms of the type (i.e., green vs. gray) and location (i.e., on-site vs. off-site) of hydrogen production, a well-to-wheel (WTW) GHG analysis of locomotive fuel use was conducted for the Project and Project variants. WTW analysis considers GHGs emitted through each stage of the fuel's production, processing, distribution, and end use. The WTW analysis presented in this EIR is given for informational purposes to enable a comparison among the hydrogen fuel options being considered by the Project variants, and also to compare those fuel options to the Project, which would use renewable diesel.

Appendix 3.3-1, *Air Quality, Greenhouse Gas, and Health Risk Assessment Supporting Documentation*, describes the methods, assumptions, and emission factors for the informational WTW fuel analysis.

Health Risk Assessment

Construction

Construction of the Project and Project variants would generate DPM from diesel-powered off-road equipment, trains, and haul trucks. Construction of the Project variants would include the same intensity and duration of construction activities except for Variant H1, which includes construction of the on-site facility to produce and store hydrogen. Exposure to construction-related DPM was assessed for the proposed alignment, station connection, shifting the ACE/Union Pacific Railroad

[11] Palm Springs is in the Salton Sea Air Basin. The most direct on-road travel route from Palm Springs to Merced would require transport through the Salton Sea Air Basin, South Coast Air Basin, and SJVAB. The most direct freight travel route from Palm Springs to Merced would require transport through the Salton Sea Air Basin, South Coast Air Basin, Mojave Desert Air Basin, and SJVAB.

spur track, new aerial guideway, surface parking for passengers, layover and maintenance facility modification, and on-site solar field (Variant H1 only).

Health risks were predicted in terms of excess cancer and non-cancer hazard impacts. USEPA's AERMOD dispersion model was used to estimate annual DPM concentrations at sensitive land uses based on the average annual exhaust emissions of DPM emissions as particulate matter (SJVAPCD 2015b, 2018). Project-level cancer risk and non-cancer hazard impacts were estimated based on annual DPM concentrations from AERMOD using CARB's Hotspots Analysis and Reporting Program Version 2 (HARP 2). HARP 2 incorporates age-specific factors that account for increased sensitivity to carcinogens during early life exposure.

The rail and track connection segments were modeled as area sources to depict the environmental footprint where site disturbance could occur. The station and maintenance facility parking locations were also modeled as area sources. Sensitive receptors shown in Figure 3.3-3 were identified along with sets of gridded receptors that were within 1,000 feet of the construction activity.

SJVAPCD and USEPA recommend that when processing National Weather Service meteorological data that the friction velocity (u*) be adjusted during stable conditions with low wind speeds by using the adjusted u* option. The urban dispersion modeling algorithm was selected and a population of 86,370 for Merced was used based on the 2020 U.S. Census (U.S. Census 2022). Use of the urban dispersion modeling algorithm accounts for the increased dispersion that occurs in nighttime conditions in urban areas due to the urban heat island effect (SJVAPCD 2022, 2023).

Operations

The connection constructed by the Project would increase operational DPM emissions along the new track and into the integrated station and maintenance facility. The new connection would decrease operational DPM emissions along the existing San Joaquins rail line and at the existing San Joaquins station. Health risks from DPM emissions from train (train movement and idling), emergency generator, and on-road (bus and truck) emissions were modeled for opening (2032) Project and No Project conditions to calculate the net change in health risks from Project operation.

Health risks are influenced by intensity of DPM emissions, local meteorology conditions, orientation and location of the emission source, and sensitive receptor proximity to the emissions source (i.e., rail line and station stops). The train segments were modeled with a width of 5 meters. The width is based on a single-track width of 3 meters plus 1 meter on either side to include turbulent wake mixing effects. Train release height and initial vertical dispersion were separated into day and night periods to include changes in plume rise from the trains (CARB 2004; Environ 2006). Locomotives were conservatively assumed to have maximum exposure when traveling at a slow speed (notch setting one) resulting in having a daytime release parameter for the plume height and initial vertical dimension of 4.8 and 2.25 meters, respectively, and a nighttime plume height and initial vertical dimension of 18.4 and 8.54 meters, respectively.

Train idling at the station[12] and layover facility was characterized as a point source. The train stack height was set at 4.6 meters, with a stack temperature 351 Kelvin, exit velocity 3.73 meters per second, and stack diameter of 0.67 meter (Environ 2006). The same default stack parameters were

[12] As noted above, subsequent to preparation of this analysis, it was determined that the Project would require the use of wayside power at the proposed integrated Merced HSR Station. This would result in a minor decrease in locomotive idling and associated diesel emissions compared to the scenario that was modeled. Thus, the analysis of health risks from receptor exposure to locomotive idling at the station presented in this analysis is conservative.

used for diesel and hydrogen locomotives, including locomotives used to deliver off-site hydrogen under Variant H3.

The emergency generator at the layover facility was characterized as a point source. The release height was set at 3 meters, with a stack temperature of 622 Kelvin, exit velocity 73.3 meters per second, and stack diameter of 0.18 meter (CARB 2000).

Connecting transit buses and trucks used to deliver off-site hydrogen under Variant H2 were characterized as line-area sources with a width of 7 meters, a release height of 3.4 meters, and an initial vertical dimension of 3.16 meters.

The same meteorological and urban dispersion modeling inputs as described above for the construction HRA were assumed. Health risks were modeled at sensitive receptor locations, as shown on Figure 3.3-2.

Carbon Monoxide Hot-Spot Analysis

The Project would attract additional motor vehicles to San Joaquins and ACE stations throughout the San Joaquin Valley, Sacramento Region, and Bay Area. A screening-level CO hot-spot analysis was conducted to verify that Project traffic would not cause or contribute to a violation of the CO CAAQS.

Although a Project-specific traffic study did not identify intersection traffic volumes, station boardings and alightings based on anticipated ridership with and without the Project were modeled by AECOM (2024). Of the stations where implementation of the Project would increase non-transfer ridership, the station with the greatest number of non-transfer San Joaquins boardings and alightings is the at the San Joaquin Street Stockton Station (735 South San Joaquin Street). Based on the ridership analysis, annual and daily non-transfer boardings and alightings at the Stockton Station are 231,300 and 634 passengers, respectively, under opening (2032) year conditions (AECOM 2024).[13] While many of these passengers would walk, bike, carpool, or use public transit to access or leave the station, this analysis conservatively assumes all 634 daily boardings and alightings represent a single-passenger vehicle trip. The analysis further assumes that all 364 trips would be hypothetically made during a single hour and travel through the intersection of South San Joaquin Street and East Hazelton Avenue just north of the station.

Background peak-hour traffic volumes at South San Joaquin Street and East Hazelton Avenue were obtained from the *San Joaquin Regional Rail Commission Stockton Diamond Grade Separation Project Traffic Report* (HDR 2020). The combined background (i.e., No Project) and 634 Project trips represent a hypothetical worst-case peak-hour condition. While this scenario would never occur, it serves as a conservative condition to screen all intersections where traffic volumes may increase with the Project.[14] The potential for this condition to result in a CO hot spot was conducted using CARB's EMFAC2021 model and CALINE4 dispersion model. Receptors were placed 3 meters from each of the four intersection corners to represent the nearest location in which a receptor could potentially be located adjacent to a travelled roadway. A standard receptor elevation of 5.9 feet was

[13] Only opening year conditions are considered in the screening-level analysis. While ridership levels will be slightly higher under horizon (2040) year conditions, the average intensity of CO emissions generated by automobiles will be less due to fleet turnover and penetration of newer and alternatively fueled vehicles between 2032 and 2040.

[14] As discussed in the preceding paragraph, the analysis is conservative because it assumes 1) all daily boardings and alightings represent a single-passenger vehicle trip and 2) all daily Project and background (i.e., No Project) vehicle trips would be hypothetically made during a single hour and travel through the same intersection.

used (Garza et al. 1997). Worst-case wind angles and meteorological conditions were modeled to estimate conservative CO concentrations at each receptor. Background CO concentrations were obtained from USEPA (2023e) and added to the modeled results to account for sources of CO not included in the modeling.

Refer to Appendix 3.3-1, *Air Quality, Greenhouse Gas, and Health Risk Assessment Supporting Documentation*, for the model output.

Principal Sources

Principal sources consulted for the impact analysis are listed below.

- SJVAPCD's (2015a) *Guide for Assessing and Mitigating Air Quality Impacts*.
- SJVAPCD's (2015b, 2018, 2022) guidance for conducting HRAs.
- USEPA's (2009, 1998, 2023d) locomotive emissions and operating data.
- AECOM's *Merced Intermodal Track Connection Ridership and Revenue Memorandum* (Appendix 2.0-3).
- MITC engineering data provided by AECOM (pers. comm.).
- Technical models, including EMFAC2021, CalEEMod version 2022, CALINE4, AERMOD, and HARP.

3.3.4.2 Thresholds of Significance

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 air quality and GHG emissions.

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

- Conflict with or obstruct implementation of the applicable air quality plan. For this analysis, "conflict with or obstruct implementation" is defined as circumstances in which the Project would worsen existing air quality violations or exceed the growth assumptions utilized by MCAG in preparation their RTP.
- Result in a cumulatively considerable net increase of any criteria pollutant for which the Project region is in nonattainment under an applicable federal or state ambient air quality standard. For this analysis, a "cumulatively considerable net increase" is defined as circumstances in which construction or operational emissions exceed the pertinent air quality thresholds of significance, as described below under *Cumulatively Considerable Criteria Pollutant Emissions* and shown in Table 3.3-11.
- Expose sensitive receptors to substantial pollutant concentrations. For this analysis, schools, day care facilities, medical facilities, parks, and residences are considered sensitive receptor locations. A "substantial pollutant concentration" is defined as levels in excess of the applicable air district thresholds described under *Exposure of Receptors to Substantial Pollutant Concentrations*.

- Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people. For this analysis, construction of an odor-producing facility, as defined by SJVAPCD, would result in an "objectionable odor" capable of affecting a substantial number of people. Odor-producing facilities include landfills, wastewater treatment plants, food processing facilities, and certain agricultural activities.
- Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment. For this analysis, a "significant" level of GHG emissions is defined as emission levels that would conflict with statewide GHG reduction goals, as discussed further under *Greenhouse Gas Emissions*.
- Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing emissions of GHGs. For the purposes of this analysis, applicable plans and regulations include SB 32, AB 1279, RTPs, and local CAPs.

Table 3.3-11. SJVAPCD Criteria Pollutant and Precursor Thresholds and Screening Criteria

Cumulative Thresholds	Daily Screening Criteria
ROG: 10 tons/year NO_X: 10 tons/year PM10: 15 tons/year PM2.5: 15 tons/year CO: 100 tons/year SO_X: 27 tons/year	100-pound-per-day of any criteria pollutant [a]

Source: San Joaquin Valley Air Pollution Control District 2015a.
SJVAPCD = San Joaquin Valley Air Pollution Control District; ROG = reactive organic gases; NO_X = nitrogen oxides; PM10 = particulate matter 10 microns or less in diameter; PM2.5 = particulate matter 2.5 microns or less in diameter; CO = carbon monoxide; SO_X = sulfur oxide; CAAQS = California ambient air quality standards; NAAQS = national ambient air quality standards.
[a] Projects with emissions below the screening criteria would not be in violation of CAAQS or NAAQS. Projects with emissions above the screening criteria would require an ambient air quality analysis to confirm this conclusion (San Joaquin Valley Air Pollution Control District 2015a).

CEQA Guidelines Section 15125 indicates that existing conditions at the time a notice of preparation is released or when environmental review begins "normally" constitute the baseline for environmental analysis. In 2010, the California Supreme Court issued an opinion that while lead agencies have some flexibility in determining what constitutes the baseline, relying on "hypothetical allowable conditions" when those conditions are not a realistic description of the conditions without the Project, would be an illusory basis for a finding of no significant impact from the Project and, therefore, a violation of CEQA (*Communities for a Better Environment v. South Coast Air Quality Management District* (2010) 48 Cal. 4th 310).

On August 5, 2013, the California Supreme Court decided *Neighbors for Smart Rail v. Exposition Metro Line Construction Authorit*y (57 Cal. 4th 439). This latest decision has clarified that, under certain circumstances, a baseline may reflect future, rather than existing, conditions. The rule specifies that factual circumstances can justify an agency using a future baseline in the following circumstances when such reasons are supported by substantial evidence:

- When necessary to prevent misinforming or misleading the public and decision makers.
- When the use of future conditions in place of existing conditions is justified by unusual aspects of the project or surrounding conditions.

With respect to the Project, using existing conditions to evaluate criteria pollutant and GHGs would misrepresent and mislead the public and decision makers with respect to potential air quality and GHG impacts, for the following reasons: (1) locomotive fleet turnover and service operations, (2) changes in on-road emission factors, and (3) net Project VMT reductions.

- The locomotive fleet mix and service operations will be different by the time the Project is fully implemented in 2032 (refer to Table 3.3-9). Emissions standards for Tier 4 engines are more stringent compared to Tier 3 standards. Accordingly, locomotive emissions will decrease between the existing (2022) and opening year (2032) fleets due to natural turnover to Tier 4 locomotives. Quantifying emissions under existing conditions would therefore overestimate locomotive emissions associated with the Project, resulting in artificially high emissions.
- On-road vehicle emissions rates will lessen in the future due to continuing engine advancements and more stringent air quality regulations. Applying the complete ridership increase under existing conditions (2022) and quantifying emissions utilizing 2022 vehicle emissions rates would not only represent a fictitious scenario but would also overestimate emissions reductions and potential air quality and GHG benefits achieved by the Project.
- Using the relatively higher existing conditions emissions factors to quantify emissions reduction benefits assorted with Project-related VMT reductions in 2032 would overstate the Project's emissions reduction benefits.

These facts represent substantial evidence in support of using a future conditions analysis, rather than existing conditions, to evaluate air quality and GHG impacts. Accordingly, for this analysis, the CEQA assessment evaluates Project emissions under full operations (2032 and 2040) compared to future No Project conditions. This approach reflects appropriate locomotive and vehicle fleet characteristics and emission factors. Using future year conditions as the basis for the CEQA analysis avoids misinforming and misleading the public and decision makers with respect to air quality impacts, consistent with existing CEQA case law.

For the purposes of full disclosure, the comparison of the Project's operational emissions is presented relative to both existing and No Project conditions; however, significance determinations are only made with respect to No Project conditions based on the rationale explained above.

The following sections summarize relevant thresholds and presents substantial evidence regarding the basis on which they were developed. The sections also describe how the thresholds are used to determine whether construction and operation of the Project would result in a significant air quality or GHG impact.

Cumulatively Considerable Criteria Pollutant Emissions

SJVAPCD's (2015a) CEQA guidelines contain emissions thresholds to assist lead agencies in evaluating the significance of project-generated criteria pollutant and precursor emissions (Table 3.3-11). The air district thresholds have been developed to prevent further deterioration of ambient air quality, which is influenced by emissions generated by projects in the SJVAB. The project-level thresholds therefore consider relevant past, present, and reasonably foreseeable future projects in the Project area. For example, as noted in SJVAPCD's (2015a) CEQA Guidelines, "any proposed development project that would individually have a significant air quality impact would also be considered to have a significant cumulative air quality impact." The emissions thresholds presented in Table 3.3-11 therefore represent the maximum emissions the Project may generate before it would result in a cumulatively considerable adverse contribution to existing air quality conditions.

SJVAPCD's cumulative thresholds are based on the New Source Review offset requirements for stationary sources. SJVAPCD has determined that use of SJVAPCD Rule 2201 (New Source Review) Offset thresholds as thresholds of significance for criteria pollutants is an appropriate and effective means of promoting consistency in significance determinations in the environmental review process and is applicable to both stationary and non-stationary emissions sources. SJVAPCD's attainment plans demonstrate that project-specific emissions below their thresholds would have a less-than-significant impact on air quality (SJVAPCD 2015a).

In addition to their cumulative thresholds, SJVAPCD has established a 100-pound-per-day screening criteria to help determine whether increased emissions from a project would cause or contribute to a violation of CAAQS or NAAQS. Projects with emissions below the screening criteria would not be in violation of CAAQS or NAAQS. Projects with emissions above the screening criteria would require an ambient air quality analysis to confirm this conclusion (SJVAPCD 2015a). The 100-pound-per-day screening criteria is shown alongside SJVAPCD's cumulative air quality thresholds in Table 3.3-11.

The relevant local air quality management districts in the expanded air quality study area (see Figure 3.3-1) have likewise developed thresholds for criteria pollutant and precursor emissions generated by projects within their jurisdictions. As noted in Section 3.3.4.1, *Methods for Analysis*, there are no new Project emission sources in the SFBAAB and SVAB and thus no potential for the Project to result in a cumulatively considerable air quality impact as indicated through exceedances of local air district thresholds. Accordingly, a comparative analysis of Project emissions to air quality management district thresholds in in the SFBAAB and SVAB is not required. Emissions benefits achieved by reductions in automobile VMT and trips throughout the SFBAAB and SVAB will support regional air quality goals in these geographies, as discussed further in Impact AQ-2b.

Exposure of Receptors to Substantial Pollutant Concentrations

In December 2018, the California Supreme Court issued its decision in *Sierra Club v. County of Fresno* (226 Cal.App.4th 704) (hereafter referred to as the "Friant Ranch" decision). The case reviewed the long-term, regional air quality analysis contained in the EIR for the proposed Friant Ranch development. The Friant Ranch project is a 942-acre master-plan development in unincorporated Fresno County in the SJVAB. The Court found that the air quality analysis was inadequate because it failed to provide enough detail "for the public to translate the bare [criteria pollutant emissions] numbers provided into adverse health impacts or to understand why such a translation is not possible at this time." The Court's decision clarifies that environmental documents must connect a project's air quality impacts to specific health effects or explain why it is not technically feasible to perform such an analysis.

As discussed in Section 3.3.3.1, *Pollutants of Concern*, all pollutants that would be generated or affected by the Project are associated with some form of health risk (e.g., asthma). The primary pollutants of concern associated with the Project are criteria pollutants (ozone precursors, CO, PM, and SO_2), TACs (DPM and asbestos), and *C. immitis* fungus spores. Thresholds of significance and analysis considerations for each pollutant are identified in the following subsections.

Criteria Pollutants

The Project would expose receptors to substantial criteria pollutant concentrations if any of the thresholds summarized in Table 3.3-11 are exceeded. As discussed previously, SJVAPCD developed the thresholds in consideration of existing air quality concentrations and attainment designations under the NAAQS and CAAQS. The NAAQS and CAAQS are informed by a wide range of scientific evidence that demonstrates there are known safe concentrations of criteria pollutants.

In addition to its mass emission thresholds, SJVAPCD (2015a) considers localized CO emissions from mobile sources to result in significant impacts if concentrations exceed CAAQS (Table 3.3-1). The air quality management districts in the expanded study area, including BAAQMD (2023) likewise considers violations of the CO CAAQS to reparent a significant localized CO impact.

Diesel Particulate Matter[15]

SJVAPCD (2015a) defines a significant impact resulting from receptor exposure to DPM emissions as (1) a probability exceeding 20 in 1 million of contracting cancer for the maximum exposed individual, and (2) the ground-level concentrations of noncarcinogenic TACs resulting in a hazard index greater than 1 for the maximum exposed individual. SJVAPCD does not have separate cumulative health risk thresholds. If the Project assessment demonstrates that potential health impacts are less than significant, the Project would likewise have a less-than-cumulatively-significant impact (Siong pers. comm.).

Asbestos

There are no quantitative thresholds related to receptor exposure to asbestos. The MITC environmental footprint is not in an area known to contain naturally occurring asbestos. Thus, the potential for the Project to expose receptors to asbestos is through demolition activities during construction. SJVAPCD (2015a) requires the demolition or renovation of asbestos-containing building materials to comply with the limitations of the National Emissions Standards for Hazardous Air Pollutants regulations as listed in the Code of Federal Regulations where all construction activities will occur. Failure to comply with the National Emissions Standards for Hazardous Air Pollutants would result in a significant impact.

Fungal Spores (Valley Fever)

There are no quantitative thresholds related to receptor exposure to *C. immitis*. The potential for the Project to expose receptors to Valley fever is highest during earthmoving activities that generate fugitive dust. Accordingly, uncontrolled construction dust emissions in SJVAPCD could result in increased health impacts from exposure of receptors to *C. immitis* spores, and would constitute a significant impact.

Exposure of Receptors to Odors

Receptors would be exposed to significant odors if the Project would result in objectionable odor emissions that affect a substantial number of people. There are no quantitative thresholds that specifically define receptor exposure to objectionable odors. SJVAPCD's (2015a) CEQA guidelines include recommended odor screening distances for common land use types that typically generate odors. SJVAPCD's (2015a) CEQA Guidelines further defines a significant odor impact as more than

[15] The air quality management districts in the expanded area have also adopted health risk thresholds for receptor exposure to DPM. However, as noted above, the Project does not include any new emission sources outside of the SJVAB and would regionally reduce mobile source emissions throughout the SFBAAB and SVAB. Increases in localized vehicle trips to passenger rail stations would be predominately light-duty, and thus gasoline or electric powered and not a substantial source of DPM.

one confirmed complaint per year averaged over 3 years, or three unconfirmed complaints per year averaged over 3 years.

Greenhouse Gas Emissions

SJVAPCD's (2015a) CEQA Guidelines do not identify a GHG emissions threshold for construction-related emissions. The guidelines include thresholds to evaluate operational emissions, but these are only applicable to land use development and stationary source projects. Within the expanded air quality study area, the SMAQMD and BAAQMD have also established GHG thresholds, but like those adopted by SJVAPCD, they only apply to land use development and stationary-source projects. The Project is a transportation project that does not fit into the land use development or stationary source project categories. Accordingly, there are no adopted quantitative GHG thresholds relevant to the Project. Therefore, direct and indirect GHG emissions from the improvements are discussed with respect to larger statewide GHG emission reduction goals, where a significant impact would occur if emissions would obstruct attainment of the targets outlined SB 32 or AB 1279.

3.3.4.3 Impacts and Mitigation Measures

Impact AQ-1	Construction and operation of the Project would not conflict with or obstruct implementation of the applicable air quality plan.
Level of Impact	**Less-than-significant impact**

Project

Impact Characterization

A project is deemed inconsistent with air quality plans if it would result in population and/or employment growth that exceeds estimates used to develop applicable air quality plans. Projects that propose development consistent with the growth anticipated by the relevant land use plans would be consistent with the current air quality plans. Likewise, projects that propose development less dense than anticipated within a general plan (or other governing land use document) would be consistent with the air quality plans because emissions would be less than estimated for the region. If a project proposes development that is greater than the anticipated growth projections, the project would be in conflict with air quality plans and might have a potentially significant impact on air quality because emissions would exceed those estimated for the region. This situation would warrant further analysis to determine if a project and surrounding projects would exceed the growth projections used in air quality plans for a specific subregional area.

Impact Details and Conclusions

As discussed in Section 3.11, *Land Use and Planning*, the Project would not result in significant environmental impacts with respect to consistency with regional and local general plans and policies (see Impacts LU-3 and LU-4). Likewise, as noted in Section 3.1, *Effects Found Not to Be Significant*, the Project would not result in substantial or unplanned population or housing growth. Potential growth that may be associated with the Project, as noted in Section 3.1, would be supportive of local development plans and would not materially increase the overall growth pressure in the communities served by the Project. The Project would not provide new access to undeveloped areas. Accordingly, the Project would not induce growth and would be consistent with recent growth projections for the region.

MCAG's (2022) adopted 2022 RTP/SCS identifies the Project as a critical project for future operations of the Amtrak San Joaquins Rail, enabling direct cross-platform connections to other rail services and transit. Thus, the Project directly supports the goals of MCAG's RTP/SCS by expanding intercity passenger service. Beyond Merced County, the Project would increase passenger rail ridership, alleviate traffic congestion, and reduce automobile VMT and trips throughout Northern California, supporting RTPs adopted by metropolitan planning organizations throughout the expanded air quality study area.

The Project benefits of reduced automobile VMT and traffic congestion are also consistent with objectives and policies of air quality plans throughout the SJVAB, SFBAAB, and SVAB. The ultimate goal of air quality plans, however, is to reduce criteria pollutants for which the SJVAB and portions of the expanded air quality study area are currently considered nonattainment or maintenance. As determined under Impact AQ-2b, operation of the Project would reduce criteria pollutant emissions across the SJVAB, SFBAAB, and SVAB, relative to No Project conditions. Thus, the Project will support regional attainment of the NAAQS and CAAQS throughout Northern California.

Construction of the Project will generate short-term criteria pollutant emissions in the SJVAB. The SJVAPCD has established project-level thresholds to identify projects that may contribute to violations of the ambient air quality standards (Table 3.3-11). Accordingly, projects that result in construction emissions in excess of district mass emission thresholds would conflict with the primary goal of the air quality plans, which is to achieve the regional attainment of NAAQS and CAAQS. As determined under Impact AQ-2a, construction of the Project would not exceed SJVAPCD's thresholds, and thus would not conflict with local air quality plans. This is a less-than-significant impact.

Variant H1

Impact Characterization

The impact characterization is the same as described above for the Project.

Impact Details and Conclusions

Variant H1 would provide the same locomotive service and achieve the same level of ridership as the Project. Thus, like the Project, Variant H1 would not induce growth, would be consistent with recent growth projections for the region, and would support regional transportation goals of MCAG and other metropolitan planning organizations throughout the expanded air quality study area. Compared to the Project, construction of the solar facility to support on-site hydrogen production would result in slightly greater short-term construction emissions, but these emissions would not exceed SJVAPCD's mass emissions thresholds (see Impact AQ-2a). Thus, like the Project, construction of Variant H1 would not conflict with local air quality plans. The ZE locomotives operated under Variant H1 would reduce operational criteria pollutant emissions relative to the Project, achieving greater net emissions benefits from avoided automobile VMT and trips (see Impact AQ-2b). Variant H1 would therefore support more rapid attainment of the NAAQS and CAAQS throughout Northern California. However, there would be no difference in the overall impact conclusion between the Project and Variant H1 (both would result in a less-than-significant impact with respect to air quality plan consistency).

Variant H2

Impact Characterization

The impact characterization is the same as described above for the Project.

Impact Details and Conclusions

The impact details are the same as described above for Variant H1 except for construction of the solar field. Variant H2 would not construct an on-site solar field and thus would have the same potential to conflict with air quality plans during construction as the Project. Like Variant H1, the ZE locomotives operated under Variant H2 would generate fewer daily and annual criteria pollutant emissions when compared to the Project. However, there would be no difference in the overall impact conclusion between the Project and Variant H2 (both would result in a less-than-significant impact with respect to air quality plan consistency).

Variant H3

Impact Characterization

The impact characterization is the same as described above for the Project.

Impact Details and Conclusions

The impact details are the same as described above for Variant H2. Variant H3 would have the same potential to conflict with air quality plans during construction as the Project and Variant H2. Like Variant H2, the ZE locomotives operated under Variant H3 would generate fewer daily and annual criteria pollutant emissions when compared to the Project. However, there would be no difference in the overall impact conclusion between the Project and Variant H3 (both would result in a less-than-significant impact with respect to air quality plan consistency).

Impact AQ-2a	Construction of the Project would not result in a cumulatively considerable net increase of any criteria pollutant for which the Project region is in nonattainment under an applicable federal or state ambient air quality standard.
Level of Impact	**Less-than-significant impact**

Project

Impact Characterization

Construction of the Project has the potential to create short-term regional air quality impacts through use of heavy-duty construction equipment, worker vehicle trips, truck hauling trips, and locomotive trips. In addition, fugitive emissions would result from site grading, earth moving, and demolition, and evaporative organic emissions from paving. Criteria pollutant and ozone precursors generated by these sources were quantified using CalEEMod version 2022 and emission factors from USEPA (2009), as described in Section 3.3.4.1, *Methods for Analysis*. The emissions modeling reflects a specific set of conservative assumptions based on the best available information currently known for the total amount, duration, and intensity of construction activity.

Table 3.3-12 summarizes estimated emissions in the SJVAB for construction of the Project in pounds per day and tons per year. The table also presents estimated emissions for construction of Variant H1. Variant H1 is discussed further below. While emissions are summarized in different units (pounds and tons), the amounts of emissions are identical (i.e., 2,000 pounds is identical to 1 ton). Summarizing emissions in both pounds per day and tons per year is necessary to evaluate effects against the appropriate air district thresholds and screening criteria, which are given in both pounds and tons. As discussed in Section 3.3.4.2, *Thresholds of Significance*, SJVAPCD has identified annual emission thresholds to evaluate impacts on air quality that are inclusive of past, present, and future projects. The annual emissions thresholds, therefore, represent the maximum emissions the Project may generate before contributing to a cumulative impact on regional air quality. SJVAPCD also has a daily screening criteria to assess whether increased emissions from a project would cause or contribute to a violation of the CAAQS or NAAQS.

Impact Details and Conclusions

As shown in Table 3.3-12, construction emissions would not exceed SJVAPCD's annual thresholds or daily screening criteria. SJVAPCD's annual thresholds were established to prevent emissions from new projects in the SJVAB from contributing to violations of the CAAQS or NAAQS. Because construction emissions would not exceed SJVAPCD's thresholds, the Project would not contribute to regional pollution in the SJVAB. This is a less-than-significant impact.

As noted above, the emissions results presented in Table 3.3-12 account for compliance with SJVAPCD Regulation VIII, which is required to control fugitive dust emissions. The Project is also subject to SJVAPCD Rule 9510, which is triggered when unmitigated NO_X or PM10 exhaust emissions exceed 2 tons per year. Per Rule 9510, NO_X and PM10 exhaust emissions from construction equipment greater than 50 horsepower must be reduced by at least 20 percent and 45 percent, respectively, compared to the statewide average for NO_X. Reductions can be achieved through any combination of SJVAPCD-approved on-site emission reduction measures, such as advanced engine tiers (e.g., Tier 4), engine electrification, or other best available control equipment. Compliance with Rule 9510 is required by law and is therefore not considered a mitigation measure.

Table 3.3-12. Estimated Criteria Pollutant and Ozone Precursor Emissions from Construction of the Project and Variant H1

	Maximum Daily Emissions (lb/day)[a]										Annual Emissions (tons/year)									
				PM10			PM2.5							PM10			PM2.5			
Year	**ROG**	**NO_X**	**CO**	**Exhaust**	**Dust[b]**	**Total[c]**	**Exhaust**	**Dust[b]**	**Total[c]**	**SO_2**	**ROG**	**NO_X**	**CO**	**Exhaust**	**Dust[b]**	**Total[c]**	**Exhaust**	**Dust[b]**	**Total[c]**	**SO_2**
Project																				
2029	2	19	21	1	16	17	1	4	4	<1	<1	1	1	<1	1	1	<1	<1	<1	<1
2030	4	43	53	1	43	43	1	4	5	<1	<1	3	3	<1	3	3	<1	<1	<1	<1
2031	7	65	78	3	70	72	2	10	12	<1	<1	4	5	<1	5	5	<1	1	1	<1
2032	7	75	94	2	67	69	2	9	11	<1	<1	3	3	<1	2	2	<1	<1	<1	<1
Variant H1																				
2029	2	19	21	1	16	17	1	4	4	<1	<1	1	1	<1	1	1	<1	<1	<1	<1
2030	4	43	53	1	43	43	1	4	5	<1	<1	3	3	<1	3	3	<1	<1	<1	<1
2031	8	66	84	3	73	75	3	10	13	<1	1	4	6	<1	5	5	<1	1	1	<1
2032	7	75	94	2	70	72	2	9	11	<1	<1	3	3	<1	2	2	<1	<1	<1	<1
Threshold[d]	*100*	*100*	*100*	–	–	*100*	–	–	*100*	*100*	*10*	*10*	*100*	–	–	*15*	–	–	*15*	*27*

AAQA = ambient air quality analysis; CAAQS = California ambient air quality standards; CO = carbon monoxide; ROG = reactive organic gases; lb = pounds; NAAQS = national ambient air quality standards; NO_X = nitrogen oxides; PM10 = particulate matter that is 10 microns in diameter and smaller; PM2.5 = particulate matter that is 2.5 microns in diameter and smaller; SJVAPCD = San Joaquin Valley Air Pollution Control District; SO_2 = sulfur dioxide.

[a] The emissions intensity of vehicles can differ in summer and winter. CalEEMod generates summer- and winter-period emissions in which summer emissions factors are used for activities occurring between April and September, and winter emissions factors are used for activities occurring between October and March. Where applicable for construction phases occurring in winter and summer, the higher of the two estimates are presented above. The reported value for each year represents the highest emissions that would be generated on any one day during the year.

[b] Modeling accounts for compliance with SJVAPCD Regulation VIII.

[c] Total PM10 and PM2.5 emissions consist of exhaust and fugitive dust emissions. Annual and daily values for exhaust and dust may not add to the totals in the total column because of rounding.

[d] In developing the annual thresholds, SJVAPCD considered levels at which project emissions are cumulatively considerable. Consequently, exceedances of the project-level annual thresholds would be cumulatively considerable. The 100-pound-per-day threshold is a screening criterion to help determine whether increased emissions from a project would cause or contribute to a violation of CAAQS or NAAQS.

Variant H1

Impact Characterization

Variant H1 would not change the intensity of construction required for the Project. However, Variant H1 would construct a solar facility to support on-site hydrogen production. Construction emissions for the on-site solar facility were quantified using CalEEMod, version 2022, and combined with emissions estimated for the Project. The resulting emissions are presented in Table 3.3-12.

Impact Details and Conclusions

Compared to the Project, construction of Variant H1 would result in slightly greater short-term emissions, but as shown in Table 3.3-12, these emissions would not exceed SJVAPCD's annual thresholds or daily screening criteria. The same regulatory compliance requirements for SJVAPCD Regulation VIII and Rule 9510 would apply to Variant H1, as described above for the Project. Thus, there would be no difference in the impact conclusion between the Project and Variant H1 (both would result in a less-than-significant impact with respect to the generation of cumulatively considerable criteria pollutant emissions during construction).

Variant H2

Impact Characterization

The impact characterization is the same as described above for the Project. Variant H2 would not change the intensity of construction required for the Project and would not construct any additional features. Thus, the emissions presented in Table 3.3-12 for the Project also characterize emissions that would be generated for construction of Variant H2.

Impact Details and Conclusions

The impact details and conclusions are the same as described above for the Project. There would be no difference in the impact conclusion between the Project and Variant H2 (both would result in a less-than-significant impact with respect to the generation of cumulatively considerable criteria pollutant emissions during construction).

Variant H3

Impact Characterization

The impact characterization is the same as described above for the Project. Variant H3 would not change the intensity of construction required for the Project and would not construct any additional features. Thus, the emissions presented in Table 3.3-12 for the Project also characterize emissions that would be generated for construction of Variant H3.

Impact Details and Conclusions

The impact details and conclusions are the same as described above for the Project. There would be no difference in the impact conclusion between the Project and Variant H3 (both would result in a less-than-significant impact with respect to the generation of cumulatively considerable criteria pollutant emissions during construction).

Impact AQ-2b	Operation of the Project would not result in a cumulatively considerable net increase of any criteria pollutant for which the Project region is in nonattainment under an applicable federal or state ambient air quality standard.
Level of Impact	**Less-than-significant impact (beneficial)**

Project

Impact Characterization

Project operations have the potential to create long-term regional air quality impacts in the SJVAB through locomotive operations, station and facility operations, and connecting bus transit. However, Project operations would increase passenger rail ridership throughout the SJVAB and adjacent SFBAAB and SVAB. This increased ridership will reduce driving, contributing to emissions reductions. Criteria pollutant emissions and reductions generated by these sources were quantified for existing (2022), opening year (2032), and horizon year (2040) conditions.

Table 3.3-13 summarizes estimated net operations emissions in the SJVAB in pounds per day and tons per year for each of the analysis conditions. While emissions are summarized in different units (pounds and tons), the amounts of emissions are identical (i.e., 2,000 pounds is identical to 1 ton). The estimates reflect the difference between emissions generated by San Joaquins operations, station and facility operations, bus bridge (No Project only), and connecting bus transit and reductions achieved by avoided VMT and trips, where negative values represent a net reduction in emissions under the operating condition. Refer to Appendix 3.3-1, *Air Quality, Greenhouse Gas, and Health Risk Assessment Supporting Documentation*, for a detailed summary of emissions and reductions by source (e.g., locomotive operations).

Table 3.3-13 compares Project emissions to existing (2022) conditions and No Project conditions under the opening (2032) and horizon (2040) years. The difference in operations emissions between the Project and the existing conditions represents the change in emissions over existing conditions with the Project, but this comparison is not used to make significance determinations, based on the reasoning described in Section 3.3.4.2, *Thresholds of Significance*. The comparisons to the No Project conditions represent the net impact of Project operation, and this is the comparison that is evaluated relative to SJVAPCD thresholds and used to determine impact significance.

Table 3.3-13. Estimated Criteria Pollutant and Ozone Precursor Emissions from Project Operations and Project Variant Operations in the SJVAB

Condition	Net Daily Emissions (lb/day) [a]						Net Annual Emissions (tons/year) [a]					
	ROG	NO_X	CO	PM10	PM2.5	SO_2	ROG	NO_X	CO	PM10	PM2.5	SO_2
Existing (2022)	9	511	-148	-137	-28	<0	1	92	-28	-25	-5	<0
Opening (2032) No Project	-1	121	-420	-291	-71	-2	<0	21	-78	-53	-13	<0
Hydrogen Variant [b]	-3	74	-482	-291	-71	-2	-1	12	-89	-53	-13	<0
Opening (2032) Project	-2	117	-500	-331	-81	-2	-1	20	-92	-61	-15	<0
Variant H1	-4	67	-563	-332	-82	-2	-1	11	-104	-61	-15	<0
Variant H2	-4	69	-563	-332	-81	-2	-1	11	-104	-61	-15	<0
Variant H3	-4	68	-562	-332	-82	-2	-1	11	-104	-61	-15	<0
Horizon (2040) No Project	2	123	-383	-318	-77	-2	<1	21	-71	-58	-14	<0
Hydrogen Variant (limited) [b]	<0	75	-446	-318	-78	-2	<0	12	-82	-58	-14	<0
Hydrogen Variant (full) [b]	-3	-3	-547	-318	-79	-2	-1	-2	-101	-58	-14	<0
Horizon (2040) Project	1	120	-458	-362	-88	-2	<0	20	-84	-66	-16	<0
Variant H1 (limited)	-1	70	-521	-362	-89	-2	<0	11	-96	-66	-16	<0
Variant H1 (full)	-5	-8	-622	-363	-90	-3	-1	-3	-114	-66	-17	<0
Variant H2 (limited)	-1	71	-521	-362	-89	-2	<0	12	-96	-66	-16	<0
Variant H2 (full)	-4	-7	-622	-362	-90	-3	-1	-3	-114	-66	-16	<0
Variant H3 (limited)	-1	71	-521	-362	-89	-2	<0	12	-96	-66	-16	<0
Variant H3 (full)	-4	-8	-621	-364	-90	-3	-1	-3	-114	-67	-17	<0
Comparison to Existing [c]												
Opening (2032) Project	-10	-394	-352	-194	-53	-2	-2	-73	-64	-35	-10	<0
Variant H1	-13	-443	-415	-195	-53	-2	-2	-82	-76	-36	-10	<0
Variant H2	-13	-442	-415	-194	-53	-2	-2	-81	-76	-35	-10	<0
Variant H3	-12	-442	-415	-195	-53	-2	-2	-81	-76	-36	-10	<0
Horizon (2040) Project	-8	-391	-310	-224	-60	-2	-2	-72	-56	-41	-11	<0
Variant H1 (limited)	-10	-440	-373	-225	-61	-2	-2	-81	-68	-41	-11	<0
Variant H1 (full)	-13	-518	-474	-225	-62	-3	-3	-95	-86	-41	-11	<0
Variant H2 (limited)	-10	-439	-373	-224	-61	-2	-2	-81	-68	-41	-11	<0
Variant H2 (full)	-13	-517	-474	-225	-62	-3	-3	-95	-86	-41	-11	<0
Variant H3 (limited)	-10	-440	-373	-225	-61	-2	-2	-81	-68	-41	-11	<0
Variant H3 (full)	-13	-518	-473	-226	-62	-3	-3	-95	-86	-41	-11	<0
Comparison to No Project												
Opening (2032) Project	-1	-5	-80	-41	-10	<0	<0	-1	-15	-7	-2	<0
Variant H1 [d]	-1	-6	-81	-41	-10	<0	<0	-1	-15	-8	-2	<0
Variant H2 [d]	-1	-5	-80	-41	-10	<0	<0	-1	-15	-7	-2	<0
Variant H3 [d]	-1	-5	-80	-41	-10	<0	<0	-1	-15	-8	-2	<0
Horizon (2040) Project	-1	-4	-75	-44	-11	<0	<0	-1	-14	-8	-2	<0
Variant H1 (limited) [d]	-1	-4	-75	-45	-11	<0	<0	-1	-14	-8	-2	<0

Condition	Net Daily Emissions (lb/day) [a]						Net Annual Emissions (tons/year) [a]					
	ROG	NO_X	CO	PM10	PM2.5	SO_2	ROG	NO_X	CO	PM10	PM2.5	SO_2
Variant H1 (full) [d]	-1	-4	-75	-45	-11	<0	<0	-1	-14	-8	-2	<0
Variant H2 (limited) [d]	-1	-4	-75	-44	-11	<0	<0	-1	-14	-8	-2	<0
Variant H2 (full) [d]	-1	-4	-75	-44	-11	<0	<0	-1	-14	-8	-2	<0
Variant H3 (limited) [d]	-1	-4	-74	-45	-11	<0	<0	-1	-14	-8	-2	<0
Variant H3 (full) [d]	-1	-5	-74	-46	-11	<0	<0	-1	-13	-8	-2	<0
Threshold [e]	*100*	*100*	*100*	*100*	*100*	*100*	*10*	*10*	*100*	*15*	*15*	*27*

AAQA = ambient air quality analysis; CO = carbon monoxide; ROG = reactive organic gases; lb = pounds; NO_X = nitrogen oxides; PM10 = particulate matter that is 10 microns in diameter and smaller; PM2.5 = particulate matter that is 2.5 microns in diameter and smaller; SJVAPCD = San Joaquin Valley Air Pollution Control District; SO_2 = sulfur dioxide.

[a] The net emissions estimates for each condition reflect the difference between emissions generated by operations sources and reductions achieved by avoided automobile VMT and trips. Operations sources for each condition include the following:

- Existing: San Joaquins operation, station and maintenance facility operations, and connecting bus transit.
- No Project: San Joaquins operation, station and maintenance facility operations, bus bridge, and connecting bus transit.
- No Project Hydrogen Variant: San Joaquins operation (three hydrogen powered trains under opening year conditions and the limited hydrogen deployment scenario for horizon year conditions; eight hydrogen powered trains under the full hydrogen deployment scenario for horizon year conditions), off-site hydrogen fuel transport by on-road tube trailer, station and maintenance facility operations (same as No Project), bus bridge (same as No Project), and connecting bus transit (same as No Project).
- Project: San Joaquins operation (same as No Project), station and maintenance facility operations (same as No Project), and connecting bus transit.
- Variant H1: San Joaquins operation (same as No Project Hydrogen Variant), station and maintenance facility operations (same as Project), connecting bus transit (same as Project), and off-site hydrogen fuel transport by on-road tube trailer under the full hydrogen deployment scenario.
- Variant H2: Variant H1 sources and off-site hydrogen fuel transport by on-road tube trailer (limited and full hydrogen deployment scenarios).
- Variant H3: Variant H1 sources except off-site hydrogen fuel transport would be by freight rail (limited and full hydrogen deployment scenarios).

Negative values represent a net reduction in emissions under the operating condition. Refer to Appendix 3.3-1, *Air Quality, Greenhouse Gas, and Health Risk Assessment Supporting Documentation*, for a detailed summary of emissions and reductions by source (e.g., locomotive operations).

[b] The No Project hydrogen variant assumes operation of hydrogen-powered San Joaquins locomotives in response to the state's ZE goals, which will facilitate transition of the statewide locomotive fleet to ZE units (see Section 3.3.2.2, *State*). For the purposes of analysis, hydrogen fuel for the No Project hydrogen variant was assumed to be sourced off-site using the same transport assumptions as Variant H2 (on-road tube trailer).

[c] Comparison provided for informational purposes only. Impact determination based on the net change in emissions relative to the No Project conditions. Refer to Section 3.3.4.2, *Thresholds of Significance*, for additional information.

[d] Emissions for the Project variants are compared to the No Project hydrogen variant.

[e] In developing the annual thresholds, SJVAPCD considered levels at which project emissions are cumulatively considerable. Consequently, exceedances of the project-level annual thresholds would be cumulatively considerable. The 100-pound-per-day threshold is a screening criterion to help determine whether increased emissions from a project would cause or contribute to a violation of CAAQS or NAAQS.

In addition to the Project analysis, Table 3.3-13 presents net operations emissions in the SJVAB for the three Project variants. The estimates reflect the difference between emissions generated by the following sources for each variant and reductions achieved by avoided VMT and trips. Emissions reductions from avoided VMT and trips are the same as estimated for the Project.

- Variant H1: San Joaquins operation (three hydrogen powered trains under opening year conditions and the limited hydrogen deployment scenario for horizon year conditions; eight hydrogen powered trains under the full hydrogen deployment scenario for horizon year conditions), station and maintenance facility operations (same as Project), connecting bus transit (same as Project), and off-site hydrogen fuel transport by on-road tube trailer under the full hydrogen deployment scenario.
- Variant H2: Variant H1 sources and off-site hydrogen fuel transport by on-road tube trailer (limited and full hydrogen deployment scenarios).
- Variant H3: Variant H1 sources and off-site hydrogen fuel transport by freight rail (limited and full hydrogen deployment scenarios).

Estimated emissions for the Project variants are compared to existing (2022) conditions and opening (2032) and horizon (2040) year No Project conditions. The No Project conditions for the hydrogen variant analysis assume operation of hydrogen-powered San Joaquins locomotives in response to the state's ZE goals, which will facilitate transition of the statewide locomotive fleet to ZE units (see Section 3.3.2.2, *State*). For the purposes of analysis, hydrogen fuel for the No Project hydrogen variant was assumed to be sourced off-site using the same transport assumptions as Variant H2 (on-road tube trailer). The Project variants are assessed further below.

Table 3.3-14 and Table 3.3-15 summarize estimated net operations emissions in the SFBAAB and SVAB, respectively, in pounds per day and tons per year. The tables also present estimated net operations emissions for the three Project variants. As discussed in Section 3.3.4.1, *Methods for Analysis*, the Project would not increase locomotive service or operate any new emission sources in the SFBAAB or SVAB. However, emissions from San Joaquins operations in the air basins were quantified and included in the analysis to enable a comparison between the diesel and hydrogen fuel options being considered by the Project and Project variants, respectively. Table 3.3-14 and Table 3.3-15 therefore present the difference between emissions generated by San Joaquins movement in each air basin and emission reductions achieved by reduced VMT and trips. Refer to Appendix 3.3-1, *Air Quality, Greenhouse Gas, and Health Risk Assessment Supporting Documentation*, for a detailed summary of emissions and reductions by source.

Impact Details and Conclusions

As shown in Table 3.3-13 through Table 3.3-15, operation of the Project would reduce emissions of all pollutants in the SJVAB, SFBAAB, and SVAB, relative to No Project conditions. This result is expected because the service improvements achieved by the Project will increase passenger rail ridership without changing the intensity or frequency of passenger train activities. Thus, the Project achieves additional avoided VMT and automobile trips for the same amount of passenger rail service, resulting in a net emission reduction. Within the SJVAB, the Project would also eliminate bus stops at the existing Merced station and the bus bridge that would operate under the No Project condition.

Table 3.3-14. Estimated Criteria Pollutant and Ozone Precursor Emissions from Project Operations and Project Variant Operations in the SFBAAB (expanded air quality study area)

Condition	Net Daily Emissions (lb/day) [a]						Net Annual Emissions (tons/year) [a]					
	ROG	NO_X	CO	PM10	PM2.5	SO_2	ROG	NO_X	CO	PM10	PM2.5	SO_2
Existing (2022)	1	92	-14	-27	-6	<0	<1	17	-3	-5	-1	<0
Opening (2032) No Project	-6	39	-322	-225	-55	-2	-1	7	-59	-41	-10	<0
Hydrogen Variant [b]	-7	15	-352	-225	-56	-2	-1	3	-64	-41	-10	<0
Opening (2032) Project	-7	37	-367	-251	-62	-2	-1	7	-67	-46	-11	<0
Variant H1	-8	13	-397	-251	-62	-2	-1	2	-72	-46	-11	<0
Variant H2	-8	13	-397	-251	-62	-2	-1	2	-72	-46	-11	<0
Variant H3	-8	13	-397	-251	-62	-2	-1	2	-72	-46	-11	<0
Horizon (2040) No Project	-5	43	-305	-245	-60	-2	-1	8	-56	-45	-11	<0
Hydrogen Variant (limited) [b]	-6	20	-335	-245	-61	-2	-1	4	-61	-45	-11	<0
Hydrogen Variant (full) [b]	-7	-19	-384	-246	-61	-2	-1	-3	-70	-45	-11	<0
Horizon (2040) Project	-5	41	-348	-273	-67	-2	-1	8	-63	-50	-12	<0
Variant H1 (limited)	-6	18	-378	-273	-68	-2	-1	3	-69	-50	-12	<0
Variant H1 (full)	-8	-21	-427	-274	-68	-2	-1	-4	-78	-50	-12	<0
Variant H2 (limited)	-6	18	-378	-273	-68	-2	-1	3	-69	-50	-12	<0
Variant H2 (full)	-8	-21	-427	-274	-68	-2	-1	-4	-78	-50	-12	<0
Variant H3 (limited)	-6	18	-378	-273	-68	-2	-1	3	-69	-50	-12	<0
Variant H3 (full)	-8	-21	-427	-274	-68	-2	-1	-4	-78	-50	-12	<0
Comparison to Existing [c]												
Opening (2032) Project	-8	-56	-353	-224	-56	-2	-2	-10	-64	-41	-10	<0
Variant H1	-9	-79	-383	-224	-57	-2	-2	-14	-70	-41	-10	<0
Variant H2	-9	-79	-383	-224	-57	-2	-2	-14	-70	-41	-10	<0
Variant H3	-9	-79	-383	-224	-57	-2	-2	-14	-70	-41	-10	<0
Horizon (2040) Project	-7	-51	-334	-246	-62	-2	-1	-9	-61	-45	-11	<0
Variant H1 (limited)	-8	-74	-364	-246	-62	-2	-1	-14	-66	-45	-11	<0
Variant H1 (full)	-9	-113	-413	-247	-63	-2	-2	-21	-75	-45	-11	<0
Variant H2 (limited)	-8	-74	-364	-246	-62	-2	-1	-14	-66	-45	-11	<0
Variant H2 (full)	-9	-113	-413	-247	-63	-2	-2	-21	-75	-45	-11	<0
Variant H3 (limited)	-8	-74	-364	-246	-62	-2	-1	-14	-66	-45	-11	<0
Variant H3 (full)	-9	-113	-413	-247	-63	-2	-2	-21	-75	-45	-11	<0
Comparison to No Project												
Opening (2032) Project	-1	-3	-45	-26	-7	<0	<0	<0	-8	-5	-1	<0
Variant H1 [d]	-1	-3	-45	-26	-7	<0	<0	<0	-8	-5	-1	<0
Variant H2 [d]	-1	-3	-45	-26	-7	<0	<0	<0	-8	-5	-1	<0
Variant H3 [d]	-1	-3	-45	-26	-7	<0	<0	<0	-8	-5	-1	<0
Horizon (2040) Project	-1	-2	-43	-28	-7	<0	<0	<0	-8	-5	-1	<0
Variant H1 (limited) [d]	-1	-2	-43	-28	-7	<0	<0	<0	-8	-5	-1	<0

Condition	Net Daily Emissions (lb/day) [a]						Net Annual Emissions (tons/year) [a]					
	ROG	NO_X	CO	PM10	PM2.5	SO_2	ROG	NO_X	CO	PM10	PM2.5	SO_2
Variant H1 (full) [d]	-1	-2	-43	-28	-7	<0	<0	<0	-8	-5	-1	<0
Variant H2 (limited) [d]	-1	-2	-43	-28	-7	<0	<0	<0	-8	-5	-1	<0
Variant H2 (full) [d]	-1	-2	-43	-28	-7	<0	<0	<0	-8	-5	-1	<0
Variant H3 (limited) [d]	-1	-2	-43	-28	-7	<0	<0	<0	-8	-5	-1	<0
Variant H3 (full) [d]	-1	-2	-43	-28	-7	<0	<0	<0	-8	-5	-1	<0
Threshold [e]	*100*	*100*	*100*	*100*	*100*	*100*	*10*	*10*	*100*	*15*	*15*	*27*

CO = carbon monoxide; ROG = reactive organic gases; lb = pounds; NO_X = nitrogen oxides; PM10 = particulate matter that is 10 microns in diameter and smaller; PM2.5 = particulate matter that is 2.5 microns in diameter and smaller; SO_2 = sulfur dioxide.

[a] The net emissions estimates for each condition reflect the difference in emissions from San Joaquins operations and reductions achieved by avoided automobile VMT and trips. The Project variants and the No Project hydrogen variant assume three hydrogen-powered trains under opening year conditions and the limited hydrogen deployment scenario for horizon year conditions, and eight hydrogen powered trains under the full hydrogen deployment scenario for horizon year conditions. Negative values represent a net reduction in emissions under the operating condition. Refer to Appendix 3.3-1, *Air Quality, Greenhouse Gas, and Health Risk Assessment Supporting Documentation*, for a detailed summary of emissions and reductions by source (e.g., locomotive operations).

[b] The No Project hydrogen variant assumes operation of hydrogen-powered locomotives in response to the state's ZE goals, which will facilitate transition of the statewide locomotive fleet to ZE units (see Section 3.3.2.2, *State*). For the purposes of analysis, hydrogen fuel for the No Project hydrogen variant was assumed to be sourced off-site using the same transport assumptions as Variant H2 (on-road tube trailer).

[c] Comparison provided for informational purposes only. Impact determination based on the net change in emissions relative to the No Project conditions. Refer to Section 3.3.4.2, *Thresholds of Significance*, for additional information.

[d] Emissions for the Project variants are compared to the No Project hydrogen variant.

Table 3.3-15. Estimated Criteria Pollutant and Ozone Precursor Emissions from Project Operations and Project Variant Operations in the SVAB (expanded air quality study area)

Condition	Net Daily Emissions (lb/day) [a]						Net Annual Emissions (tons/year) [a]					
	ROG	NO_X	CO	PM10	PM2.5	SO_2	ROG	NO_X	CO	PM10	PM2.5	SO_2
Existing (2022)	<1	16	-6	-5	-1	<0	<1	3	-1	-1	<0	<0
Opening (2032) No Project	<1	15	-1	-10	-2	<0	<1	3	<0	-2	<0	<0
Hydrogen Variant [b]	<0	9	-9	-11	-3	<0	<0	2	-2	-2	<0	<0
Opening (2032) Project	<1	15	-4	-12	-3	<0	<1	3	-1	-2	-1	<0
Variant H1	<0	9	-12	-12	-3	<0	<0	2	-2	-2	-1	<0
Variant H2	<0	9	-12	-12	-3	<0	<0	2	-2	-2	-1	<0
Variant H3	<0	9	-12	-12	-3	<0	<0	2	-2	-2	-1	<0
Horizon (2040) No Project	<1	16	1	-11	-3	<0	<1	3	<1	-2	<0	<0
Hydrogen Variant (limited) [b]	<1	9	-8	-12	-3	<0	<1	2	-1	-2	-1	<0
Hydrogen Variant (full) [b]	<0	-1	-21	-12	-3	<0	<0	<0	-4	-2	-1	<0
Horizon (2040) Project	<1	15	-3	-13	-3	<0	<1	3	-1	-2	-1	<0
Variant H1 (limited)	<0	9	-11	-14	-3	<0	<0	2	-2	-2	-1	<0
Variant H1 (full)	<0	-1	-24	-14	-3	<0	<0	<0	-4	-3	-1	<0
Variant H2 (limited)	<0	9	-11	-14	-3	<0	<0	2	-2	-2	-1	<0
Variant H2 (full)	<0	-1	-24	-14	-3	<0	<0	<0	-4	-3	-1	<0
Variant H3 (limited)	<0	9	-11	-14	-3	<0	<0	2	-2	-2	-1	<0
Variant H3 (full)	<0	-1	-24	-14	-3	<0	<0	<0	-4	-3	-1	<0
Comparison to Existing [c]												
Opening (2032) Project	<0	-1	1	-8	-2	<0	<0	<0	<1	-1	<0	<0
Variant H1	<0	-7	-7	-8	-2	<0	<0	-1	-1	-1	<0	<0
Variant H2	<0	-7	-7	-8	-2	<0	<0	-1	-1	-1	<0	<0
Variant H3	<0	-7	-7	-8	-2	<0	<0	-1	-1	-1	<0	<0
Horizon (2040) Project	<1	<0	3	-9	-2	<0	<1	<0	<1	-2	<0	<0
Variant H1 (limited)	<0	-7	-5	-9	-2	<0	<0	-1	-1	-2	<0	<0
Variant H1 (full)	-1	-17	-18	-9	-2	<0	<0	-3	-3	-2	<0	<0
Variant H2 (limited)	<0	-7	-5	-9	-2	<0	<0	-1	-1	-2	<0	<0
Variant H2 (full)	-1	-17	-18	-9	-2	<0	<0	-3	-3	-2	<0	<0
Variant H3 (limited)	<0	-7	-5	-9	-2	<0	<0	-1	-1	-2	<0	<0
Variant H3 (full)	-1	-17	-18	-9	-2	<0	<0	-3	-3	-2	<0	<0
Comparison to No Project												
Opening (2032) Project	<0	<0	-4	-2	<0	<0	<0	<0	-1	<0	<0	<0
Variant H1 [d]	<0	<0	-4	-2	<0	<0	<0	<0	-1	<0	<0	<0
Variant H2 [d]	<0	<0	-4	-2	<0	<0	<0	<0	-1	<0	<0	<0
Variant H3 [d]	<0	<0	-4	-2	<0	<0	<0	<0	-1	<0	<0	<0
Horizon (2040) Project	<0	<0	-4	-2	-1	<0	<0	<0	-1	<0	<0	<0
Variant H1 (limited) [d]	<0	<0	-4	-2	-1	<0	<0	<0	-1	<0	<0	<0

Condition	Net Daily Emissions (lb/day) [a]						Net Annual Emissions (tons/year) [a]					
	ROG	NO_X	CO	PM10	PM2.5	SO_2	ROG	NO_X	CO	PM10	PM2.5	SO_2
Variant H1 (full) [d]	<0	<0	-4	-2	-1	<0	<0	<0	-1	<0	<0	<0
Variant H2 (limited) [d]	<0	<0	-4	-2	-1	<0	<0	<0	-1	<0	<0	<0
Variant H2 (full) [d]	<0	<0	-4	-2	-1	<0	<0	<0	-1	<0	<0	<0
Variant H3 (limited) [d]	<0	<0	-4	-2	-1	<0	<0	<0	-1	<0	<0	<0
Variant H3 (full) [d]	<0	<0	-4	-2	-1	<0	<0	<0	-1	<0	<0	<0
Threshold [e]	*100*	*100*	*100*	*100*	*100*	*100*	*10*	*10*	*100*	*15*	*15*	*27*

CO = carbon monoxide; ROG = reactive organic gases; lb = pounds; NO_X = nitrogen oxides; PM10 = particulate matter that is 10 microns in diameter and smaller; PM2.5 = particulate matter that is 2.5 microns in diameter and smaller; SO_2 = sulfur dioxide.

[a] The net emissions estimates for each condition reflect the difference in emissions from San Joaquins operations and reductions achieved by avoided automobile VMT and trips. The Project variants and the No Project hydrogen variant assume three hydrogen-powered trains under opening year conditions and the limited hydrogen deployment scenario for horizon year conditions, and eight hydrogen powered trains under the full hydrogen deployment scenario for horizon year conditions. Negative values represent a net reduction in emissions under the operating condition. Refer to Appendix 3.3-1, *Air Quality, Greenhouse Gas, and Health Risk Assessment Supporting Documentation*, for a detailed summary of emissions and reductions by source (e.g., locomotive operations).

[b] The No Project hydrogen variant assumes operation of hydrogen-powered locomotives in response to the state's ZE goals, which will facilitate transition of the statewide locomotive fleet to ZE units (see Section 3.3.2.2, *State*). For the purposes of analysis, hydrogen fuel for the No Project hydrogen variant was assumed to be sourced off-site using the same transport assumptions as Variant H2 (on-road tube trailer).

[c] Comparison provided for informational purposes only. Impact determination based on the net change in emissions relative to the No Project conditions. Refer to Section 3.3.4.2, *Thresholds of Significance*, for additional information.

[d] Emissions for the Project variants are compared to the No Project hydrogen variant.

Since the Project would result in net reductions of criteria pollutant emissions and would be "beneficial", there would be no significant impact associated with Project operations. Thus, the Project would not result in a cumulatively considerable net increase of a criteria pollutant for which the Project region is designated a nonattainment area. This is a less-than-significant impact and beneficial.[16]

Variant H1

Impact Characterization

Variant H1 would not change station and maintenance facility operations,[17] the need for connecting bus transit, or the reduction in automobile VMT and trips relative to what was analyzed for the Project. Variant H1 likewise would not change the frequency of passenger train activities (i.e., movement and idling hours) but would operate hydrogen-powered trains. Table 3.3-13 through Table 3.3-15 summarize estimated operations emissions in the SJVAB, SFBAAB, and SVAB, respectively, for Variant H1 analysis.

Under the full hydrogen deployment scenario, Variant H1 would use a combination of hydrogen produced on-site and sourced from off-site locations. This analysis assumes on-road trucks would be used to transport hydrogen produced off-site to the ACE Merced Layover and Maintenance Facility. As discussed in Section 3.3.4.1, *Methods for Analysis*, the air quality considers a worst-case transport condition that assumes all off-site hydrogen fuel would be transported from Palm Springs, California. The most direct on-road travel route from Palm Springs to the ACE Merced Layover and Maintenance Facility would require transport through the Salton Sea Air Basin (SSAB) and South Coast Air Basin (SCAB) (in addition to the SJVAB).[18] Table 3.3-16 presents the transport emissions that would be generated in the SSAB and SCAB under the worst-case transport scenario that is being considered for the purposes of analyses. The table also presents emissions for Variants H2 and H3, which would transport all required hydrogen from off-site locations via on-road trucks (Variant H2) or freight rail (Variant H3). Variants H2 and H3 are discussed further below.

[16] As discussed in Section 3.3.4.1, *Methods for Analysis*, subsequent to preparation of this analysis, it was determined that the Project would require the use of wayside power at the proposed integrated Merced HSR Station. This would result in a minor decrease in locomotive idling and associated emissions compared to the scenario that was modeled. However, the use of wayside power would not result in any change to the level of impact of the Project.

[17] Additional water would be consumed to support the on-site solar field. However, water consumption does not generate any direct criteria pollutant emissions. GHG emissions from increased water consumption under Variant H1 are assessed under Impact AQ-5.

[18] The SSAB and SCAB are in Southern California and outside of the expanded air quality study area (see Figure 3.3-1). As discussed in Section 3.3.4.1, *Methods for Analysis*, the specific origin of off-site hydrogen that would be supplied to the Project variant is current unknown. This analysis discloses transport emissions from the furthest existing hydrogen processing facility from the approved ACE Merced Layover and Maintenance Facility to provide a worst-case assessment of potential air quality impacts. Depending on the actual origin of hydrogen fuel, emissions may not be generated in the SSAB or SCAB.

Table 3.3-16. Estimated Criteria Pollutant and Ozone Precursor Emissions from Off-Site Fuel Transport in Southern California under the Project Variants

Condition	Daily Emissions (lb/day)						Annual Emissions (tons/year)					
	ROG	NO_X	CO	PM10	PM2.5	SO_2	ROG	NO_X	CO	PM10	PM2.5	SO_2
Opening (2032) Variant H2 [a]	<1	1	<1	1	<1	<1	<1	<1	<1	<1	<1	<1
Opening (2032) Variant H3 [b]	<1	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Horizon (2040) Variant H1 (full) [c]	<1	1	<1	1	<1	<1	<1	<1	<1	<1	<1	<1
Horizon (2040) Variant H2 (limited) [a]	<1	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Horizon (2040) Variant H2 (full) [a]	<1	2	1	1	<1	<1	<1	<1	<1	<1	<1	<1
Horizon (2040) Variant H3 (limited) [b]	<1	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Opening (2032) Variant H3 (full) [b]	<1	1	1	<1	<1	<1	<1	<1	<1	<1	<1	<1

CO = carbon monoxide; ROG = reactive organic gases; lb = pounds; NO_X = nitrogen oxides; PM10 = particulate matter that is 10 microns in diameter and smaller; PM2.5 = particulate matter that is 2.5 microns in diameter and smaller; SO_2 = sulfur dioxide.

[a] Emissions were quantified for a worst-case transport condition that assumes all off-site hydrogen fuel would be transported from Palm Springs, California by on-road truck. Emissions were assigned to the SSAB and SCAB based on the percentage of roadway miles (assuming a direct travel route) in each air basin. The table presents the sum of emissions for the SSAB and SCAB.

[b] Emissions were quantified for a worst-case transport condition that assumes all off-site hydrogen fuel would be transported from Palm Springs, California by freight rail. Emissions were assigned to the SSAB, SCAB, and Mojave Desert Air Basin based on the percentage of freight rail miles in each air basin. The table presents the sum of emissions for the SSAB, SCAB, and Mojave Desert Air Basin.

[c] Under the full hydrogen deployment scenario, Variant H1 would use a combination of hydrogen produced on-site and sourced from off-site locations. The off-site transport assumptions are the same as described above for Variant H2. Variant H1 would not require off-site fuel transport under opening (2032) year conditions or the limited hydrogen deployment scenario for horizon (2040) year conditions.

Impact Details and Conclusions

Variant H1 would provide the same locomotive service and achieve the same level of ridership as the Project. However, the ZE locomotives operated under Variant H1 would reduce daily and annual criteria pollutant emissions relative to the Project. When compared to the No Project hydrogen condition, which assumes operation of ZE locomotives fueled exclusively by off-site hydrogen transported by on-road trucks, Variant H1 would achieve slightly greater net emissions benefits. Variant H1 would therefore support more rapid attainment of the NAAQS and CAAQS for which the Project region is designated a nonattainment area. Under the full hydrogen deployment scenario, Variant H1 may generate emissions from hydrogen fuel transport outside the expanded air quality study area. However, as shown in Table 3.3-16, these emissions would be negligible under the worst-case transport scenario, which assumed travel through the SSAB and SCAB. These emissions were also assumed to occur under the No Project hydrogen condition. Overall, there would be no difference in the impact conclusion between the Project and Variant H1 (both would result in a less-than-significant and beneficial impact with respect to the generation of cumulatively considerable criteria pollutant emission during operation).

Variant H2

Impact Characterization

The impact characterization is the same as described above for Variant H1 except that Variant H2 would use on-road trucks to transport all required hydrogen produced at off-site locations to the ACE Merced Layover and Maintenance Facility. Table 3.3-13 through Table 3.3-15 summarize estimated operations emissions in the SJVAB, SFBAAB, and SVAB, respectively, for Variant H2 analysis. Table 3.3-16 presents the transport emissions that would be generated in the SSAB and SCAB under the worst-case transport scenario that is being considered for the purposes of analyses.

Impact Details and Conclusions

Like Variant H1, the ZE locomotives operated under Variant H2 would generate fewer daily and annual emissions when compared to the Project. Relative to the No Project hydrogen condition, which assumes operation of ZE locomotives also fueled exclusively by off-site hydrogen transported by on-road trucks, Variant H2 would achieve net emissions benefits that are comparable to those achieved by the Project in the SJVAB, SFBAAB, and SVAB. Variant H2 may generate emissions from hydrogen fuel transport outside the expanded air quality study area. However, as shown in Table 3.3-16, these emissions would be negligible under the worst-case transport scenario, which assumed travel through the SSAB and SCAB. These emissions were also assumed to occur under the No Project hydrogen condition. Overall, there would be no difference in the impact conclusion between the Project and Variant H2 (both would result in a less-than-significant and beneficial impact with respect to the generation of cumulatively considerable criteria pollutant emissions during operation).

Variant H3

Impact Characterization

The impact characterization is the same as described above for Variant H2 except that Variant H3 would use freight rail to transport all required hydrogen produced at off-site locations to the ACE

Merced Layover and Maintenance Facility. Table 3.3-13 through Table 3.3-15 summarize estimated operations emissions in the SJVAB, SFBAAB, and SVAB, respectively, for Variant H3 analysis. Table 3.3-16 presents freight rail emissions that may be generated in Southern California under the worst-case transport scenario that is being considered for the purposes of analyses. The transport scenario for Variant H3 assumes freight travel would require transport through the SSAB, SCAB, and Mojave Desert Air Basin.

Impact Details and Conclusions

Like Variants H1 and H2, the ZE locomotives operated under Variant H3 would generate fewer daily and annual emissions when compared to the Project. The use of freight rail to transport off-site hydrogen, which is a more efficient mode of transportation compared to on-road trucks, would achieve slightly greater net emissions benefits relative to the No Project hydrogen condition, which assumes operation of ZE locomotives fueled exclusively by off-site hydrogen transported by on-road trucks. Variant H3 may generate emissions from hydrogen fuel transport outside the expanded air quality study area. However, as shown in Table 3.3-16, these emissions would be negligible under the worst-case transport scenario, which assumed travel through the SSAB and SCAB. Overall, there would be no difference in the impact conclusion between the Project and Variant H3 (both would result in a less-than-significant and beneficial impact with respect to the generation of cumulatively considerable criteria pollutant emissions during operation).

Impact AQ-3a	Construction or operation of the Project would not expose sensitive receptors to health risks from increased exposure to substantial criteria pollutant concentrations.
Level of Impact	**Less-than-significant impact** Regional criteria pollutants, Project construction Localized particulate matter, Project construction Localized carbon monoxide, Project operations **Less-than-significant impact (beneficial)** Regional criteria pollutants, Project operations Localized particulate matter, Project operations

Project

Impact Characterization

All criteria pollutants and precursors can adversely affect human health at certain concentrations (see Table 3.3-2). Ozone precursors (ROG and NO_X) and PM are considered regional pollutants because they affect air quality on a regional scale. Localized pollutants are deposited and potentially affect populations near the emission source. Because these pollutants dissipate with distance, emissions from individual projects can result in direct and material health impacts on adjacent sensitive receptors. The localized criteria pollutants of concern that would be generated by the Project are CO and PM.[19] Estimated criteria pollutants from construction and operation of the Project are presented in Table 3.3-12 through Table 3.3-15 in Impacts AQ-2a and AQ-2b.

[19] PM is both a regional and local pollutant.

Impact Details and Conclusions

Regional Pollutants

Some individuals exposed to high concentrations of ozone or PM may experience certain health effects, including increased incidence of cardiovascular and respiratory ailments. As discussed under Impact AQ-2a, construction of the Project would generate short-term ozone precursor and PM emissions. However, as shown in Table 3.3-12, predicted emissions levels would not exceed SJVAPCD's regional thresholds or daily screening criteria. SJVAPCD's regional thresholds are derived from regionally specific modeling that demonstrates that the air basin can accommodate emissions below the threshold levels without attainment of the NAAQS or CAAQS being affected, as required by the local air quality plans. The NAAQS and CAAQS are set to protect public health and the environment within an adequate margin of safety. Accordingly, projects that do not exceed SJVAPCD's thresholds would not adversely affect regional air quality or exceed the NAAQS or CAAQS. The analysis presented in Impact AQ-2a demonstrates that construction of the Project would not exceed SJVAPCD's regional thresholds and therefore would not contribute a significant level of air pollution that could degrade regional air quality within the SJVAB. This is a less-than-significant impact.

Operation of the Project would achieve a net reduction of all criteria pollutant and precursor emissions relative to No Project conditions. As shown in Table 3.3-13 through Table 3.3-15, emission reductions would be achieved by Project operations across the SJVAB, SFBAAB, and SVAB. These reductions will support regional air quality goals throughout Northern California and contribute to improvements in overall ambient air quality. This is a less-than-significant (beneficial) impact.

Localized Particulate Matter

Exposure to localized PM at certain concentrations can irritate the respiratory system, especially for people who are naturally sensitive or susceptible to breathing problems. The primary sources of localized PM (fugitive dust) during Project construction are earthmoving activities and vehicle travel over unpaved surfaces. The amount of dust generated by a Project during construction is highly variable and dependent on the size of the disturbed area at any given time, the amount of activity, soil conditions, and meteorological conditions. Fugitive dust emissions from Project construction activities would be spread throughout the entire MITC environmental footprint, as opposed to being concentrated at a single location. Despite the variability in emissions, numerous control measures can be reasonably implemented to reduce construction fugitive-dust emissions. Localized dust emissions generated by construction of the Project would be substantially reduced at the nearest receptor location with compliance with SJVAPCD's Regulation VIII. Accordingly, construction of the Project would not expose sensitive receptors to substantial localized PM concentrations. This is a less-than-significant impact.

Increased passenger rail ridership achieved by operation of the Project will avoid vehicle trips and VMT on roadways throughout Northern California. Vehicle travel over paved and unpaved roads can resuspend PM, elevating near roadway pollutant concentrations. Thus, the VMT avoided by operation of the Project will contribute to reductions in localized PM along Northern California roadways. This is a less-than-significant (beneficial) impact.

Localized Carbon Monoxide

Continuous engine exhaust may elevate localized CO concentrations. Certain people exposed to CO hot spots may have a greater likelihood of developing health effects such as fatigue, headaches, confusion, dizziness, and chest pain. CO hot spots are typically observed at heavily congested roadway intersections where a substantial number of gasoline-powered vehicles idle for prolonged durations throughout the day. Construction sites are less likely to result in localized CO hot spots due to the nature of construction activities, which normally utilize diesel-powered equipment for intermittent or short durations. Locomotives that would operate under the Project would be fueled by renewable diesel and thus unlikely to contribute to a CO hot spot. Accordingly, this analysis focuses on potential CO hot spots associated with changes in vehicle traffic during Project operation.

As described in Section 3.3.4.1, *Methods for Analysis*, a bus bridge would operate under future No Project conditions. The location and frequency of The Bus service in Merced would also slightly change under future conditions with and without the Project. Diesel buses may be operated under opening (2032) year conditions, with transition to ZE vehicles expected over time due in part to state mandates for clean transit (see Section 3.3.2.2, *State*). Given the minor service changes anticipated with the Project (see Section 3.3.4.1, *Methods for Analysis*) and the vehicle fuel types (diesel or alternative), connecting bus transit would not contribute to substantial localized CO concentrations.

The Project would attract additional motor vehicles to San Joaquins and ACE stations throughout the San Joaquin Valley, Sacramento Region, and Bay Area. A screening-level CO hot-spot analysis was conducted to verify that Project traffic near stations would not cause or contribute to a violation of the CO CAAQS. CO concentrations were estimated at the intersection of South San Joaquin Street and East Hazelton Avenue. This intersection is just north of the San Joaquin Street Stockton Station, which has the highest number of passenger boardings and alightings (excluding transfers) of all stations where ridership will increase with the Project. Worst-case conditions were modeled, including assuming all passengers would pass through the intersection in a single-occupancy vehicle during a single hour. While this scenario would never occur, it serves as a conservative condition to screen all intersections where traffic volumes may increase with the Project.

The highest total 1-hour CO concentration modeled at the four receptor locations adjacent to the intersection is 2.3 parts per million (see Appendix 3.3-1, *Air Quality, Greenhouse Gas, and Health Risk Assessment Supporting Documentation*). This is well below the NAAQS and CAAQS (see Table 3.3-1).

In addition, construction activities and temporary construction easements may result in temporary construction impacts to businesses adjacent to the corridor. As discussed in Section 2.6, *Right-of-Way and Easement Need*s, and shown in Figures 2-9 through 2-11 in Chapter 2, *Project Description*, the Project would require 23 temporary construction easements, which would be restored upon completion of Project construction and delivered back to the property owner. Construction activities may cause a temporary decrease in localized air quality for businesses adjacent to the project, but the disturbance would not require business closure or temporary relocation. Since these air quality effects would be minor and temporary, the Project is not expected to expose sensitive receptors to health risks from increased exposure to substantial criteria pollutant concentrations.

It is anticipated that that five full property acquisitions would be required and three permanent businesses would be displaced by the Project easements and ROW requirements, including Safeway Manufacturing, SJR LLC, and Smith Ronald W & Ann E Trustees. Acquired businesses are expected to be relocated to existing buildings, which would not require substantial construction. As such, the permanent business relocations and related construction are not anticipated to result in significant temporary air quality impacts related to the use of heavy construction equipment, demolition, excavation, hauling, and construction activities. In addition, new construction would be subject to local land use review and permitting and will be subject to the same or similar regulatory requirements as the Project, as applicable.

The Project would require demolition of the buildings and structures occupied by the displaced businesses as well as a small number of other buildings and structures (e.g., those that are not occupied by businesses). Demolition may result in temporary air quality impacts related to the use of heavy construction equipment, excavation, hauling, and construction activities. However, these impacts are expected to be minor and temporary. In addition, new construction would be subject to local land use review and permitting and will be subject to the same or similar regulatory requirements as the Project, as applicable. As such, the Project is not expected to expose sensitive receptors to health risks from increased exposure to substantial criteria pollutant concentrations.

Based on the above, the Project would not contribute to CO hot spots or expose receptors to substantial CO concentrations. This is a less-than-significant impact.

Variant H1

Impact Characterization

The impact characterization is the same as described above for the Project. Estimated criteria pollutants from construction and operation of Variant H1 are presented in Table 3.3-12 through Table 3.3-16 in Impacts AQ-2a and AQ-2b.

Impact Details and Conclusions

Compared to the Project, construction of Variant H1 would result in slightly greater short-term regional criteria pollutants and localized PM, but as shown in Table 3.3-12, these emissions would not exceed SJVAPCD's annual thresholds. The ZE locomotives operated under Variant H1 would reduce operations emissions relative to the Project, achieving greater regional criteria pollutant benefits. Reductions in localized near-roadway PM concentrations would be the same between the Project and Variant H1 because the two conditions would achieve the same amount of avoided automobile VMT. Variant H1 likewise would not result in meaningful differences in localized CO concentrations from increased station traffic because Variant H1 and Project would achieve the same level of passenger rail ridership. Under the full hydrogen deployment scenario, Variant H1 would generate regional and localized criteria pollutants from hydrogen fuel transport, but based on the estimated emissions in Table 3.3-16, resultant pollutant concentrations would not be substantial. Overall, there would be no difference in the impact conclusion between the Project and Variant H1 (both would result in a less-than-significant impact with respect to exposure of sensitive receptors to substantial criteria pollutant concentrations).

Variant H2

Impact Characterization

The impact characterization is the same as described above for Variant H1.

Impact Details and Conclusions

The impact details and conclusions are the same as described above for Variant H1. Overall, there would be no difference in the impact conclusion between the Project and Variant H2 (both would result in a less-than-significant impact with respect to exposure of sensitive receptors to substantial criteria pollutant concentrations).

Variant H3

Impact Characterization

The impact characterization is the same as described above for Variant H1.

Impact Details and Conclusions

The impact details and conclusions are the same as described above for Variant H1. Overall, there would be no difference in the impact conclusion between the Project and Variant H3 (both would result in a less-than-significant impact with respect to exposure of sensitive receptors to substantial criteria pollutant concentrations).

Impact AQ-3b	Construction of the Project would not expose sensitive receptors to health risks from increased exposure to substantial diesel particulate matter concentrations.
Level of Impact	**Less-than-significant impact**

Project

Impact Characterization

DPM is a TAC generated by diesel-fueled equipment and vehicles. Exposure to DPM can increase the risk of developing some cancers. Equipment and vehicles used during construction of the Project would generate DPM, potentially resulting in the exposure of nearby existing sensitive receptors to increased health risks.

An HRA was performed to assess the potential for construction of the Project to expose sensitive receptors to increased health risks from exposure to construction-generated DPM. The local topography and meteorology can have a substantial effect on the distribution of DPM concentrations and the resulting exposure. Consequently, DPM concentrations were estimated using conservative air quality modeling options and representative local meteorological conditions. Modeling results are reported based on the annual average concentration average over 5 years of meteorology (2018–2022). Because of these conservative assumptions, actual health risks could be less than modeled.

Table 3.3-17 summarizes the estimated maximum modeled individual cancer risks and chronic health hazards from construction of the Project and Variant H1 in the SJVAB. Results are given for the four receptors with the highest impact at each of the four neighborhoods closest to the MITC Environmental Footprint. Variant H1 is discussed further below. Refer to Appendix 3.3-1, *Air Quality, Greenhouse Gas, and Health Risk Assessment Supporting Documentation*, for model outputs.

Table 3.3-17. Estimated Maximum Inhalation Cancer Risks and Chronic Hazards from Construction of the Project and Variant H1

Location	Maximum Increased Cancer Risk (per million)		Chronic Hazard Index	
	Project	Variant H1	Project	Variant H1
Apple Blossom Apartments	6.8	6.8	<0. 1	<0.1
Woodbridge Place Apartments	4.4	4.4	<0. 1	<0. 1
Sierra Meadows Senior Apartments	0.1	0.1	<0. 1	<0. 1
Modern Mobile Home Park	0.4	0.4	<0. 1	<0.1
Threshold	20.0	20.0	1.0	1.0

Impact Details and Conclusions

No locations showed a significant increase in either cancer risk or chronic exposure risk. The largest increased risk is modeled at the Apple Blossom Apartments due to the construction of the aerial guideway and shifted spur track. However, as shown in Table 3.3-17, all modeled risks would be below SJVAPCD's thresholds. This is a less-than-significant impact.

Variant H1

Impact Characterization

Variant H1 would not change receptor exposure to DPM generated by construction of the Project. However, Variant H1 would construct a solar facility to support the production of on-site green hydrogen production and storage. Construction of solar and hydrogen production facilities would result in a minor amount of additional DPM. The modeled risks from construction of Variant H1 are shown in Table 3.3-17.

Impact Details and Conclusions

As shown in Table 3.3-17, construction of Variant H1 would have the same impact as the Project at all modeled receptor locations. Thus, there would be no difference in the impact conclusion between the Project and Variant H1 (both would result in a less-than-significant impact with respect to exposure of sensitive receptors to substantial DPM concentrations during construction).

Variant H2

Impact Characterization

The impact characterization is the same as described above for the Project. Variant H2 would not change the intensity of construction required for the Project and would not construct any additional features. Thus, the estimated maximum individual cancer risk and chronic health hazard presented in Table 3.3-17 for the Project also characterizes potential risks from construction of Variant H2.

Impact Details and Conclusions

The impact details and conclusions are the same as described above for the Project. There would be no difference in the impact conclusion between the Project and Variant H2 (both would result in a less-than-significant impact with respect to exposure of sensitive receptors to substantial DPM concentrations during construction).

Variant H3

Impact Characterization

The impact characterization is the same as described above for the Project. Variant H3 would not change the intensity of construction required for the Project and would not construct any additional features. Thus, the estimated maximum individual cancer risk and chronic health hazard presented in Table 3.3-17 for the Project also characterizes potential risks from construction of Variant H3.

Impact Details and Conclusions

The impact details and conclusions are the same as described above for the Project. There would be no difference in the impact conclusion between the Project and Variant H3 (both would result in a less-than-significant impact with respect to exposure of sensitive receptors to substantial DPM concentrations during construction).

Impact AQ-3c	Operation of the Project would not expose sensitive receptors to health risks from increased exposure to substantial diesel particulate matter concentrations.
Level of Impact	**Less-than-significant impact**

Project

Impact Characterization

The Project would shift the location of San Joaquins emissions to the new track connection and into the integrated station. Connecting bus transit and station operations (including emergency generator maintenance) would also relocate to the integrated station from the existing Merced station. Finally, compared to No Project conditions, operation of the Project would eliminate the need for a bus bridge. An HRA was conducted to assess the health implications of these Project changes to sensitive receptors within 1,000 feet of the MITC environmental footprint.

DPM concentrations at receptor locations (see Figure 3.3-2) were estimated using conservative air quality modeling options and representative local meteorological conditions. Modeling results are reported based on the annual average concentration average over 5 years of meteorology (2018–2022). Because of these conservative assumptions, actual health risks could be less than modeled.

Table 3.3-18 summarizes the estimated maximum modeled individual cancer risks and chronic health hazards with and without the Project. Results are given for the receptor locations with the highest impact proximate to each location where the Project would relocate or change the intensity of a DPM source. The analyses account for the combined effect of all emission sources within the modeling domain relevant to the receptor location. For example, the No Project analysis of the Merced Station includes emission contributions from San Joaquins (ingress/egress and idling), connecting transit, the bus bridge, and station operations. The incremental change in health risks that would result between the Project and No Project conditions represents the net impact of the Project, and that net impact is compared to SJVAPCD thresholds. Figure 3.3-3 displays the net change in cancer risk across the modeling domain. Refer to Appendix 3.3-1, *Air Quality, Greenhouse Gas, and Health Risk Assessment Supporting Documentation*, for model outputs.

Table 3.3-18. Estimated Maximum Inhalation Cancer Risks and Chronic Hazards from Operation of the Project

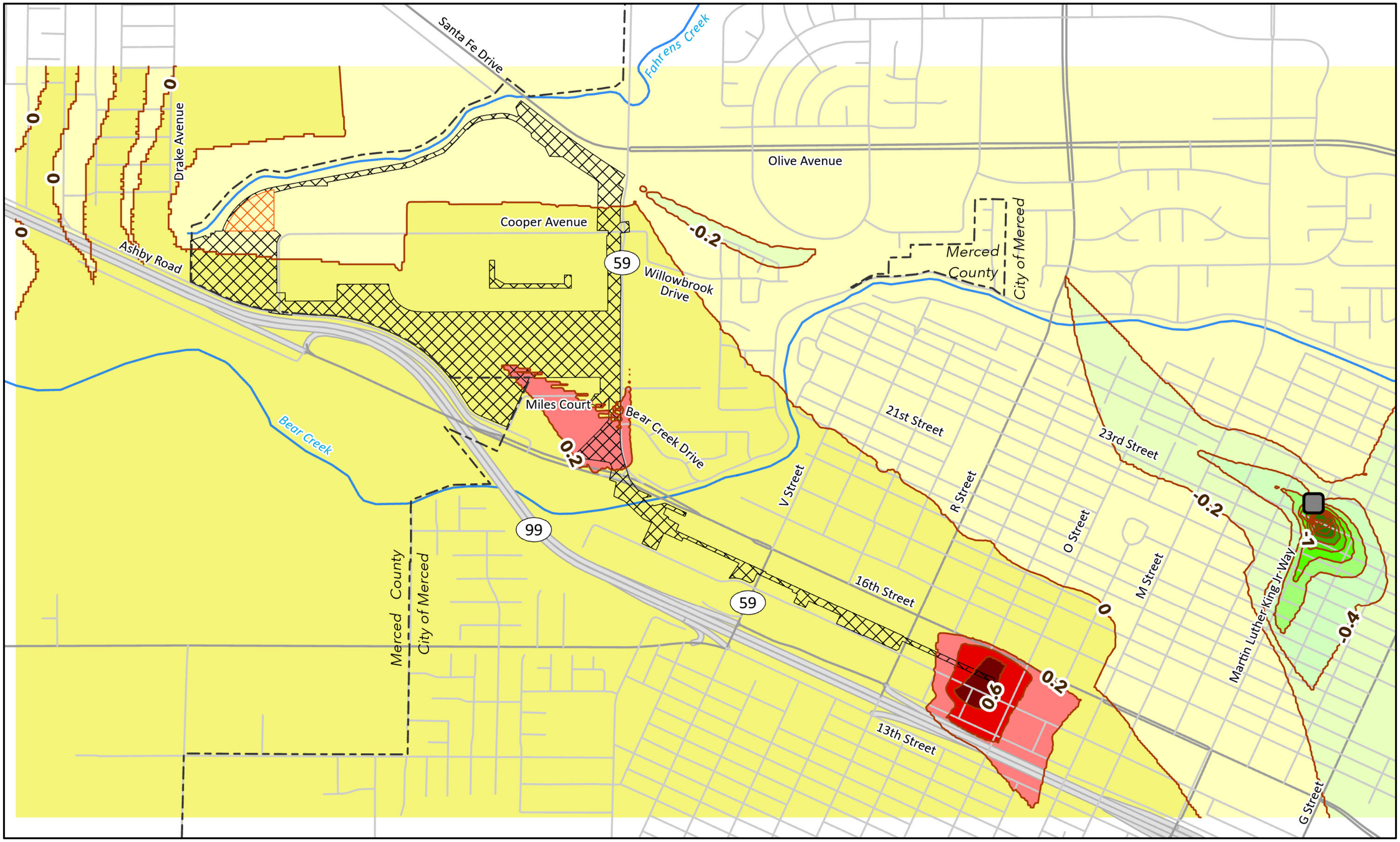
Location [a]	Maximum Increased Cancer Risk (per million)			Chronic Hazard Index		
	No Project	Project	Increment[b]	No Project	Project	Increment[b]
Residences near West 15th Street and P Street	0.1	0.9	0.8	<0.1	<0.1	<0.1
Apple Blossom Apartments	0.5	0.7	0.2	<0.1	<0.1	<0.1
Willowbrook Apartments	0.3	0.5	0.2	<0.1	<0.1	<0.1
Residences near West 24th Street and Martin Luther King Jr Way	2.3	<0.1	-2.2	<0.1	<0.1	<0.0
Threshold	-	-	20.0	-	-	1.0

[a] Table presents the highest modeled risk at each location where the Project would relocate or change the intensity of a DPM source. The results account for the combined effect of all emission sources within the modeling domain relevant to the receptor location and are not additive.
[b] Represents the difference in health risk between the Project and No Project conditions.

Impact Details and Conclusions

No locations showed a significant increase in either cancer risk or chronic exposure risk. The largest increased risk increment is modeled at the residences south of the new integrated station near West 15th Street and P Street due to DPM emissions associated with locomotive movement and idling at the new integrated station. However, as shown in Table 3.3-18, all modeled risks would be below SJVAPCD's thresholds. Health risks to residences near the existing Merced Station (i.e., West 24th Street and Martin Luther King Jr. Way) are modeled to decrease with the Project. This is a less-than-significant impact.[20]

[20] As discussed in Section 3.3.4.1, *Methods for Analysis*, subsequent to preparation of this analysis, it was determined that the Project would require the use of wayside power at the proposed integrated Merced HSR Station. This would result in a minor decrease in diesel locomotive idling and associated health risks compared to the scenario that was modeled. However, the use of wayside power would not result in any change to the level of impact of the Project.



City of Merced Boundary
MITC Environmental Footprint
Variant H1 Additional Environmental Footprint
Cancer Risk Isopleth
Existing Merced Station (To Be Discontinued)

0 1,000 2,000 Feet

Net Operational Cancer Risk (cases per million)

- 0.6 to 0.8
- 0.4 to 0.6
- 0.2 to 0.4
- 0.0 to 0.2
- -0.2 to 0.0
- -0.4 to -0.2
- -0.6 to -0.4
- -0.8 to -0.6
- -1.0 to -0.8
- -1.2 to -1.0
- -1.4 to -1.2
- < -1.4

Note: This does not include the reduction in risks associated with diverting automobile travel to rail travel.

Figure 3.3-3
Net Operational Cancer Risk
Merced Intermodal Track Connection Project

MITC

Variant H1

Impact Characterization

Variant H1 would not change the location of San Joaquins emissions or the need for connecting bus transit and station operations (including emergency generator maintenance) compared to the Project. However, the ZE locomotives operated under Variant H1 would reduce receptor exposure to operational DPM.

Table 3.3-19 presents the modeled risks for the receptor locations evaluated for the Project. The No Project condition and Variant H1 assume operation of three hydrogen-powered trains (i.e., limited hydrogen deployment scenario). The operation of these trains is held constant over the 30-year lifetime analysis period (2032-2062). As discussed in Section 3.3.4.1, *Methods for Analysis*, SJJPA is committed to fully transitioning to ZE trains as soon as practical. The full hydrogen deployment scenario assumes operation of eight hydrogen trains beginning in 2040. While on-road trucks would likely be used to transport a portion of the required hydrogen fuel under the full hydrogen deployment scenario, operation of eight ZE trains beginning in 2040 would reduce overall lifetime risks relative to what is presented in Table 3.3-19.

Table 3.3-19. Estimated Maximum Inhalation Cancer Risks and Chronic Hazards from Operation of Variant H1

Location [a]	Maximum Increased Cancer Risk (per million)			Chronic Hazard Index		
	No Project[b]	Variant H1[b]	Increment[c]	No Project[b]	Variant H1[b]	Increment[c]
Residences near West 15th Street and P Street	0.1	0.6	0.5	<0.1	<0.1	<0.1
Apple Blossom Apartments	0.4	0.5	0.2	<0.1	<0.1	<0.1
Willowbrook Apartments	0.2	0.3	0.1	<0.1	<0.1	<0.1
Residences near West 24th Street and Martin Luther King Jr. Way	1.9	<0.1	-1.8	<0.1	<0.1	<0.0
Threshold	-	-	20.0	-	-	1.0

[a] Table presents the highest modeled risk at each location where the Project variant would relocate or change the intensity of a DPM source. The results account for the combined effect of all emission sources within the modeling domain relevant to the receptor location and are not additive.

[b] The No Project hydrogen variant and Variant H1 assume operation of three hydrogen-powered trains (i.e., limited hydrogen deployment scenario). All other emission sources (e.g., generators) are the same as modeled for the No Project and Project conditions, respectively, analyzed in Table 3.3-18.

[c] Represents the difference in health risk between Variant H1 and the No Project condition.

Impact Details and Conclusions

As shown in Table 3.3-19, operation of Variant H1 would have a reduced impact compared to the Project at the maximally exposed receptor location (residences near West 15th Street and P Street). All modeled risks would be below SJVAPCD's thresholds. Thus, there would be no difference in the impact conclusion between the Project and Variant H1 (both would result in a less-than-significant impact with respect to exposure of sensitive receptors to substantial DPM concentrations during operation).

Variant H2

Impact Characterization

The impact characterization is the same as described above for Variant H1 except that Variant H2 would use on-road trucks to transport all required hydrogen produced at off-site locations to the ACE Merced Layover and Maintenance Facility. DPM emissions from these vehicles were included in the HRA for Variant H2. However, because the concentration and exposure to these additional DPM emissions is relatively minor, the modeled risks from operation of Variant H2 are the same as presented in Table 3.3-19 for Variant H1.

Impact Details and Conclusions

As shown in Table 3.3-19, operation of Variant H2 would have a reduced impact compared to the Project at the maximally exposed receptor location (residences near West 15th Street and P Street). All modeled risks would be below SJVAPCD's thresholds. Thus, there would be no difference in the impact conclusion between the Project and Variant H2 (both would result in a less-than-significant impact with respect to exposure of sensitive receptors to substantial DPM concentrations during operation).

Variant H3

Impact Characterization

The impact characterization is the same as described above for Variant H1 except that Variant H3 would use freight rail to transport all required hydrogen produced at off-site locations to the ACE Merced Layover and Maintenance Facility. DPM emissions from these vehicles were included in the HRA for Variant H3. However, because the concentration and exposure to these additional DPM emissions is relatively minor, the modeled risks from operation of Variant H3 are the same as presented in Table 3.3-19 for Variant H1.

Impact Details and Conclusions

As shown in Table 3.3-19, operation of Variant H3 would have a reduced impact compared to the Project at the maximally exposed receptor location (residences near West 15th Street and P Street). All modeled risks would be below SJVAPCD's thresholds. Thus, there would be no difference in the impact conclusion between the Project and Variant H3 (both would result in a less-than-significant impact with respect to exposure of sensitive receptors to substantial DPM concentrations during operation).

Impact AQ-3d	Construction of the Project would not expose sensitive receptors to substantial increased risk of contracting Valley fever or exposure to asbestos-containing material.
Level of Impact	**Less-than-significant impact**

Project

Impact Characterization

Disturbance of soil containing *C. immitis* could expose the receptors adjacent to the construction site to spores known to cause Valley fever. Areas endemic to *C. immitis* are generally arid to semiarid with low annual rainfall, and as such, soil containing the fungus is commonly found in Southern California and throughout the Central Valley. Based on Valley fever incidence rates from the California Department of Public Health for 2021, over 50 percent of Valley fever cases have been in people who live in the SJVAB (California Department of Public Health 2023). Merced County had the 17th highest incidence rate of Valley fever of all counties in the state (California Department of Public Health 2023).

Demolition of existing structures results in fugitive dust and other particulates that may disperse to adjacent sensitive receptor locations. Asbestos-containing materials (ACM) were commonly used as fireproofing and insulating agents prior to the 1970s. The U.S. Consumer Product Safety Commission banned use of most ACM in 1977 due to their link to mesothelioma. However, structures constructed prior to 1977 that would be demolished by the Project may have used ACM and could expose receptors to asbestos, which may become airborne with other particulates during demolition.

Impact Details and Conclusions

Valley Fever

The presence of *C. immitis* in the Project area does not guarantee that construction activities would result in increased incidence of Valley fever. Propagation of *C. immitis* is dependent on climatic conditions, with the potential for growth and surface exposure highest following early seasonal rains and long dry spells. *C. immitis* spores can be released when filaments are disturbed by earthmoving activities, although receptors must be exposed to and inhale the spores to be at increased risk of developing Valley fever. Moreover, exposure to *C. immitis* does not guarantee that an individual will become ill—approximately 60 percent of people exposed to the fungal spores are asymptomatic and show no signs of an infection (U.S. Geological Survey 2000).

All Project construction activities are located within Merced County. As noted above, *C. immitis* is endemic to the San Joaquin Valley, and has been found in Merced County. Earthmoving activities for the Project may release *C. immitis* spores if filaments are present and other soil chemistry and climatic conditions are conducive to spore development. Receptors adjacent to the construction area, therefore, may be exposed to increase risk of inhaling *C. immitis* spores and subsequent development of Valley fever. However, the presence of *C. immitis* in the Project area does not guarantee that construction activities would result in increased incidence of Valley fever. Dust control measures are the primary defense against Valley fever infection (U.S. Geological Survey 2000). Fugitive dust controls required by compliance with SJVAPCD Regulation VIII would avoid dusty conditions and reduce the risk of contracting Valley fever through routine watering and other controls. Therefore, the impact of exposure of sensitive receptors to increased Valley fever risk during construction would be less than significant.

Asbestos-Containing Materials

The Project would require a small amount of demolition. If ACM were present in the existing structures that would be demolished, demolition activities could expose adjacent receptors to increased risk from airborne asbestos. The asbestos National Emission Standards for Hazardous Air Pollutants (NESHAP) regulations for demolition and renovation are outlined in SJVAPCD Regulations III and VIII. Compliance with the asbestos NESHAP regulations would be mandatory in the event ACM is found in any of the existing structures. Therefore, the impact of exposure of sensitive receptors to increased asbestos during construction would be less than significant.

Variant H1

Impact Characterization

The impact characterization is the same as described above for the Project.

Impact Details and Conclusions

Variant H1 would construct an on-site solar field and would require more sitework than the Project. Thus, there is a slightly greater potential for Variant H1 to release *C. immitis* spores if filaments are present and other soil chemistry and climatic conditions are conducive to spore development. Nonetheless, construction of both the Project and Variant H1 would require implementation of the same SJVAPCD regulations to reduce the risk of contracting Valley fever. Likewise, Variant H1 would not increase the risk of receptor exposure to ACM because Variant H1 and Project would require the same amount of demolition. Thus, there would be no difference in the overall impact conclusion between the Project and Variant H1 (both would result in a less-than-significant impact with respect to increased risks from Valley fever and ACM).

Variant H2

Impact Characterization

The impact characterization is the same as described above for the Project.

Impact Details and Conclusions

The impact details and conclusions are the same as described above for the Project. There would be no difference in the impact conclusion between the Project and Variant H2 (both would result in a less-than-significant impact with respect to increased risks from Valley fever and ACM).

Variant H3

Impact Characterization

The impact characterization is the same as described above for the Project.

Impact Details and Conclusions

The impact details and conclusions are the same as described above for the Project. There would be no difference in the impact conclusion between the Project and Variant H3 (both would result in a less-than-significant impact with respect to increased risks from Valley fever and ACM).

Impact AQ-4	Construction or operation of the Project would not result in other emissions (such as those leading to odors) adversely affecting a substantial number of people.
Level of Impact	**Less-than-significant impact**

Project

Impact Characterization

The generation and severity of odors is dependent on a number of factors, including the nature, frequency, and intensity of the source; wind direction; and the location of the receptor(s). Odors rarely cause physical harm, but can cause discomfort, leading to complaints to regulatory agencies. Land uses associated with odor complaints typically include agricultural uses, wastewater treatment plants, food processing plants, chemical plants, composting facilities, refineries, landfills, dairies, and fiberglass molding facilities (CARB 2005).

Impact Details and Conclusions

Sources of odor during construction include diesel exhaust from construction equipment and asphalt paving. All odors would be localized, generally confined to the immediate area surrounding the construction site and would cease once construction activities have been completed. Construction of the Project would utilize typical construction techniques. The equipment odors would be typical of most construction sites, temporary in nature, and localized to the vicinity of the construction work area. The construction odors would cease once construction activities have been completed. SJVAPCD has adopted rules that limit the amount of ROG emissions from cutback asphalt (see Section 3.3.2.3, *Regional and Local*). Accordingly, potential odors generated during asphalt paving would be addressed through mandatory compliance with air district rules. This impact would be less than significant.

The operations associated with the Project would not include any uses identified by CARB as being associated with odors. While the Project would not change the intensity or frequency of passenger train activities, compared to the No Project condition, the location of San Joaquins emissions would shift to the new track connection and integrated station. San Joaquins operation on the new track connection and at the integrated station (idling) may increase localized odors from locomotive fuel (diesel) combustion at adjacent receptor locations. These odors would be intermittent, occurring only as trains pass by receptors; would be consistent with existing land uses and passenger rail operation; and are not considered a significant odor-generating source (CARB 2005). This impact would be less than significant.

Variant H1

Impact Characterization

The impact characterization is the same as described above for the Project.

Impact Details and Conclusions

Variant H1 would construct an on-site solar field and would require more equipment and vehicles. Thus, there is a slightly greater potential for Variant H1 to result in temporary odors from diesel fuel combustion. However, like the Project, any odors generated by construction of Variant H1 would be short-term, intermittent, and would not adversely affect a substantial number of people. Operation of ZE locomotives under Variant H1 would reduce locomotive fuel (diesel) combustion and thus the potential for localized odors on the new track connection and at the integrated station. However, given that any odors from locomotive operations would be limited, the overall potential for odor generation would not differ appreciably between Variant H1 and the Project. If diesel trucks are used, additional odors could be generated by off-site hydrogen transport under the full hydrogen deployment scenario. However, these odors would occur as vehicles pass by and would be localized to the transportation corridors. Thus, there would be no difference in the impact conclusion between Variant H1 and the Project (both would result in a less-than-significant impact with respect to odor emissions).

Variant H2

Impact Characterization

The impact characterization is the same as described above for the Project.

Impact Details and Conclusions

The impact details and conclusions are the same as described above for Variant H1. Overall, there would be no difference in the impact conclusion between the Project and Variant H2 (both would result in a less-than-significant impact with respect to odor emissions).

Variant H3

Impact Characterization

The impact characterization is the same as described above for the Project.

Impact Details and Conclusions

The impact details and conclusions are the same as described above for Variant H1. Overall, there would be no difference in the impact conclusion between the Project and Variant H3 (both would result in a less-than-significant impact with respect to odor emissions).

Impact AQ-5	Construction and operation of the Project would not generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment.
Level of Impact	**Less-than-significant impact**

Project

Impact Characterization

Construction of the Project has the potential to create short-term GHG impacts through use of heavy-duty construction equipment, worker vehicle trips, truck hauling trips, and locomotive trips. GHG emissions generated by these sources were quantified using CalEEMod version 2022 and emission factors from USEPA, as described in Section 3.3.4.1, *Methods for Analysi*s. The emissions modeling reflects a specific set of conservative assumptions based on the best available information currently known for the total amount, duration, and intensity of construction activity. Table 3.3-20 summarizes estimated construction emissions in the SJVAB in metric tons per year. The table also presents estimated emissions for construction of Variant H1. Variant H1 is discussed further below.

Table 3.3-20. Estimated GHG Emissions from Construction of the Project and Variant H1 (metric tons)

Year	CO_2	CH_4	N_2O	CO_2e
Project				
2029	164	<1	<1	166
2030	813	<1	<1	825
2031	1,169	<1	<1	1,182
2032	736	<1	<1	743
Total Project	2,881	<1	<1	2,915
Variant H1				
2029	164	<1	<1	166
2030	813	<1	<1	825
2031	1,263	<1	<1	1,277
2032	746	<1	<1	753
Total Variant H1	2,985	<1	<1	3,020

CO_2 = carbon dioxide; CH_4 = methane; N_2O = nitrous oxide; CO_2e = carbon dioxide equivalent.

The analysis presented in Table 3.3-20 accounts for all emissions directly and indirectly generated by construction activities for which SJJPA has practical control and program responsibility. Emissions generated upstream (e.g., material manufacturing) and downstream (e.g., recycling) of construction, otherwise known as "lifecycle emissions," are not included in the analysis, consistent with guidance from the California Natural Resources Agency (2018:41–42). While the origin of most raw materials is not known, and thus an emissions analysis would be speculative, construction of the Project would require concrete from off-site batch plants. Lifecycle emissions for cement and aggregate manufacturing, which is upstream of the concrete batching process, have been studied in various literature. Accordingly, for the purposes of disclosure, upstream CO_2 emissions resulting from cement and aggregate manufacturing were quantified using emissions factors from Marceau et al. (2007:Tables E1b and G1b). The analysis indicates that cement and aggregate manufacturing would generate 9,723 metric tons CO_2e. These emissions would be generated upstream of construction and through activities for which SJJPA has no practical control. Furthermore, CARB directly regulates the industrial emissions associated with cement manufacturing and thus those emissions would be regulated by CARB consistent with overall meeting of California GHG reduction targets over time. The emissions associated with cement manufacturing are therefore disclosed for informational purposes only.

Project operations have the potential to create long-term GHG impacts through locomotive operations, station and facility operations, and connecting bus transit. However, Project operations would increase passenger rail ridership throughout the SJVAB and adjacent SFBAAB and SVAB. This increased ridership will reduce driving, contributing to emissions reductions. GHG emissions and reductions generated by these sources were quantified for existing (2022), opening year (2032), and horizon year (2040) conditions.

Table 3.3-21 summarizes estimated net operations emissions in metric tons per year for each of the analysis conditions. The estimates reflect the difference between emissions generated by San Joaquins operations, station and facility operations, bus bridge (No Project only), and connecting bus transit and reductions achieved by avoided VMT and trips, where negative values represent a net reduction in emissions under the operating condition.

Table 3.3-21. Estimated Total Net GHG Emissions from Project Operations and Project Variant Operations (metric tons per year) [a]

Condition	CO_2	CH_4	N_2O	CO_2e
Existing (2022)	262	2	<1	408
Opening (2032) No Project	-53,040	1	<0	-53,125
Hydrogen Variant [b]	-58,917	1	<0	-59,037
Opening (2032) Project	-62,517	1	-1	-62,649
Variant H1	-68,963	1	-1	-69,156
Variant H2	-68,394	1	-1	-68,560
Variant H3	-68,903	1	-1	-69,096
Horizon (2040) No Project	-53,566	1	<0	-53,627
Hydrogen Variant (limited) [b]	-59,620	1	<0	-59,724
Hydrogen Variant (full) [b]	-69,340	<0	-1	-69,511
Horizon (2040) Project	-62,965	1	<0	-63,069
Variant H1 (limited)	-69,412	1	-1	-69,576
Variant H1 (full)	-79,132	<0	-1	-79,364
Variant H2 (limited)	-69,020	1	-1	-69,166
Variant H2 (full)	-78,740	<0	-1	-78,953
Variant H3 (limited)	-69,351	1	-1	-69,516
Variant H3 (full)	-79,624	<0	-1	-79,888
Comparison to Existing [c]				
Opening (2032) Project	-62,779	-1	-1	-63,057
Variant H1	-69,225	-1	-1	-69,564
Variant H2	-68,656	-1	-1	-68,968
Variant H3	-69,165	-1	-1	-69,504
Horizon (2040) Project	-63,227	-1	-1	-63,477
Variant H1 (limited)	-69,674	-1	-1	-69,984
Variant H1 (full)	-79,394	-2	-1	-79,772
Variant H2 (limited)	-69,282	-1	-1	-69,574
Variant H2 (full)	-79,002	-2	-1	-79,361
Variant H3 (limited)	-69,614	-1	-1	-69,924
Variant H3 (full)	-79,886	-2	-1	-80,296
Comparison to No Project				
Opening (2032) Project	-9,477	<0	<0	-9,524
Variant H1 [d]	-10,046	<0	<0	-10,120
Variant H2 [d]	-9,477	<0	<0	-9,524
Variant H3 [d]	-9,986	<0	<0	-10,060
Horizon (2040) Project	-9,399	<0	<0	-9,442
Variant H1 (limited) [d]	-9,791	<0	<0	-9,852
Variant H1 (full) [d]	-9,791	<0	<0	-9,852

Condition	CO_2	CH_4	N_2O	CO_2e
Variant H2 (limited) [d]	-9,399	<0	<0	-9,442
Variant H2 (full) [d]	-9,399	<0	<0	-9,442
Variant H3 (limited) [d]	-9,731	<0	<0	-9,793
Variant H3 (full) [d]	-10,284	<0	<0	-10,377

CO_2 = carbon dioxide; CH_4 = methane; N_2O = nitrous oxide; CO_2e = carbon dioxide equivalent.

[a] The net emissions estimates for each condition reflect the difference between emissions generated by operations sources and reductions achieved by avoided automobile VMT and trips. Operations sources for each condition include the following:

- Existing: San Joaquins operation, station and maintenance facility operations, and connecting bus transit.
- No Project: San Joaquins operation, station and maintenance facility operations, bus bridge, and connecting bus transit.
- No Project Hydrogen Variant: San Joaquins operation (three hydrogen-powered trains under opening year conditions and the limited hydrogen deployment scenario for horizon year conditions; eight hydrogen powered trains under the full hydrogen deployment scenario for horizon year conditions), off-site hydrogen fuel transport by on-road tube trailer, station and maintenance facility operations (same as No Project), bus bridge (same as No Project), and connecting bus transit (same as No Project).
- Project: San Joaquins operation (same as No Project), station and maintenance facility operations, and connecting bus transit.
- Variant H1: San Joaquins operation (same as No Project Hydrogen Variant), station and maintenance facility operations, connecting bus transit (same as Project); and off-site hydrogen fuel transport by on-road tube trailer under the full hydrogen deployment scenario.
- Variant H2: San Joaquins operation (same as Variant H1), station and maintenance facility operations (same as Project), connecting bus transit (same as Project), and off-site hydrogen fuel transport by on-road tube trailer (limited and full hydrogen deployment scenarios).
- Variant H3: Variant H2 sources except off-site hydrogen fuel transport would be by freight rail (limited and full hydrogen deployment scenarios).

Negative values represent a net reduction in emissions under the operating condition. Refer to Appendix 3.3-1, *Air Quality, Greenhouse Gas, and Health Risk Assessment Supporting Documentation*, for a detailed summary of emissions and reductions by source (e.g., San Joaquins operations) and geography (e.g., SJVAB).

[b] The No Project hydrogen variant assumes operation of hydrogen-powered San Joaquins locomotives in response to the state's ZE goals, which will facilitate transition of the statewide locomotive fleet to ZE units (see Section 3.3.2.2, *State*). For the purposes of analysis, hydrogen fuel for the No Project hydrogen variant was assumed to be sourced off-site using the same transport assumptions as Variant H2 (on-road tube trailer).

[c] Comparison provided for informational purposes only. Impact determination based on the net change in emissions relative to the No Project conditions. Refer to Section 3.3.4.2, *Thresholds of Significance*, for additional information.

[d] Emissions for the Project variants are compared to the No Project hydrogen variant.

Table 3.3-21 compares Project emissions to existing (2022) conditions and No Project conditions under the opening (2032) and horizon (2040) years. The difference in operations emissions between the Project and the existing conditions represents the change in emissions over existing conditions with the Project, but this comparison is not used to make significance determinations, based on the reasoning described in Section 3.3.4.2, *Thresholds of Significance*. The comparisons to the No Project conditions represent the net impact of Project operation.

In addition to the Project analysis, Table 3.3-21 presents net operations emissions for the three Project variants. The estimates reflect the difference between emissions generated by the sources identified in Impact AQ-2b for each variant and reductions achieved by avoided VMT and trips. Estimated emissions for the Project variants are compared to existing (2022) conditions and opening (2032) and horizon (2040) year No Project conditions. The No Project conditions for the hydrogen variant analysis assume operation of hydrogen-powered San Joaquins locomotives in response to the state's zero emission goals, which will facilitate transition of the statewide locomotive fleet to ZE units (see Section 3.3.2.2, *State*). For the purposes of analysis, hydrogen fuel for the No Project hydrogen variant was assumed to be sourced off-site using the same transport assumptions as Variant H2 (on-road tube trailer). The Project variants are assessed further below.

Because GHG emissions are global pollutants, the results presented in Table 3.3-21 reflect the total net emissions impact of the Project, inclusive of emissions and reductions that would be generated across the SJVAB, SFBAAB, and SVAB. The emission results for Variant H1 (full hydrogen deployment scenario only) and Variants H2 and H3 also include emissions from off-site hydrogen fuel transport under the worst-case transport scenario, which would result in emissions outside the expanded air quality study area. Refer to Appendix 3.3-1, *Air Quality, Greenhouse Gas, and Health Risk Assessment Supporting Documentation*, for a detailed summary of emissions and reductions by source (e.g., San Joaquins operations) and geography (e.g., SJVAB).

The analysis presented in Table 3.3-21 accounts for all emissions directly and indirectly generated by operation of the Project and Project variants for which SJJPA has practical control and program responsibility. Renewable diesel consumed by the Project and hydrogen consumed by the Project variants can be produced using different energy inputs and techniques, which can result in considerably different GHG emissions from the production and transport of the fuel. These emissions would occur "upstream" of the Project and Project variants, and as discussed in Section 3.3.4.1, *Methods for Analysis*, are not included in the impact analysis for this EIR. However, a WTW analysis of San Joaquins fuel consumption was prepared for informational purposes to enable a comparison between the hydrogen fuel options being considered by the Project variants, and also to compare those fuel options to the Project, which would use renewable diesel.[21] WTW analysis considers GHGs emitted through each stage of the fuel's production, processing, distribution, and end use.

Table 3.3-22 summarizes the results of the informational WTW analysis for San Joaquins fuel consumption under opening (2032) year conditions and the horizon (2040) year limited hydrogen deployment scenario. For the purposes of analysis, Variants H2 and H3 were assessed using a banded analysis of available carbon intensities for hydrogen feedstocks (e.g., solar, biomass) and potential travel distances from off-site hydrogen production facilities. The results presented in Table 3.3-22 reflect the range of estimated emissions (minimum and maximum). Refer to Appendix 3.3-1, *Air Quality, Greenhouse Gas, and Health Risk Assessment Supporting Documentation*, for a detailed summary of emissions by hydrogen pathway and transportation scenario.

Table 3.3-23 summarizes the results of the informational WTW analysis for San Joaquins fuel consumption under the horizon (2040) year full hydrogen deployment scenario. As discussed in Section 3.3.4.1, *Methods for Analysis*, the full hydrogen deployment scenario assumes operation of eight hydrogen trains beginning in 2040. Under Variant H1, a portion of the required hydrogen fuel would be produced off-site and delivered to the ACE Merced Layover and Maintenance Facility by on-road truck.

[21] The WTW analysis is limited to San Joaquins fuel use because it is the only source that differs substantially among the analysis conditions. Between the Project and Project variants, there would be minimal differences in GHG emissions from station and maintenance facility operations and no change in GHG emissions from connecting bus transit or reductions from avoided automobile VMT and trips.

Table 3.3-22. Informational Well-to-Wheel GHG from San Joaquins Fuel Use for the Project and Project Variants under Opening (2032) Year Conditions and Horizon (2040) Year "Limited" Hydrogen Deployment Scenario (metric tons CO_2e per year) [a]

Condition [b, c]	Minimum Estimate	Maximum Estimate
Project	8,625	8,625
Variant H1 (on-site solar)	5,645	5,645
Variant H2A (off-site green)	6,018	7,365
Variant H2B (off-site gray)	8,199	8,828
Variant H3A (off-site green)	5,665	6,067
Variant H3B (off-site gray)	7,787	7,839
Comparison to the Project		
Variant H1	-2,979	-2,979
Variant H2A	-2,607	-1,260
Variant H2B	-426	203
Variant H3A	-2,960	-2,558
Variant H3B	-838	-786

CO_2e = carbon dioxide equivalent.

[a] Information in this table is given for informational purposes to enable a comparison between the hydrogen fuel options being considered by the Project variants, and also to compare those fuel options to the Project, which would use renewable diesel. The results are not included in the impact analysis for this EIR.

[b] Refer to Chapter 2, *Project Description*, for additional information Project variants. See also Appendix 3.3-1, *Air Quality, Greenhouse Gas, and Health Risk Assessment Supporting Documentation*.

[c] The Project variants analyzed in this table would operate three hydrogen powered trains.

Table 3.3-23. Informational Well-to-Wheel GHG from San Joaquins Fuel Use for the Project and Project Variants under the Horizon (2040) Year "Full" Hydrogen Deployment Scenario (metric tons CO_2e per year) [a]

Condition [b, c]	Minimum Estimate	Maximum Estimate
Project	8,625	8,625
Variant H1A (on-site solar + off-site green)	1,491	3,735
Variant H1B (on-site solar + off-site gray)	5,126	6,173
Variant H2A (off-site green)	1,863	5,455
Variant H2B (off-site gray)	7,680	9,355
Variant H3A (off-site green)	921	1,994
Variant H3B (off-site gray)	6,580	6,719
Comparison to the Project		
Variant H1A (on-site solar + off-site green)	-7,134	-4,889
Variant H1B (on-site solar + off-site gray)	-3,499	-2,452
Variant H2A (off-site green)	-6,762	-3,170
Variant H2B (off-site gray)	-945	731
Variant H3A (off-site green)	-7,703	-6,631
Variant H3B (off-site gray)	-2,045	-1,906

CO_2e = carbon dioxide equivalent.

[a] Information in this table is given for informational purposes to enable a comparison between the hydrogen fuel options being considered by the Project variants, and also to compare those fuel options to the Project, which would use renewable diesel. The results are not included in the impact analysis for this EIR.

[b] Refer to Chapter 2, *Project Description*, for additional information Project variants. See also Appendix 3.3-1, *Air Quality, Greenhouse Gas, and Health Risk Assessment Supporting Documentation*.

[c] The Project variants analyzed in this table would operate eight hydrogen powered trains.

Impact Details and Conclusions

As shown in Table 3.3-21, operation of the Project would reduce GHG emissions relative to No Project conditions. This result is expected because the service improvements achieved by the Project will increase passenger rail ridership without changing the intensity or frequency of passenger train activities. Thus, the Project achieves additional avoided VMT and automobile trips for the same amount of passenger rail service, resulting in a net emission reduction. The Project would also eliminate bus stops at the existing Merced station and the bus bridge that would operate under the No Project condition.

Estimated annual GHG reductions under Project operations for 2032 and 2040 conditions would be -9,524 and -9,442 metric tons CO_2e, respectively, relative to the No Project conditions. Net emission reductions on a per-vehicle-mile basis from avoided automobile VMT would decline as a function of time, because the vehicles that would be removed from the road will be progressively cleaner due to engine improvements and vehicle modernization. The transition to cleaner vehicles results in 2040 emission reductions that are slightly less than in 2032. The Project analysis assumes that diesel locomotives would continue to operate under both opening (2032) and horizon (2040) years. As discussed in Section 3.3.2.2, *State*, an increasing percentage of ZE locomotives will operate statewide in the future. Because transition of the locomotive fleet will be due in part to regulatory mandates, ZE vehicles are expected to operate under either the Project or No Project. Nevertheless, operation of ZE locomotives will reduce the emissions intensity of passenger rail service, and as such, the net reductions presented in Table 3.3-21 for the Project conditions are conservative. Emissions implications from operation of hydrogen-powered San Joaquins locomotives are assessed under the Project variants below.

GHG benefits achieved by operation of the Project would offset the short-term construction emissions in less than 1 year. Emissions savings achieved thereafter would contribute to reductions in statewide emissions. These reductions would be an environmental benefit and would assist the state in meeting larger statewide GHG reduction goals outlined under AB 1279. Therefore, this impact would be less than significant and beneficial.[22]

Variant H1

Impact Characterization

Variant H1 would not change the need for connecting bus transit or the reduction in automobile VMT and trips relative to what was analyzed for the Project. Variant H1 likewise would not change the frequency of passenger train activities (i.e., movement and idling hours) but would operate hydrogen-powered San Joaquins trains. Variant H1 would construct an on-site solar field to generate green hydrogen. Operation of the on-site hydrogen production facility at the ACE Merced Layover and Maintenance Facility would require water, resulting in slightly more indirect GHG emissions from maintenance facility operations when compared to the Project. Under the full hydrogen deployment scenario, Variant H1 would use a combination of hydrogen produced on-site and

[22] As discussed in Section 3.3.4.1, *Methods for Analysis*, subsequent to preparation of this analysis, it was determined that the Project would require the use of wayside power at the proposed integrated Merced HSR Station. This would result in a minor increase in the amount of operational electricity and associated GHG emissions compared to the scenario that was modeled. However, the use of wayside power would not result in any change to the level of impact of the Project.

sourced from off-site locations. Table 3.3-20 and Table 3.3-21 summarize estimated construction and operations emissions, respectively, for Variant H1 analysis.

Impact Details and Conclusions

Compared to the Project, construction of Variant H1 would result in slightly greater short-term emissions. However, the ZE locomotives operated under Variant H1 would reduce operational GHG emissions relative to the Project, achieving greater net emissions benefits from avoided automobile VMT and trips. Variant H1 would therefore support more rapid decarbonization of the transportation sector and attainment of state's GHG reduction targets. However, there would be no overall difference in the impact conclusion between the Project and Variant H1 (both would result in a less-than-significant and beneficial impact with respect to the generation of GHG emissions).

While not considered as part of the impact conclusion, the informational results presented in Table 3.3-22 and Table 3.3-23 indicate that when emissions are analyzed across the full lifecycle of locomotive fuel use, operation of three San Joaquins trains using hydrogen produced on-site by solar energy would achieve an annual emissions reduction of nearly 3,000 metric tons CO_2e, compared to use of renewable diesel under the Project. Under the full hydrogen deployment scenario, annual emissions reduction would range from about 7,100 metric tons CO_2e to 2,400 metric tons CO_2e. The range in emissions is due to the assumed hydrogen pathway (i.e., green vs. gray) and origin of production for the off-site hydrogen, with use of locally (i.e., Northern California) produced green hydrogen resulting in fewer emissions.

Variant H2

Impact Characterization

The characterization of short-term construction emissions is the same as described above for the Project. Variant H2 would not change the intensity of construction required for the Project and would not construct any additional features. Thus, the construction emissions presented in Table 3.3-20 for the Project also characterize emissions that would be generated for construction of Variant H2.

The characterization of operations emissions is the same as described above for Variant H1 except that Variant H2 would not operate on-site solar facility and instead would use on-road trucks to transport all required hydrogen from off-site production locations to the ACE Merced Layover and Maintenance Facility. Table 3.3-21 summarizes estimated operations emissions for Variant H2 analysis.

Impact Details and Conclusions

Like Variant H1, the ZE locomotives operated under Variant H2 would generate fewer annual emissions when compared to the Project. Relative to the No Project hydrogen condition, which assumes operation of ZE locomotives also fueled exclusively by off-site hydrogen transported by on-road trucks, Variant H2 would achieve net emissions benefits that are comparable to those achieved by the Project. Thus, there would be no difference in the overall impact conclusion between the Project and Variant H2 (both would result in a less-than-significant and beneficial impact with respect to the generation of GHG emissions).

While not considered as part of the impact conclusion, the informational results presented in Table 3.3-22 indicate that when emissions are analyzed across the full lifecycle of locomotive fuel use, operation of three San Joaquins trains using hydrogen produced off-site and transported by on-road trucks would achieve an annual emissions reduction of about 2,600 metric tons CO_2e to an annual emissions increase of about 200 metric tons CO_2e, compared to use of renewable diesel under the Project. The range in emissions is due to the assumed hydrogen pathway (i.e., green vs. gray) and origin of production, with use of locally (i.e., Northern California) produced green hydrogen resulting in fewer emissions. Under the full hydrogen deployment scenario the variant would achieve an annual emissions reduction of about 6,700 metric tons CO_2e to an annual emissions increase of about 700 metric tons CO_2e, depending on the hydrogen pathway and origin of production.

Variant H3

Impact Characterization

The characterization of GHG emissions is the same as described above for Variant H2, except that Variant H3 would use freight trail to transport off-site hydrogen to the ACE Merced Layover and Maintenance Facility. Table 3.3-20 and Table 3.3-21 summarize estimated construction operations emissions, respectively, for Variant H3 analysis.

Impact Details and Conclusions

Like Variants H1 and H2, the ZE locomotives operated under Variant H3 would generate fewer annual emissions when compared to the Project. The use of freight rail to transport off-site hydrogen, which is a more efficient mode of transportation compared to on-road trucks, would achieve slightly greater net emissions benefits relative to the No Project hydrogen condition, which assumes operation of ZE locomotives fueled exclusively by off-site hydrogen transported by on-road trucks. Variant H3 would therefore support more rapid decarbonization of the transportation sector and attainment of state's GHG reduction targets compared to the Project. However, there would be no difference in the overall impact conclusion between the Project and Variant H3 (both would result in a less-than-significant and beneficial impact with respect to the generation of GHG emissions).

While not considered as part of the impact conclusion, the informational results presented in Table 3.3-22 indicate that when emissions are analyzed across the full lifecycle of locomotive fuel use, operation of three San Joaquins trains using hydrogen produced off-site and transported by freight rail would achieve annual emissions reductions between about 800 and 3,000 metric tons CO_2e, compared to use of renewable diesel under the Project. The range in emissions is due to the assumed hydrogen pathway (i.e., green vs. gray) and origin of production, with use of locally (i.e., Northern California) produced green hydrogen resulting in fewer emissions. Under the full hydrogen deployment scenario, annual emissions reduction would range from about 1,900 metric tons CO_2e to 7,700 metric tons CO_2e, depending on the hydrogen pathway and origin of production.

Impact AQ-6	Construction and operation of the Project would not conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs.
Level of Impact	**Less-than-significant impact**

Project

Impact Characterization

AB 1279 outlines the state's GHG reduction goal of achieving net zero GHG emissions (i.e., reach a balance between the GHGs emitted and removed from the atmosphere) no later than 2045. CARB adopted the *2022 Scoping Plan* as a framework for achieving AB 1279. The plan outlines a series of technologically feasible, cost-effective, and equity-focused measures to reduce statewide GHG emissions. Many of these actions build on programs of previous scoping plans, including the *2017 Scoping Plan*, which CARB adopted to achieve its 2030 GHG reduction target, pursuant to SB 32. Principal among these actions is reducing reliance on automobiles by providing sustainable and convenient public transit.

Several jurisdictions in the expanded air quality study area have adopted or are currently preparing CAPs, some of which include net zero reduction targets for community GHG emissions. Many CAPs outline an array of strategies to expand and improve local transit. Local metropolitan planning organizations, including MCAG, have also developed transportation plans with policies and goals that are relevant to transportation and rail projects. Relevant to Merced County, MCAG identifies the provision of reliable passenger rail service as key goal of their 2022 RTP/SCS.

These state, regional, and local plans share the common goals of reducing automobile VMT, expanding public transit, and decarbonizing the transportation sector. Consistency with these goals is evaluated in this impact.

Impact Details and Conclusions

The Project would increase passenger rail ridership, alleviate traffic congestion, and reduce automobile VMT and trips throughout Northern California, directly supporting state and local alternative transportation and VMT reduction goals. These Project benefits would also support implementation of MCAG's 2022 RTP/SCS, in which the Project is specifically listed as a priority action under MCAG's broader passenger rail goal (MCAG 2022). The Project is also mentioned in the 2023 Draft California State Rail Plan (California Department of Transportation 2023). Ultimately, the emission reductions achieved through operation of the Project (see Table 3.3-21) would facilitate attainment of state, regional, and local GHG reduction goals and are consistent with the trajectory of statewide climate change planning to achieve carbon neutral by 2045. Therefore, this impact would be less than significant and beneficial.

Variant H1

Impact Characterization

The impact characterization is the same as described above for the Project.

Impact Details and Conclusions

Variant H1 would achieve the same benefits as the Project with respect to increases in passenger rail ridership, alleviation of traffic congestion, and reductions in automobile VMT and trips throughout Northern California. Thus, like the Project, Variant H1 would support state, regional, and local transportation and emission reduction goals. Use of hydrogen generated on-site by solar power is consistent with state goals to bolster renewably generated fuels and enhance the resilience and security of fuels production. The ZE locomotives operated under Variant H1 would also reduce operational GHG emissions relative to the Project, thus achieving greater net emissions benefits from avoided automobile VMT and trips. Variant H1 would therefore support more rapid decarbonization of the transportation sector and attainment of state's GHG reduction targets. However, there would be no overall difference in the impact conclusion between the Project and Variant H1 (both would result in a less-than-significant and beneficial impact with respect to GHG plan consistency).

Variant H2

Impact Characterization

The impact characterization is the same as described above for the Project.

Impact Details and Conclusions

The impact characterization is the same as described above for Variant H1 except that Variant H2 would rely on hydrogen fuel that is exclusively produced off-site. While the transport of off-site hydrogen to the ACE Merced Layover and Maintenance Facility would result in emissions, the ZE locomotives operated under Variant H2 would generate fewer annual GHG emissions when compared to the Project. Like the Project, Variant H2 would directly support state, regional, and local transportation, and emission reduction goals through increases in passenger rail ridership, alleviation of traffic congestion, and reductions in automobile VMT and trips. Thus, there would be no difference in the impact conclusion between the Project and Variant H2 (both would result in a less-than-significant and beneficial impact with respect to GHG plan consistency).

Variant H3

Impact Characterization

The impact characterization is the same as described above for the Project.

Impact Details and Conclusions

The impact details and conclusions are the same as described above for Variant H2. There would be no difference in the impact conclusion between the Project and Variant H3 (both would result in a less-than-significant and beneficial impact with respect to GHG plan consistency).

3.4 Biological Resources

3.4.1 Introduction

This section describes the regulatory and environmental setting for biological resources in the vicinity of the Project. It also describes the impacts on biological resources that would result from the Project and mitigation measures that would reduce significant impacts, where feasible and appropriate. Appendix 3.4-1 of this environmental impact report (EIR) contains the Rare Plant Survey Technical Memorandum prepared for the Project, Appendix 3.4-2 contains the Preliminary Aquatic Resources Delineation Report prepared for the Project, and Appendix 3.4-3 provides a list of special-status wildlife, plant, and fish species identified during a review of existing information.

Cumulative impacts on biological resources, in combination with planned, approved, and reasonably foreseeable projects, are discussed in Chapter 4, *Cumulative Impacts*.

3.4.2 Regulatory Setting

This section summarizes the federal, state, regional, and local regulations related to biological resources applicable to the Project.

3.4.2.1 Federal Regulations

Federal Endangered Species Act

The federal Endangered Species Act (ESA) of 1973 requires federal agencies to consult with the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS) when a federal action may result in take of a species listed as threatened or endangered under ESA. Take, as defined by ESA, means "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." Harm is defined as "any act that kills or injures the species, including significant habitat modification." Under federal regulations, take is further defined to include habitat modification or degradation that results, or is reasonably expected to result, in death or injury to wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering.

Pursuant to the requirements of ESA, when reviewing a proposed action within its jurisdiction, an agency must determine whether any federally listed species may be present on a project site and determine if the proposed action will result in a take of such species. Under ESA, habitat loss is considered an impact on a species. In addition, the agency is required to determine whether the proposed action is likely to jeopardize the continued existence of any species that is proposed for listing under ESA or result in the destruction or negative modification of critical habitat that has been proposed or designated for such species (16 United States Code [U.S.C.] § 1536(3), (4)).

Endangered Species Act Section 7 (Consultation Process)

USFWS and NMFS maintain areas of critical habitat for federally regulated species to safeguard the continued existence of such species by restricting the type and extent of activities proposed under Section 7 of ESA. Section 7 of ESA requires federal agencies to consult with USFWS and/or NMFS for actions that may take a listed species or its habitat. Federal agency actions include activities that are on federal land, conducted by a federal agency, funded by a federal agency, or authorized by a federal agency (including issuance of federal permits and licenses).

Under Section 7, the federal agency conducting, funding, or permitting an action (the federal lead agency) must consult with USFWS and/or NMFS, as appropriate, to ensure that the proposed action will not jeopardize endangered or threatened species or destroy or adversely modify designated critical habitat. If a proposed action "may affect" a listed species or designated critical habitat, the lead agency is required to prepare a biological assessment evaluating the nature and severity of the expected effect. In response, USFWS and/or NMFS issues a biological opinion with a determination that the proposed action would have one of the following results.

- Jeopardize the continued existence of one or more listed species (jeopardy finding) or result in the destruction or adverse modification of critical habitat (adverse modification finding).
- Not jeopardize the continued existence of any listed species (no jeopardy finding) or result in adverse modification of critical habitat (no adverse modification finding).

The biological opinion issued by USFWS and/or NMFS may stipulate discretionary "reasonable and prudent" conservation measures. If the proposed action would not jeopardize a listed species, USFWS and/or NMFS will issue an incidental take statement to authorize the proposed activity.

For the Project, Section 7 consultation may be initiated by the Federal Railroad Administration (FRA), the Federal Transit Administration (FTA), or the California High Speed Rail Authority (CHSRA). If none of these agencies take on the federal lead agency role, then the U.S. Army Corps of Engineers (USACE) would be the lead federal agency and would complete the consultation under Section 7 related to permits for Project activities that affect wetland or waters within its jurisdiction. To the extent that Section 7 consultation does not address certain Project activities, San Joaquin Joint Powers Authority (SJJPA) may need to obtain take coverage under Section 10 of ESA instead.

Endangered Species Act Section 9 (Prohibitions)

Section 9 of ESA prohibits the take of any fish or wildlife species listed under ESA as endangered. Take of threatened species is also prohibited under Section 9, unless otherwise authorized by federal regulations. In addition to the take definition described above, Section 9 prohibits removing, digging up, cutting, or maliciously damaging or destroying federally listed plants on sites under federal jurisdiction. Section 9 does not prohibit take of federally listed plants on sites that are not under federal jurisdiction.

Endangered Species Act Section 10 (Habitat Conservation Plans)

In cases where a nonfederal entity is undertaking an action that does not require federal authorization, the take of listed species must be permitted by USFWS and/or NMFS through the Section 10 process. If a proposed project would result in the incidental take of a listed species, the project proponent must first obtain a Section 10(a)(1)(B) incidental take permit (ITP). Incidental take is defined under Section 10 as the take of federally listed fish and wildlife species that are "incidental to, but not the purposes of, otherwise lawful activities."

To receive an ITP, the nonfederal entity is required to prepare a habitat conservation plan. The habitat conservation plan must include conservation measures to avoid, minimize, and mitigate the project's impact on listed species and their habitat. If no federal lead agency is required, SJJPA would use the Section 10 consultation process for this the Project. SJJPA would work with USFWS or NMFS, as necessary, to meet the Section 10 process requirements.

Magnuson-Stevens Fishery Conservation and Management Act

The Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act), first passed in 1976, establishes a management system for national marine and estuarine fishery resources. This legislation requires that all federal agencies consult with NMFS regarding all actions or proposed actions whether permitted, funded, or undertaken, that may adversely affect essential fish habitat (EFH), defined as "waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." The phrase "adversely affect" refers to any impact that reduces the quality or quantity of EFH.

The Magnuson-Stevens Act states that migratory routes to and from anadromous fish spawning grounds are considered EFH. Federal activities that occur outside of EFH but that may have an impact on EFH must also be considered in the consultation process.

Clean Water Act: Sections 404 and 401

Waters of the United States are protected under Section 404 of the Clean Water Act (CWA). Waters of the United States may include both wetlands and non-wetland waters. Any activity that involves a discharge of dredged or fill material into waters of the United States, including wetlands, is subject to regulation by USACE. Waters of the United States are defined to include (33 Code of Federal Regulations [CFR] § 328.3):

(1) Waters that are:
- (i) Currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;
- (ii) The territorial seas; or
- (iii) Interstate waters, including interstate wetlands;

(2) Impoundments of waters otherwise defined as waters of the United States under this definition, other than impoundments of waters identified under paragraph (5) of this section;

(3) Tributaries of waters identified in paragraph (1) or (2) of this section:
- (i) That are relatively permanent, standing or continuously flowing bodies of water; or
- (ii) That either alone or in combination with similarly situated waters in the region, significantly affect the chemical, physical, or biological integrity of waters identified in paragraph (1) of this section;

(4) Wetlands adjacent to the following waters:
- (i) Waters identified in paragraph (1) of this section; or
- (ii) Relatively permanent, standing or continuously flowing bodies of water identified in paragraph (2) or (3)(i) of this section and with a continuous surface connection to those waters; or
- (iii) Waters identified in paragraph (2) or (3) of this section when the wetlands either alone or in combination with similarly situated waters in the region, significantly affect the chemical, physical, or biological integrity of waters identified in paragraph (1) of this section;

(5) Intrastate lakes and ponds, streams, or wetlands not identified in paragraphs (1) through (4) of this section:

(i) That are relatively permanent, standing or continuously flowing bodies of water with a continuous surface connection to the waters identified in paragraph (1) or (3)(i) of this section; or

(ii) That either alone or in combination with similarly situated waters in the region, significantly affect the chemical, physical, or biological integrity of waters identified in paragraph (1) of this section.

Features that are not considered waters of the United States include waste treatment ponds; prior converted cropland; ditches (including roadside ditches) excavated in and draining only dry land and without a relatively permanent flow; artificially irrigated areas; artificial lakes or ponds, including settling basins; swimming pools; borrow site depressions created in dry land, unless the resulting water body meets the definition of waters of the United States; and swales and erosional features with infrequent, short-duration flow.

Wetlands are defined under Section 404 as those areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and, under normal circumstances, do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Jurisdictional wetlands must meet three wetland delineation criteria.

- They support hydrophytic vegetation (i.e., plants that grow in saturated soil).
- They have hydric soil types (i.e., soils that are wet or moist enough to develop anaerobic conditions).
- They have wetland hydrology (i.e., flooding, inundation, or saturation conditions that support wetland communities).

The extent of USACE jurisdiction in inland situations extends to the ordinary high water mark—the line on the shore established by fluctuations of water and indicated by a clear, natural line impressed on the bank, shelving, changes in soil character, destruction of terrestrial vegetation, and/or the presence of litter and debris.

Activities requiring a Section 404 permit must obtain certification from the state in which the discharge would originate or, if appropriate, from the interstate water pollution control agency with jurisdiction over affected waters at the point where the discharge would originate, pursuant to CWA Section 401. Either the State Water Resources Control Board (State Water Board) or the Central Valley Regional Water Quality Control Board would have to issue such certification prior to the alteration of or discharge to waters of the United States and the state (i.e., work involving bridge crossings of jurisdictional waters). Waters of the state are defined in Section 3.4.2.2, *State Regulations*.

Clean Water Act Section 402

CWA Section 402 regulates construction-related stormwater discharges to surface waters through the National Pollutant Discharge Elimination System program, administered by the U.S. Environmental Protection Agency. CWA Section 402 is discussed in detail in Section 3.10, *Hydrology and Water Quality*, of this EIR.

Executive Order 11990: Protection of Wetlands

Executive Order 11990 (May 24, 1997) directs federal agencies to refrain from assisting in or giving financial support to projects that encroach on publicly or privately owned wetlands. It further requires that federal agencies support a policy to minimize the destruction, loss, or degradation of wetlands. A project that encroaches on wetlands may not be undertaken unless the agency has determined that (1) there are no practicable alternatives to construction, (2) the project includes all practicable measures to minimize harm to wetlands affected, and (3) the impact will be minor.

Migratory Bird Treaty Act

The federal Migratory Bird Treaty Act (MBTA) (16 U.S.C. § 703) enacts the provisions of treaties between the United States, Great Britain, Mexico, Japan, and the Soviet Union (now Russia) and authorizes the U.S. Secretary of the Interior to protect and regulate the taking of migratory birds. It establishes seasons and bag limits for hunted species and protects migratory birds, their occupied nests, and their eggs (16 U.S.C. § 703, 50 CFR § 21, 50 CFR § 10). Most actions that result in taking or in permanent or temporary possession of a protected species constitute violations of the MBTA. Examples of permitted actions that do not violate the MBTA are the possession of a hunting license to pursue specific gamebirds, legitimate research activities, display in zoological gardens, banding, and other similar activities. USFWS is responsible for overseeing compliance with the MBTA, and the U.S. Department of Agriculture's Animal Damage Control Officer makes recommendations on related animal protection issues.

On December 22, 2017, the Department of Interior's Solicitor issued Opinion M-37050, which formally revises the Department of the Interior's interpretation of the MBTA's prohibition on the take of migratory bird species. Opinion M-37050 concludes that "consistent with the text, history, and purpose of the MBTA, the statute's prohibitions on pursuing, hunting, taking, capturing, killing, or attempting to do the same apply only to affirmative actions that have as their purpose the taking or killing of migratory birds, their nests, or their killing of migratory birds, their nests, or their eggs."

On April 11, 2018, USFWS issued guidance on Opinion M-37050, which states that the MBTA's prohibitions on take apply when the purpose of an action is to take migratory birds, their eggs, or their nests. This guidance also states that ESA and some state laws and regulations are not affected by Opinion M-37050.

According to the USFWS guidance, take of a migratory bird, its nest, or eggs that is incidental to another lawful activity does not violate the MBTA, and the MBTA's criminal provisions do not apply to those activities.

Although the Project has the potential to affect migratory birds protected by the MBTA, incidental take of migratory birds during construction of the Project e would not be enforced by USFWS per this guidance; however, the Project would still need to comply with state regulations on migratory birds.

Executive Order 13186: Responsibilities of Federal Agencies to Protect Migratory Birds

Executive Order 13186 (January 10, 2001) directs each federal agency, when conducting actions that will have or be likely to have a negative impact on migratory bird populations, to work with USFWS to develop a memorandum of understanding and promote the conservation of migratory bird populations. Protocols developed under the memorandum of understanding must include the following agency responsibilities.

- Avoid and minimize, to the extent practicable, adverse impacts on migratory bird resources when conducting agency actions.
- Restore and enhance habitat of migratory birds, as practicable.
- Prevent or abate the pollution or detrimental alteration of the environment for the benefit of migratory birds, as practicable.

The Executive Order is designed to assist federal agencies in their efforts to comply with MBTA. The order does not constitute any legal authorization to take migratory birds.

Executive Order 13112: Invasive Species Prevention

Executive Order 11312 (February 3, 1999) directs all federal agencies to prevent and control the introduction and spread of invasive nonnative species in a cost-effective and environmentally sound manner to minimize their effects on economic, ecological, and human health.

3.4.2.2 State Regulations

California Environmental Quality Act

The California Environmental Quality Act (CEQA) of 1970 requires state and local agencies to identify significant environmental impacts of their actions and to avoid or mitigate those impacts, if feasible. A public agency must comply with CEQA when it undertakes an activity defined by CEQA as a project. A project is any activity undertaken by a public agency or a private activity that must receive some discretionary approval (meaning that the agency has the authority to deny the requested permit or approval) from a government agency, which may cause either a direct physical change in the environmental or a reasonably foreseeable indirect change in the environment.

California Native Plant Protection Act

The California Native Plant Protection Act of 1977 (California Fish and Game Code [Fish & G. Code] §§ 1900–1913) prohibits take, possession, transportation, exportation, importation, or sale of rare and threatened plants, except as a result of agricultural practices, fire control measures, timber operations, mining, or actions of public agencies or private utilities. Private landowners are also exempt from the prohibition against removing rare and endangered plants, although they must provide 10-day notice to the California Department of Fish and Wildlife (CDFW) before removing the plants. This act has mostly been superseded by the California Endangered Species Act (CESA).

California Fish and Game Code

Lake and Streambed Alteration

Fish & G. Code Section 1600 et seq. requires notifying CDFW prior to any project activity undertaken in or near a river, stream, or lake that flows at least intermittently through a bed or channel.

California Endangered Species Act

CESA (Fish & G. Code §§ 2050–2116) states that all native species of fishes, amphibians, reptiles, birds, mammals, invertebrates, plants, and their habitats that are threatened with extinction, as well as those experiencing a significant decline that, if not halted, would lead to a threatened or endangered designation, will be protected or preserved.

Incidental Take Permit

Under Section 2081, an ITP from CDFW is required for projects that could result in take of a species that is state listed as threatened or endangered or identified as candidates for threatened or endangered under CESA. Take is defined as an activity that would directly or indirectly kill an individual of a species. The definition does not include harm or harass, as does the definition of take under ESA. In addition, habitat destruction is not included in the definition of take. Consequently, the threshold for take under CESA is higher than that under ESA. For example, habitat modification is not necessarily considered take under CESA. CDFW administers CESA and authorizes take through Section 2081 agreements (ITPs), except for species designated as fully protected. Section 2081 also requires measures to avoid and minimize take of CESA-regulated species, and to fully mitigate the impact of take.

Bird Nesting Protections

Sections 3503 and 3503.3 state that it is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird, except as otherwise provided by the code or any regulation made pursuant thereto.

Fully Protected Species

Sections 3511, 4700, 5050, 5515 list 37 fully protected species and prohibit take or possession at any time of the species listed, except for collecting these species for scientific research and relocation of bird species for the protection of livestock.

Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act of 1969 (Porter-Cologne Act) (California Water Code [Wat. Code] § 13000 et seq.) governs water quality in California. This act delegates responsibility to the State Water Board for water rights and water quality protection and directs the nine statewide Regional Water Quality Control Boards (Regional Water Boards) to develop and enforce water quality standards within their jurisdictions. The Porter-Cologne Act requires any entity discharging waste, or proposing to discharge waste, in any region that could affect the quality of the waters of the state to file a report of waste discharge with the appropriate Regional Water Board. Waters of the state are defined as “any surface water or groundwater, including saline waters, within the boundaries of the state” (Wat. Code § 13050(e)) including both natural and certain artificial or constructed facilities. Waters of the state includes both waters of the United Sates and non-federal waters of the state (State Water Board 2021). The appropriate Regional Water Board then must issue a permit, referred to as a waste discharge requirement. Waste discharge requirements implement water quality control plans and take into consideration the beneficial uses to be protected, the water quality objectives reasonably required for that purpose, other waste discharges, and the need to prevent nuisances (Wat. Code § 13263).

3.4.2.3 Regional and Local Regulations

The SJJPA, as a state joint powers agency, proposes improvements within and outside the Union Pacific Railroad (UPRR) and BNSF Railway (BNSF) rights-of-way. The Interstate Commerce Commission Termination Act (ICCTA) affords railroads that engage in interstate commerce considerable flexibility in making necessary improvements and modifications to rail infrastructure, subject to the requirements of the Surface Transportation Board. ICCTA broadly preempts state and local regulation of railroads; this preemption extends to the construction and operation of rail lines. As such, activities within the UPRR and BNSF rights-of-way are clearly exempt from local building and zoning codes as well as other land use ordinances. Project activities outside of the UPRR and BNSF rights-of-way, however, would be subject to regional and local plans and regulations. Though ICCTA broadly preempts state and local regulation of railroads, SJJPA intends to obtain local agency permits for construction of facilities that fall outside the UPRR and BNSF rights-of-way, even though SJJPA has not determined whether such permits are legally necessary or required.

Appendix 3.0-1 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 Project improvements would be located. Section 15125(d) of the 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 Project would be consistent with the plans of relevant jurisdictions.[1] The Project would be generally consistent with the applicable goals, policies, and objectives related to biological resources identified in Appendix 3.0-1.

City of Merced Tree Policy

Chapter 14.12 of the City of Merced Municipal Code protects any street tree in the road right-of-way of the City or in adjacent easements. A permit is required to trim, prune, or remove a street tree. There is no replacement requirement, which is at discretion of Director of Recreation and Parks. In addition, construction activities must protect street trees to prevent injury.

3.4.3 Environmental Setting

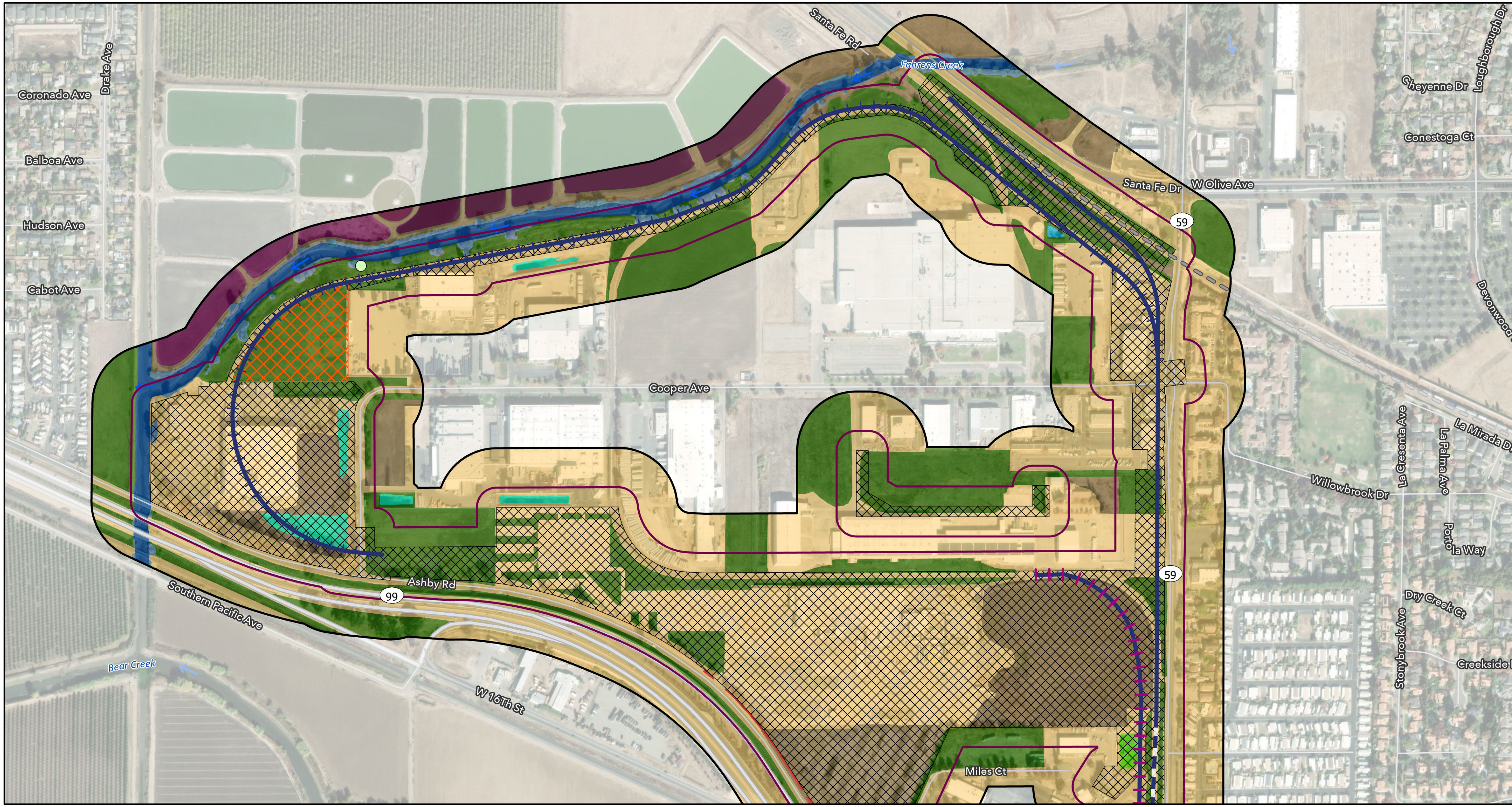
This section describes the environmental setting related to biological resources for the Project. For the purposes of this analysis, the study area for biological resources is specific to the resource analyzed (i.e., special-status species, wetlands, and other waters of the United States).

The study area for each biological resource is defined as follows:

- The study area for special-status plant species is a 100-foot lateral buffer from the environmental footprint of the Project.
- The study area for wetlands resources, land cover, and special-status wildlife species is a 300-foot lateral buffer from the environmental footprint of the Project.

Figures 3.4-1a and 3.4.1b depict the study areas for each category of biological resources.

[1] 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.



Land Cover, Wetland Resources, and Special-Status Wildlife Species Study Area
Special-Status Plant Study Area
MITC Environmental Footprint
Variant H1 Additional Environmental Footprint

MITC Project

San Joaquins: Elevated Track
San Joaquins: At-grade Track
San Joaquins: Layover and Maintenance Access Line
ACE/UPRR Spur Track
San Joaquins: To be discontinued under MITC Project

Land Cover Types

Detention Basin
Developed/Landscaped
Disturbed/Unvegetated
Freshwater Marsh
Perennial Drainage
Ruderal Riparian
Roadside Ditch
Ruderal Annual Grassland
Seasonal Wetland
Wastewater Treatment Pond
Elderberry Shrub

Notes: Imagery Source: ESRI 2023

0 500 1,000 Feet

Figure 3.4-1a
Land Cover Types in the Study Area
Merced Intermodal Track Connection Project

MITC

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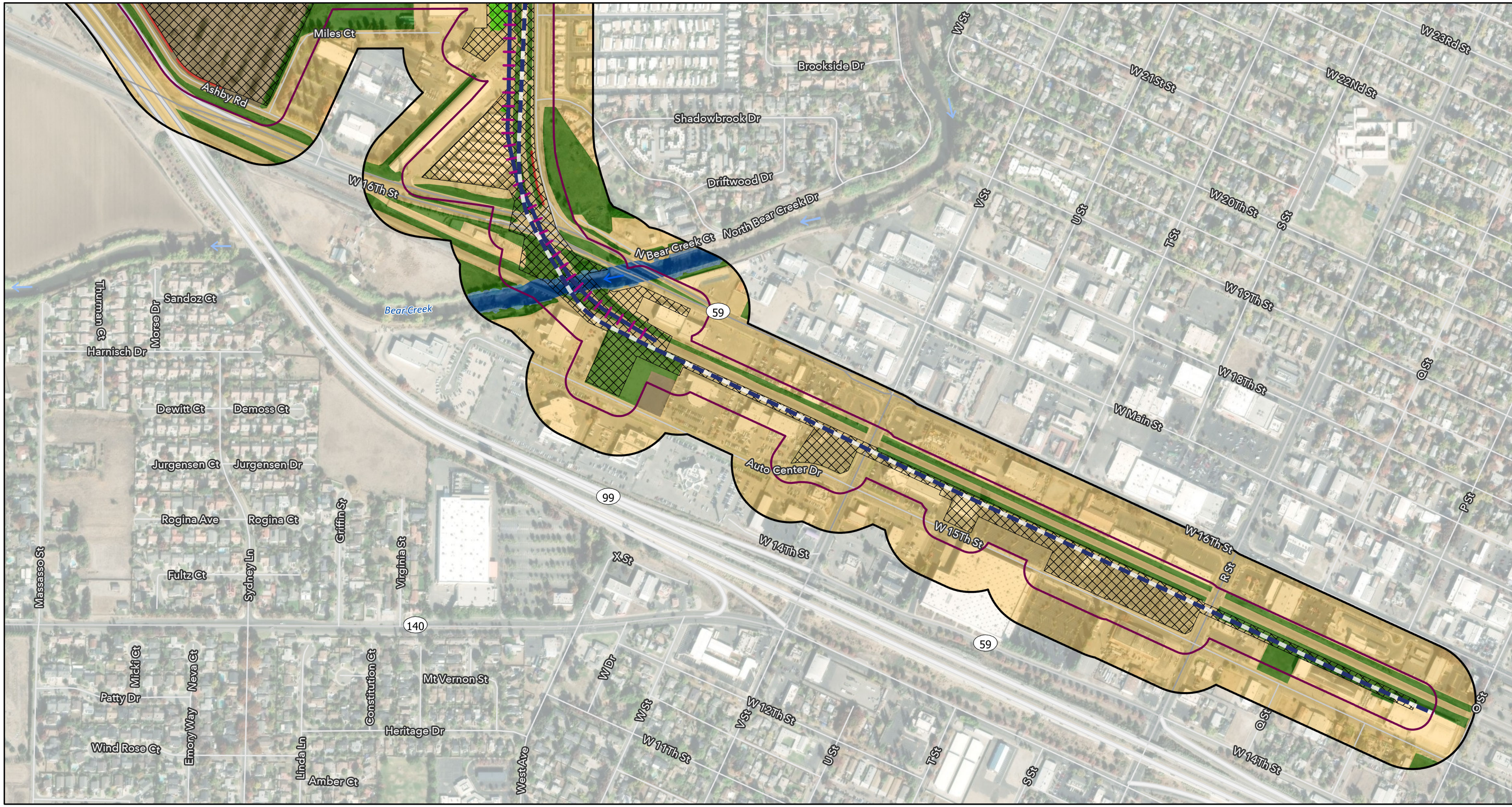

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Land Cover, Wetland Resources, and Special-Status Wildlife Species Study Area
Special-Status Plant Study Area
MITC Environmental Footprint

MITC Project
San Joaquins: Elevated Track
ACE/UPRR Spur Track

Land Cover Types
Detention Basin
Developed/Landscaped
Disturbed/Unvegetated
Perennial Drainage
Ruderal Riparian
Roadside Ditch
Ruderal Annual Grassland
Seasonal Wetland

Notes: Imagery Source: ESRI 2023

0 500 1,000 Feet

N

Figure 3.4-1b
Land Cover Types in the Study Area
Merced Intermodal Track Connection Project

MITC

The information presented in this section was obtained from the following sources:

- Plants, wildlife, and fish:
  - Background research from the California Natural Diversity Database (CNDDB) (Merced and Atwater 7.5-minute USGS quadrangles) (CDFW 2024), California Native Plant Society Inventory (Merced and Atwater 7.5-minute USGS quadrangles) (CNPS 2023), NMFS list (Merced and Atwater 7.5-minute USGS quadrangles) (NMFS 2016), and Information for Planning and Consultation (IPaC) (for project footprint) (USFWS 2023).
  - Biological reconnaissance-level surveys of land cover types and general habitat characteristics.
  - Blooming-period floristic surveys for special-status plant species.
  - Biological reconnaissance-level surveys for special-status wildlife species and their habitats, sensitive habitats of concern, and wildlife corridors.
- Waters and wetlands:
  - Determination based on standards and procedures presented in the 1987 *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987) and as clarified in the *Regional Supplement to the Corps of Engineers Wetlands Delineation Manual: Arid West Region* (USACE 2008).
  - Field analysis of accessible potential non-wetland waters and wetlands within the environmental footprint of the Project.
  - Draft map showing all potential jurisdictional areas (e.g., streams, creeks, ditches, wetlands) including all state and federal jurisdictional waters and wetlands.
  - Stand-alone determination report, including potential waters and wetlands mapping, suitable for submittal to USACE.
  - Identification of waters and wetlands using aerial photography and existing water/wetland inventory data (such as the National Wetland Inventory).

The study area is located in the San Joaquin Valley subregion of the California Floristic Province (Baldwin et al. 2012). Elevations in the study area range from approximately 160 to 165 feet above mean sea level.

The study area supports six soil map units: Honcut silt loam, 0 to 1 percent slopes; Honcut silty clay loam, 0 to 1 percent slopes; Landlow clay, 0 to 1 percent slopes; Wyman clay loam, 0 to 3 percent slopes; Wyman clay loam, deep over hardpan, 0 to 1 percent slopes; and water (Natural Resources Conservation Service 2022). The only hydric soil mapped in the study area is an unnamed minor component of Landlow clay that occurs in depressions (Natural Resources Conservation Service 2022).

The regional climate is characterized by hot, dry summer months with relatively cool, wet winters. Data from the Merced weather station, which is 1.4 miles south of the study area, was reviewed for temperature and precipitation averages (Natural Resources Conservation Service 2023). The average high temperatures range from 96.85 degrees Fahrenheit (°F) in July to 55.7°F in December and January, and the average low temperatures range from 36.2°F in December to 61.5°F in July. The total average annual precipitation is 12.40 inches, with precipitation falling entirely as rain.

The study area includes two surface waters, Fahrens Creek, also referred to as Black Rascal Creek, and Bear Creek.

3.4.3.1 Land Cover Types and Associated Wildlife

For the purposes of this analysis, land cover types are defined as the dominant character of the land surface, as determined by vegetation, water, or human uses. Figures 3.4-1a and 3.4.1b depict the land cover types in the study area. Table 3.4-1 presents the acres of land cover types in the study area for the Project. Vegetation and wildlife associations (including special-status species) for each land cover type are described in the following subsections. Disturbed/unvegetated land cover includes graded road shoulders, graveled areas, barren land, driveways, and pullouts that do not support vegetation and are not further described below. Additional details of the aquatic resource land cover types (perennial drainage, freshwater marsh, and seasonal wetland) are described in the Preliminary Aquatic Resources Delineation Report prepared for the Project (see Appendix 3.4-2).

Table 3.4-1. Land Cover Types in the Study Area

Land Cover Type	Acres
Perennial Drainage	11.59
Detention Basin	2.36
Wastewater Treatment Pond	8.41
Developed/Landscaped	268.56
Ruderal Riparian	3.83
Ruderal Annual Grassland	92.94
Freshwater Marsh	0.07
Seasonal Wetland	0.40
Roadside Ditch	0.33
Disturbed/Unvegetated	37.63
Total	**426.13**

Perennial Drainage

The perennial drainage land cover type includes perennial streams characterized by a defined bed and bank. Perennial streams support flowing water year-round in normal rainfall years. The perennial drainage land cover type is most closely associated with riparian and freshwater marsh plant communities (refer to *Ruderal Riparian* and *Freshwater Marsh* sections below). Bear Creek and Fahrens Creek are the perennial streams in the study area.

Wildlife and Fish Associations

Streams provide habitat for many fish and wildlife species. Fish species present in the study area are both native and nonnative. Species composition in aquatic habitat varies depending on physical characteristics, including salinity, temperature, flow velocity, dissolved oxygen, organic matter, and plant species composition. Special-status wildlife species known to use perennial drainage habitat include western pond turtle (*Actinemys marmorata*). Several waterbird species known to use perennial drainage habitats include American wigeon (*Anas americana*), pied-billed grebe (*Podilymbus podiceps*), mallard (*Anas platyrhynchos*), American coot (*Fulica americana*), and great egret (*Ardea alba*). Common nonnative fish species occurring in perennial drainage habitat may include mosquito fish (*Gambusia affinis*), bass species such as largemouth (*Micropterus salmoides*), spotted (*M. punctulatus*) and striped (*Morone saxatilis*), and sunfish species such as pumpkinseed (*Lepomis gibbosus*), redear (*L. microlophus*), and green (*L. cyanellus*) (Stillwater Sciences 2008). Native fish species may include prickly sculpin (*Cottus asper*), Sacramento sucker (*Catostomus occidantalis*), Sacramento pikeminnow (*Ptychocheilus grandis*), and California roach (*Lavinia symmetricus*) (Stillwater Sciences 2008). Only one listed fish species, Central Valley steelhead (*Oncorhynchus mykiss*), is identified as occurring in the vicinity of the environmental footprint of the Project.

Detention Basin/Wastewater Treatment Pond

Eight detention basins occur in the study area, five of which are located in the industrial area around Cooper Avenue. A series of three connected detention basins north of West 16th Street ultimately drain to Bear Creek. The detention basins are excavated in uplands and drain runoff following storm events. Most of the detention basins are sparsely vegetated, but two basins support seasonal wetlands and one basin supports freshwater marsh (refer to *Seasonal Wetland* and *Freshwater Marsh* sections below).

The wastewater treatment ponds are located along the north boundary of the study area and are outside of the environmental footprint of the Project. These ponds are part of the Franklin County Water District sewer/stormwater treatment area. The ponds are full year-round and maintained for water treatment. These areas do not support hydrophytic vegetation and are subject to regular maintenance and disturbance.

Wildlife Associations

Detention basins undergo frequent, routine maintenance including removal of vegetation. Due to this constant disturbance, this habitat is largely unsuitable for common wildlife species. Nonetheless, especially when disturbance is infrequent, this habitat could be used by common birds, such as mallard and great egret, and common amphibians, such as Sierran treefrog (*Pseudacris sierra*) and California toad (*Anaxyrus boreas halophilus*).

Developed/Landscaped

Developed/landscaped areas in the study area include development for commercial, industrial, transportation, and landscaping uses (e.g., commercial and residential sites with structures, paved surfaces, horticultural and ornamental plantings, and irrigated lawns). Vegetation in developed/landscaped areas is highly variable, ranging from nonexistent in paved areas to maintained lawns and ornamental shade trees. Common ornamental species in the study area include eucalyptus (*Eucalyptus* sp.), olive (*Olea europaea*), coast redwood (*Sequoia sempervirens*), Chinese pistache (*Pistacia chinensis*), and oleander (*Nerium oleander*), among others. Ground cover generally consists of ornamental (non-native horticultural species) or ruderal (non-native weedy species) vegetation. The developed/landscaped land cover type is one of the most common land cover types in the study area.

Wildlife Associations

Wildlife species occurring in developed/landscaped areas are typically generalists that have adapted to human-modified landscapes. Ornamental trees and lawns provide nesting and foraging habitat for urban-adapted birds such as American crow (*Corvus brachyrhynchos*), western scrub-jay

(*Aphelocoma californica*), American robin (*Turdus migratorius*), northern mockingbird (*Mimus polyglottos*), European starling (*Sturnus vulgaris*), and house finch (*Haemorhous mexicanus*). Other common wildlife found in developed/landscaped areas include Virginia opossum (*Didelphis virginiana*), northern raccoon (*Procyon lotor*), striped skunk (*Mephitis mephitis*), and a variety of rodents. Some barren areas along current railroad grades also support California ground squirrel (*Otospermophilus beecheyi*), which create burrows that also provide habitat for burrowing owl (*Athene cunicularia*). Although not common, Swainson's hawks (*Buteo swainsoni*) have also been observed nesting in urban areas where tall ornamental trees are present; urban nesting sites are near or adjacent to foraging habitat. Human-made structures could provide suitable roosting habitat for western mastiff bat (*Eumops perotis californicus*). Urban pollinator gardens associated with developed/landscaped areas can also provide nectar and breeding resources (e.g., milkweed [*Asclepias* spp.]) for western monarch butterfly (*Danaus plexippus plexippus*).

Ruderal Riparian

Riparian is a natural community of special concern in undisturbed situations, although the riparian habitat in the study area supports mostly ruderal and nonnative species (CDFW 2023). The ruderal riparian cover type in the study area is associated with Fahrens Creek and Bear Creek. A mix of native and nonnative species occur in the riparian habitat, with none being dominant throughout. Species include deodar cedar (*Cedrus deodara*), red gum eucalyptus (*Eucalyptus calmaldulensis*), Northern California black walnut (*Juglans hindsii*), English walnut (*Juglans regia*), olive (*Olea europaea*), almond (*Prunus dulcis*), valley oak (*Quercus lobata*), narrowleaf willow (*Salix exigua*), black willow (*Salix gooddingii*), and coast redwood. The understory layer includes Himalayan blackberry (*Rubus armeniacus*), blue elderberry (*Sambucus nigra* ssp. *caerulea*), and native and nonnative herbaceous forbs and grasses. A large stand of invasive giant reed (*Arundo donax*) and several invasive black locust (*Robinia pseudoacacia*) trees grow in the riparian area along Bear Creek.

Wildlife Associations

Ruderal riparian vegetation provides lower habitat value for wildlife species in comparison to more natural riparian habitats due to its historic and present disturbed nature. Nonetheless, ruderal riparian communities provide escape cover, forage, and nesting opportunities for wildlife. Ruderal riparian habitats may support several riparian-specific species, such as Pacific-slope flycatcher (*Empidonax difficilis*), warbling vireo (*Vireo gilvus*), Wilson's warbler (*Cardellina pusilla*), and black-headed grosbeak (*Pheucticus melanocephalus*). The presence of elderberry shrubs (*Sambucus* sp.) in ruderal riparian habitats can also provide suitable habitat for valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*). One elderberry shrub (*Sambucus Mexicana*) was observed in ruderal riparian habitat along Fahrens Creek during the 2023 surveys. Swainson's hawks have the potential to nest in ruderal riparian areas where tall trees are present. Two patches of narrow leaf milkweed (*Asclepias fascicularis*) were observed in ruderal riparian habitat, providing suitable habitat for western monarch butterfly. Ruderal riparian habitats can also be used by bat species such as western mastiff bat. Ruderal riparian corridors also function as wildlife corridors as they provide cover and foraging habitat in otherwise suboptimal wildlife habitat (e.g., tree-lined streams in Central Valley cropland). Ruderal riparian canopy cover along streams and creeks provides shaded riverine aquatic cover that benefits fish by reducing water temperature, providing in-water cover, and increasing aquatic productivity by vegetation input (e.g., leaves, branches) into the channel.

Ruderal Annual Grassland

Ruderal annual grassland occurs in areas where natural vegetation has been removed or significantly degraded by past or current human activity. Ruderal annual grassland vegetation often is associated with the sides of railroad tracks, vacant lots, roadsides, vacant lots, and other highly disturbed areas. Ruderal annual grassland vegetation is typified by the dominance of nonnative annual grasses and forbs that thrive in disturbed conditions including wild oat (*Avena fatua*), wall barley (*Hordeum murinum*), rip-gut brome (*Bromus diandrus*), Italian ryegrass (*Festuca perennis*), black mustard (*Brassica nigra*), bindweed (*Convolvulus arvensis*), horseweed (*Erigeron canadensis*), filaree (*Erodium* spp.), prickly lettuce (*Lactuca serriola*), cheeseweed (*Malva parviflora*), curly dock (*Rumex crispus*), Russian thistle (*Salsola tragus*), milk thistle (*Silybum marianum*), and Johnson grass (*Sorghum halapense*). Ruderal areas may be similar to California annual grassland but are characterized by a greater level of disturbance. The ruderal land cover type can be found throughout the study area.

Wildlife Associations

Wildlife species occurring in ruderal land cover are primarily determined by the characteristics of nearby natural, less disturbed habitat, although the dense cover provided by weeds can attract foraging songbirds that are otherwise absent from adjacent developed, grassland, woodland, or wetland areas. Species in this category include white-crowned sparrow (*Zonotrichia leucophrys*), American goldfinch (*Spinus tristis*), dark-eyed junco (*Junco hyemalis*), and song sparrow (*Melospiza melodia*). Such cover type also provides habitat for common reptiles such as western fence lizard (*Sceloporus occidentalis*), gopher snake (*Pituophis catenifer*), and common garter snake (*Thamnophis* spp.). Ruderal habitat type can also provide low quality habitat for burrowing owl, tricolored blackbird (*Agelaius tricolor*) foraging, and Swainson’s hawk foraging. Ruderal habitat can also support insects such as western monarch butterfly if blooming nectar resources and milkweed plants are present.

Freshwater Marsh

Freshwater marsh habitat in the study area is dominated by emergent herbaceous wetland plants in areas that are either intermittently flooded and fed by groundwater in a basin or contain perennially saturated soils along creek edges. Spikerush (*Eleocharis macrostachya*), narrowleaf cattail (*Typha angustifolia*), tule (*Schoenoplectus acutus* var. *occidentalis*) are the dominant plant species in freshwater marsh. Freshwater marsh cover type in the study area is associated with detention basin, Fahrens Creek and Bear Creek perennial drainage, and riparian land cover types.

Wildlife Associations

Common wildlife species occurring in freshwater marsh habitat include birds, such as mallard and great egret, reptiles such as common garter snake, amphibians such as Sierran treefrog and California toad, and fish such as mosquitofish or bass species. Freshwater marsh habitat can also provide aquatic habitat for western pond turtle and nesting habitat for tricolored blackbird.

Seasonal Wetland

There are seasonal wetlands located within two of the connected detention basins north of West 16th Street. Dominant vegetation includes Oregon ash (*Fraxinus latifolia*), narrowleaf cattail, curly dock, Italian ryegrass, and Bermuda grass (*Cynodon dactylon*). These two basins are the first in the series of three basins from which water is ultimately pumped and discharged to Bear Creek.

Wildlife Associations

Seasonal wetlands can support a variety of invertebrates and amphibians that, in turn, provide food for many other wildlife species, such as great egret, mallard, song sparrow, great blue heron (*Ardea herodias*), and killdeer (*Charadrius vociferus*). Seasonal wetlands also provide aquatic breeding habitat for Sierran treefrog and western spadefoot toad (*Spea hammondi*). Numerous narrow leaf milkweed plants were observed in the northernmost basin, providing a potential nectar resource for western monarch butterfly.

Roadside Ditch

Although most parts of the survey area have paved gutters along the roads, Ashby Road and SR 59 have unpaved upland ditches along the shoulders that are vegetated with ruderal annual grassland vegetation. These ditches, which are excavated in uplands, drain road runoff following storm events and are subject to regular maintenance and disturbance.

3.4.3.2 Special-Status Species

Special-Status Plants

Appendix 3.4-3 of this EIR provides a list of special-status plant species identified during the review of existing information as having the potential to occur in the study area. This list was derived from CNDDB and California Native Plant Society occurrences within U.S. Geological Survey (USGS) topographic quadrangle maps with which the Project footprint overlaps (Merced and Atwater quadrangles) and IPaC results using the Project footprint. A table of the special-status plant species with potential to occur in the study area is also provided in the Rare Plant Survey Technical Memorandum included in Appendix 3.4-1 of this EIR. Special-status plant species were identified as having potential to be either present or absent in the study area based on suitable habitat, range of the species and occurrences of the species in the vicinity of the study area. Six special-status plants have potential to be present. None of the four species that bloom in May (spiny-sepaled button-celery [*Eryngium spinosepalum*], forked hare-leaf [*Lagophylla dichotoma*], shining navarretia [*Navarretia nigelliformis* ssp. *radians*], and Merced phacelia [*Phacelia ciliata* var. *opaca*]) or the two species that bloom in June (watershield [*Brasenia schreberi*] and Sanford's arrowhead [*Sagittaria sanfordii*]) were observed in the study area during May 2 or June 12, 2023 surveys (refer to the Rare Plant Survey Technical Memorandum prepared for the Project included in Appendix 3.4-1). Due to lack of access to some properties, transects were not walked in all parts of the study area. These areas were observed from public rights of way and/or adjacent properties with access permission. Several of the inaccessible parcels support ruderal annual grassland; other properties were almost completely developed, with minimal areas of vegetation. However, because of the low habitat quality present in the study area and dominance of non-native and invasive plant species in the ruderal annual grassland on accessible properties, the potential for undetected special-status plants on inaccessible properties is low.

Special-Status Wildlife

Appendix 3.4-3 provides a list of special-status wildlife species identified during the review of existing information as having the potential to occur in the study area. This list was derived from CNDDB occurrences in USGS topographic quadrangle maps with which the Project footprint overlaps (Merced and Atwater quadrangles) and IPaC results using the Project footprint. Special-status wildlife species were determined to be either present or absent in the study area based on suitable habitat, range of the species, and known occurrences of the species in the vicinity of the study area. Seven special-status wildlife species have potential to be present (Monarch butterfly, valley elderberry longhorn beetle, western pond turtle, tricolored blackbird, burrowing owl, Swainson's hawk, and western mastiff bat).

Special-Status Fish

Appendix 3.4-3 provides a list of special-status fish species identified during the review of existing information as having the potential to occur in the study area. This list was derived from NMFS (2016) occurrences in USGS topographic quadrangle maps with which the Project footprint overlaps (Merced and Atwater quadrangles). Central Valley steelhead occur in both of the quadrangles.

3.4.3.3 Sensitive Natural Communities

Special-status or sensitive natural communities are communities (vegetation types) that are of limited distribution statewide or within a county or region. CDFW's Vegetation Classification and Mapping Program (VegCAMP) works to classify and map the vegetation of California and determine the rarity of vegetation types. Vegetation types with a state rarity ranking of S1 through S3 in CDFW's Natural Communities List (CDFW 2023) are considered to be highly imperiled, and project impacts on high-quality occurrences of these vegetation types are typically considered significant under CEQA.

Sensitive natural communities in the study area include riparian and wetland plant communities. At the state level, riparian plant communities are considered sensitive because of habitat loss and their value to a diverse community of plant and wildlife species (CDFW 2023). In general, wetlands represent a sensitive biotic community due to their limited distribution and importance to special-status plant and wildlife species.

3.4.3.4 Potential Jurisdictional Waters, Wetlands, and Other Habitats

Waters of the United States Subject to U.S. Army Corps of Engineers Jurisdiction

The term *waters of the United States* is an encompassing term used by USACE for areas that are subject to federal regulation under CWA Section 404 referring to wetlands and non-wetland (other waters) features. *Wetlands* that exhibit the prevalence of hydrophytic vegetation, hydric soils, and wetland hydrology were identified in the environmental footprint of the Project and include seasonal wetland and freshwater marsh. Appendix 3.4-2 of this EIR includes the Preliminary Aquatic Resources Delineation Report, which reflects the preliminary research and field delineation efforts conducted to date (refer to *Freshwater Marsh* and *Seasonal Wetland* in Section 3.4.3.1, *Land Cover Types and Associated Wildlife*). Final acreages of aquatic resources will be verified by the USACE.

Inland *non-wetland waters of the United States* are seasonal or perennial water bodies, including lakes, stream channels, and drainages that exhibit an ordinary high water mark but lack positive indicators for one or two of the three wetland parameters (33 CFR § 328.4). Non-wetland waters of the United States that occur in the study area include Bear Creek and Fahrens Creek (refer to Figures 3.4-1a and 3.4.1b).

California Fish and Game Code Section 1602 Jurisdiction

Fish & Game Code Section 89.1, through referral to Wat. Code Section 13050, defines *waters of the state* as "any surface water or groundwater, including saline waters, within the boundaries of the state." Activities that result in diversion or obstruction of the natural flow of any river, stream or lake; substantially change or use any material from the bed, channel, or bank of any river, stream, or lake; or deposit debris, waste, or other materials that could pass into any river, stream, or lake require that the project applicant enter into a Lake or Streambed Alteration Agreement with CDFW under Section 1602 of the Fish & G. Code (refer to *Perennial Drainage* in Section 3.4.3.1). Waterways that would be under CDFW 1602 jurisdiction include Bear Creek and Fahrens Creek.

Regional Water Quality Control Board Jurisdictional Areas

Waters subject to CWA Section 404 also require a Water Quality Certification from the Regional Water Board under CWA Section 401. The extent of Regional Water Board jurisdiction over wetlands and other waters of the United States is the same as that of USACE. In addition, the Regional Water Board regulates waters under California's Porter-Cologne Act. Waters regulated under the Porter-Cologne Act are called *waters of the state*. Waters of the state include any surface water or groundwater, including saline waters, within state boundaries. Riparian plant communities associated with stream channels in the study area could also be considered jurisdictional by the Regional Water Board. If a project requires a Water Quality Certification, the Regional Water Board incorporates requirements to also comply with the Porter-Cologne Act. Features that do not fall under USACE jurisdiction (e.g., isolated wetland features, ditches, features excavated in uplands) would be considered *waters of the state*. Features created for settling of sediment or detention of stormwater runoff are not waters of the state unless they are natural wetlands, wetlands created by modification of a water of the state, artificial wetlands created as mitigation, artificial wetlands identified in a water quality control plan, or artificial wetlands that are not subject to ongoing maintenance. In the study area, waters of the state include perennial drainage, freshwater marsh, and seasonal wetland.

Critical Habitat

There are no USFWS- or NMFS-designated critical habitats in the study area.

Essential Fish Habitat

Pacific salmon EFH is present in both Bear and Fahrens Creeks (NMFS 2024).

3.4.3.5 Wildlife Corridors

The term corridor is used by ecologists and conservation biologists in a variety of ways. For the purposes of this EIR, a *wildlife corridor* is defined as "any space, usually linear in shape that improves the ability of organisms to move among patches of their habitat" (Hilty et al. 2006).

Corridors can be viewed over broad spatial scales, from those connecting continents (e.g., Isthmus of Panama) to structures crossing agricultural canals or roads. Most wildlife corridors analyzed in the context of land use planning, including those analyzed in this EIR, are moderate in scale and facilitate regional wildlife movement among habitat patches and through human-dominated landscapes.

The environmental footprint of the Project crosses natural waterways, including Bear Creek and Fahrens Creek, that may be used by migratory fish and semi-aquatic species (refer to Figure 3.10-1 in Section 3.10, *Hydrology and Water Quality*). Special-status species that may use these corridors include Swainson's hawk, western pond turtle, and Central Valley steelhead.

Western pond turtle occurs throughout the San Joaquin River and its tributaries and moves throughout the system where perennial water occurs. Common species of terrestrial wildlife (e.g., racoon (*Procyon lotor*), striped skunk (*Mephitis mephitis*), and river otter (*Lontra canadensis*) also migrate through the lowlands.

3.4.4 Impact Analysis

This section describes the environmental impacts of the Project on biological resources. This section also 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.

3.4.4.1 Methods for Analysis

Methods

The methods used to evaluate impacts on biological resources are described below.

The area for direct permanent and temporary impacts is the environmental footprint of the Project. The area for indirect impacts is the environmental footprint of the Project plus a resource-specific buffer. The environmental footprint was developed to be a conservative estimation of where facilities could be placed and where construction could occur. The environmental footprint might include certain areas with habitat that might not actually be affected by the Project, and parts of the environmental footprint outside the Project footprint would be temporarily affected. As such, the numbers presented in Table 3.4-2 and the environmental footprint for the Project shown on Figures 3.4-1a and 3.4.1b provide an estimate of the potential impacts on habitat and, in some instances, might overestimate the potential impact. The area of the approved ACE Merced Layover and Maintenance Facility (refer to Figures 2-1 and 2-5 in Chapter 2, *Project Description*) was previously evaluated for impacts and mitigation as part of the ACE Ceres to Merced Extension EIR (SJRRC 2021) and, therefore, is not part of the environmental footprint or impact evaluation for the Project. Where mitigation may be identified for certain impacts requiring compensatory mitigation, the calculation will be based on subsequent estimates of actual impacts based on subsequent final design and may be less than estimated in this document.

Operation impacts were based on implementation of track maintenance, station maintenance, and fleet maintenance, as described in Chapter 2, *Project Description.* Track maintenance would include maintaining track and track structures, bridges, drainage features, signal apparatus, and infrastructure. Bridge maintenance would include removal of woody debris, sediment, and materials that accumulate around the bridge piers. Maintenance also would include tree pruning and removal, annual vegetation trimming, and herbicide application. Station maintenance would occur within constructed areas and would not affect natural habitats. Fleet maintenance would occur primarily off-site, with only light maintenance and servicing at the approved Altamont Corridor Express (ACE) Merced Layover and Maintenance Facility.

Table 3.4-2. Impacts on Land Cover Types for the Project and Variants

Land Cover Type	Study Area (Acres)	Project Impact (Acres)	Variant H1 Impact (Acres)	Variant H2 Impact (Acres)	Variant H3 Impact (Acres)
Perennial Drainage[a]	11.59	0.001 (29.4 square feet)	0.001 (29.4 square feet)	0.001 (29.4 square feet)	0.001 (29.4 square feet)
Detention Basin	2.36	1.61	1.61	1.61	1.61
Wastewater Treatment Pond	8.41	0.00	0.00	0.00	0.00
Developed/Landscaped	268.56	45.46	45.58	45.46	45.46
Ruderal Riparian*	3.83	0.20	0.20	0.20	0.20
Ruderal Annual Grassland	92.94	15.36	19.84	15.36	15.36
Freshwater Marsh*	0.07	0.00	0.00	0.00	0.00
Seasonal Wetland*	0.40	0.40	0.40	0.40	0.40
Roadside Ditch	0.33	0.09	0.09	0.09	0.09
Disturbed/ Unvegetated	37.63	4.48	8.03	4.48	4.48
Total	**426.13**	**67.60**	**76.19**	**67.60**	**67.60**

[a] Sensitive natural community, water of the United States, or water of the state.

3.4.4.2 Thresholds of Significance

The CEQA Guidelines Appendix G (14 California Code of Regulations § 15000 et seq.) has identified significance criteria to be considered for determining whether a project could have significant impacts on biological resources.

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

- Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by CDFW or USFWS.
- Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by CDFW or USFWS.
- Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means.
- Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors or impede the use of native wildlife nursery sites.

- Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.
- Conflict with the provisions of an adopted HCP, natural community conservation plan (NCCP), or other approved local, regional, or state HCP.

3.4.4.3 Impacts and Mitigation Measures

Impact BIO-1	Construction of the Project would not have a substantial adverse effect, either directly or through habitat modifications, on any plant species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service.
Level of Impact	**Less-than-significant impact**

Project

Impact Characterization

Project construction would disturb ruderal annual grassland, freshwater marsh, and seasonal wetland habitats with potential to support special-status plant species. Although unlikely, special-status plant species could be present within the existing UPRR and BNSF right-of-way. Outside of the existing UPRR and BNSF right-of-way, special-status plant species have the potential to occur in annual grassland, freshwater marsh, and seasonal wetland habitats.

If and where special-status plant species are present, ground disturbance activities could result in the direct mortality of individuals through the removal of vegetation, crushing, trampling, introduction of nonnative or invasive plants, and degradation or loss of habitat. Other temporary construction impacts on special-status plant species would include air pollution from dust and construction and removal of vegetation that would likely regenerate within 1 year. Additionally, there is potential for runoff of sediment and contaminants (e.g., oil, grease, concrete) into upland areas and waterbodies adjacent to construction activities, which would decrease habitat quality and potentially affect special-status plant species.

Impact Details and Conclusions

The Project area includes primarily highly disturbed habitats that have been historically modified for agriculture and railway use, and more recently for industrial development. Undeveloped parcels support primarily nonnative plant species in ruderal annual grassland. The Project construction area supports 15.36 acres of low-quality special-status plant habitat in ruderal annual grassland The May 2 and June 13, 2023, survey dates captured the early and late blooming periods for all the special-status plants with potential to occur in the Project area.

Based on the lack of special-status plants observed during the 2023 surveys, the low habitat quality present in the Project area, and dominance of nonnative and invasive plant species in the ruderal annual grassland on accessible properties, the potential for undetected special-status plants on inaccessible properties is low and potential construction impacts on special-status plants would be less than significant.

Variant H1

Impact Characterization

Construction of Variant H1 would have a slightly greater impact than discussed above for the Project with disturbance or removal of additional ruderal annual grassland habitat with potential to support special-status plant species. Ground disturbance activities for construction of Variant H1 could result in the direct mortality of special-status plant individuals and permanent degradation or loss of special-status plant habitat in the Variant H1 footprint. Temporary impacts during construction of Variant H1 could also occur.

Impact Details and Conclusions

The Variant H1 construction area supports 19.84 acres of low-quality special-status plant habitat in ruderal annual grassland dominated by nonnative species, and no special-status plants were observed during 2023 surveys. Therefore, the potential for special-status plants in the Variant H1 footprint is low, and potential construction impacts on special-status plants would be less than significant.

Variant H2

Impact Characterization

Construction of Variant H2 would have the same impacts on ruderal annual grassland habitat with potential to support special-status plant species as discussed above for the Project. Ground disturbance activities for construction of Variant H2 could result in the direct mortality of special-status plant individuals and permanent degradation or loss of special-status plant habitat in the Variant H2 footprint. Temporary impacts during construction of Variant H2 could also occur.

Impact Details and Conclusions

As described above for the Project area, the Variant H2 construction area supports low-quality special-status plant habitat in ruderal annual grassland dominated by nonnative species, and no special-status plants were observed during 2023 surveys. Therefore, the potential for special-status plants in the Variant H2 footprint is low, and potential construction impacts on special-status plants would be less than significant.

Variant H3

Impact Characterization

Construction of Variant H3 would have the same impacts on ruderal annual grassland habitat with potential to support special-status plant species as discussed above for the Project. Ground disturbance activities for construction of Variant H3 could result in the direct mortality of special-status plant individuals and permanent degradation or loss of special-status plant habitat in the Variant H3 footprint. Temporary impacts during construction of Variant H3 could also occur.

Impact Details and Conclusions

As described above for the Project area, the Variant H3 construction area supports low-quality special-status plant habitat in ruderal annual grassland dominated by nonnative species, and no special-status plants were observed during 2023 surveys. Therefore, the potential for special-status plants in the Variant H3 footprint is low, and potential construction impacts on special-status plants would be less than significant.

Impact BIO-2	Construction of the Project could have a substantial adverse effect, either directly or through habitat modifications, on wildlife or fish species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife, U.S. Fish and Wildlife Service, or National Marine Fisheries Service.
Level of Impact	**Potentially significant impact**
Mitigation Measures	BIO-2.1: Conduct a Worker Environmental Training Program for Construction Personnel BIO-2.2: Install Fencing to Protect Sensitive Biological Resources BIO-2.3: Retain a Designated Biologist to Conduct Monitoring prior to Construction during Fence Installation and during all Construction Activities BIO-2.4: Avoidance, Minimization, and Compensatory Measures for Valley Elderberry Longhorn Beetle BIO-2.5: Avoidance and Minimization Measures for Western Pond Turtle BIO-2.6: Avoidance and Minimization Measures for Nesting Birds during Construction Activities BIO-2.7: Avoidance and Minimization Measures for Swainson's Hawk BIO-2.8: Compensate for Swainson's Hawk Foraging Habitat Loss BIO-2.9: Avoidance and Minimization Measures for Burrowing Owl BIO-2.10: Compensate for Burrowing Owl Habitat Loss BIO-2.11: Avoidance and Minimization Measures for Tricolored Blackbird BIO-2.12: Avoidance and Minimization Measures for Roosting Bats BIO-2.13: Avoidance, Minimization, and Compensatory Measures for Monarch Butterfly BIO-2.14: Implement Seasonal Restrictions for In-Water Work
Level of Impact After Mitigation	**Less-than-significant impact**

Project

Impact Characterization

Construction for the majority of the Project would occur in the existing right-of-way and would mainly disturb developed/landscaped, disturbed/unvegetated and ruderal annual grassland areas with limited potential to support special-status wildlife species. Although unlikely, special-status wildlife species could be present within the existing right-of-way and previously disturbed areas during construction. Outside of the existing right-of-way, special-status wildlife species have the potential to occur in natural land cover with suitable habitat characteristics (e.g., riparian, annual grasslands, riverine). Construction of the Project could have direct and indirect effects on special-status wildlife species. Direct effects can be temporary (return to baseline within 1 year of disturbance) or permanent in duration and could be caused by the following actions.

- Injury or mortality of wildlife from construction equipment vehicle strike, crushing, and/or entombment.

- Loss or disturbance of habitat from vegetation clearing (including removal of trees, shrubs, and ground cover vegetation), grading, excavating/trenching, tie and ballast installation, bridge work, and concrete work activities during construction.
- Temporary stockpiling, soil movement, construction materials, or other construction waste.
- Excavation and placement of fill.
- Soil compaction, dust, air pollution, and water runoff from the construction site.
- Increased vehicle traffic and human presence.
- Short-term construction-related noise (from equipment and human presence) and visual disturbance.
- Degradation of water quality in aquatic habitat features from construction runoff containing petroleum or concrete products.
- Indirect effects on wildlife could be caused by the following actions.
    - Increased light and noise levels.
    - Alteration of hydrology or aquatic thermal regime.
    - Damage through toxicity associated with exposure to herbicides and other chemicals.
    - Introduction of invasive (nonnative) species.
    - Decreased reproductive success because of loss of foraging and nesting habitat.
    - Reduced habitat suitability and prey abundance as a result of habitat alteration or degradation.

The types of direct and indirect effects on special-status wildlife resulting from these actions would be similar wherever habitat for a given species or species group is present. For the purposes of this discussion, effects on special-status wildlife and fish are described based on land cover types or habitat features that support special-status species (including some that support multiple species) that could be affected by the Project. The following subsections summarize the land covers that could be affected by the Project and the associated species that could be affected. See Table 3.4-2 for impact acreages on land cover types in the project and variant footprints.

Wetland Habitat for Special-Status Birds

Construction activities affecting wetlands (0.40 acres) could affect tricolored blackbird. Potential direct effects include mortality and harm of adults, young, or eggs, occurring in wetland habitat features within the Project; permanent habitat loss; and permanent habitat degradation. Potential indirect effects include habitat degradation from invasive plants, increased light and noise levels, alteration of hydrology or aquatic thermal regime, lower reproductive success, altered normal behavior due to increased noise and light, and herbicide exposure.

Riverine Habitat for Special-Status Reptiles and Fish

Construction activities affecting perennial drainage habitat (0.001 acres) could affect western pond turtle and Central Valley steelhead. Potential direct effects from pile driving in the water include injury or mortality of steelhead juveniles and adults that may be present during pile driving activities. Western pond turtle young and eggs occurring in aquatic habitat features within the component footprint could be killed or injured from heavy equipment and there could be a resulting permanent habitat loss and permanent habitat degradation. Removal of vegetation along riverine habitat could harm and injure individuals. Potential indirect effects include habitat degradation from invasive plants, loss of or reduced prey based due to habitat degradation or modification, increased light and noise levels, visual and vibrational disturbance, alteration of hydrology or aquatic thermal regime, and herbicide exposure.

Riparian Habitat for Valley Elderberry Longhorn Beetle, Western Monarch Butterfly, and Special-Status Reptiles, Birds, Mammals, and Fish

Construction activities affecting ruderal riparian habitat (0.20 acres) could affect the following special-status species: valley elderberry longhorn beetle, western monarch butterfly, western pond turtle, Swainson's hawk, tricolored blackbird, western mastiff bat, and Central Valley steelhead. Potential direct effects include injury and mortality of adults, young, and eggs occurring in riparian habitat within the Project footprint; nest loss; bat roost loss and disturbance, host plant loss (e.g., Sambucus and milkweed species); permanent habitat loss; and permanent habitat degradation through impacts that result in reduced host plant health.

Potential indirect effects include habitat degradation from invasive plants, reduced habitat suitability from removal of vegetation cover, increased light and noise levels, alteration of vegetation composition or structure through changes to associated hydrology, alteration of sub-canopy thermal regime, fugitive dust affecting insect host plants, and herbicide/insecticide exposure.

Grassland Habitat for Special-Status Invertebrates, Reptiles, and Birds

Construction activities affecting ruderal annual grassland habitat (15.36 acres) could affect the following special-status species: western monarch butterfly, western pond turtle, Swainson's hawk, and burrowing owl. Potential direct effects include injury and mortality of adults, young, and eggs occurring in grassland habitat within the Project footprint, nest loss, host plant loss (e.g., milkweed sp.), permanent habitat loss, and permanent habitat degradation through impacts that result in reduced host plant health. Potential indirect effects include habitat degradation from invasive plants, increased light and noise levels, decreased reproductive success, reduced prey abundance, fugitive dust affecting host or nectar plants by covering leaves and reducing plant vigor, and herbicide/insecticide exposure.

Nesting Habitat for Special-Status Birds

Construction activities affecting nesting habitat (i.e., trees, shrubs, bridges, built structures, grasslands, wetlands, gravel, open areas, and creek banks) could affect Swainson's hawk, tricolored blackbird, and other nesting bird species. Potential direct effects include injury and mortality of adults, young, hatchlings, and eggs occurring in nesting habitat within the construction footprint; nest abandonment or loss; permanent habitat loss; and permanent habitat degradation. Potential indirect effects include habitat degradation from invasive plants, increased light and noise levels, reduced reproductive success from loss of foraging habitat and decreased habitat suitability, and herbicide exposure.

Roosting Habitat for Special-Status Bats

Construction activities affecting roosting habitat (i.e., trees, bridges, and anthropogenic structures with little human disturbance) could affect western mastiff bat. Potential direct effects include injury and mortality of adults and young roosting within the construction footprint, permanent loss of roost sites, permanent roosting and foraging habitat loss, and permanent habitat degradation.

Potential indirect effects include habitat degradation from invasive plants; habitat fragmentation; decreased prey availability as a result of habitat loss, increased light, wind, and noise levels; alteration to roost thermal regime; and herbicide exposure.

Mitigation Measures

Mitigation Measure BIO-2.1: Conduct Environmental Awareness Training for Construction Personnel

Before any equipment staging, grading, or vegetation removal in areas supporting or potentially supporting sensitive biological resources (e.g., ruderal riparian, perennial drainage, and wetland habitats; habitat for special-status wildlife species; active bird nests and active bat roosts), SJJPA's contractor(s) will prepare and implement a worker environmental awareness training program. The training program will be provided to all construction personnel (contractors and subcontractors) to brief them on the need to avoid effects on sensitive biological resources and penalties for not complying with applicable state and federal laws and permit requirements. The training program will be delivered by a biologist and will include information on the life history and habitat requirements of special-status species potentially occurring in or adjacent to the environmental footprint, the importance of protecting habitat, and the terms and conditions of resource protection measures from applicable permits for the Project. The training program will also cover general restrictions and guidelines that must be followed by all construction personnel to reduce or avoid effects on sensitive biological resources during construction.

Mitigation Measure BIO-2.2: Install Fencing to Protect Sensitive Biological Resources

Prior to the start of construction, SJJPA or its contractor(s) will install exclusion fencing and erosion control measures prior to any ground disturbance within 50 feet of environmentally sensitive areas (e.g., wetlands, perennial drainages, riparian, and active nests, if present) under the guidance of a qualified biologist. The fencing will be installed around the perimeter of grassland land cover containing wetlands. The contractor, under the supervision of a qualified biologist, will erect and maintain the exclusion fencing for the duration of the construction activity. Fencing will be removed as soon as construction activities are completed.

Mitigation Measure BIO-2.3: Retain a Designated Biologist to Conduct Monitoring prior to Construction during Fence Installation and during all Construction Activities

To ensure that all construction personnel are trained, that avoidance and minimization measures are properly implemented, that required construction fencing, silt fencing, and/or straw wattles are installed, and that sensitive habitats are avoided, SJJPA or its contractor(s) will designate a biologist to monitor all construction activities. If a special-status wildlife species is observed within the work area during construction, all activities within the immediate area of the animal will stop until the individual moves out of the work area on its own accord. Observations of state or federally listed species will be reported to CDFW, USFWS, and/or NMFS.

Mitigation Measure BIO-2.4: Avoidance, Minimization, and Compensatory Measures for the Valley Elderberry Longhorn Beetle

Before ground disturbance within 100 feet of upland and riparian habitat with potential to support valley elderberry longhorn beetle (unless disturbance is unavoidable), a qualified biologist will identify any shrubs in and along areas with potential to support valley elderberry longhorn beetle. SJJPA or its contractor(s) will comply with the following avoidance and minimization measures from the 2017 USFWS' Framework for Assessing Impacts to the Valley Elderberry Longhorn Beetle:

- Areas with elderberry shrubs will be avoided during construction activities. Areas with elderberry shrubs will be fenced, flagged, or both. Fencing and/or flagging will be placed as close to the construction limits as feasible.
- Activities that may damage or kill an elderberry shrub (e.g., trenching, paving, pile driving), may need an avoidance area of at least 20 feet from the drip line.
- A qualified biologist will provide training for all contractors and any on-site personnel on the status of the valley elderberry longhorn beetle, its host plant and habitat, the need to avoid damaging elderberry shrubs, and the possible penalties for noncompliance.
- A qualified biologist will monitor the work area at Project-appropriate intervals to verify that all avoidance and minimization measures are implemented.
- To the extent feasible, all activities that could occur within 65 feet of an elderberry shrub will be conducted outside the flight season of the valley elderberry longhorn beetle (March–July).
- Trimming of elderberry shrubs will occur between November and February and will avoid the removal of any branches or stems that are 1 inch or more in diameter.
- Herbicides will not be used within the drip line of elderberry shrubs. All chemicals will be applied using a backpack sprayer or similar direct application method.
- Mechanical vegetation removal within the drip line of elderberry shrubs will be limited to the season when adults are not active (August–February) and will avoid damaging elderberry shrubs.

SJJPA's contractor(s) will be responsible for ensuring that the contractor maintains the buffer area fences around elderberry shrubs throughout construction. SJJPA's contractor(s) will ensure that the environmental footprint is watered down as necessary to prevent fugitive dust from becoming airborne and accumulating on elderberry shrubs in environmental footprints and adjacent to construction areas activities (including unpaved access routes).

Where avoidance of elderberry shrubs is not feasible, SJJPA will provide compensatory mitigation for impacts on valley elderberry longhorn beetle habitat, including through transplantation and replacement of elderberry shrubs and maintenance of replacement shrubs, consistent with the 2017 USFWS' Framework for Assessing Impacts to the Valley Elderberry Longhorn Beetle as follows:

- Suitable riparian habitat will be replaced at a minimum of 3:1 (acres of mitigation to acres of impact).
- Suitable nonriparian habitat will be replaced at a minimum of 1:1 (acres of mitigation to acres of impact).
- Individual elderberry shrubs in riparian areas will be replaced through a purchase of two credits at a USFWS-approved bank for each shrub that would be trimmed or removed regardless of the presence of exit holes.

- Individual elderberry shrubs in nonriparian areas will be replaced through a purchase of one credit at a USFWS-approved bank for each shrub that would be trimmed if exit holes have been found in any shrub in or within 165 feet of the work area.
- If an elderberry shrub is to be completely removed by the activity, the entire shrub will be transplanted to a USFWS-approved location in addition to the specified credit purchase.
- For transplanted elderberry plants, a survival rate of at least 60 percent of the elderberry plants and 60 percent of the associated native plants must be maintained throughout the 10- to 15-year monitoring period. If survival rates drop below 60 percent during the monitoring period, failed plantings will be replaced and maintained until the 60 percent survival rate is achieved.

Mitigation Measure BIO-2.5: Avoidance and Minimization Measures for the Western Pond Turtle

SJJPA's contractors(s) will implement the following measures to avoid and minimize impacts on western pond turtle during construction.

- Prior to the start of construction in western pond turtle habitat (i.e., any undeveloped areas within 400 feet of riverine aquatic habitat, ponds, or seasonal wetlands) during the nesting or overwintering season, SJJPA will retain a qualified biologist (one who is familiar with different species of turtles) to conduct preconstruction surveys 1 week before and within 24 hours of beginning work. The surveys will be timed to coincide with the time of day when turtles are most likely to be active (i.e., during the cooler part of the day between 8:00 a.m. and 12:00 p.m. during spring and summer). Prior to conducting the surveys, the biologist will locate the microhabitats for turtle basking (logs, rocks, brush thickets) and determine a location to observe turtles. Each survey will include a 30-minute wait time after arriving on-site to allow startled turtles to return to open basking areas. The survey will consist of a minimum 15-minute observation time per area where turtles could be observed. If western pond turtle is observed during either survey, a biological monitor will be present during construction activities in the aquatic habitat where the turtle was observed and will capture and relocate, if possible, any entrapped turtles.
- The biological monitor will also be mindful of suitable nesting and overwintering areas in proximity to suitable aquatic habitat and periodically inspect these areas for nests and turtles. If preconstruction surveys identify active nests, the biologist will establish 50-foot no-disturbance buffer zones around each nest using temporary orange construction fencing with a 4-inch-tall gap below the fence. The fencing will be permeable to young turtles and allow them to move away from the nest following hatching. The buffer zones and fencing will remain in place until the biologist has confirmed that the young have left the nest.
- If western pond turtles are found in the construction footprint, construction will cease until the turtle has left the work area. If approved by CDFW, the biological monitor will remove and relocate the turtle to suitable habitat outside the construction footprint. Relocation sites will be subject to CDFW approval.

Mitigation Measure BIO-2.6: Avoidance and Minimization Measures for Nesting Birds during Construction Activities

SJJPA or its contractor(s) will conduct construction activities near nesting areas outside of the bird nesting season (September 1 to February 1) to the extent feasible. If construction in the nesting season is unavoidable, SJJPA or its contractor(s) will retain a qualified biologist with demonstrated nest-searching experience to conduct preconstruction surveys for nesting birds (including raptors but excluding Swainson's hawk and burrowing owl) within 300 feet and including the environmental footprints. Adjacent lands outside the environmental footprints will be scanned with binoculars from the limit of ground disturbance, the right-of-way, and publicly accessible areas. Preconstruction surveys will occur no more than 3 days prior to the onset of ground-disturbing activities (including clearing, grubbing, and staging) at each improvement area. If active nests are found in the environmental footprints, the biologist will establish a no-disturbance buffer around the nest and mark the buffer perimeter with high-visibility fencing, flagging, or pin flags. The size of the buffer will be based on the species' sensitivity to disturbance and planned work activities in the vicinity; typical buffer sizes are 250 feet for raptors and 50 feet for other birds. The buffer will remain in place until the nest is no longer active, as determined by the biologist. Buffers for any nests found outside but within 300 feet of environmental footprints will be established based on the biologist's best professional judgment whether the work would result in nest abandonment. If a lapse in construction activities of 15 days or longer at a previously surveyed environmental footprint occurs, another preconstruction survey will be conducted.

To the extent possible, SJJPA or its contractor(s) will initiate new bridge construction outside of the nesting season to avoid impacts on active nests affixed to the existing bridge on Bear Creek before they become active during the nesting season (February 1 to August 31). If activities cannot occur outside of the nesting season, SJJPA or its contractor(s) will remove inactive nests from the existing bridge structure and install nest exclusion measures (e.g., fine mesh netting, panels, or metal projectors) outside of the nesting season. All exclusionary devices will be monitored and maintained throughout the breeding season to ensure that they are successful in preventing the birds from accessing the cavities or nest sites. No more than 3 days prior to construction activities, a qualified biologist will conduct a preconstruction survey of all potential nesting habitat on the existing bridge on Bear Creek and the surrounding areas for the presence of active nests. If active nests are found on the existing bridge or in the affected area, then construction activities will not proceed until the biologist verifies that all nests are inactive.

After all surveys and/or nest deterrence activities are completed at the environmental footprint, the biologist will complete a memorandum detailing the survey effort and results and submit the memorandum to SJJPA within 7 days of survey completion.

Mitigation Measure BIO-2.7: Avoidance and Minimization Measures for the Swainson's Hawk

To protect Swainson's hawk nesting habitat, SJJPA or its contractor(s) will conduct focused surveys for Swainson's hawk and Swainson's hawk nests. Surveys will be conducted prior to construction activities occurring from March 1 to August 31. Surveys will be conducted by a qualified biologist within 0.5 mile and inclusive of the construction areas. The survey buffer may be smaller in areas where topography (e.g., hills) obstructs the line of sight from the construction area. Survey buffer areas lacking suitable nest trees or with an obstructed line of sight will not be surveyed. Biologists will focus on suitable nest trees within and immediately adjacent to the construction areas that have the highest likelihood for disturbance. The number of surveys needed to determine the status of nesting will be dependent on the conditions during the surveys and observed Swainson's hawk behavior. Survey methods will follow those prescribed in Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in

California's Central Valley (2000 Swainson's Hawk Survey Protocol) (Swainson's Hawk Technical Advisory Committee 2000), and generally be conducted between February and July. Survey methods and results will be reported to CDFW.

If active nests are found, SJJPA or its contractor(s) will maintain a 0.5-mile buffer between construction activities and the active nest(s) until it has been determined that young have fledged. The buffer may be reduced in consultation with CDFW if the biologist demonstrates via daily observations (minimum of 2 hours before and during construction activity) that adults tending the nest (on eggs or feeding nestlings) are not disturbed by construction noise. If the biologist observes signs of adult agitation or stress from construction (e.g., alarm-calling, flying away from nest when construction starts), construction activities will cease until the qualified biologist, in consultation with CDFW, determines that young have fledged.

Mitigation Measure BIO-2.8: Compensate for Swainson's Hawk Foraging Habitat Loss

To compensate for impacts on Swainson's hawk foraging habitat, SJJPA or its contractor(s) will preserve off-site habitat management lands as described in California Department of Fish and Game's (now CDFW) Staff Report Regarding Mitigation for Impacts to Swainson's Hawks in the Central Valley of California (California Department of Fish and Game 1994) at a 1:1 to 0.25:1 ratio (acreage preserved: acreage affected), depending on the distance between the construction areas and the nearest active nest. The location of the closest nest to where construction will occur will be identified during Swainson's hawk surveys conducted under Mitigation Measure BIO-2.7. If acceptable to CDFW, SJJPA may alternatively or additionally purchase mitigation credits for Swainson's hawk foraging habitat from a CDFW-approved mitigation or conservation bank that offers service coverage for the impact location. If no active nests are found during the surveys, a search of the CNDDB will be conducted, and CDFW will be contacted to determine the nearest active nest in relation to each construction site.

Mitigation Measure BIO-2.9: Avoidance and Minimization Measures for the Burrowing Owl

Prior to any construction activity planned during the fall and winter non-nesting season (September 1 through January 31) or at any time during the construction process, the SJJPA or its contractor(s) will retain a qualified wildlife biologist to conduct non-breeding season surveys for burrowing owls. Survey methodology will follow the guidance provided by CDFW's Staff Report on Burrowing Owl Mitigation, Appendix D (California Department of Fish and Game 2012). Surveys will be conducted at each area of suitable habitat that will be disturbed. The survey area will cover all suitable burrowing owl habitat subject to disturbance pursuant to CDFW's Staff Report on Burrowing Owl Mitigation (California Department of Fish and Game 2012). If any burrowing owls are found within the disturbance area, SJJPA or its contractor(s) will notify CDFW and will proceed under CDFW direction.

If construction is planned to occur during the nesting season (February 1 through August 31), SJJPA will retain a qualified wildlife biologist to conduct breeding season burrowing owl surveys prior to construction. The survey will be conducted to determine if there is a breeding pair within approximately 500 feet of the construction footprint, unless the biologist determines that a smaller survey buffer around the construction footprint is warranted based on preexisting background disturbance and conditions. Survey visits will be timed in accordance with CDFW's Staff Report on Burrowing Owl Mitigation, Appendix D, Breeding and Non-Breeding Season Surveys and Reports (California Department of Fish and Game 2012). This will provide the

Project team advance notice of nesting owls and allow ample time to discuss appropriate avoidance measures with CDFW.

In addition, take avoidance surveys will be conducted no less than 14 days prior to ground-disturbing activities and a final survey will be conducted within 24 hours prior to ground disturbance in all areas of the environmental footprint supporting burrowing owl habitat. If the biologist identifies the presence of a burrowing owl nest in an area scheduled to be disturbed by construction, a 660-foot (~200-meter) no-activity buffer will be established and maintained around the nest while it is active. Surveys and buffer establishment will be performed by qualified wildlife biologists, will be coordinated with CDFW, and will be subject to CDFW review and oversight.

Mitigation Measure BIO-2.10: Compensate for Burrowing Owl Habitat Loss

SJJPA will provide compensatory mitigation for the loss of occupied owl habitat before construction impacts occur. Occupancy of owl habitat will be determined during implementation of Mitigation Measure BIO-2.9, in the environmental footprints that will be permanently affected. Burrows within areas that will undergo temporary impacts will be avoided. Compensatory mitigation may occur in the form of mitigation credit purchase from a CDFW-approved bank with burrowing owl habitat credits and/or preservation of suitable habitat. Mitigation credit purchase or habitat preservation will occur at a 3:1 ratio (compensation area: habitat loss area).

Habitat preservation will require the development and implementation of a management plan to ensure the preserved area is managed as suitable burrowing owl habitat in perpetuity. The details and specifications of a management plan will be developed in consultation with CDFW, prior to impact on burrowing owl habitat, and will at minimum include the following success criteria.

- Perform routine mowing or grazing to maintain vegetation height consistent with burrowing owl habitat requirements.
- Conduct biological monitoring surveys to confirm suitable owl habitat conditions and document ground squirrel and burrowing owl presence for a minimum of 5 years.
- Restrict deeds to maintain and manage the preserve for burrowing owl in perpetuity, with the ability to grant the preserve to a conservation entity.
- Preserve maintenance and funding reserves.

Mitigation Measure BIO-2.11: Avoidance and Minimization Measures for the Tricolored Blackbird

To the extent possible, SJJPA or its contractor(s) will conduct construction within 300 feet of freshwater marsh or streambank habitat during the bird non-breeding season (September 1 through January 31). The construction window will avoid disturbance-related effects on tricolored blackbirds potentially breeding in or near streambanks and freshwater marsh.

If construction activities in or within 300 feet of freshwater marsh or streambank habitat occur during the bird breeding season (February 1 through August 31), SJJPA will retain a qualified biologist to conduct surveys for the presence of tricolored blackbird nesting colony or nests. If an active nest colony or nest is observed by the qualified biologist, then a no-disturbance buffer of 250 feet will be established until the end of the breeding season or until the nesting colony or nest is determined inactive by the qualified biologist. Nest buffers may be reduced if site-specific conditions reduce the possibility of disturbance, as determined by the qualified biologist in coordination with CDFW.

Mitigation Measure BIO-2.12: Avoidance and Minimization Measures for Roosting Bats

Where feasible, construction activities that have potential to affect bats with potential to occur within the construction site (i.e., western mastiff bat, other common species of bats) will be conducted outside of the maternity season of bats (April 1 to September 15) and prior to the beginning of the hibernation period (November 1).

Measures to avoid and minimize impacts on sensitive bats species will be determined in coordination with CDFW and may include the following.

Trees

- To avoid and minimize impacts on maternity roosts and hibernating bat species, trees will be removed or trimmed between September 1 and October 30. Tree removal conducted between September 15 and October 30 corresponds to a time period when bats have not yet entered torpor or would be caring for nonvolant young.
- If tree removal and trimming cannot be conducted between September 15 and October 30, a qualified biologist (i.e., a biologist with experience with tree-roosting habitats and life histories of local bats) retained by the SJJPA or its contractor(s) will examine trees for suitable bat roosting habitat (e.g., large tree cavities, loose or peeling bark, basal hollows, large snags, palm trees with intact thatch) 7 to 14 days before tree removal or trimming. Trees will also be evaluated to determine if they provide suitable habitat for foliage-roosting bats. Riparian woodland, orchards, and stands of mature broadleaf trees should be considered potential habitat for solitary foliage-roosting bat species.
- If the biologist determines that trees to be removed or trimmed provide suitable bat roosting habitat, the biologist will monitor tree removal/trimming.
- The biologist will make recommendations to implement measures to avoid and minimize disturbance or mortality of bats, such as conducting trimming and removal in the late afternoon or evening when it is closer to the time that bats would normally arouse, removing the tree in pieces rather than felling an entire tree, and gently shaking each tree with construction equipment and waiting several minutes before felling trees or removing limbs to allow bats time to arouse and leave the tree. The biologist will search downed vegetation for dead and injured bats. The presence of dead or injured bats that are species of special concern will be reported to CDFW. The biologist will prepare a biological monitoring report, which will be provided to the SJJPA and CDFW.
- Passive monitoring using full spectrum bat detectors may be needed if identification of bat species is required. Survey methods will be discussed with CDFW prior to the start of surveys.
- If a maternity roost is located, whether solitary or colonial, that roost will remain undisturbed until September 15 or a qualified biologist has determined the roost is no longer active.

Human-Made Structure and Natural Structures

- At least 30 days prior to structure removal or disturbance, a qualified biologist will conduct an initial daytime survey to assess the structure for potential bat roosting habitat and look for bat sign (e.g., guano, urine staining). The biologist will examine the entire structure (i.e., inside and outside for human-made structure and all cracks, seams, and fissures for natural structures) for potential roosting habitat as well as routes of entry to the structure.
- If no habitat or limited habitat for roosting bats is present and no signs of bat use are present, a preconstruction survey of the entire structure by a qualified biologist will be conducted within 24 hours of demolition.
- If signs of bat use are found or if all areas of the structure cannot be examined and the structure provides moderate or high potential habitat, the biologist will prepare a memo with recommended measures to exclude bats from using the structure as a roost site. The memo will include recommendations for excluding bats from using the structure to roost, such as sealing off entry points or using lights and other means to deter bats. The memo will include specifications on when and how exclusion measures should be implemented and will be provided to the SJJPA and CDFW.

Mitigation Measure BIO-2.13: Avoidance, Minimization and Compensatory Measures for Monarch Butterfly

Prior to construction, a qualified biologist retained by the SJJPA or its contractor(s) will survey for western monarch butterfly egg and larvae host plant—native and nonnative milkweed species—within suitable habitat. If host plants are found, the qualified biologist will conduct surveys for adult butterflies during the peak of the flight period to determine presence/absence. Where adult butterflies are present, construction personnel will avoid host plants outside permanent impact areas, by establishing a no-work buffer around host plants. The size and configuration of the no-work buffer will be based on the best professional judgement of a qualified biologist and, at minimum, provide 20 feet of clearance around the resources and maintain a disturbance-free airspace. No herbicides/insecticides will be applied within the no-work buffer.

To the extent feasible, SJJPA's contractor(s) will implement pollinator conservation measures in the Xerces Society Best Management Practice for Pollinators on Western Rangelands (Xerces Society 2018), conservation measures in the Nationwide Candidate Conservation Agreement for Monarch Butterfly on Energy and Transportation Lands (Cardno 2020), or other applicable sources.

If full avoidance of monarch habitat is not feasible, SJJPA will provide compensatory mitigation at a minimum of 1:1 ratio for occupied breeding and foraging habitat unless a higher ratio is required by ESA. SJJPA, in accordance with authorizations issued under the ESA, will determine the compensatory mitigation required to offset impacts on habitat for monarch butterfly. Mitigation for monarch butterfly will prioritize any areas with existing monarch butterfly populations and suitable milkweed populations to support breeding.

Mitigation Measure BIO-2.14: Implement Seasonal Restrictions for In-Water Work

There will be a construction work window from June 15 to October 15 for all work within creek channels. This time period will minimize impacts on migrating special-status fish species, such as adult Central Valley steelhead. In-water work within flowing streams will only dewater up to half of the wetted stream at any time to allow fish passage.

Significance with Application of Mitigation

With implementation of Mitigation Measures BIO-2.1, BIO-2.2, BIO-2.3, BIO-2.4, BIO-2.5, BIO-2.6, BIO-2.7, BIO-2.8, BIO-2.9, BIO-2.10, BIO-2.11, BIO-2.12, BIO-2.13, and BIO-2.14, impacts on wildlife or fish species identified as a candidate, sensitive, or special-status species during construction of the Project would be less than significant.

Variant H1

Impact Characterization

Construction of Variant H1 would disturb or remove an additional 0.12 acre of developed/landscaped habitat and 4.48 acres of ruderal annual grassland compared to the Project, with potential to support special-status wildlife species. Variant H1 would include construction of 15 acres of solar panels. Monarch butterflies, western pond turtle, Swainson's hawk, burrowing owl, and nesting birds could be affected by construction within developed landscape and ruderal annual grassland habitat. Ground disturbance activities for construction of Variant H1 could result in habitat loss, habitat degradation from invasive plants, increased light and noise levels, decreased reproductive success, reduced prey abundance, fugitive dust affecting host or nectar plants by covering leaves and reducing plant vigor, and herbicide/insecticide exposure.

Impact Details and Conclusions

The Variant H1 construction area supports the special-status wildlife species mentioned above. The potential for impacts on wildlife or fish species identified as a candidate, sensitive, or special-status species under Variant H1 is the same as described for the Project and would be a potentially significant impact.

Mitigation Measures

Mitigation Measure BIO-2.1: Conduct a Worker Environmental Training Program for Construction Personnel

Mitigation Measure BIO-2.2: Install Fencing to Protect Sensitive Biological Resources

Mitigation Measure BIO-2.3: Retain a Designated Biologist to Conduct Monitoring prior to Construction during Fence Installation and during all Construction Activities

Mitigation Measure BIO-2.4: Avoidance, Minimization, and Compensatory Measures for Valley Elderberry Longhorn Beetle

Mitigation Measure BIO-2.5: Avoidance and Minimization Measures for Western Pond Turtle

Mitigation Measure BIO-2.6: Avoidance and Minimization Measures for Nesting Birds during Construction Activities

Mitigation Measure BIO-2.7: Avoidance and Minimization Measures for Swainson's Hawk

Mitigation Measure BIO-2.8: Compensate for Swainson's Hawk Foraging Habitat Loss

Mitigation Measure BIO-2.9: Avoidance and Minimization Measures for Burrowing Owl

Mitigation Measure BIO-2.10: Compensate for Burrowing Owl Habitat Loss

Mitigation Measure BIO-2.13: Avoidance, Minimization, and Compensatory Measures for Monarch Butterfly

Significance with Application of Mitigation

With implementation of Mitigation Measures BIO-2.1, BIO-2.2, BIO-2.3, BIO-2.4, BIO-2.5, BIO-2.6, BIO-2.7, BIO-2.8, BIO-2.9, BIO-2.10, and BIO-2.13, impacts on wildlife or fish species identified as a candidate, sensitive, or special-status species under Variant H1 would be less than significant.

Variant H2

Impact Characterization

Construction of Variant H2 would disturb or remove developed/landscaped habitat, ruderal annual grassland, detention basin and disturbed/unvegetated habitat with potential to support special-status wildlife species. Ground disturbance activities for construction of Variant H2 could result in the permanent degradation or loss of special-status wildlife habitat in the Variant H2 footprint. Temporary impacts during construction of Variant H2 could also occur.

Impact Details and Conclusions

The Variant H2 construction area supports the special-status wildlife species mentioned above. The potential for impacts on wildlife or fish species identified as a candidate, sensitive, or special-status species under Variant H2 is the same as described for the Project and would be a potentially significant impact.

Mitigation Measures

Mitigation Measure BIO-2.1: Conduct a Worker Environmental Training Program for Construction Personnel

Mitigation Measure BIO-2.2: Install Fencing to Protect Sensitive Biological Resources

Mitigation Measure BIO-2.3: Retain a Designated Biologist to Conduct Monitoring prior to Construction during Fence Installation and during all Construction Activities

Mitigation Measure BIO-2.4: Avoidance, Minimization, and Compensatory Measures for Valley Elderberry Longhorn Beetle

Mitigation Measure BIO-2.5: Avoidance and Minimization Measures for Western Pond Turtle

Mitigation Measure BIO-2.6: Avoidance and Minimization Measures for Nesting Birds during Construction Activities

Mitigation Measure BIO-2.7: Avoidance and Minimization Measures for Swainson's Hawk

Mitigation Measure BIO-2.8: Compensate for Swainson's Hawk Foraging Habitat Loss

Mitigation Measure BIO-2.9: Avoidance and Minimization Measures for Burrowing Owl

Mitigation Measure BIO-2.10: Compensate for Burrowing Owl Habitat Loss

Mitigation Measure BIO-2.13: Avoidance, Minimization, and Compensatory Measures for Monarch Butterfly

Significance with Application of Mitigation

With implementation of Mitigation Measures BIO-2.1, BIO-2.2, BIO-2.3, BIO-2.4, BIO-2.5, BIO-2.6, BIO-2.7, BIO-2.8, BIO-2.9, BIO-2.10, and BIO-2.13, impacts on wildlife or fish species identified as a candidate, sensitive, or special-status species under Variant H2 would be less than significant.

Variant H3

Impact Characterization

Construction of Variant H3 would disturb or remove developed/landscaped habitat, ruderal annual grassland, detention basin and disturbed/unvegetated habitat with potential to support special-status wildlife species. Ground disturbance activities for construction of Variant H3 could result in the permanent degradation or loss of special-status wildlife habitat in the Variant H3 footprint. Temporary impacts during construction of Variant H3 could also occur.

Impact Details and Conclusions

The Variant H3 construction area supports the special-status wildlife species mentioned above. The potential for impacts on wildlife or fish species identified as a candidate, sensitive, or special-status species under Variant H3 is the same as described for the Project and would be a potentially significant impact.

Mitigation Measures

Mitigation Measure BIO-2.1: Conduct a Worker Environmental Training Program for Construction Personnel

Mitigation Measure BIO-2.2: Install Fencing to Protect Sensitive Biological Resources

Mitigation Measure BIO-2.3: Retain a Designated Biologist to Conduct Monitoring prior to Construction during Fence Installation and during all Construction Activities

Mitigation Measure BIO-2.4: Avoidance, Minimization, and Compensatory Measures for Valley Elderberry Longhorn Beetle

Mitigation Measure BIO-2.5: Avoidance and Minimization Measures for Western Pond Turtle

Mitigation Measure BIO-2.6: Avoidance and Minimization Measures for Nesting Birds during Construction Activities

Mitigation Measure BIO-2.7: Avoidance and Minimization Measures for Swainson's Hawk

Mitigation Measure BIO-2.8: Compensate for Swainson's Hawk Foraging Habitat Loss

Mitigation Measure BIO-2.9: Avoidance and Minimization Measures for Burrowing Owl

Mitigation Measure BIO-2.10: Compensate for Burrowing Owl Habitat Loss

Mitigation Measure BIO-2.13: Avoidance, Minimization, and Compensatory Measures for Monarch Butterfly

Significance with Application of Mitigation

With implementation of Mitigation Measures BIO-2.1, BIO-2.2, BIO-2.3, BIO-2.4, BIO-2.5, BIO-2.6, BIO-2.7, BIO-2.8, BIO-2.9, BIO-2.10, and BIO-2.13, impacts on wildlife or fish species identified as a candidate, sensitive, or special-status species under Variant H3 would be less than significant.

Impact BIO-3	Construction of the Project could have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service.
Level of Impact	**Potentially significant impact**
Mitigation Measures	BIO-3.1: Avoidance and Minimization Measures for Sensitive Natural Communities, including Ruderal Riparian Habitat BIO-3.2: Compensate for Loss of Ruderal Riparian Habitat BIO-3.3: Prevent the Introduction or Spread of Invasive Plant Species
Level of Impact After Mitigation	**Less-than-significant impact**

Project

Impact Characterization

Project construction would remove ruderal riparian habitat for construction activities associated with new tracks and bridge. Where ruderal riparian habitat is present, ground disturbance activities could result in the removal of trees and herbaceous vegetation, crushing, trampling, introduction of nonnative or invasive plants, and degradation or loss of habitat. Permanent loss of ruderal riparian habitat would occur in the Project footprint, while temporary construction impacts on ruderal riparian habitat would include removal of vegetation that would likely regenerate within 1 year. Additionally, there is potential for runoff of sediment and contaminants (e.g., oil, grease, concrete) into ruderal riparian habitat areas adjacent to construction activities, which would decrease habitat quality.

Impact Details and Conclusions

Ruderal riparian habitat grows along Fahrens Creek and Bear Creek. Construction activities associated with the San Joaquins Layover and Maintenance Access Line could affect riparian trees and herbaceous understory vegetation along Fahrens Creek. Relocation of the ACE/UPRR Industrial Spur Track and construction of the San Joaquins Elevated Track over Bear Creek would remove riparian trees and herbaceous understory vegetation along Bear Creek. Up to 0.20 acre of ruderal riparian would be directly impacted. The areas within the Project footprint would be permanently lost, but the impact acreage includes areas that may be temporarily affected during construction by movement of equipment and will not be within the permanent footprint. The temporarily affected areas are expected to regenerate in less than 1 year after construction is complete. The impact is likely overestimated due to the inclusion of both permanent and temporary ruderal riparian habitat in the affected acreage. Indirect impacts on ruderal riparian habitat could occur by erosion of habitat or damage to trees adjacent to the construction area. Direct and indirect impacts on ruderal riparian habitat would be a potentially significant impact.

The ruderal riparian habitat on Bear Creek includes the invasive species black locust and giant reed, and removal of vegetation for construction could disperse propagules of these species into Bear Creek and further spread them downstream of the Project footprint. Spread of invasive species would be a potentially significant impact.

Mitigation Measures

Mitigation Measure BIO-3.1: Avoidance and Minimization Measures for Sensitive Natural Communities, including Ruderal Riparian Habitat

SJJPA or its contractor(s) will ensure that a qualified resource specialist (i.e., biologist, botanist, ecologist, or soil scientist) will clearly identify sensitive natural communities, including riparian habitat, to be preserved abutting the Project areas and outside of the direct construction area with high-visibility construction fencing or markers (e.g., lath or pin flags) before site preparation. Construction will not encroach upon sensitive natural communities identified by the resource specialist. The resource specialist will use the verified wetland delineation, soils data, and land cover data to confirm the location of sensitive natural community boundaries based on existing conditions at the time of the avoidance marking. Exclusion fencing or markers will be installed before construction activities are initiated, and the fencing will be maintained throughout the construction period. No construction activity, traffic, equipment, or materials will be permitted in fenced sensitive natural community areas. Exclusion fencing and markers will be removed following completion of construction activities. All conditions imposed by the state and federal permits will be implemented as part of the Project. The conditions will be clearly identified in the construction plans and specifications and monitored during and after construction to ensure compliance.

Mitigation Measure BIO-3.2: Compensate for Loss of Ruderal Riparian Habitat

For direct effects on ruderal riparian habitat that cannot be avoided, SJJPA will compensate for the loss of riparian habitat to ensure no net loss of habitat functions and values. Compensation ratios will be based on site-specific information and determined through coordination with the appropriate state and federal agencies during the permitting process. At a minimum, the compensation ratio will be 2:1 (e.g., 2 acres restored/created/enhanced or credits purchased for every 1 acre removed) for permanent impacts and 1:1 for temporary impacts (where riparian habitat will regenerate to pre-activity character within 1 year). Compensation may be a combination of off-site restoration or mitigation credits. SJJPA or its contractor(s) will develop a restoration and monitoring plan that describes how riparian habitat will be enhanced or recreated and monitored over at least 5 years, or as determined by the appropriate state and federal agencies. If SJJPA or its contractor(s) identifies suitable on-site areas (adjacent to the permanent construction footprint) that are outside the right-of-way vegetation management zone and chooses to compensate on-site or in the Project vicinity, a revegetation plan will be prepared. The revegetation plan will be developed prior to the removal of existing riparian vegetation and will be conducted on-site or in the Project vicinity to the extent feasible; however, mitigation site selection will avoid areas where future improvements are likely. The revegetation plan will be prepared by a qualified botanist or restoration specialist with experience in riparian restoration and reviewed by the appropriate agencies. The revegetation plan will specify the planting stock appropriate for each riparian land cover type and each mitigation site, ensuring the use of genetic stock from the corresponding Project area. The plan will employ the most successful techniques available at the time of planting. Success criteria will be established as part of the plan and will include a minimum of 70 percent revegetation success after 3 years, 80 percent revegetation success at the end of 5 years, and 75 percent vegetative coverage after 5 years.

SJJPA or its contractor(s) will retain a qualified botanist, restoration ecologist, or biologist with experience in riparian restoration to monitor the plantings as necessary for 5 years. SJJPA or its contractor(s) will be responsible for maintaining the plantings, including managing invasive plants (as defined by the California Invasive Plant Council) and other weeds, and implementing irrigation and plant protection, if necessary. SJJPA or its contractor(s) will submit annual monitoring reports to the regulatory agencies issuing permits related to habitat effects, including CDFW, USACE, NMFS, and USFWS. Replanting will be necessary if success criteria are not met, and replacement plants subsequently will be monitored and maintained to meet the success criteria. The riparian habitat mitigation will be considered successful when the sapling trees established meet the success criteria, the habitat no longer requires substantial active management, and vegetation is arranged in groups that, when mature, replicate the area, natural structure, stratification, and species composition of similar riparian habitats in the region.

Mitigation Measure BIO-3.3: Prevent the Introduction or Spread of Invasive Plant Species

SJJPA's contractor(s) will implement the following actions to avoid and minimize the spread or introduction of invasive plant species.

- Clean construction equipment and vehicles in a designated wash area prior to entering and exiting the construction site.
- Educate construction supervisors and managers about invasive plant identification and the importance of controlling and preventing the spread of invasive plant infestations.
- Treat small, isolated infestations with eradication methods that have been approved by or developed in conjunction with CDFW and USFWS to prevent or destroy viable plant parts or seeds.
- Minimize surface disturbance to the greatest extent feasible to complete the work.
- Use native, noninvasive species or nonpersistent hybrids in erosion-control plantings to stabilize site conditions and prevent invasive plant species from colonizing.
- Use weed-free imported erosion-control materials (or rice straw) in upland areas.
- One year after construction, conduct a monitoring visit to each active or previously active (within 1 year) environmental footprint to ensure that no new occurrences of invasive plant species not previously present have become established.

Detailed information about these best management practices can be found in the California Invasive Plant Council's *Preventing the Spread of Invasive Plants: Best Management Practices for Transportation and Utility Corridors* (California Invasive Plant Council 2012).

Significance with Application of Mitigation

With implementation of Mitigation Measures BIO-3.1, BIO-3.2, and BIO-3.3, impacts on ruderal riparian habitat during construction of the Project would be less than significant. No other sensitive natural communities other than wetlands, which are discussed in Impact BIO-4 below, would be affected during construction.

Variant H1

Impact Characterization

Construction of Variant H1 would have the same impacts on ruderal riparian habitat as discussed above for the Project.

Impact Details and Conclusions

Ruderal riparian habitat associated with the Variant H1 construction area is located along Fahrens Creek and Bear Creek, as described for the Project. Therefore, direct and indirect impacts on ruderal riparian habitat under Variant H1 would be the same as those described for the Project and would be a potentially significant impact. Potential for spread of invasive species under Variant H1 is also the same as described for the Project and would be a potentially significant impact.

Mitigation Measures

Mitigation Measure BIO-3.1: Avoidance and Minimization Measures for Sensitive Natural Communities, including Ruderal Riparian Habitat

Mitigation Measure BIO-3.2: Compensate for Loss of Ruderal Riparian Habitat

Mitigation Measure BIO-3.3: Prevent the Introduction or Spread of Invasive Plant Species

Significance with Application of Mitigation

With implementation of Mitigation Measures BIO-3.1, BIO-3.2, and BIO-3.3, impacts on ruderal riparian habitat during construction of Variant H1 would be less than significant. No other sensitive natural communities other than wetlands, which are discussed in Impact BIO-4 below, would be affected during construction.

Variant H2

Impact Characterization

Construction of Variant H2 would have the same impacts on ruderal riparian habitat as discussed above for the Project.

Impact Details and Conclusions

Ruderal riparian habitat associated with the Variant H2 construction area is located along Fahrens Creek and Bear Creek, as described for the Project. Therefore, direct and indirect impacts on ruderal riparian habitat under Variant H2 would be the same as those described for the Project and would be a potentially significant impact. Potential for spread of invasive species under Variant H2 is also the same as described for the Project and would be a potentially significant impact.

Mitigation Measures

Mitigation Measure BIO-3.1: Avoidance and Minimization Measures for Sensitive Natural Communities, including Ruderal Riparian Habitat

Mitigation Measure BIO-3.2: Compensate for Loss of Ruderal Riparian Habitat

Mitigation Measure BIO-3.3: Prevent the Introduction or Spread of Invasive Plant Species

Significance with Application of Mitigation

With implementation of Mitigation Measures BIO-3.1, BIO-3.2, and BIO-3.3, impacts on ruderal riparian habitat during construction of Variant H2 would be less than significant. No other sensitive natural communities other than wetlands, which are discussed in Impact BIO-4 below, would be affected during construction.

Variant H3

Impact Characterization

Construction of Variant H3 would have the same impacts on ruderal riparian habitat as discussed above for the Project.

Impact Details and Conclusions

Ruderal riparian habitat associated with the Variant H3 construction area is located along Fahrens Creek and Bear Creek, as described for the Project. Therefore, direct and indirect impacts on ruderal riparian habitat under Variant H3 would be the same as those described for the Project and would be a potentially significant impact. Potential for spread of invasive species under Variant H3 is also the same as described for the Project and would be a potentially significant impact.

Mitigation Measures

Mitigation Measure BIO-3.1: Avoidance and Minimization Measures for Sensitive Natural Communities, including Ruderal Riparian Habitat

Mitigation Measure BIO-3.2: Compensate for Loss of Ruderal Riparian Habitat

Mitigation Measure BIO-3.3: Prevent the Introduction or Spread of Invasive Plant Species

Significance with Application of Mitigation

With implementation of Mitigation Measures BIO-3.1, BIO-3.2, and BIO-3.3, impacts on ruderal riparian habitat during construction of Variant H3 would be less than significant. No other sensitive natural communities other than wetlands, which are discussed in Impact BIO-4 below, would be affected during construction.

Impact BIO-4	Construction of the Project could have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means.
Level of Impact	**Potentially significant impact**
Mitigation Measures	BIO-4.1: Avoidance and Minimization Measures for Wetlands and Drainages during Construction BIO-4.2: Compensate for Impacts on Jurisdictional Wetlands and Nonwetland Waters of the United States (aquatic resources) and the state prior to Impacts during Construction
Level of Impact After Mitigation	**Less-than-significant impact**

Project

Impact Characterization

Project construction would result in the placement of fill in perennial drainage and seasonal wetland for construction activities associated with new tracks and bridge. Ground disturbance activities in perennial drainage could result in the removal of adjacent vegetation, crushing, trampling, introduction of nonnative or invasive plants, and degradation of water quality or loss of habitat. These same activities could affect seasonal wetland habitat. Permanent loss of perennial drainage and seasonal wetland would occur in the Project footprint, while temporary construction impacts on perennial drainage and seasonal wetland would include temporary placement of fill or removal of vegetation that would likely regenerate within 1 year. Additionally, there is potential for runoff of sediment and contaminants (e.g., oil, grease, concrete) into perennial drainage and seasonal wetland areas adjacent to construction activities, which would adversely affect water and habitat quality.

Impact Details and Conclusions

Perennial drainage occurs in Fahrens Creek and Bear Creek, and seasonal wetland occurs in a basin on the west side of the ACE/UPRR spur track. Construction activities associated with relocating the ACE/UPRR spur track could remove seasonal wetland in the basin. Relocation of the ACE/UPRR industrial spur track and construction of the new UPRR industrial spur bridge over Bear Creek would require construction activities and placement of piles in Bear Creek. There would be no direct impact on Fahrens Creek. There would be up to 0.001 acre of direct impact on perennial drainage and 0.40 acre of direct impact on seasonal wetland. The areas within the Project footprint would be permanently lost, but the impact acreage includes areas that may be temporarily affected during construction by movement of equipment and would not be within the permanent footprint. The temporarily affected areas are expected to regenerate in less than 1 year after construction is complete. The impact is likely overestimated due to the inclusion of both permanent and temporary perennial drainage habitat in the affected acreage. Construction could also result in indirect impacts on water quality in perennial drainage and seasonal wetland. Direct and indirect impacts on perennial drainage and seasonal wetland would be a potentially significant impact.

Potential indirect construction effects on creek water quality and measures to protect water quality and prevent erosion and sedimentation in perennial drainages are discussed under Impact HYD-1 in Section 3.10, *Hydrology and Water Quality*.

Mitigation Measures

Mitigation Measure BIO-4.1: Avoidance and Minimization Measures for Wetlands and Drainages during Construction

SJJPA will ensure that a qualified resource specialist (i.e., wetland biologist, ecologist, or soil scientist) will clearly identify wetland and edge of perennial drainage areas to be preserved abutting the Project areas and wetland areas outside of the direct construction area with high-visibility construction fencing or markers (e.g., lath or pin flags) before site preparation. Construction will not encroach upon wetlands and drainages identified by the resource specialist. The resource specialist will use the verified aquatic resources delineation to confirm the location of wetland and perennial drainage boundaries based on existing conditions at the time of the avoidance marking. Exclusion fencing or markers will be installed before construction activities are initiated, and the fencing will be maintained throughout the construction period. No construction activity, traffic, equipment, or materials will be permitted in fenced wetland and perennial drainage areas. Exclusion fencing and markers will be removed following the completion of construction activities.

All conditions imposed by the state and federal permits will be implemented as part of the Project. The conditions will be clearly identified in the construction plans and specifications and monitored during and after construction to ensure compliance.

Mitigation Measure BIO-4.2: Compensate for Impacts on Jurisdictional Wetlands and Nonwetland Waters of the United States (aquatic resources) and of the State Prior to Improvements Impacts during Construction

SJJPA and/or its contractor(s) will develop an aquatic resource (wetlands and nonwetland waters of the United States) mitigation plan, subject to approval by USACE and the Central Valley Water Board, which will ensure no net loss of wetlands from Project impacts. The plan will detail the amount and type of wetlands (based on the verified wetland delineation) that will be compensated for (through preservation, creation, or restoration) for impacts on existing wetlands and nonwetland waters of the United States (aquatic resources) and the state and outline the monitoring and success criteria for the compensation of wetlands and nonwetland waters of the United States and the state. Compensatory mitigation will include creating or preserving wetlands and non-wetland waters at a minimum 1:1 ratio (1 acre restored or created for every 1 acre filled), but the final compensation ratios will be determined through coordination with the RWQCB and USACE during permit processing. Additional enhancement options include fish barrier removal, riparian restoration, floodplain restoration, and streambank layback to improve overall ecologic function and connectivity of wetland and non-wetland waters. Enhancement sites will be located as near the impact location as possible but, in the event that local enhancement opportunities are not available, such activities will occur within the same stream system or watershed to provide improved ecologic function and connectivity of wetlands and nonwetland waters affected by the Project.

Monitoring and success criteria applicable to created or restored wetlands will require the following.

- At least two surveys by a qualified wetland biologist, botanist, or ecologist per monitoring year.

- At least 80 percent of the created or restored features support vegetation consistent with reference feature conditions.
- At least 80 percent of the created or restored features support hydrologic regimes similar to reference feature conditions.
- A minimum of 5 consecutive years of monitoring to ensure success criteria are met.
- Remedial actions to restore intended ecological function of created or restored features that fail to meet the success criteria for 3 consecutive years.

Once the plan is approved, SJJPA will implement the aquatic resource compensation measures prior to the initiation of Project construction. SJJPA will be responsible for funding compensatory mitigation, monitoring of the created or restored features per the mitigation plan, and any remedial actions necessary. All conditions that are attached to the state and federal permits will be implemented as part of the Project. The conditions will be clearly identified in the construction plans and specifications and monitored during and after construction to ensure compliance.

Significance with Application of Mitigation

With implementation of Mitigation Measures BIO-4.1 and BIO-4.2, impacts related to a substantial adverse effect on state or federally protected wetlands during construction of the Project would be less than significant.

Variant H1

Impact Characterization

Construction of Variant H1 would have the same impacts on perennial drainage and seasonal wetland as discussed above for the Project.

Impact Details and Conclusions

Perennial drainage and seasonal wetland habitats associated with the Variant H1 construction area for relocating the ACE/UPRR spur track are the same as described for the Project and could remove seasonal wetland in the basin. Relocation of the ACE/UPRR industrial spur track and construction of the new UPRR industrial spur bridge over Bear Creek under Variant H1 would be the same as described for the Project and would require construction activities and placement of piles in Bear Creek. Therefore, direct and indirect construction impacts on perennial drainage and seasonal wetland under Variant H1 would be the same as those described for the Project. This would be a potentially significant impact.

Mitigation Measures

Mitigation Measure BIO-4.1: Avoidance and Minimization Measures for Wetlands and Drainages during Construction

Mitigation Measure BIO-4.2: Compensate for Impacts on Jurisdictional Wetlands and Nonwetland Waters of the United States (aquatic resources) and of the State Prior to Improvements Impacts during Construction

Significance with Application of Mitigation

With implementation of Mitigation Measures BIO-4.1 and BIO-4.2, impacts related to a substantial adverse effect on state or federally protected wetlands during construction of the Variant H1 would be less than significant.

Variant H2

Impact Characterization

Construction of Variant H2 would have the same impacts on perennial drainage and seasonal wetland as discussed above for the Project.

Impact Details and Conclusions

Perennial drainage and seasonal wetland habitats associated with the Variant H2 construction area for relocating the ACE/UPRR spur track are the same as described for the Project and could remove seasonal wetland in the basin. Relocation of the ACE/UPRR industrial spur track and construction of the new UPRR industrial spur bridge over Bear Creek under Variant H2 would be the same as described for the Project and would require construction activities and placement of piles in Bear Creek. Therefore, direct and indirect construction impacts on perennial drainage and seasonal wetland under Variant H2 would be the same as those described for the Project. This would be a potentially significant impact.

Mitigation Measures

Mitigation Measure BIO-4.1: Avoidance and Minimization Measures for Wetlands and Drainages during Construction

Mitigation Measure BIO-4.2: Compensate for Impacts on Jurisdictional Wetlands and Nonwetland Waters of the United States (aquatic resources) and of the State Prior to Impacts during Construction

Significance with Application of Mitigation

With implementation of Mitigation Measures BIO-4.1 and BIO-4.2, impacts related to a substantial adverse effect on state or federally protected wetlands during construction of the Variant H2 would be less than significant.

Variant H3

Impact Characterization

Construction of Variant H3 would have the same impacts on perennial drainage and seasonal wetland as discussed above for the Project.

Impact Details and Conclusions

Perennial drainage and seasonal wetland habitats associated with the Variant H3 construction area for relocating the ACE/UPRR spur track are the same as described for the Project and could remove seasonal wetland in the basin. Relocation of the ACE/UPRR industrial spur track and construction of the new UPRR industrial spur bridge over Bear Creek under Variant H3 would be the same as described for the Project and would require construction activities and placement of piles in Bear Creek. Therefore, direct and indirect construction impacts on perennial drainage and seasonal wetland under Variant H3 would be the same as those described for the Project. This would be a potentially significant impact.

Mitigation Measures

Mitigation Measure BIO-4.1: Avoidance and Minimization Measures for Wetlands and Drainages during Construction

Mitigation Measure BIO-4.2: Compensate for Impacts on Jurisdictional Wetlands and Nonwetland Waters of the United States (aquatic resources) and of the State Prior to Improvements Impacts during Construction

Significance with Application of Mitigation

With implementation of Mitigation Measures BIO-4.1 and BIO-4.2, impacts related to a substantial adverse effect on state or federally protected wetlands during construction of the Variant H3 would be less than significant.

Impact BIO-5	Construction of the Project could conflict with local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.
Level of Impact	**Potentially significant impact**
Mitigation Measures	BIO-5.1: Compensate for Tree Removal during Construction
Level of Impact After Mitigation	**Less-than-significant impact**

Project

Impact Characterization

Construction of the Project could conflict with local biological resource policies (including the City of Merced tree policies and the protection of sensitive plant and wildlife habitat policies or ordinances) by removing locally regulated street trees and/or disturbing sensitive plant and wildlife habitat during construction.

Tree removal is expected during construction, as part of ground disturbance activities. Local regulations do not apply inside or outside the UPRR right-of-way because UPRR is a federally regulated rail carrier and the SJJPA is a joint powers authority that benefits from the exemption contained in Public Utilities Code Section 103200.

Construction of the Project would avoid tree removal unless it is necessary. Tree removals would be limited in areas within the existing UPRR right-of-way because existing UPRR maintenance actions routinely prune and remove trees in the right-of-way as necessary for safe operation. Tree removals are expected in some portions of the existing right-of-way and in environmental footprints outside the existing right-of-way.

The analysis below identifies the potential impacts on trees. Impacts on special-status plants and their habitat are discussed under Impact BIO-1; impacts on special-status wildlife and fish and their habitat are discussed under Impact BIO-2.

Impact Details and Conclusions

The San Joaquins tracks and ACE/UPRR spur track construction areas are primarily located within developed and ruderal land cover and would affect a low number of trees. Trees would mostly be affected in ruderal riparian habitat, which is discussed in Impact BIO-3.

While compliance with local ordinances is not legally required for construction of the Project, the loss of trees from areas outside the UPRR right-of-way would be significant and could conflict with the City of Merced tree policies. Therefore, the impacts from tree removal due to the Project would be potentially significant.

In addition, there are local policies related to the protection of plants, wildlife, and fish species. These local policies are identified in Appendix 3.0-1, *Regional Plans and Local General Plans*, and include policies from the Merced County General Plan. As described in Impact BIO-2, construction of the Project would result in a potentially significant impact on special-status wildlife and fish species. As such, construction of the Project could conflict with local biological resource policies, resulting in a potentially significant impact.

Mitigation Measures

Mitigation Measure BIO-2.1: Conduct Environmental Awareness Training for Construction Personnel

Mitigation Measure BIO-2.2: Install Fencing to Protect Sensitive Biological Resources

Mitigation Measure BIO-2.3: Retain a Designated Biologist to Conduct Monitoring prior to Construction during Fence Installation and during all Construction Activities

Mitigation Measure BIO-2.4: Avoidance, Minimization, and Compensatory Measures for the Valley Elderberry Longhorn Beetle

Mitigation Measure BIO-2.5: Avoidance and Minimization Measures for the Western Pond Turtle

Mitigation Measure BIO-2.6: Avoidance and Minimization Measures for Nesting Birds during Construction Activities

Mitigation Measure BIO-2.7: Avoidance and Minimization Measures for the Swainson's Hawk

Mitigation Measure BIO-2.8: Compensate for Swainson's Hawk Foraging Habitat Loss

Mitigation Measure BIO-2.9: Avoidance and Minimization Measures for the Burrowing Owl

Mitigation Measure BIO-2.10: Compensate for Burrowing Owl Habitat Loss

Mitigation Measure BIO-2.11: Avoidance and Minimization Measures for the Tricolored Blackbird

Mitigation Measure BIO-2.12: Avoidance and Minimization Measures for Roosting Bats

Mitigation Measure BIO-5.1: Compensate for Tree Removal during Construction

A tree avoidance, minimization, and replacement plan will be developed in consultation with a certified arborist and in consultation with the City of Merced. The plan will contain the following provisions.

- The definition of what is and is not a tree for the purposes of this mitigation will be the same as the street tree definition for the City of Merced.
- Prior to the construction phase, SJJPA and/or its contractor(s) will assess the potential to modify the construction methods and access of stations and other facilities to avoid or minimize the amount of tree removal or pruning necessary to be consistent with maintenance, operational, and safety requirements. SJJPA or its contractor(s) will consult with the City of Merced to identify where tree removals can and cannot be avoided with Project design measures.
- Tree pruning during construction will be done in accordance with arboricultural industry recommended practices.

- If pruning will result in the loss of 25 percent or more of an individual tree's canopy, then SJJPA and/or its contractor(s) will consider the tree removed and it will be replaced in a manner consistent with the following replacement requirements.
- SJJPA and/or its contractor(s) will replace street trees on a 1:1 basis using 15-gallon trees (i.e., one 15-gallon tree would be planted for each tree removed). Trees will be replaced with a tree of the same species wherever possible, unless that species in a nonnative, invasive, or undesirable species. Alternative species to the tree removed may be planted with concurrence of the landowner and local municipality. If on-site tree replacement cannot occur on the UPRR right-of-way (where trees are removed from the right-of-way) or on adjacent property (where trees are removed outside of the right-of-way), then tree replacement may occur on other parts of the affected property (with concurrence of the landowner) or other parts of the local area (with concurrence of the City of Merced). Alternatively, SJJPA may pay into a local urban forestry fund to support local tree planting programs, provided SJJPA and the City of Merced can agree on the appropriate fund and amount. The replacement requirements described above will apply in determining the equivalent funding amount.

Significance with Application of Mitigation

With implementation of Mitigation Measures BIO-2.1, BIO-2.2, BIO-2.3, BIO-2.4, BIO-2.5, BIO-2.6, BIO-2.7, BIO-2.8, BIO-2.9, BIO-2.10, BIO-2.11, BIO-2.12, BIO-2.13, and BIO-5.1, impacts related to a conflict with local policies or ordinances protecting biological resources during construction of the Project would be less than significant.

Variant H1

Impact Characterization

Construction of Variant H1 would have the same impacts on protected street trees and/or sensitive plant and wildlife habitat as discussed above for the Project.

Impact Details and Conclusions

As described above for the Project, loss of trees within ruderal riparian habitat is discussed in Impact BIO-3. Under Variant H1, the loss of trees from areas outside the UPRR right-of-way would be significant and could conflict with the City of Merced tree policies. Therefore, the impacts from tree removal due to construction of Variant H1 would be potentially significant.

Construction of Variant H1 could also conflict with local biological resource policies, resulting in a potentially significant impact.

Mitigation Measures

Mitigation Measure BIO-2.1: Conduct Environmental Awareness Training for Construction Personnel

Mitigation Measure BIO-2.2: Install Fencing to Protect Sensitive Biological Resources

Mitigation Measure BIO-2.3: Retain a Designated Biologist to Conduct Monitoring prior to Construction during Fence Installation and during all Construction Activities

Mitigation Measure BIO-2.4: Avoidance, Minimization, and Compensatory Measures for the Valley Elderberry Longhorn Beetle

Mitigation Measure BIO-2.5: Avoidance and Minimization Measures for the Western Pond Turtle

Mitigation Measure BIO-2.6: Avoidance and Minimization Measures for Nesting Birds during Construction Activities

Mitigation Measure BIO-2.7: Avoidance and Minimization Measures for the Swainson's Hawk

Mitigation Measure BIO-2.8: Compensate for Swainson's Hawk Foraging Habitat Loss

Mitigation Measure BIO-2.9: Avoidance and Minimization Measures for the Burrowing Owl

Mitigation Measure BIO-2.10: Compensate for Burrowing Owl Habitat Loss

Mitigation Measure BIO-2.11: Avoidance and Minimization Measures for the Tricolored Blackbird

Mitigation Measure BIO-2.12: Avoidance and Minimization Measures for Roosting Bats

Mitigation Measure BIO-5.1: Compensate for Tree Removal during Construction

Significance with Application of Mitigation

With implementation of Mitigation Measures BIO-2.1, BIO-2.2, BIO-2.3, BIO-2.4, BIO-2.5, BIO-2.6, BIO-2.7, BIO-2.8, BIO-2.9, BIO-2.10, BIO-2.11, BIO-2.12, BIO-2.13, and BIO-5.1, impacts related to a conflict with local policies or ordinances protecting biological resources during construction of Variant H1 would be less than significant.

Variant H2

Impact Characterization

Construction of Variant H2 would have the same impacts on protected street trees and/or sensitive plant and wildlife habitat as discussed above for the Project.

Impact Details and Conclusions

As described above for the Project, loss of trees within ruderal riparian habitat is discussed in Impact BIO-3. Under Variant H2, the loss of trees from areas outside the UPRR right-of-way would be significant and could conflict with the City of Merced tree policies. Therefore, the impacts from tree removal due to construction of Variant H2 would be potentially significant.

Construction of Variant H2 could also conflict with local biological resource policies, resulting in a potentially significant impact.

Mitigation Measures

Mitigation Measure BIO-2.1: Conduct Environmental Awareness Training for Construction Personnel

Mitigation Measure BIO-2.2: Install Fencing to Protect Sensitive Biological Resources

Mitigation Measure BIO-2.3: Retain a Designated Biologist to Conduct Monitoring prior to Construction during Fence Installation and during all Construction Activities

Mitigation Measure BIO-2.4: Avoidance, Minimization, and Compensatory Measures for the Valley Elderberry Longhorn Beetle

Mitigation Measure BIO-2.5: Avoidance and Minimization Measures for the Western Pond Turtle

Mitigation Measure BIO-2.6: Avoidance and Minimization Measures for Nesting Birds during Construction Activities

Mitigation Measure BIO-2.7: Avoidance and Minimization Measures for the Swainson's Hawk

Mitigation Measure BIO-2.8: Compensate for Swainson's Hawk Foraging Habitat Loss

Mitigation Measure BIO-2.9: Avoidance and Minimization Measures for the Burrowing Owl

Mitigation Measure BIO-2.10: Compensate for Burrowing Owl Habitat Loss

Mitigation Measure BIO-2.11: Avoidance and Minimization Measures for the Tricolored Blackbird

Mitigation Measure BIO-2.12: Avoidance and Minimization Measures for Roosting Bats

Mitigation Measure BIO-5.1: Compensate for Tree Removal during Construction

Significance with Application of Mitigation

With implementation of Mitigation Measures BIO-2.1, BIO-2.2, BIO-2.3, BIO-2.4, BIO-2.5, BIO-2.6, BIO-2.7, BIO-2.8, BIO-2.9, BIO-2.10, BIO-2.11, BIO-2.12, BIO-2.13, and BIO-5.1, impacts related to a conflict with local policies or ordinances protecting biological resources during construction of Variant H2 would be less than significant.

Variant H3

Impact Characterization

Construction of Variant H3 would have the same impacts on protected street trees and/or sensitive plant and wildlife habitat as discussed above for the Project.

Impact Details and Conclusions

As described above for the Project, loss of trees within ruderal riparian habitat is discussed in Impact BIO-3. Under Variant H3, the loss of trees from areas outside the UPRR right-of-way would be significant and could conflict with the City of Merced tree policies. Therefore, the impacts from tree removal due to construction of Variant H3 would be potentially significant.

Construction of Variant H3 could also conflict with local biological resource policies, resulting in a potentially significant impact.

Mitigation Measures

Mitigation Measure BIO-2.1: Conduct Environmental Awareness Training for Construction Personnel

Mitigation Measure BIO-2.2: Install Fencing to Protect Sensitive Biological Resources

Mitigation Measure BIO-2.3: Retain a Designated Biologist to Conduct Monitoring prior to Construction during Fence Installation and during all Construction Activities

Mitigation Measure BIO-2.4: Avoidance, Minimization, and Compensatory Measures for the Valley Elderberry Longhorn Beetle

Mitigation Measure BIO-2.5: Avoidance and Minimization Measures for the Western Pond Turtle

Mitigation Measure BIO-2.6: Avoidance and Minimization Measures for Nesting Birds during Construction Activities

Mitigation Measure BIO-2.7: Avoidance and Minimization Measures for the Swainson's Hawk

Mitigation Measure BIO-2.8: Compensate for Swainson's Hawk Foraging Habitat Loss

Mitigation Measure BIO-2.9: Avoidance and Minimization Measures for the Burrowing Owl

Mitigation Measure BIO-2.10: Compensate for Burrowing Owl Habitat Loss

Mitigation Measure BIO-2.11: Avoidance and Minimization Measures for the Tricolored Blackbird

Mitigation Measure BIO-2.12: Avoidance and Minimization Measures for Roosting Bats

Mitigation Measure BIO-5.1: Compensate for Tree Removal during Construction

Significance with Application of Mitigation

With implementation of Mitigation Measures BIO-2.1, BIO-2.2, BIO-2.3, BIO-2.4, BIO-2.5, BIO-2.6, BIO-2.7, BIO-2.8, BIO-2.9, BIO-2.10, BIO-2.11, BIO-2.12, BIO-2.13, and BIO-5.1, impacts related to a conflict with local policies or ordinances protecting biological resources during construction of Variant H3 would be less than significant.

Impact BIO-6	Operation of the Project would not have a substantial adverse effect, either directly or through habitat modifications, on any plant species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service.
Level of Impact	**Less-than-significant impact**

Project

Impact Characterization

Project operation would include maintenance activities that could disturb ruderal annual grassland, freshwater marsh, and seasonal wetland habitats with potential to support special-status plant species. Although unlikely, special-status plant species could be present within the existing UPRR and San Joaquins right-of-way. Outside of the existing UPRR and San Joaquins right-of-way, special-status plant species have the potential to occur in annual grassland, freshwater marsh, and seasonal wetland habitats.

If and where special-status plant species are present, ground disturbance activities associated with Project maintenance could result in the direct mortality of individuals through the removal of vegetation, crushing, trampling, introduction of nonnative or invasive plants, and degradation or loss of habitat. Other temporary operation impacts on special-status plant species would include air pollution from dust and removal of vegetation that would likely regenerate within 1 year. Additionally, there is potential for runoff of sediment and contaminants (e.g., oil, grease, concrete, herbicides) into upland areas and waterbodies adjacent to maintenance activities, which would decrease habitat quality and potentially affect special-status plant species.

Impact Details and Conclusions

Based on the lack of special-status plants observed during the 2023 surveys, the low habitat quality present in the Project area, and dominance of nonnative and invasive plant species in the ruderal annual grassland on accessible properties, the potential for undetected special-status plants on inaccessible properties is low and potential operation impacts from maintenance on special-status plants would be less than significant.

Variant H1

Impact Characterization

Operation of Variant H1 would be as described above for the Project but would additionally include processing and storing green hydrogen at the approved ACE Merced Layover and Maintenance Facility, which would be a developed area with no suitable habitat for special-status plant species.

Impact Details and Conclusions

As described above for the Project, the lack of special-status plants observed during the 2023 surveys, the low habitat quality present in the Variant H1 area, and dominance of nonnative and invasive plant species in the ruderal annual grassland on accessible properties, the potential for undetected special-status plants on inaccessible properties is low and potential operation impacts of Variant H1 on special-status plants would be less than significant.

Variant H2

Impact Characterization

Operation of Variant H2 would be as described above for the Project but would additionally include storing green or grey hydrogen at the approved ACE Merced Layover and Maintenance Facility, which would be a developed area with no suitable habitat for special-status plant species.

Impact Details and Conclusions

As described above for the Project, the lack of special-status plants observed during the 2023 surveys, the low habitat quality present in the Variant H2 area, and dominance of nonnative and invasive plant species in the ruderal annual grassland on accessible properties, the potential for undetected special-status plants on inaccessible properties is low and potential operation impacts of Variant H2 on special-status plants would be less than significant.

Variant H3

Impact Characterization

Operation of Variant H3 would be as described above for the Project but would additionally include storing green or grey hydrogen at the approved ACE Merced Layover and Maintenance Facility, which would be a developed area with no suitable habitat for special-status plant species.

Impact Details and Conclusions

As described above for the Project, the lack of special-status plants observed during the 2023 surveys, the low habitat quality present in the Variant H3 area, and dominance of nonnative and invasive plant species in the ruderal annual grassland on accessible properties, the potential for undetected special-status plants on inaccessible properties is low and potential operation impacts of Variant H3 on special-status plants would be less than significant.

Impact BIO-7	Operation of the Project could have a substantial adverse effect, either directly or through habitat modifications, on wildlife or fish species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife, U.S. Fish and Wildlife Service, or National Marine Fisheries Service.
Level of Impact	**Potentially significant impact**
Mitigation Measures	**Project** BIO-7.1: Avoidance and Minimization Measures for Nesting Birds during Operation and Maintenance Activities BIO-7.2: Avoidance and Minimization Measures for Roosting Bats during Operation and Maintenance Activities BIO-7.3: Conduct Pre-Activity Survey for Special-Status Wildlife Species Prior to Conducting Maintenance Activities **Variant H1** BIO-7.4: Avoidance and Minimization Measures for Birds during Operation of the Solar Facility
Level of Impact After Mitigation	**Less-than-significant impact**

Project

Impact Characterization

Project operations would entail a new track connection from the BNSF corridor to the proposed integrated Merced High-Speed Rail (HSR) Station in downtown Merced between R and O Streets, in addition to a new platform that would allow for a cross-platform transfer between the San Joaquins and HSR. Figure 2-7 in Chapter 2, *Project Description*, shows the planned eight daily roundtrips to be operated by SJJPA, including five daily roundtrips from Oakland to Merced and two daily roundtrips from Sacramento to Merced, and one between Natomas and Merced. Increased passenger train traffic would occur following construction but operational conditions along the right-of-way are not expected to be significantly different from existing conditions with respect to special-status wildlife species. Noise and occasional train strikes from operation of the trains could affect special-status wildlife, including pollinators such as monarch butterfly and individual birds, but these effects are expected to be similar in magnitude to the operational noise and train strikes experienced from existing service in this area. Operation of the Project would not significantly change habitat conditions along the corridor after construction is completed. Operations impacts from rail service on sensitive and special-status wildlife species and their associated habitats from increased train service would be less than significant.

Maintenance-of-way is the ongoing maintenance of track (e.g., tie replacement, switch greasing, ballast recontouring), track structures, bridges, drainage features, signal apparatus, and other signal infrastructure. Maintenance activities are both ongoing responses to daily issues and planned preventive maintenance. Track maintenance includes vegetation management and herbicide/insecticide application within the right-of-way, which could affect nesting birds if management activities are conducted during the bird nesting season (February 1 to August 31). Destruction of an active bird nest would violate the MBTA and California Fish and Game Code and would, therefore, be a significant impact. Vegetation management and application of herbicide/insecticide could degrade or kill host and nectar plants for invertebrates such as monarch butterfly. Additionally, vegetation management activities could affect roosting bats. Destruction of bat roosts, including roosts for western mastiff bat—state species of special concern and relevant under CEQA—would be a significant impact. Vegetation management could affect valley elderberry longhorn beetle through the removal of host plants and direct impacts on individual beetles. Impacts on special-status species and their habitat from vegetation management would be potentially significant.

The Project would operate on a new bridge over Bear Creek. The presence of the new bridge over Bear Creek could likely contribute to predation on aquatic wildlife (e.g., western pond turtle hatchlings); however, there is an existing bridge in operation at this location. The operation of the new bridge immediately adjacent to the existing bridge would not significantly alter environmental predation pressures because the area is already developed and disturbed. The level of predation is not expected to substantially change from existing conditions. Therefore, the new bridge structure would not significantly increase predation on wildlife species above existing levels. The new bridge would affect riverine habitat for fish by installation of new piers within the channel. The special-status fish species that could be present seasonally is Central Valley steelhead, which could be present in the winter and spring. Overall, Bear Creek in the Project area is not suitable habitat for steelhead due to its low-velocity water and high water temperatures in the summer and fall. The new bridge would not affect steelhead or its habitat.

Bridge maintenance would include routine removal of woody debris, sediment, and other materials that accumulate near the piers of the bridge. Special-status species such as western pond turtle could take refuge on creek banks below the bridge, as well as forage, hunt, and bask near the piers of bridge. Maintenance activities that would occur as a result of bridge maintenance could affect special-status wildlife species.

Impact Details and Conclusions

Operation of the Project could injure or kill special-status wildlife species. This impact would be potentially significant.

Mitigation Measures

Mitigation Measure BIO-7.1: Avoidance and Minimization Measures for Nesting Birds During Operation and Maintenance Activities

SJJPA or its contractor(s) will conduct vegetation and structural maintenance activities outside of the general bird nesting season (February 1 to August 31) to the extent feasible. If vegetation and structural maintenance during the nesting season is unavoidable, SJJPA or its contractor(s) will retain a qualified wildlife biologist with demonstrated nest-searching experience to conduct pre-activity surveys for nesting birds within 300 feet of the vegetation removal location. Adjacent lands outside the right-of-way will be scanned with binoculars from Project operations areas, the right-of-way, and publicly accessible areas. The preconstruction surveys will occur no more than 3 days prior to vegetation removal activities (including removing or trimming vegetation, modifying structures that provide nesting habitat, clearing, grubbing, and staging) at each contiguous vegetation removal area.

If active nests are found in the area to undergo maintenance activities, no-disturbance species-specific buffer zones will be established by the biologist and marked with high-visibility fencing, flagging, or pin flags. No maintenance activities will be allowed within the buffer zones. The size of the buffer will be based on the species' sensitivity to disturbance and planned work activities in the vicinity; typical buffer sizes are 250 feet for raptors and 50 feet for other birds (i.e., passerines). The buffer will remain in effect until the nest is no longer active, as determined by the biologist. Buffers for any nests found outside of the area to undergo vegetation removal but within 250 feet of the vegetation removal location will be established based on the biologist's best professional judgment whether the work would result in nest abandonment. If a lapse in vegetation removal activities of 3 days or longer at a previously surveyed area occurs, another preconstruction survey will be conducted. After all surveys activities are completed at each continuous vegetation removal area, the biologist will complete a memorandum detailing the survey effort and results and submit the memorandum to SJJPA within 7 days of survey completion.

Mitigation Measure BIO-7.2: Avoidance and Minimization Measures for Roosting Bats during Operation and Maintenance Activities

SJJPA or its contractor(s) will conduct maintenance activities (e.g., operational tree removal and trimming, structure modification or removal) in roosting bat habitat from September 15 to October 30 to the extent feasible to avoid maternity bat roosts, roosting bats in torpor (reduced metabolic function similar to hibernation), or nonvolant (flightless) young. If operational maintenance activities cannot be conducted between September 15 and October 30, SJJPA or its contractor(s) will retain qualified biologists who will examine trees and structures to be removed, trimmed, or modified for suitable bat roosting habitat no more than 2 weeks before conducting the maintenance activity. High-quality habitat features (e.g., large tree cavities, basal hollows, loose or peeling bark, larger snags, palm trees with intact thatch) will be identified and the area around these features searched for bats and bat signs (e.g., guano, culled insect parts, urine staining). Riparian woodland, orchards, and stands of mature broadleaf trees should be considered potential habitat for solitary foliage-roosting bat species. Survey methods will be discussed with CDFW prior to the start of surveys.

Measures to avoid and minimize impacts on sensitive bats species will be determined in coordination with CDFW and may include the following.

- Tree removal will be avoided between April 1 and September 15 (the maternity period) to avoid effects on pregnant females and active maternity roosts (whether colonial or solitary).
- Tree removal, tree trimming, structure modification, or removal of trees that provide suitable habitat for bats will be conducted between September 15 and October 30, which corresponds to a time period when bats have not yet entered torpor or caring for nonvolant young.
- Each tree will be removed in pieces rather than felling the entire tree.
- Trees and tree limbs that do not provide habitat will be removed prior to removing trees and limbs that do provide roosting habitat.
- If a maternity roost is located, whether solitary or colonial, that roost will remain undisturbed until September 15 or a qualified biologist has determined the roost is no longer active.
- Passive monitoring using full-spectrum bat detectors may be needed if identification of bat species is required.

If avoidance of nonmaternity roost trees is not possible, and tree removal or trimming must occur between October 30 and September 15, qualified biologists will monitor tree trimming and removal. If possible, tree trimming and removal should occur in the late afternoon or evening when it is closer to the time that bats would normally arouse. Prior to removal and trimming, each tree will be shaken gently and several minutes should pass before felling trees or limbs to allow bats time to arouse and leave the tree. The biologists will search downed vegetation for dead and injured bats. The presence of dead or injured bats that are species of special concern, or candidate threatened or endangered species, will be reported to CDFW. The biologist will prepare a biological monitoring report, which will be provided to the SJJPA and CDFW no more than 30 days following completion of all bat surveys.

Mitigation Measure BIO-7.3: Conduct Pre-Activity Surveys for Special-Status Wildlife Species Prior to Conducting Maintenance Activities

SJJPA or its contractor(s) will retain a qualified biologist to conduct a pre-activity survey for special-status wildlife species prior to conducting maintenance activities within suitable habitat for special-status wildlife (i.e., within any undeveloped natural land cover). The pre-activity survey will be conducted immediately prior to the start of maintenance activities. The survey area will include all suitable habitat within the work area boundary plus a 250-foot buffer zone around the work area boundary.

If special-status wildlife species, nest colonies, or floral resources are observed, maintenance activities will not begin until the special-status species passively moves out of the work area and a no-work buffer around nest colonies and floral resources identified during surveys has been established. The size and configuration of the no-work buffer would be based on best professional judgement of a qualified biologist and, at minimum, provide 20 feet of clearance around the resources and maintain a disturbance-free airspace. No herbicides/insecticides will be applied within the no-work buffer, except when applied to cut stumps. Biological monitoring may be required for the duration of the maintenance activity and will be determined by the discretion of the qualified biologist. If special-status wildlife species are observed, the biologist will notify USFWS and CDFW. Following completion of the pre-activity survey, the surveying biologist will prepare a memo describing the survey methods and conditions and summarizing the survey effort and results. The memorandum will include any survey data form and or map showing the location of special-status wildlife species observed. The survey memo will be provided to SJJPA.

If special-status wildlife species are not observed, maintenance activities can begin upon completion of the pre-activity survey.

Significance with Application of Mitigation

Mitigation Measures BIO-7.1, BIO-7.2, and BIO-7.3 would apply to operation and maintenance of the Project. Mitigation Measures BIO-7.1, BIO-7.2, and BIO-7.3 would reduce and/or avoid impacts associated with maintenance activities of the Project through maintenance activities outside of sensitive timeframes (e.g., the general bird nesting season [February 1 to August 31] and bat maternity and pupping season [September 15 to October 31]). Where avoidance is not feasible, Mitigation Measure BIO-7.3 requires conducting pre-activity surveys for special-status species prior to conducting maintenance activities. With Mitigation Measures BIO-7.1, BIO-7.2, and BIO-7.3, impacts on special-status wildlife species from operation of the Project would be less than significant. For the same reasons as the Project, impacts due to maintenance of the project would be less than significant after Mitigation Measures BIO-7.1, BIO-7.2, and BIO-7.3.

With implementation of Mitigation Measures BIO-7.1, BIO-7.2, and BIO-7.3, impacts on wildlife or fish species identified as a candidate, sensitive, or special-status species during operation of the Project would be less than significant.

Variant H1

Impact Characterization

Operation of Variant H1 would disturb or remove detention basin, developed/landscaped, ruderal annual grassland habitat and disturbed/unvegetated habitats with potential to support special-status wildlife species. Variant H1 would include operation of solar panels within the Project footprint. Solar panels would be installed in ruderal annual grassland habitat. Monarch butterflies, western pond turtle, Swainson's hawk, burrowing owl, and nesting birds could be affected by operation within this habitat. Additionally, the proposed solar arrays have the potential to cause collisions with panels resulting in injury or mortality of special-status and migratory birds, including ground-dwelling passerine birds and waterbirds. Ground-dwelling birds have been commonly detected during fatality monitoring surveys at solar facilities in the southwestern United States (Kosciuch et al. 2020). The attraction of waterfowl and water birds to the Project area by birds perceiving the solar panels as waterbodies could result in mortality by attracting water birds that are dependent on water for taking flight (e.g., grebes). The Project area consists of two creeks and detention basins, so this may not be an issue at the site. The permanent installation of solar panels due to operation of Variant H1 could result in habitat loss, habitat degradation from invasive plants, increased noise levels, decreased reproductive success, and reduced prey abundance.

Impact Details and Conclusions

The Variant H1 operation area supports the special-status wildlife species mentioned above. This impact would be potentially significant.

Mitigation Measures

Mitigation Measure BIO-7.1: Avoidance and Minimization Measures for Nesting Birds During Operation and Maintenance Activities

Mitigation Measure BIO-7.2: Avoidance and Minimization Measures for Roosting Bats during Operation and Maintenance Activities

Mitigation Measure BIO-7.3: Conduct Pre-Activity Surveys for Special-Status Wildlife Species Prior to Conducting Maintenance Activities

Mitigation Measure BIO-7.4: Avoidance and Minimization Measures for Birds during Operation of the Solar Facility

Mitigation Measure BIO-7.4a: Project facility lighting will be designed to provide the minimum illumination needed to achieve safety and security objectives. All lighting will be directed downward and shielded to focus illumination on the desired areas only and avoid light trespass into adjacent areas. Lenses and bulbs will not extend below the shields. This will prevent impacts on bird species nesting and foraging in riparian areas in Bear Creek or Fahrens Creek and other sensitive habitats adjacent to the site.

Mitigation Measure BIO-7.4b: Rodenticides will not be used at the Project site. Rodents will be controlled by encouraging raptor foraging. If additional rodent control is required to minimize impacts on adjacent agricultural operations, non-chemical methods will be employed.

Mitigation Measure BIO-7.4c: During operations, trash—including microtrash that can be harmful to birds and other wildlife—will be regularly removed from the Project site to avoid impacts on birds using the Project site. The area of trash cleanup will include the Project site within the fence lines, in addition to focused trash pickup along the fence on the interior and exterior sides of the fence.

Mitigation Measure BIO-7.4d: The Project will be designed to underground electrical wiring to the maximum extent feasible. In particular, guy wires will be avoided to the maximum extent feasible without compromising public safety.

Mitigation Measure BIO-7.4e: In compliance with the Avian Power Line Interaction Committee's (APLIC) guidance, Reducing Avian Collisions with Power Lines: State of the Art in 2012 (APLIC 2012), transmission lines and all electrical components will be designed, installed, and maintained in accordance with APLIC (2012) guidance to reduce the likelihood of large bird electrocutions and collisions.

Mitigation Measure BIO-7.4f: The Applicant will implement the following measures to reduce the risk of bird collisions with photovoltaic panels.

- A qualified biologist will be retained by SJJPA or its contractor(s) to prepare an avian monitoring plan to assess and monitor the potential for avian collisions with solar panels on the site. The plan will include monitoring for levels of avian activity as well as avian mortality in treated and untreated (control) portions of the solar facility to determine if avian mortality is occurring and if there is any apparent difference in avian mortality between treated and untreated panels. The plan will also include methods to install visual deterrents or cues to encourage bird avoidance of the Project site. Implementation of the plan will provide quantitative data on the effectiveness of the avian deterrent in terms of overall bird use and large-bird mortality in treated portions of the Project versus an untreated control. Within 30 days after Project commissioning, avian deterrent materials will be installed within the solar facility on a 3-month trial basis to evaluate potential avian collision issues. These deterrents will be made of a material that is both reflective and highly visible, such that the material reflects ambient light and is stimulated by air movement. The effect of installation will create the visual impression of continuous and varied movement, which has been shown as an avian deterrent in agricultural applications. Examples of the types of material that could be used include plastic compact discs and reflective tape.
- Upon installation of deterrent measures, avian monitoring will occur once per week for a total of 12 consecutive weeks; this will be repeated for the first 3 consecutive years of operation. During each monitoring event, bird abundance in each block (four treatment blocks and one untreated control block) will be quantified using a point count method and the number, species, and behavior of birds observed within each block will be recorded. Behaviors will be recorded for each species and will reflect the modal (or typical) behavior observed for all individuals of the species, not for each individual bird. The observer will also record temperature, average wind speed, and percent cloud cover at the start of each observation period.
- Mortality of large birds in each block will be assessed by surveying the block for carcasses of large birds (crow-sized and larger). During the surveys, the location and species of each carcass will be recorded using a handheld GPS receiver, a photograph will be taken of the carcass, and the cause of mortality will be noted if apparent. Carcasses will not be collected or preserved.
- Overall bird abundance, species diversity, and large-bird mortality will be compared among all blocks, and between the control block and the treatment blocks combined. Analysis may include t-test comparisons of means for overall abundance and large-bird mortality; however, statistical power may be low depending on the overall level of bird activity at the site.
- Facility operator or agent will provide a brief analysis of the effects of the deterrent measures on panel performance and the feasibility of maintaining avian deterrents for inclusion in the analysis.
- Following the initial 3-month period and based on the results of the plan, visual deterrents will either be discontinued if there is no significant difference between avian mortality between the treatment and control blocks, adjusted to reduce performance issues and reexamined on a continuing 3-month basis, or if adjustments are not deemed necessary to improve panel performance, deployed on the remainder of the site and maintained for the

life of the project or until determined infeasible (based on the definition of "feasible" in CEQA Guidelines § 15364) or ineffective by the Project owner in consultation with CDFW.

Mitigation Measure BIO-7.4g: Panels will include, if feasible, a light-colored, ultraviolet-reflective, or otherwise nonpolarizing outline, frame, grid, or border, which has been shown to substantially reduce panel attractiveness to aquatic insects (Horvath et al. 2010).

Significance with Application of Mitigation

With implementation of Mitigation Measures BIO-7.1, BIO-7.2, BIO-7.3, and BIO-7.4, effects on wildlife species or their habitat during operation of Variant H1 would be less than significant.

Variant H2

Impact Characterization

Operation and maintenance of Variant H2 would disturb or remove developed/landscaped habitat, ruderal annual grassland, detention basin and disturbed/unvegetated habitat with potential to support special-status wildlife species. Maintenance activities for Variant H2 could result in the permanent degradation or loss of special-status wildlife habitat in the Variant H2 footprint.

Impact Details and Conclusions

The Variant H2 operation area supports the special-status wildlife species mentioned above. This impact would be potentially significant.

Mitigation Measures

Mitigation Measure BIO-7.1: Avoidance and Minimization Measures for Nesting Birds During Operation and Maintenance Activities

Mitigation Measure BIO-7.2: Avoidance and Minimization Measures for Roosting Bats during Operation and Maintenance Activities

Mitigation Measure BIO-7.3: Conduct Pre-Activity Surveys for Special-Status Wildlife Species Prior to Conducting Maintenance Activities

Significance with Application of Mitigation

With implementation of Mitigation Measures BIO-7.1, BIO-7.2, and BIO-7.3, effects on wildlife species or their habitat during operation of Variant H2 would be less than significant.

Variant H3

Impact Characterization

Operation and maintenance of Variant H3 would disturb or remove developed/landscaped habitat, ruderal annual grassland, detention basin and disturbed/unvegetated habitat with potential to support special-status wildlife species. Maintenance activities for Variant H3 could result in the permanent degradation or loss of special-status wildlife habitat in the Variant H3 footprint.

Impact Details and Conclusions

The Variant H3 operation area supports the special-status wildlife species mentioned above. This impact would be potentially significant.

Mitigation Measures

Mitigation Measure BIO-7.1: Avoidance and Minimization Measures for Nesting Birds During Operation and Maintenance Activities

Mitigation Measure BIO-7.2: Avoidance and Minimization Measures for Roosting Bats during Operation and Maintenance Activities

Mitigation Measure BIO-7.3: Conduct Pre-Activity Surveys for Special-Status Wildlife Species Prior to Conducting Maintenance Activities

Significance with Application of Mitigation

With implementation of Mitigation Measures BIO-7.1, BIO-7.2, and BIO-7.3, effects on wildlife species or their habitat during operation of Variant H3 would be less than significant.

Impact BIO-8	Operation of the Project could have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service.
Level of Impact	**Potentially significant impact**
Mitigation Measures	BIO-3.1: Avoidance and Minimization Measures for Sensitive Natural Communities, including Ruderal Riparian Habitat BIO-3.3: Prevent the Introduction or Spread of Invasive Species
Level of Impact After Mitigation	**Less-than-significant impact**

Project

Impact Characterization

Project operation would include maintenance activities that could temporarily disturb ruderal riparian habitat. Ground disturbance activities associated with Project maintenance could result in the removal of vegetation, crushing, trampling, introduction of nonnative or invasive plants, and degradation or loss of habitat.

Impact Details and Conclusions

Operation maintenance activities would include routine removal of woody debris, sediment, and other materials that accumulate near the piers of the bridges. Maintenance activities within the rail corridor also include tree pruning and removal, annual vegetation trimming, and herbicide application. Maintenance activities associated with the San Joaquins Layover and Maintenance Access Line could affect riparian vegetation along Fahrens Creek. Maintenance of the ACE/UPRR Industrial Spur Track and San Joaquins Elevated Track over Bear Creek could affect riparian vegetation along Bear Creek. This would be a potentially significant impact.

Mitigation Measures

Mitigation Measure BIO-3.1: Avoidance and Minimization Measures for Sensitive Natural Communities, including Ruderal Riparian Habitat

Mitigation Measure BIO-3.3: Prevent the Introduction or Spread of Invasive Species

Significance with Application of Mitigation

With implementation of Mitigation Measures BIO-3.1 and BIO-3.3, impacts on riparian habitat or other sensitive natural community during operation of the Project would be less than significant.

Variant H1

Impact Characterization

Maintenance of the Variant H1 area would be as described above for the Project.

Impact Details and Conclusions

Variant H1 maintenance activities would be as described for the Project and would include routine removal of woody debris, sediment, and other materials that accumulate near the piers of the bridges; tree pruning and removal, annual vegetation trimming, and herbicide application within the rail corridor; and could affect riparian vegetation along Fahrens Creek and Bear Creek. This would be a potentially significant impact.

Mitigation Measures

Mitigation Measure BIO-3.1: Avoidance and Minimization Measures for Sensitive Natural Communities, including Ruderal Riparian Habitat

Mitigation Measure BIO-3.3: Prevent the Introduction or Spread of Invasive Species

Significance with Application of Mitigation

With implementation of Mitigation Measures BIO-3.1 and BIO-3.3, impacts on riparian habitat or other sensitive natural community during operation of Variant H1 would be less than significant.

Variant H2

Impact Characterization

Maintenance of the Variant H2 area would be as described above for the Project.

Impact Details and Conclusions

Variant H2 maintenance activities would be as described for the Project and would include routine removal of woody debris, sediment, and other materials that accumulate near the piers of the bridges; tree pruning and removal, annual vegetation trimming, and herbicide application within the rail corridor; and could affect riparian vegetation along Fahrens Creek and Bear Creek. This would be a potentially significant impact.

Mitigation Measures

Mitigation Measure BIO-3.1: Avoidance and Minimization Measures for Sensitive Natural Communities, including Ruderal Riparian Habitat

Mitigation Measure BIO-3.3: Prevent the Introduction or Spread of Invasive Species

Significance with Application of Mitigation

With implementation of Mitigation Measures BIO-3.1 and BIO-3.3, impacts on riparian habitat or other sensitive natural community during operation of Variant H2 would be less than significant.

Variant H3

Impact Characterization

Maintenance of the Variant H3 area would be as described above for the Project.

Impact Details and Conclusions

Variant H3 maintenance activities would be as described for the Project and would include routine removal of woody debris, sediment, and other materials that accumulate near the piers of the bridges; tree pruning and removal, annual vegetation trimming, and herbicide application within the rail corridor; and could affect riparian vegetation along Fahrens Creek and Bear Creek. This would be a potentially significant impact.

Mitigation Measures

Mitigation Measure BIO-3.1: Avoidance and Minimization Measures for Sensitive Natural Communities, including Ruderal Riparian Habitat

Mitigation Measure BIO-3.3: Prevent the Introduction or Spread of Invasive Species

Significance with Application of Mitigation

With implementation of Mitigation Measures BIO-3.1 and BIO-3.3, impacts on riparian habitat or other sensitive natural community during operation of Variant H3 would be less than significant.

Impact BIO-9	Operation of the Project would not have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means.
Level of Impact	**Less-than-significant impact**

Project

Impact Characterization

Ground disturbance activities associated with Project maintenance would not occur in perennial drainage, freshwater marsh, or seasonal wetlands. However, there is potential for runoff of sediment and contaminants (e.g., oil, grease, concrete, herbicides) into waterbodies adjacent to maintenance activities, which would adversely affect water quality.

Impact Details and Conclusions

Operation maintenance activities would avoid wetlands and creeks and would not result in direct impacts due to removal, fill, or hydrological interruption. This would be a less-than-significant impact. Potential operation impacts on water quality in wetlands or creeks is discussed in Section 3.10, *Hydrology and Water Quality,* Impact HYD-2: *Operation of the Project would not violate water quality standards or WDRs or otherwise substantially degrade surface or groundwater quality*.

Variant H1

Impact Characterization

Maintenance of the Variant H1 area would be the same as described above for the Project.

Impact Details and Conclusions

Operation maintenance activities under Variant H1 would avoid wetlands and creeks and would not result in direct impacts due to removal, fill, or hydrological interruption. This would be a less-than-significant impact.

Variant H2

Impact Characterization

Maintenance of the Variant H2 area would be the same as described above for the Project.

Impact Details and Conclusions

Operation maintenance activities under Variant H2 would avoid wetlands and creeks and would not result in direct impacts due to removal, fill, or hydrological interruption. This would be a less-than-significant impact.

Variant H3

Impact Characterization

Maintenance of the Variant H3 area would be the same as described above for the Project.

Impact Details and Conclusions

Operation maintenance activities under Variant H3 would avoid wetlands and creeks and would not result in direct impacts due to removal, fill, or hydrological interruption. This would be a less-than-significant impact.

Impact BIO-10	Operation of the Project could interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors or impede the use of native wildlife nursery sites.
Level of Impact	**Potentially significant impact**
Mitigation Measures	BIO-10.1: Model Hydraulics of New Bridge before Construction and Design Bridge to Accommodate Fish Migration
Level of Impact After Mitigation	**Less-than-significant impact**

Project

Impact Characterization

The Project would increase train traffic along the right-of-way but the increased traffic is not expected to have significantly different effects on wildlife species from existing operational conditions. The greatest extent of disturbance that could interfere with fish and wildlife movement would occur during the construction of the Bear Creek bridge. Once construction is completed, operations would occur entirely within areas previously disturbed and cleared of natural land cover during construction.

Operation of the new bridge crossing can affect fish habitat. Anadromous fish migratory habitat could change as a result of the installation of new piles in Bear Creek. New structures could cause shading and changes to channel morphology and hydraulics. Channel morphology describes the linear, aerial, and volumetric features of a channel, including depth, length, width, and the shape or configuration of the channel (e.g., the characteristics of secondary channels, riffles, runs, pools, backwaters, and sloughs). Channel morphology, along with flow, affects stream hydraulics, which refers to a stream's depth, surface elevation, velocity, and turbulence. Together, channel morphology and hydraulics influence the conditions that support fish migration and movement. Channel morphology and hydraulics have a major effect on cover and water temperature. Central Valley steelhead and hardhead migration could be affected if water velocities exceed swimming speeds of each fish species. In-water structures can alter local channel hydraulics and underwater light conditions and provide potentially favorable holding conditions for juvenile and adult fish and species that prey on small or juvenile fishes. Permanent shading from the new bridge could potentially reduce primary productivity of affected habitats and increase the number of predatory fishes in the study area and/or their ability to prey on juvenile fishes.

Impact Details and Conclusions

The new Bear Creek bridge would be a 115-foot, single-track concrete bridge that would be 20 feet wide with two abutments at each end and three piers located between the span sections in the creek. At this bridge crossing, the pilings in the water could affect stream velocities, which could affect special-status fish or degrade their habitat within the study area. Operation of the Project could result in potentially significant impacts on Central Valley steelhead and hardhead. The increased number of in-water structures due to the new bridge over Bear Creek could affect channel velocities and affect fish movement, as well as instream erosion. Given the bridge designs, this is unlikely to result in substantial change in velocities or erosion, but pending further evaluation, is considered potentially significant. Furthermore, shading would occur from the new bridge, which could increase predation. However, since the bridge is only 20 feet wide, shading would be minimal.

Shading would not occur all day in any particular location and, therefore, is not expected to strongly affect juvenile native and special-status fish species. Additionally, because of the height of the bridges over the water, ambient light levels generally would be expected to penetrate the water, minimizing the effects of bridge shading on aquatic habitats. Thus, shading is considered a less-than-significant impact on special-status fish species.

Apart from the special-status fish and wildlife species impacts related to construction, operation of the Project is not expected to be significantly different from existing operations regarding fish or wildlife movement along stream corridors, riparian habitat, or wetland complexes, and thus would have a less-than-significant impact on fish or wildlife movement, migration corridors, or nursery areas. Mitigation Measure BIO-10.1 would ensure fish passage through Bear Creek in the Project area.

Mitigation Measure BIO-10.1: Model Hydraulics of New Bridges Before Construction and Design Bridge to Accommodate Fish Migration

SJJPA or its contractor(s) will perform a hydraulic analysis for all new bridge crossings that expand in-water footprints to determine if changes in velocities will occur and identify the most feasible option with the least impact on the geomorphic integrity of the creek. Any change in velocities will be compared to the swimming velocities of the special-status fish species that are present in the waterbody to determine if upstream migration can still occur after the installation of the piles. If velocities would impede fish migration, the bridge design(s) will be changed to reduce velocities that allow migration by reducing the bulk or number of pier structures within stream margins. Additionally, SJJPA or its contractor(s) will involve Regional Water Boards, CDFW, USACE, USFWS, and NMFS in development of scope of work and methodology, analysis of the options, and development of a draft report.

Significance with Application of Mitigation

With implementation of Mitigation Measure BIO-10.1, impacts related to interfering substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors or impeding the use of native wildlife nursery sites during operation of the Project would be less than significant.

Variant H1

Impact Characterization

Operation of Variant H1 would include operation of solar panels within and a small area outside of the Project footprint. Solar panels are not expected to interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors or impede the use of native wildlife nursery sites. Wildlife are able to move under and around the solar panels.

Impact Details and Conclusions

There would be no interference of movement of wildlife from the solar panel installation. This impact is less than significant.

Variant H2

Impact Characterization

Operation of Variant H2 includes storage of hydrogen within the Project area. The hydrogen storage area is not expected to interfere with movement of any native resident or migratory fish or wildlife species.

Impact Details and Conclusions

There would be no interference of movement of wildlife from the solar panel installation. This impact is less than significant.

Variant H3

Impact Characterization

Operation of Variant H3 includes storage of hydrogen within the Project area. The hydrogen storage area is not expected to interfere with movement of any native resident or migratory fish or wildlife species.

Impact Details and Conclusions

There would be no interference of movement of wildlife from the solar panel installation. This impact is less than significant.

Impact BIO-11	Operation of the Project could conflict with local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.
Level of Impact	**Potentially significant impact**
Mitigation Measures	BIO-7.1: Avoidance and Minimization Measures for Nesting Birds during Operation and Maintenance Activities BIO-7.2: Avoidance and Minimization Measures for Roosting Bats during Operation and Maintenance Activities BIO-7.3: Conduct Pre-Activity Surveys for Special-Status Wildlife Species Prior to Conducting Maintenance Activities
Level of Impact After Mitigation	**Less-than-significant impact**

Project

Impact Characterization

Operation of the Project is not expected to affect trees regulated by local tree preservation policies or ordinances because tree removal would occur during construction of the Project. Special-status species discussed in local policies in the Merced County General Plan could be affected by operation of the Project.

Impact Details and Conclusions

Routine vegetation management, including tree pruning for right-of-way clearance associated with operations would occur entirely within areas previously disturbed and cleared during construction of the Project. As noted in Impact BIO-5, local tree regulations do not apply within the UPRR right-of-way. Local tree ordinances would not legally apply to tree removal or pruning associated with the operation of the Project. Furthermore, operational tree removal would be limited because tree removals necessary for the Project would be removed during construction; operations effects would be limited to pruning to maintain clearance zones established during construction. Thus, operation of the Project would not conflict with tree preservation policies or ordinances, and this impact would be less than significant.

In addition, there are local policies related to the protection of special-status species. These local policies are identified in Appendix 3.0-1, *Regional Plans and Local General Plans*, and include policies from the Merced County General Plan. Pertinent policies include the Merced County General Plan (Natural Resource Policy NR-1.2.1, Special Status Species Surveys and Mitigation). As described in Impact BIO-7, operation of the Project could result in a potentially significant impact on special-status wildlife and fish species. As such, operation of the Project could conflict with local biological resource policies, resulting in a potentially significant impact.

Mitigation Measures

Mitigation Measure BIO-7.1: Avoidance and Minimization Measures for Nesting Birds during Operation and Maintenance Activities

Mitigation Measure BIO-7.2: Avoidance and Minimization Measures for Roosting Bats during Operation and Maintenance Activities

Mitigation Measure BIO-7.3: Conduct Pre-Activity Surveys for Special-Status Wildlife Species Prior to Conducting Maintenance Activities

Significance with Application of Mitigation

With implementation of Mitigation Measures BIO-7.1, BIO-7.2, and BIO-7.3, which require surveys for nesting birds, roosting bats and special-status wildlife species be conducted before maintenance activities, respectively, impacts related to conflicts with local policies or ordinances protecting biological resources during operation of the Project would be less than significant.

Variant H1

Impact Characterization

Operation of Variant H1 would be the same as described above for the Project.

Impact Details and Conclusions

As described for the Project, routine vegetation management, including tree pruning for right-of-way clearance associated with operations of Variant H1 would occur entirely within areas previously disturbed and cleared during construction. Thus, operation of Variant H1 would not conflict with tree preservation policies or ordinances, and this impact would be less than significant.

As described in Impact BIO-7, operation of Variant H1 could result in a potentially significant impact on special-status wildlife and fish species. As such, operation of Variant H1 could conflict with local biological resource policies, resulting in a potentially significant impact.

Mitigation Measures

Mitigation Measure BIO-7.1: Avoidance and Minimization Measures for Nesting Birds during Operation and Maintenance Activities

Mitigation Measure BIO-7.2: Avoidance and Minimization Measures for Roosting Bats during Operation and Maintenance Activities

Mitigation Measure BIO-7.3: Conduct Pre-Activity Surveys for Special-Status Wildlife Species Prior to Conducting Maintenance Activities

Mitigation Measure BIO-7.4: Avoidance and Minimization Measures for Birds during Operation of the Solar Facility

Significance with Application of Mitigation

With implementation of Mitigation Measures BIO-7.1, BIO-7.2, BIO-7.3, and BIO-7.4, which require surveys for nesting birds, roosting bats, and special-status wildlife species be conducted before maintenance activities as well as avoidance and minimization measures for birds, respectively, impacts related to conflicts with local policies or ordinances protecting biological resources during operation of Variant H1 would be less than significant.

Variant H2

Impact Characterization

Operation of Variant H2 would be the same as described above for the Project.

Impact Details and Conclusions

As described for the Project, routine vegetation management, including tree pruning for right-of-way clearance associated with operations of Variant H2 would occur entirely within areas previously disturbed and cleared during construction. Thus, operation of Variant H2 would not conflict with tree preservation policies or ordinances, and this impact would be less than significant.

As described in Impact BIO-7, operation of Variant H2 could result in a potentially significant impact on special-status wildlife and fish species. As such, operation of Variant H2 could conflict with local biological resource policies, resulting in a potentially significant impact.

Mitigation Measures

Mitigation Measure BIO-7.1: Avoidance and Minimization Measures for Nesting Birds during Operation and Maintenance Activities

Mitigation Measure BIO-7.2: Avoidance and Minimization Measures for Roosting Bats during Operation and Maintenance Activities

Mitigation Measure BIO-7.3: Conduct Pre-Activity Surveys for Special-Status Wildlife Species Prior to Conducting Maintenance Activities

Significance with Application of Mitigation

With implementation of Mitigation Measures BIO-7.1, BIO-7.2, and BIO-7.3, which require surveys for nesting birds, roosting bats and special-status wildlife species be conducted before maintenance activities, respectively, impacts related to conflicts with local policies or ordinances protecting biological resources during operation of Variant H2 would be less than significant.

Variant H3

Impact Characterization

Operation of Variant H3 would be the same as described above for the Project.

Impact Details and Conclusions

As described for the Project, routine vegetation management, including tree pruning for right-of-way clearance associated with operations of Variant H3 would occur entirely within areas previously disturbed and cleared during construction. Thus, operation of Variant H3 would not conflict with tree preservation policies or ordinances, and this impact would be less than significant.

As described in Impact BIO-7, operation of Variant H3 could result in a potentially significant impact on special-status wildlife and fish species. As such, operation of Variant H3 could conflict with local biological resource policies, resulting in a potentially significant impact.

Mitigation Measures

Mitigation Measure BIO-7.1: Avoidance and Minimization Measures for Nesting Birds during Operation and Maintenance Activities

Mitigation Measure BIO-7.2: Avoidance and Minimization Measures for Roosting Bats during Operation and Maintenance Activities

Mitigation Measure BIO-7.3: Conduct Pre-Activity Surveys for Special-Status Wildlife Species Prior to Conducting Maintenance Activities

Significance with Application of Mitigation

With implementation of Mitigation Measures BIO-7.1, BIO-7.2, and BIO-7.3, which require surveys for nesting birds, roosting bats and special-status wildlife species be conducted before maintenance activities, respectively, impacts related to conflicts with local policies or ordinances protecting biological resources during operation of Variant H3 would be less than significant.

Impact BIO-12	Operation of the Project would not conflict with the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan.
Level of Impact	**No impact**

Project

Impact Details and Conclusions

No HCPs, NCCPs, or other approved local regional, or state HCPs cover the area where the Project would be located. Operation of the Project would, therefore, not conflict with adopted HCPs, NCCPs, or approved local, regional, or state HCP provisions, and there would be no impact.

Variant H1

Impact Details and Conclusions

No HCPs, NCCPs, or other approved local regional, or state HCPs cover the area where Variant H1 would be located. Operation of Variant H1 would, therefore, not conflict with adopted HCPs, NCCPs, or approved local, regional, or state HCP provisions, and there would be no impact.

Variant H2

Impact Details and Conclusions

No HCPs, NCCPs, or other approved local regional, or state HCPs cover the area where Variant H2 would be located. Operation of Variant H2 would, therefore, not conflict with adopted HCPs, NCCPs, or approved local, regional, or state HCP provisions, and there would be no impact.

Variant H3

Impact Details and Conclusions

No HCPs, NCCPs, or other approved local regional, or state HCPs cover the area where Variant H3 would be located. Operation of Variant H3 would, therefore, not conflict with adopted HCPs, NCCPs, or approved local, regional, or state HCP provisions, and there would be no impact.

3.5 Cultural Resources

3.5.1 Introduction

This section describes the regulatory and environmental setting for cultural resources in the vicinity of the Project. It also describes the impacts on cultural resources that would result from the Project and mitigation measures that would reduce significant impacts, where feasible and appropriate. Appendix 3.5-1 of this environmental impact report (EIR) contains the Historical Resources Inventory and Evaluation Report prepared for the Project and Appendix 3.5-2 contains the Archaeological Resources Study Report prepared for the Project. The Archaeological Resources Study Report is confidential and not for public release. Public distribution and access should be restricted.

Cultural resources include historic buildings and structures, historic districts, historic sites, prehistoric and historic archaeological sites, and other precontact or historic-aged buildings, districts, objects, sites, and structures and artifacts.[1] *Historical resource* is a California Environmental Quality Act (CEQA) term that includes both archaeological and built cultural resources (described in Section 3.5.4.1, *Methods for Analysis*). Section 3.5.2, *Regulatory Setting,* further defines *historical resources* in relation to their recognition under CEQA.

Cumulative impacts on cultural resources, in combination with planned, approved, and reasonably foreseeable projects, are discussed in Chapter 4, *Cumulative Impacts*.

3.5.2 Regulatory Setting

This section summarizes the federal, state, regional, and local regulations related to cultural resources applicable to the Project.

3.5.2.1 Federal Regulations

Because federal permits would be required for the Project, compliance with the following applicable laws is required:

- Section 106 of the National Historic Preservation Act (16 United States Code [U.S.C.] § 470 et seq.)
- Archaeological and Historic Preservation Act (16 U.S.C. § 469–469(c)-2)
- Archaeological Resources Protection Act (16 U.S.C. § 470(a)-11)
- American Indian Religious Freedom Act (42 U.S.C. § 1996)
- Native American Graves Protection and Repatriation Act (25 U.S.C. § 3001–3013)
- American Antiquities Act (16 U.S.C. § 431–433)

[1] Impacts on paleontological resources, such as vertebrate, invertebrate, or plant fossils, are discussed in Section 3.8, *Geology, Seismicity, Soils, and Paleontological Resources*.

3.5.2.2 State Regulations

California Public Resources Code

Archaeological and historical sites are protected pursuant to a wide variety of state policies and regulations, as enumerated under the California Public Resources Code (Cal. Public Res. Code). Cultural resources are recognized as nonrenewable resources and receive additional protection under the Cal. Public Res. Code and CEQA.

Cal. Public Res. Code Sections 5020–5029.5 continued the former Historical Landmarks Advisory Committee as the State Historical Resources Commission. The commission oversees the administration of the California Register of Historical Resources (CRHR) and is responsible for the designation of State Historical Landmarks and Historical Points of Interest.

Cal. Public Res. Code Sections 5079–5079.65 define the functions and duties of the Office of Historic Preservation (OHP). The OHP is responsible for the administration of federally and state-mandated historic preservation programs in California and the California Heritage Fund.

Cal. Public Res. Code Sections 5097.9–5097.991 provide protection to Native American historical and cultural resources and sacred sites and identify the powers and duties of the Native American Heritage Commission (NAHC). These sections also require notification to descendants of discoveries of Native American human remains and provide for treatment and disposition of human remains and associated grave goods.

If Native American human remains are identified within the cultural resources study area (also known as the *CEQA study area*, as defined in Section 3.5.3, *Environmental Setting*) and located on non-federal lands (including private lands), the project must follow the procedures set forth under Section 5097.98.

California Environmental Quality Act

ICF prepared a historical resource inventory and evaluation report on behalf of the San Joaquin Joint Powers Authority (SJJPA) to identify California Environmental Quality Act (CEQA) historical resources that could potentially be affected by the Project. For the purposes of this EIR, and in accordance with Section 15064.5(a)(1) of the State CEQA Guidelines, a *historical resource* is a resource listed in, or determined to be eligible for listing in, the National Register of Historic Places (NRHP), CRHR, or a local register of historical resources, and therefore considered a historical resource for the purposes of CEQA. The *MITC Historical Resources Inventory and Evaluation Report* (technical study) has also been completed following Section 15064.5(a)(2)–(3) of the State CEQA Guidelines using the criteria outlined in Section 5024.1 of the California Public Resources Code (PRC).

CEQA requires public or private projects financed or approved by public agencies to assess the effects of a project on historical resources. *Historical resources* are buildings, sites, structures, objects, or districts, each of which may have historical, architectural, archaeological, cultural, or scientific significance and meet the criteria cited in the previous paragraph. CEQA requires that, if a project would result in an effect that may cause a substantial adverse change in the significance of a historical resource, alternative plans or measures to mitigate the effect must be considered; however, only significant historical resources need to be addressed. Therefore, the significance of cultural resources must be determined. The following steps are normally taken in a cultural resources investigation for CEQA compliance:

1. Identify cultural resources
2. Evaluate the significance of the resources
3. Evaluate the effects of the project on significant resources
4. Develop and implement measures to mitigate the effects of the project on significant resources

The State CEQA Guidelines define three ways that a property may qualify as a significant historical resource for the purposes of CEQA review:

- The resource is listed in or determined eligible for listing in the CRHR.
- The resource is included in a local register of historical resources, as defined in PRC Section 5020.1(k) or identified as significant in a historical resource survey meeting the requirements of PRC Section 5024.1(g), unless the preponderance of evidence demonstrates that it is not historically or culturally significant.
- The lead agency determines the resource to be significant as supported by substantial evidence in light of the whole record (California Code of Regulations, Title 14, Division 6, Chapter 3, Section 15064.5(a)).

Each of these ways of qualifying as a significant historical resource for the purposes of CEQA is related to the eligibility criteria for inclusion in the CRHR (PRC §§ 5020.1(k), 5024.1, 5024.1(g)). A historical resource may be eligible for inclusion in the CRHR if it meets any of the following criteria:

- Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage
- Is associated with the lives of persons important in our past
- Embodies the distinctive characteristics of a type, period, region, or method of construction; represents the work of an important creative individual; or possesses high artistic values
- Has yielded, or may be likely to yield, information important in prehistory or history

Properties that are listed in or eligible for listing in the NRHP are considered eligible for listing in the CRHR, and thus are significant historical resources for the purpose of CEQA (PRC § 5024.1(d)(1)).

California Register of Historical Resources (Public Resources Code Section 5024.1 and 14 California Code of Regulations Section 4850)

PRC Section 5024.1 establishes the CRHR, which lists all California properties considered to be significant historical resources. The CRHR automatically includes all properties listed in or determined eligible for listing in the NRHP.

Title 14, Section 4850 of the California Code of Regulations governs the eligibility for listing in the CRHR. The regulations set forth the criteria for evaluating significance and the historical integrity of that significance.

To be eligible for listing in the CRHR, a resource must have significance at the local, state, or national level under one or more of the following four criteria:

- It is associated with events or patterns of events that have made a significant contribution to the broad patterns of local or regional history, or the cultural heritage of California or the United States.

- It is associated with the lives of persons important to local, California, or national history.
- It embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of a master, or possesses high artistic values.
- It has yielded, or has the potential to yield, information important to the prehistory or history of the local area, California, or the nation.

If a resource is found to have significance through the application of the four associative criteria, then the integrity of that significance must be evaluated. Integrity is defined as "the authenticity of an historical resource's physical identity evidenced by the survival of characteristics that existed during the resource's period of significance." Integrity involves interpreting the resource's retention of location, design, setting, materials, workmanship, feeling, and association and must be judged with reference to its criterion or criteria of significance.

Unique Archaeological Resources

State CEQA Guidelines Section 15064.5(c) specifies how CEQA applies to archaeological sites, including archaeological sites that are historical resources, unique archaeological resources, or neither.

PRC Section 21083.2(g) defines a unique archaeological resource as an archaeological artifact, object, or site about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria:

1. It contains information needed to answer important scientific research questions, and there is a demonstrable public interest in that information.
2. It has a special and particular quality, such as being the oldest of its type or the best available example of its type.
3. It is directly associated with a scientifically recognized important prehistoric or historic event or person.

State CEQA Guidelines Sections 15064.5(d) and (e) specify responsibilities and respectful treatment of human remains, including Native American human remains, that are found or likely to be found within a project site.

Treatment of Human Remains (California Health and Safety Code Section 7050.5)

Section 7050.5 of the California Health and Safety Code states that, in the event of discovery or recognition of any human remains in any location other than a dedicated cemetery, there shall be no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent remains until the coroner of the county in which the remains are discovered has determined whether the remains are subject to the coroner's authority. If the human remains are of Native American origin, the coroner must notify the NAHC within 24 hours of this identification.

Notification of Most Likely Descendant (Public Resources Code Section 5097.98)

PRC Section 5097.98 states that the NAHC, upon notification of the discovery of Native American human remains pursuant to Health and Safety Code Section 7050.5, shall immediately notify the most likely descendant of the deceased. With permission of the landowner or a designated representative, the most likely descendant may inspect the remains and any associated cultural materials and make recommendations for treatment or disposition of the remains and associated grave goods. The most likely descendant shall provide recommendations or preferences for treatment of the remains and associated cultural materials within 48 hours of being granted access to the site.

3.5.2.3 Regional and Local Regulations

The SJJPA, as a state joint powers agency, proposes improvements within and outside the Union Pacific Railroad (UPRR) and BNSF Railway (BNSF) rights-of-way. The Interstate Commerce Commission Termination Act (ICCTA) affords railroads that engage in interstate commerce considerable flexibility in making necessary improvements and modifications to rail infrastructure, subject to the requirements of the Surface Transportation Board. ICCTA broadly preempts state and local regulation of railroads; this preemption extends to the construction and operation of rail lines. As such, activities within the UPRR and BNSF rights-of-way are clearly exempt from local building and zoning codes as well as other land use ordinances. Project activities outside of the UPRR and BNSF rights-of-way, however, would be subject to regional and local plans and regulations. Though ICCTA broadly preempts state and local regulation of railroads, SJJPA intends to obtain local agency permits for construction of facilities that fall outside the UPRR and BNSF rights-of-way, even though SJJPA has not determined whether such permits are legally necessary or required.

Appendix 3.0-1, *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 Project improvements would be located. Section 15125(d) of the State 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 Project would be consistent with the plans of relevant jurisdictions.[2] The Project would be generally consistent with the applicable goals, policies, and objectives related to cultural resources identified in Appendix 3.0-1.

3.5.3 Environmental Setting

This section describes the environmental setting related to cultural resources for the Project. For the purposes of this analysis, the CEQA study area for cultural resources is referred to as the *study area* for both archaeological resources and built environment resources.

The study area for cultural resources is defined as follows:

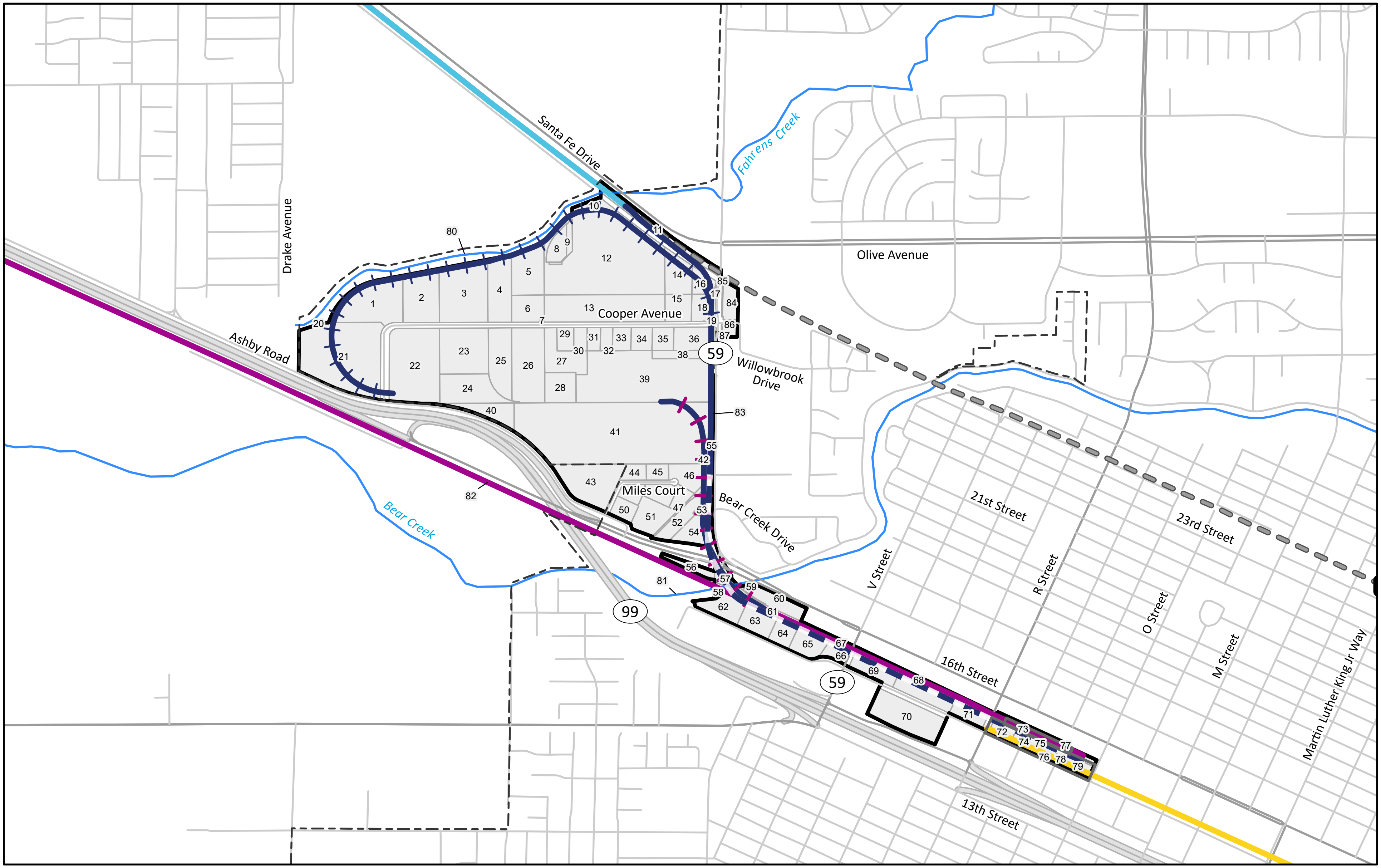
- The archaeological resources study area is the environmental footprint of the Project and consists of those areas affected by physical changes, including both horizontal surface disturbance and vertical subsurface disturbance. The environmental footprint of the Project is bordered to the north by Santa Fe Drive as well as a canal that runs just north of Cooper Avenue. The southern border of the environmental footprint of the Project consists of State Route 99 (SR 99) and 16th Street in the western portion, and cuts over to 15th Street in the eastern portion. The eastern border of the environmental footprint of the Project generally follows the alignment of State Route 59 (SR 59) as well as West 16th Street.

[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.

- The built environment study area is roughly bounded by Black Rascal Creek (northwest), Ashby Road (south), SR 59 (east), and Santa Fe Drive (northeast), which encompasses a light industrial region with the highest concentration of potential historic-period resources in the study area. From this industrial area, the study area extends southwest along the railroad right-of-way running roughly between 16th Street to the north and 15th Street to the south to O Street. Direct impacts include all impacts on built environment historical resources that may result from construction and operation of the Project. Physical, visual, auditory, and vibrational impacts are considered potential direct impacts because they all have the potential to alter the resource or its immediate surroundings such that its historical significance would be impaired. The full parcel boundaries that intersect the study area are generally included as a whole. The study area accounts for operational impacts. At the time of writing, the operational changes proposed as part of the Project are not anticipated to require a larger study area. In addition to the Project footprint, the area of direct impact generally extends one parcel around proposed above-grade features to account for potential visual, atmospheric, or audible impacts. The exceptions to the one parcel buffer around new Project features include the following conditions:
    - Where substantial linear features, such as waterways, roadways, or railroad tracks, separate project features from nearby built environment resources, the area of direct impact does not extend the one parcel buffer from the project feature, unless there was a compelling reason to do so.
    - The installation of new railroad tracks, within the existing railroad right-of-way, does not require a one-parcel buffer surrounding the study area to account for potential impacts. The installation of additional parallel tracks within the existing right-of-way does not have the potential to affect built environment cultural resources that already have an extant railroad within the setting because such changes would be consistent with the visual, atmospheric, or audible setting that existed during the historic period.

Figure 3.5-1 depicts the area of direct impact for built environment historical resources, which includes the environmental footprint of the Project and parcels in or immediately adjacent to all areas of construction activity. The study areas for the built environment resources and archaeological resources for the Project are described in greater detail in Appendices 3.5-1 and 3.5-2.

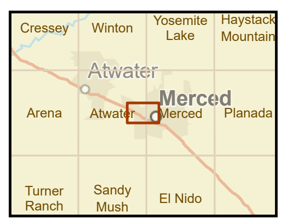
This section also includes a general discussion of the research conducted and methods employed for the cultural resources technical reports (Appendices 3.5-1 and 3.5-2) that aid in the identification and analysis of cultural resources. The records search conducted for the technical reports included a review of previously conducted cultural resources studies and recorded archaeological and built environment resources. This research also informed the prehistoric, ethnographic, and historic settings for cultural resources within the region where the Project and Variants are located. Detailed descriptions of known archaeological and built environment CEQA resources within the study area are presented in Section 3.5.3.1, *Cultural Resource Data Sources*.



Existing UPRR/Approved ACE
Proposed High Speed Rail
Existing BNSF/San Joaquins
Proposed Integrated Station
Approved ACE Layover and Maintenance Facility
City of Merced Boundary
BNSF Railway

MITC Project

San Joaquins: Elevated Section
San Joaquins: At-grade Track
San Joaquins: Layover and Maintenance Access Line
ACE/UPRR Spur Track
San Joaquins: To be discontinued under MITC Project
Built Environment Study Area (combined areas of direct and indirect impacts)



0 1,000 2,000 Feet

N

Figure 3.5-1
Built Environment CEQA Study Area
Merced Intermodal Track Connection Project

MITC

\\PDCCITRDSGIS01\Projects_1\AECOM\MercedIntegratedConnectorProject_EIR_EA\Figures\Doc\EIR\1_DEIR\01_ADEIR\Ch03\Fig_03_05-01_BuiltEnvStudyArea.aprx; User: 35015; Date: 3/21/2024

3.5.3.1 Cultural Resource Data Sources

Archaeological Resources

Records Search

Two cultural resources records searches were conducted by staff at Central California Information Center (CCAIC) of the California Historical Resources Information System to identify previous cultural resources studies and site records for the archaeological resources study area and ¼-mile buffer. The CCAIC, an affiliate of the Office of Historic Preservation (OHP), is the official state repository of cultural resources records and reports for Merced County. The initial search was conducted on March 15, 2023 (CCAIC File No. 12473I). On August 1, 2023 (CCAIC File No. 12612I), an additional records search was conducted to incorporate changes to environmental footprint of the Project.

The archaeological resources study area study area plus a ¼-mile buffer have been subject to 42 cultural resources studies. None of these studies identified archaeological resources within the study area or the ¼-mile buffer. No previously recorded archaeological resources were identified within the study area or the ¼-mile buffer.

Desktop Geoarchaeological Review

Geoarchaeological research was performed through a geologic and archaeological literature review. The purpose of the research was to identify portions of the archaeological resources study area with elevated archaeological sensitivity.

The archaeological resources study area s extends across numerous geologic units that range in age from the Pleistocene (>13,000 years) to within the last 150 years. Most of the study area was determined to have a moderate to high degree of sensitivity for containing buried archaeological resources. All soils dating 30,000 years or older were determined to have a low degree of sensitivity.

Pedestrian Survey

An archaeological pedestrian reconnaissance survey of the study area for the Project was conducted on May 2, 2024. The study area is characterized by a mix of railroad riprap, vegetated areas surrounding the railroad, and paved surfaces. No archaeological resources were observed during the survey.

Native American Consultation

The NAHC is a state agency that maintains the Sacred Lands File, an official list of sites that are of cultural and religious importance to California Native American tribes. ICF requested a review of the NAHC Sacred Lands File on January 30, 2023, for any Native American cultural resources within the Project site. ICF received a response on March 2, 2023, from Pricilla Torres-Fuentes, Cultural Resources Analyst at the NAHC, stating that, "The results of any Sacred Lands File (SLF) check conducted through the Native American Heritage Commission was negative." A list of eight tribal contacts and their information was also provided with the NAHC's response.

- Valentin Lopez, Amah Mutsun Tribal Band
- Robert Ledger, Dumna Wo-Wah Tribal Government

- Elaine Fink, North Fork Rancheria of Mono Indians
- Katherine Perez, North Valley Yokuts Tribe
- Timothy Perez, North Valley Yokuts Tribe
- Sandra Chapman, Southern Sierra Miwuk Nation
- Neil Peyron, Tule River Indian Tribe
- Kenneth Woodrow, Wuksache Indian Tribe/Eshom Valley Band

On April 19, 2023, letters were sent to each of the eight contacts on the list provided by the NAHC informing them of the Project and inviting them to consultation per PRC Section 21080.3.1(i.e., AB 52). To date, no responses have been received.

Built Environment Resources

Cultural resources staff conducted background research to identify known, previously recorded, or previously evaluated historic-period properties in the built environment study area. Staff reviewed the records search results from the Central California Information Center (CCIC) as well as previously completed surveys and reports, historic maps, and historic property databases/historical resource inventories. Additional background research included a review of listed historical resources on the OHP website (such as the listings of the California Historical Landmarks, Points of Historical Interest, and CRHR listings), California Department of Transportation Historic Bridge Inventory, local agency register listings, State Historical Resource Commission minutes, and NRHP listings on file with the National Park Service. Archival and historic research was conducted using published literature on local and regional history, cultural resource databases, archive and library collections, and online resources regarding the history of the built environment study area and Merced area.

Cultural resources staff sent letters requesting information concerning historical resources located in or near the built environment study area to various groups, including local special interest groups, historical societies, and archives on April 19, 2023. Two responses were received. Chris Rockwell, librarian for the California State Railroad Museum Library responded on April 24, 2023, providing a link to Merced-related results in digital collections and offering to scan specific sources if requested. Sarah Lim, Museum Director of the Merced County Courthouse Museum and Merced County Historical Society responded on June 1, 2023, describing the project vicinity as culturally and historically significant because the area just west of Merced within the perimeter of the project was farmed by Italian and Portuguese immigrants in the early 20th century.

Individuals who meet the Secretary of the Interior's professional qualifications standards for Architectural History and History completed the research, survey, and evaluation for built environment resources. ICF conducted a field study on August 29, 2023. ICF evaluated historic-period resources for NRHP and CRHR eligibility from September to October 2023.

3.5.3.2 Prehistoric, Ethnographic, and Historic Conditions

Prehistoric Setting

In the late 1800s and early 1900s, knowledge of Delta prehistory was derived largely from local collectors. The collections of J. A. Barr and E. J. Dawson, amateur archaeologists working in the

Stockton area from 1893 to the early 1930s, provided the groundwork for the later development of a three-phase chronological sequence for central California (Ragir 1972). Professional archaeological research in the lower Sacramento Valley was initiated during the 1920s and 1930s. Lillard and Purves (1936) worked at several mound sites near the Deer Creek/Cosumnes River confluence in Sacramento County. From the relative sequences in stratified occupational and burial sites, Lillard and Purves identified a three-stage chronology based upon artifacts, burial orientation, and condition. Simply called the Early, Transitional (later called Middle), and Late horizons, these were defined by shifting patterns in site assemblages and mortuary morphology. Although interpretations varied, explanations for change were usually linked to the movements of people. In 1939, a synthesis of this research was published and later expanded into the Central California Taxonomic System (CCTS) (Lillard et al. 1939). Later refined by Heizer (1949) and Beardsley (1948, 1954a, 1954b), the CCTS was characterized by specific artifact types, mortuary practices, and other cultural features.

Subsequent archaeological research was aimed at refining the CCTS and incorporating the study of paleoenvironmental change, settlement patterns, population movement, subsistence strategies, and development of exchange networks. These studies led to the development of a second approach. As absolute dates became available for sites with Early, Middle, and Late Horizon assemblages, it was discovered that sites with different assemblages were contemporaneous. This was particularly true with sites from the Early and Middle horizons. This discovery, along with a change in archaeological paradigms to a more economic and functional orientation in the 1960s, led to a reorganization of the CCTS. This new scheme used the same archaeological manifestations to differentiate sites, as did the CCTS, but ordered sites into functional groups rather than temporal ones, which led to the establishment of different cultural models for many localities of central California.

This approach was advanced by Fredrickson (1973), who used the term pattern to describe an “adaptive mode extending across one or more regions, characterized by particular technological skills and devices, and particular economic modes.” Three patterns were introduced: Windmiller, Berkeley, and Augustine. These patterns, while generally corresponding to the Early, Middle, and Late horizons within the Central Valley, were conceptually different and free of spatial and temporal constraints. By changing the paradigm from a cultural/historical orientation to a more processual/adaptive one and introducing the concept of pattern, Fredrickson addressed problems with the chronological and regional sequences that had been nagging archaeologists for several decades (cf. King 1974).

One problem with both approaches is that they have been based upon an archaeological record derived primarily from village sites. Although not a significant problem under a chronological framework, this presents a more substantial problem when an economic perspective is taken. Current understanding of the prehistoric valley settlement and subsistence systems is heavily biased toward large habitation sites adjacent to permanent water sources. These sites, by their very nature, can provide only limited information on the total economic system. Much more archaeological work is needed at ephemeral and peripheral sites located away from the larger habitation sites.

The taxonomic framework of the Sacramento Valley has been described in the following sections in terms of archaeological patterns, following Fredrickson’s (1973) system. A pattern is a general mode of life characterized archaeologically by technology, particular artifacts, economic systems, trade, burial practices, and other aspects of culture. Fredrickson’s (1973) periods are also employed in the discussion of Paleoindian (12,000–8000 BP), Lower Archaic (8000–5000 BP), Middle Archaic

(5000–2500 BP), Upper Archaic (2500–950 BP), Lower Emergent (950–450 BP), and Upper Emergent (450–150 BP) (White et al. 2002: Figure 15). In Fredrickson's use, periods served as arbitrary intervals that could be used to compare patterns over space and time. Only with the clear identification of pervasive temporal patterns would periods acquire specific archaeological meaning.

Terminal Pleistocene and Early Holocene: 13,500–7000 BP

At the end of the Pleistocene (roughly the beginning of the Paleoindian Period), circa 13,500 to 10,500 BP, parts of the Sierra Nevada adjacent to the Central Valley were covered with large glaciers (West et al. 2007:27), and the valley provided a major transportation route for animals and people. This transportation corridor, perhaps rivaled only by maritime coastal travel (Erlandson et al. 2007), was undoubtedly used heavily by early Californians. Evidence of human occupation during this period, however, is scarce, the hypothesized result of being buried by deep alluvial sediments that accumulated rapidly during the late Holocene (Westwood 2005:17).

Although rare, archaeological remains of this early period have been reported in and around the Central Valley. Johnson (1967:283–284) presents evidence for some use of the Mokelumne River area, under what is now Camanche Reservoir (50 miles northeast of the project), during the late Pleistocene. Archaeologists working at Camanche Reservoir found several lithic cores and a flake that are associated with Pleistocene gravels. These archaeological remains were grouped into what is called the Farmington Complex, characterized by core tools and large, reworked percussion flakes (Treganza and Heizer 1953:28). Recent geoarchaeological investigations at CA-STA-69 (in the vicinity of Farmington Complex–type site CA-STA-44), however, indicate that the Farmington Complex assemblage at the site is contained completely within Holocene alluvial terrace deposits, not Pleistocene glacial outwash deposits. These findings raise the question of whether reinvestigation of other Farmington Complex assemblages will reveal a Holocene assemblage (Rosenthal and Meyer 2004:96; Rosenthal et al. 2007:151).

The economy of the Central Valley residents during the late Pleistocene is thought to have been based upon the hunting of large Pleistocene mammals. Although no direct evidence of this exists in the Central Valley, the similarity of the artifact assemblages with those of other locations in western North America lends some support to the notion of a large-game economic focus. Much of the Pleistocene megafauna became extinct during the Pleistocene/Holocene transition. These extinctions were caused by warming temperatures, rising sea levels, and changing precipitation patterns. As the Central Valley gradually became both warmer and dryer, pine forests were replaced with vegetation similar to that found today. The rising sea level filled San Francisco Bay and created the Delta marshes. To survive without large game, people had to change their food procurement strategies to make use of a more diverse range of smaller plants and animals.

Middle to Late Holocene: 7000–1200 BP

Using a wider range of smaller resources meant people had to have access to larger areas of land to hunt and collect the food and other resources they needed. Small groups of people probably moved through the valley, foothills, and Sierra Nevada to take advantage of seasonally available resources and resources limited to particular ecozones. This mobile foraging strategy was essential to their survival.

Reliance upon a diverse number of smaller plants and animals had several consequences. First, people had to move around from one area to another to take advantage of the seasonal availability of particular resources. Second, large areas of land were needed to ensure that enough resources were available throughout the year. Third, more specialized tools were necessary to procure and process the wider range of plants and animals that were being used. This generalized subsistence strategy worked well for the inhabitants of the Central Valley for many millennia.

During the Lower Archaic Period, beginning approximately 6000 BP, a shift to a more specialized subsistence strategy began to take place. The more specialized strategy focused on ways of increasing the amount of food that could be produced from smaller portions of land. This change can be at least partially explained by the increasing numbers of people living in the Central Valley. An increased population is indicated by a much more abundant archaeological record and by dietary stress, as indicated by dental pathologies (Moratto 1984:203–204). As the population slowly increased, it became more difficult for people to obtain seasonally available resources across large areas of land. The beginnings of this intensification can be seen in the Middle-Archaic Windmiller Pattern (4500–2800 BP) and is based upon the assemblage at the Windmiller site (CA-SAC-107). The Windmiller Pattern shows evidence of a mixed economy of game procurement and use of wild plant foods. Artifacts and faunal remains at Windmiller sites include seeds, a variety of small game, and fish. The archaeological record contains numerous projectile points and a wide range of faunal remains. Hunting was not limited to terrestrial animals, as evidenced by fishing hooks and spears that have been found in association with the remains of sturgeon (Acipenser sp.), salmon (Oncorhynchus sp.), and other fish. Plants also were used, as indicated by ground-stone artifacts and clay balls that were used for boiling acorn mush. The bone tool industry appears minimal but includes awls, needles, and flakers. Other characteristic artifacts include charmstones, quartz crystals, bone awls and needles, and abalone (Haliotis sp.) and olive snail (Olivella sp.) shell beads and ornaments. Trade is reflected in the material from which utilitarian, ornamental, and ceremonial objects were produced (Moratto 1984).

Windmiller Pattern origins are believed to be linked to the arrival of Utian peoples from outside California who were adapted to riverine and wetland environments (Moratto 1984). Windmiller sites are concentrated on low rises or knolls within the floodplains of major creeks or rivers. Such locations provided protection from seasonal flooding and proximity to riverine, marsh, and valley grassland biotic communities. People with a Windmiller adaptation buried their dead in formal cemeteries (suggesting a degree of sedentism) both within and separate from their villages, in a ritual context that included the use of red ochre, often rich grave offerings, and ventral extension with a predominantly western orientation (although other burial positions, such as dorsal extension and flexed, and cremations are also known) (Moratto 1984).

Settlement strategies during the Windmiller Pattern reflect seasonal adaptations; habitation sites in the valley were occupied during winter, but populations moved into the foothills during summer (Moratto 1984). The earliest evidence of widespread occupation of the lower Sacramento Valley/Delta region comes from several sites assigned to the Windmiller Pattern (previously, Early Horizon), dated ca. 4500–2800 BP (Ragir 1972). Although the Windmiller Pattern is identified with the Delta, work at Camanche Reservoir has identified sites with Windmiller assemblages (Johnson 1967), indicating that other valley settings were also used by people exhibiting these adaptations (Beardsley 1948; Gerow 1974; Heizer 1949; Heizer and Fenenga 1939; Lillard et al. 1939; Ragir 1972; Schulz 1970).

Central Valley inhabitants responded to the Middle Archaic population increase in two ways. First, they used the marshlands of the Delta, which were much more extensive and richer in food resources than they are today. Second, they increased the use of the acorn as a food source. The acorn had been used before this time, but it became a much more predominant resource with specialized procurement and processing technologies. People following these strategies were more sedentary than they had been in the past, and village sites are found throughout the valley along rivers and near other areas with permanent sources of water. An economic shift from foraging to a collecting strategy probably occurred during the Middle Archaic.

The result of the settlement and subsistence reorientation was a coeval, adaptive pattern with the Windmiller Pattern labeled the Berkeley Pattern (3500–2500 BP) (Fredrickson 1973). Windmiller Pattern sites seem to occur with more frequency in or near the Delta, while Berkeley Pattern sites tend to be more prevalent farther north. Berkeley Pattern sites are more numerous and more widely distributed than Windmiller sites and are characterized by deep midden deposits, suggesting intensified occupation and a broadened subsistence base. The Berkeley Pattern also has a greater emphasis on the exploitation of the acorn as a staple. A reduction in the number of handstones and millingstones and an increase in the number of mortars and pestles reflect this greater dependence on acorns. Although gathered resources gained importance during this period, the continued presence of projectile points and atlatls (spear-throwers) in the archaeological record indicates that hunting was still an important activity (Fredrickson 1973). Fishing technology improved and diversified, suggesting greater reliance on riverine estuarine resources. This pattern is also noted for its especially well-developed bone industry and such technological innovations as ribbon flaking of chipped stone artifacts.

Material culture similarities to the Windmiller Pattern include mortars and millingstones, quartz crystals, charmstones, projectile points, shell beads and ornaments, and bone tools. New elements include steatite beads, tubes and ear ornaments, slate pendants, and burial of the dead in flexed positions with variable orientation or cremations accompanied by fewer grave goods. During this period, flexed burials are found alongside extended burials at CA-COL-247, contrary to the pattern elsewhere in the valley, which saw near exclusive use of flexed burials for interment of the deceased (Moratto 1984; Rosenthal et al. 2007:155; White 2003:175). The use of grave goods generally declined (Moratto 1984), and trade continued to be important (Beardsley 1948; Fredrickson 1973; Heizer and Fenenga 1939; Lillard et al. 1939; Moratto 1984).

A restricted land base, coupled with a more specialized resource base, meant that people had to develop economic relationships with other groups of people with different specialized resources living in other areas. Although resources and commodities were being exchanged throughout the region before this period, more extensive and more frequently used economic networks developed during this time. Transported resources likely included and commodities more visible in the archaeological record, such as shell and lithic materials (Rosenthal et al. 2007:155).

Late Horizon: 1200 BP to Historic Period

The trends toward specialization, exchange, and spatial circumscription that characterized prior periods continued in the Late Horizon. Population continued to increase, and group territories continued to become smaller and more defined. The Delta region of the Central Valley reached population density figures higher than almost any other area of North America (Chartkoff and Chartkoff 1984). Patterns in the activities, social relationships, belief systems, and material culture continued to develop during this period and took forms similar to those described by the first Europeans that entered the area.

The predominant generalized subsistence pattern during this period is called the Augustine Pattern (1200 BP) and shows a high degree of technological specialization (Fredrickson 1973).

Development of the Augustine Pattern was apparently stimulated by the southward expansion of Wintuan populations into the Sacramento Valley (Moratto 1984). The Augustine Pattern reflects a change in subsistence and land-use patterns to those of the ethnographically known people of the historic era. This pattern exhibits a great elaboration of ceremonial and social organization, including the development of social stratification. Exchange became well developed, and an even more intensive emphasis was placed on the use of the acorn, as evidenced by the presence of shaped mortars and pestles and numerous hopper mortars in the archaeological record.

Other notable elements of the artifact assemblage associated with the Augustine Pattern include flanged tubular smoking pipes, harpoons, clam shell disc beads, bone awls for basketry, bone whistles, stone pipes, and an especially elaborate baked clay industry, which includes figurines and pottery vessels (Cosumnes brownware). The presence of small projectile point types, referred to as the Gunther Barbed series, suggests the use of bow and arrow. Other traits associated with the Augustine Pattern include the introduction of pre-interment burning of offerings in a grave pit during a mortuary ritual, increased village sedentism, maintenance of extensive exchange networks, population growth, and an incipient monetary economy in which beads were used as a standard of exchange (Moratto 1984). Burials were flexed with variable orientation and generally lacked grave goods (Beardsley 1948; Fredrickson 1973; Moratto 1984; Ragir 1972).

Ethnographic Setting

Northern Valley Yokuts

The Project site was aboriginally inhabited by the Northern Valley Yokuts, whose territory is bound by the crest of the Diablo Range to the west and the Sierra Nevada foothills to the east. The southern boundary is approximately where the San Joaquin River bends northward, and the northern boundary is roughly halfway between the Calaveras and Mokelumne Rivers. The Yokuts may have been fairly recent arrivals in the San Joaquin Valley, perhaps being pushed out of the foothills about 500 years ago (Wallace 1978:462–470).

Population estimates for the Northern Valley Yokuts vary from 11,000 to more than 31,000. Populations were concentrated along waterways and on the more hospitable east side of the San Joaquin River. Clusters of villages made up tribelets that were governed by headmen. The number of tribelets is estimated to have been 30 to 40. Each tribe spoke its own dialect of the Yokuts language. (Shipley 1978:83-84).

Principal settlements were located atop low mounds, on or near the banks of larger watercourses. Settlements were composed of single-family dwellings, sweathouses, and ceremonial assembly chambers. Dwellings were small, lightly constructed, semisubterranean, and oval. The public structures were large and earth-covered. Sedentism was fostered by the abundance of riverine resources in the area (Wallace 1978:462–470).

Subsistence among the Northern Valley Yokuts revolved around the waterways and marshes of the lower San Joaquin Valley. Fishing with dragnets, harpoons, and hook and line yielded salmon, white sturgeon, river perch, and other species of edible fish. Waterfowl and small game that were attracted to the riverine environment also provided sources of protein. The contribution of big game to the diet was probably minimal. Vegetal staples included acorns, tule roots, and seeds (Wallace 1978:462–470).

Goods not available locally were obtained through trade. Paiute and Shoshone groups on the eastern side of the Sierra Nevada were suppliers of obsidian. Shell beads and mussels were obtained from Salinan and Costanoan groups to the west. Trading relations with Miwok groups to the north yielded baskets, bows, and arrows. Overland transport was facilitated by a network of trails and tule rafts were used for water transport (Wallace 1978:462–470).

Most Northern Valley Yokuts groups had their first contact with Europeans in the late 1700s, when the Spanish began exploring the Delta. The gradual erosion of Yokuts culture began during the mission period, when escaped neophytes brought foreign (both European and Native American) habits and tastes back to their native culture, and Spanish expeditions to recover them followed. Epidemics of European diseases played a large role in the decimation of the native population. As a result of intensive proselytizing by the Spanish missionaries from 1805 to the 1820s, several Yokuts were removed from their tribal lands and relocated to the Missions to the west (Merriam 1955:188–225).

The secularization of the missions and release of neophytes set tribal and territorial adjustments in motion. Former neophytes returned to Native American groups other than their group of origin, and several polyglot “tribes” were formed. The final blow to the aboriginal population came with the Gold Rush and its aftermath. In the rush to the mines, native populations were pushed out or exterminated. Many natives became dependent on the Gold Rush economy for their subsistence, drastically changing their ways of life. Former miners who settled in the fertile valley applied further pressure to the native groups and altered the landforms and waterways of the valley. Many Yokuts resorted to wage labor on farms and ranches. Others were settled on land set aside for them on the Fresno and Tule River Reserves (Wallace 1978:462–470).

Today’s North Valley Yokuts are descended from a group of tribes with an extensive aboriginal territory in the San Joaquin Valley. As many as 63 tribes of Yokuts, consisting of an estimated 35,000 people, occupied the valley from Mount Diablo in the north to the Sierra foothills. The nearest Yokuts tribe to the project vicinity may have been the Miumne. According to Latta, the Miumne were said to range “from the San Joaquin River west to the summit of the inner Mount Diablo range” (Latta 1999: 1–2, 126), which encompasses the project location. No ethnographic research beyond Latta’s could be found to associate the Miumne with North Valley Yokuts or any specific contemporary Yokuts group. North Valley Yokuts today have a cultural representative, but do not appear to have an organized tribal entity.

San Joaquin Valley Historic Overview

Background research conducted for the proposed project revealed several key themes that frame the historical context for which potentially affected resources are best understood: regional development and agricultural and irrigation development. A discussion of these themes follows.

Regional Development

Juan Rodriguez Cabrillo, sailing on behalf of Spain, is thought to have been the first European to have visited California when he landed in San Diego in 1542. Other than scattered coastal landings, European contact with Native Americans was rare until the latter part of the eighteenth century. Setting off from San Diego in 1769, a Spanish expedition led by Gaspar de Portolá travelled the California coast to as far north as Monterey. This led to the Spanish establishing Catholic missions throughout California, though none in the Central Valley. The purpose of the missions was to convert

Native peoples and firmly impose Spanish control over the region (Castillo 1978:99–104; Starr 2005:22–23, 32–37).

After its independence from Spain, in 1821, Mexico assumed control over California. Throughout the 1830s, Mexico closed the missions and sold former mission lands and previously unoccupied (by Euro-Americans) lands to Mexicans for cattle ranching. This led to further displacement of Native Americans throughout the region (Starr 2005:49–50; Castillo 1978:105).

The 1826–1827 fur-trapping expedition led by Jedediah Smith brought the earliest Anglo-Americans to the Central Valley. Another notable expedition into the area was that of United States Army General John C. Fremont, passing through the Valley in 1844. In 1848, the Treaty of Guadalupe ended the Mexican-American War, and transferred ownership of California from Mexico to the United States. Gold was discovered in Northern California the same year and brought a flood of hopeful miners and other settlers. Farming and cattle ranching quickly increased throughout the Valley in order to fulfill the needs of these new settlers (Starr 2005:57, 74, 78–83).

Merced County was established in 1855 after the division of Mariposa County into 10 separate counties (Parker 1881:86). In 1870, construction of the Stockton and Visalia Division of the Central Pacific Railroad began, branching off from Lathrop and running through the center of Merced County. The railroad line went through the city of Merced, which quickly grew and became the County seat the same year as the railroad's installation. The city centered around agricultural activities and cattle ranching. As early as the 1860s, irrigation projects had been carried out in order to supply the arid area with water from the region's drainages; wheat, fruits, nuts, and alfalfa were among the most important crops grown in the area (Parker 1881:86, 98, 170–180). Much more extensive and reliable irrigation systems came in the mid-twentieth century with the Central Valley Project and the California Water Project. The California Aqueduct flows in the project vicinity to the east (Kahrl 1978:21, 25, 46–57).

Irrigation and Agriculture Development

In its more than 150 years of existence, Merced County has grown into one of California's most agriculturally productive areas. The county, which owes its name to the Merced River, was carved out of the northwest section of Mariposa County when on April 17, 1855, the California legislature decided to subdivide the then 30,000-square-mile Mariposa County, the largest of the state's original 27 Counties. Merced County was largely a cattle-grazing and wheat-growing region in the central San Joaquin Valley and remained sparsely populated through the end of the nineteenth century. Barely 9,000 people lived in its boundaries in 1900, or fewer than 5 people per square mile. In spite of a 21 percent population increase between 2000 and 2010, the county remains one of the more sparsely populated in the state, with barely a quarter of a million people in its 2,000 square miles. Merced County, along with Stanislaus and Tulare Counties, remains one of the top three dairy production centers in the state, and one of the top agricultural centers in the nation.

Merced County's first Anglo-American settlers arrived with the Gold Rush generation. When the search for gold in the hills failed to result in riches, many sought opportunity in the Central Valley. Miners sought mostly meat and bread, so the area's first generation of settlers became farmers and ranchers focused on stock raising and wheat cultivation. The valley landscape and climate presented unique challenges and opportunities. Dry farming was the rule, and individual farms often ran into hundreds and thousands of acres (Radcliffe 1940:176–188).

Reclamation and irrigation began along the San Joaquin and Merced Rivers in the 1850s. Some farmers were able to irrigate their wheat with surface flooding, but most had to rely on rainfall. Dry-farmed wheat remained the area's most important crop even after the extended drought of the 1870s killed most of the valley's cattle. And though calls for effective irrigation schemes grew louder, it took another decade for the state government to attempt significant intervention (Radcliffe 1940:176–188; Igler 2001:60-91).

By 1880, there were barely 8,000 acres of irrigated land in Merced County. Because irrigation schemes were initiated by private capital seeking private benefit, they often depended on the dryness of the soil for inspiration. William Collier, the Merced County surveyor employed by Miller & Lux to expand their holdings in the area, was the first to organize a large-scale irrigation project. Though his Robla Canal Company never completed its ambitious scheme, it did lay the foundation for the Farmers' Canal Company, which incorporated in 1873. Later, landowner C. H. Huffman convinced the capitalist Charles Crocker to finance irrigation works in the 1870s to water a proposed agricultural empire. Huffman and Crocker eventually purchased the assets of the Farmers' Canal Company and created the Merced Canal and Irrigation Company in 1888 (Elliott and Moore 1881:175–178, 180; Radcliffe 1940:178–180; Igler 2001:72–73).

By 1900 the value of irrigated crops in the county surpassed those of dry farming (Radcliffe 1940:188). In any case, large grain farmers in the San Joaquin Valley resisted creating irrigation districts. It was not until several more drought- and flood-prone years did their resistance break. In 1909, San Joaquin Valley farmers created the South San Joaquin Irrigation District. In 1913 the state legislature passed a law that established California first regulatory body for the state's irrigation districts. The Merced Irrigation District was created in 1919 and in 1922 purchased the water rights of the Huffman-Crocker system. With more predictable water deliveries, dairy farming, fruit, and vegetable row crops expanded (Radcliffe 1940:179).

By the early 1920s the county had established itself as one of the most important agricultural centers in California. Historian John Outcalt's 1925 History of Merced County, California describes a dairy industry experiencing explosive growth since irrigation water made year-round forage available to feed a growing herd. In 1920 the county ranked fourth in the state in butterfat production, and by 1924 the county was home to more than 40,000 dairy cattle in addition to its 80,000 stock cattle (Outcalt 1925:250). The dairy industry in Merced County continued to grow during the post-World War II era.

Built Environment Historic Contexts

In 2018, AECOM prepared a *Historical Resource Inventory and Evaluation Report* for the ACE Extension Lathrop to Ceres/Merced Project (ACE Project) and developed a comprehensive historical overview and context applicable to this identification and evaluation of historic-age resources in the MITC built environment study area. The ACE Project spanned Stanislaus and Merced Counties in the San Joaquin Valley and included general thematic information from the Spanish period of the late 18th century to the post-World War II period, including specific contexts on the history of the San Joaquin Valley, railroad development, agricultural and water management, highway and road development, and World War II-era industry and postwar development (AECOM 2018:8-15).

The following historic contexts are based on AECOM's *Historical Resources Inventory and Evaluation Report, ACE Extension Lathrop to Ceres/Merced* from 2018 (AECOM 2018:8-15) and ICF's *Historical Resources Inventory and Evaluation Report, ACE Extension Ceres to Merced Extension* from 2021 (ICF

2021:5-1—5-6) with supplemental research to evaluate specific properties within the MITC built environment study area.

Historical Development of Western Merced

The majority of the built environment study area is roughly bounded by Ashby Road, SR 59, Santa Fe Drive, and Black Rascal Creek, which encompasses a light industrial region with the highest concentration of potential historic-period resources in the study area. Merced was established as a railroad town in 1872, and the study area just west of Merced was surrounded by an area farmed by Italian and Portuguese immigrants in the early 20th century; however, the study area does not appear to have been used for agriculture. A historic aerial photograph from 1946 shows surrounding areas developed as farms or orchards, but the study area remained undeveloped (Historic Aerials 1946). The area appears to have been vacant and undeveloped through the 1970s. Before 1976, the Southern Pacific Industrial Development Company, a subsidiary of the Southern Pacific Railroad, owned properties within this industrial portion of the study area. In the late 1970s, Cooper Avenue at the northeast of the industrial area appeared undeveloped or unpaved with no industrial buildings accessed along its alignment. The area was known as the Southern Pacific Industrial Park area of the broader Western Industrial Park (Merced Sun-Star 1976:1; 1977:1).

In June 1976 the Merced City Council approved $3.8 million for improvements to Improvement District No. 19 starting with 194 acres of the Southern Pacific Industrial Park within the Western Industrial Park area, with work expected to begin in July 1976 (Merced Sun-Star 1976:1).

By May 1977, representatives from the Southern Pacific Industrial Development Company, city officials, and community members gathered for a dedication of the Southern Pacific Industrial Park, "bounded by Black Rascal Creek, SR 59, existing industries and portions of Ashby Road," with a goal of filling the property within five to ten years (Merced Sun-Star 1977:1).

In January 1980, Manager Jack Kimberling of the Merced Chamber of Commerce reported that many companies had established operations in the Western Industrial Park. Merced Plumbing facility was located at 2200 Cooper Avenue as of December 1981 (Merced Sun-Star 1980:29; 1981:5). Other companies and buildings included the Ragu Foods plant (1785 Ashby Road), Stuart Radiator (2777 N. Highway 59), and Rheem Manufacturing (then accessed from the south via Ashby Road, now 2400 Cooper Avenue) (Merced Sun-Star 1974:23; 1975:22; 1976:1; 1976b:31; 1979:24;). A new building was constructed for 84 Lumber Company (2901 Highway 59). Advertisements for hiring manager trainees at the 84 Lumber Company facility at 2901 Highway 59 first appeared in September 1979, suggesting the facility was built sometime close to September 1979 (Merced Sun-Star 1979:24).

The large Merced Color Press plant (2201 Cooper Avenue) was a planned development in August 1980 and began printing operations by September 1981 (Merced Sun-Star 1980b:1; 1983:12). Allied Electric Motor Service Inc. opened a new commercial space at 2250 Cooper Avenue in late 1981 (Merced Sun-Star 1981b:26) and TV Guide moved to its new office space at 2130 Cooper Avenue in December 1982 (Merced Sun-Star 1982:22).

Transportation

Railroads in the San Joaquin Valley

In the 19th century, railroad construction established the settlement patterns of the San Joaquin Valley that define the area through the present day. The San Joaquin Valley was not a major destination for settlers who came to California at the start of the American Period following the end of the Mexican-American War in 1848. Settlers who did come were concentrated in the northern part of the San Joaquin Valley, primarily due to the Gold Rush which began in 1849. The Transcontinental Railroad was completed in the region by 1869, and settlement increased in the San Joaquin Valley. Rail provided easy passenger travel and efficient commercial transport of goods to and from large urban centers such as San Francisco and Sacramento. The towns of Lathrop and Manteca became major railroad stops by 1871 and 1873, respectively. Tracy, is located northwest of the Project location. was established in 1882 around the junction of three rail lines— the San Francisco Bay Area to San Joaquin County line, the northern line to Martinez County, and the southern line to Los Angeles (AECOM 2018:9). The Central Pacific Railroad arrived in Merced County in 1872, establishing the town of Merced in December, and connected the San Joaquin Valley to national markets, with wheat being a major local crop (County of Merced 2012:9-30).

Construction of the San Joaquin Valley mainline of the Southern Pacific Railroad (SPRR), which was originally known as the San Joaquin Valley Railroad, began in 1869. The railroad branched off the transcontinental line at the newly established town of Lathrop in San Joaquin County. From 1870 to 1880, the population of the San Joaquin Valley increased by 40 percent, and the SPRR established 50 stations in the San Joaquin Valley, 24 of which became town sites. Eight of those sites became major towns, including Modesto, Turlock, and Merced (AECOM 2018:9).

Highways and Roads

Automobiles and the construction of highways contributed to the growth and development of the San Joaquin Valley during the 20th century. The most important was State Route (SR) 99, a major roadway that connected San Joaquin Valley agricultural towns to larger urban markets. During the early 20th century, officials planned to connect different parts of California with a state highway system, which included a route from the Oregon state line through the Sacramento and San Joaquin valleys to Los Angeles. With the approval of bond issues in 1910, work began to establish Route 3, which ran from Oregon to Sacramento, and Route 4, which connected Sacramento and Los Angeles via the San Joaquin Valley. Portions of Route 3 north of Sacramento replaced the Siskiyou Trail, an old Native American trail, while other portions of the roadway along Route 4 followed the main lines of the SPRR. The combined routes were designated SR 99 in 1926 while portions of this route were still being paved. Development of the interstate highway system and construction of Interstate (I-) 5 and other interstate routes during the 1960s truncated SR 99, which now runs from near Wheeler Ridge in Kern County north to Red Bluff in Tehama County. A segment of SR 99 sits just outside the southern border of the study area, parallel to Ashby Road (AECOM 2018:12; County of Merced 2012:9-30).

Transportation during World War II

By the start of World War II, transit networks connected the San Joaquin Valley to the rest of the nation and the world, enabling the region to play a major role in war efforts. War-related industries and activities brought thousands of people to the San Joaquin Valley. Established in 1942, the San Joaquin Depot was made up of distribution facilities at three separate locations—Tracy, Sharpe (Lathrop), and Stockton’s Rough and Ready Island (California Military Department 2016). The depots received, stored, and shipped supplies throughout the United States and the Pacific overseas combat areas. In addition, Permanente Metals, a manufacturer of aircraft parts and magnesium bombs, came to Lathrop. Lathrop was an ideal location for a magnesium plant because a natural gas pipeline ran underneath the town and was a ready supplier to maintain the numerous furnaces required for production. Between 1942 and 1944, the plant became the most important source of magnesium in California, which was used to make aircraft parts and bombs (Hillman and Covello 1985).

Water Management and Irrigation

The San Joaquin Valley forms the southernmost part of the Great Central Valley. The region includes the counties of San Joaquin, Stanislaus, Merced, Madera, Fresno, Kings, Tulare, and Kern. Approximately one-third of the state's farmland lies in the San Joaquin Valley, and nearly 90 percent of the valley is currently under irrigation. No single river runs through the entire valley, although the San Joaquin River drains the northern portion of the valley and forms the core of the state's Delta region. Lake basins, once fed by runoff from the Sierra Nevada, formed the southern end of the valley. Early farming depended upon natural aquifers for irrigation, and on the reclamation of the Tulare and Buena Vista Lake Basins (Caltrans 2007:28).

Several irrigation districts emerged in the San Joaquin Valley during the late 19th and early 20th centuries. Irrigation districts were cooperations between public and private entities representing large portions of land that joined together to solve water distribution problems. Several of those districts were formed in the San Joaquin Valley. The Merced Irrigation District (MID) in Merced County traversed the study area (AECOM 2018:9). A segment of Bear Creek, part of the MID, sits within the study area at the intersection of W 16th Street and the UPRR railroad track alignment near North Bear Creek Court (AECOM 2018:9-12). A segment of Black Rascal Creek, part of the MID, sits just outside the study area's western border, while a segment of the project passes over Bear Creek.

The MID dates to 1919, although irrigation in southern Merced County began nearly 25 years earlier under the Crocker-Huffman Land and Water Company. Under ownership by C.H. Huffman, a prominent local farmer, and Charles F. Crocker, a banker and railroad magnate, the Crocker-Huffman Land and Water Company erected miles of canals with irrigation infrastructure stretching from Livingston to Merced, totaling almost 50,000 acres. In 1922, the MID purchased the existing system from the Crocker-Huffman Land and Water Company. After the purchase, the district began several projects, including the construction of the district's first dam, the Exchequer Dam (completed in 1926), providing hydroelectric power, and extending the canal system. During the 1960s, the district secured a license from the Federal Power Commission to expand power and irrigation networks along the Merced River, resulting in the construction of the second Exchequer Dam in 1964 and the McSwain Dam in 1967. Irrigation in Merced County enabled the conversion of its grain-heavy agricultural industry to the cultivation of grapes, peaches, plums, citrus fruits, olives, figs, nut trees, and a variety of vegetables. The diversification and intensification of farming in the San Joaquin Valley led to the growth of large agricultural communities during the 20th century. In addition to being able to grow a wide variety of crops, California also quickly became the cattle and dairy hub of the American West (Severn 2023).

The MID System and associated segments were evaluated for historical significance multiple times between 1993 and 2023. Most irrigation districts that functioned from the 1920s through the 1960s were a catalyst for agricultural diversification and an important influence on the growth of communities. Research and previous evaluations have not revealed that the MID has a specific association with irrigation, agricultural diversification, or community growth that must be considered important. Moreover, the canals and ditches that form the majority of the system have been altered substantially altered with modern concrete lining and are found to lack integrity of design, materials, workmanship, feeling, or association. Natural creeks that were integrated into the system reflect a natural, rather than cultural, resource and are not an integral part of the wider MID System. While the MID is part of the history of the study area, natural and built resources that are part of the MID do not possess historical significance (Severn 2023).

Industrial Development

Agriculture and Food Processing

The San Joaquin Valley is home to a wide variety of farming enterprises, ranging from smaller, intensively cultivated farms to large, extensive, industrial enterprises. Approximately one-third of the state's farmland lies in the San Joaquin Valley. The 1940s and 1950s saw increased irrigation water into the southern end of the valley through projects such as the California Valley Project (CVP). This greatly increased the variety of crops cultivated in the San Joaquin Valley (Caltrans 2007: 28). Along with the diversification of crops came allied industries, such as canning, packing, food machinery, and transportation services (Caltrans 2007: 55).

Cotton had been among the most important field crops in the valley since its introduction in 1871. Livestock was widely distributed throughout the valley floor, including the former home to the famous Miller and Lux cattle enterprise. Other products included milk, chickens, turkeys, eggs, and apiary products. Grain sorghum became important in the area after 1870 as a summer grain crop (Caltrans 2007: 28). Between 1890 and 1914, the California farm economy swiftly shifted from large-scale ranching and grain-growing operations to smaller-scale, intensive fruit cultivation. In addition to fruit, nuts are important crops, as are many other field crops (e.g., barley, beans, corn, hay, potatoes, sugar beets, and wheat) (Caltrans 2007:55). Citrus fruits were especially easy to transport in simple crates.

Transportation of vegetables seriously concerned early growers. Exorbitant shipping costs precluded widespread use of the Transcontinental Railroad during the 1870s as a primary source for distributing vegetable products. The lack of reliable cross-country refrigeration also made shipping precarious at best. The canning of both fruits and vegetables, particularly tomatoes, dramatically increased after 1900 (Caltrans 2007: 27). By the 1920s, the most common commercially canned vegetables included asparagus, string beans, peas, spinach, and tomatoes (Caltrans 2007: 68). Beginning prior to World War II, a shift in food processing occurred. Instead of purchasing raw or pure canned ingredients, more processed, manufactured foods were packaged and sold to consumers. (SurveyLA 2016: 131). New food processing plants were constructed in and around Merced after World War II.

Post-World War II Commercial Warehouses

The main function of warehouse buildings centers on goods (e.g., storing, processing, distributing, and often light manufacturing). By the nature of their use, warehouse buildings exhibit utilitarian features. Historically, several issues have inspired their design. Fire safety and theft prevention needs resulted in builders using thick masonry walls and fire-resistant materials, such as iron, for doors and shutters. The need to economize space led to the elimination of some features, such as interior ceilings and partitions, which resulted in a simplification of exterior ornamentation (Page & Turnbull, Inc. 2009:93).

Changing construction technologies allowed builders to adapt warehouse designs from load-bearing brick to concrete construction. In 1916, the creation of the forklift enabled warehouses to be organized more compactly, eventually changing the building typology from a multi-story to a single-story construction. Because of their utilitarian nature, warehouses often have compact rectangular footprints, with building heights made to accommodate multiple stacked shipping pallets for storage. During the post-World War II period, warehouse development increased across the nation as the industry became decentralized by automobile and truck transportation (Munce 1960:54–55).

As technology improved, warehouses became less dependent on ventilation and natural light. Lighting, air-conditioning, and heating systems were eventually moved inside warehouses, which stripped exterior façades to having few or no windows, further reducing exterior detail. Additionally, as building materials improved, low-cost prefabrication options further stripped warehouse façades. Most warehouses became utilitarian buildings with simple footprints, boxed massing, flat roofs, and modest siding with exposed concrete or concrete blocks. Hybrid commercial warehouse buildings are often zoned for commercial use, but their exteriors resemble standard warehouses. Commercial warehouse buildings emerged from the post-World War II era. During that time, builders across the United States erected commercial warehouses, warehouses, and light-industrial buildings at city peripheries, in areas outside of older downtowns where trucking and shipping of goods could be accommodated. Often cities zoned such developments nearby but not intermixed with new housing developments. Commercial warehouses usually contain smaller business enterprises than dedicated warehouses; they contain space for warehouse use (e.g., storing, processing, and distributing goods), as well as consumer use with designated space for retail activities (Munce 1960:47–48).

Commercial warehouse buildings have architectural elements of the standard warehouse typology. Key features include a rectangular footprint, one-story height, simple massing, raised foundation with loading docks, roll-up doors for vehicular use, minimal fenestration or complete lack of windows, utilitarian style, often with no ornamentation, prefabricated materials, and simple siding.

In addition to their warehouse function, commercial warehouse buildings also feature architectural elements representing their commercial use, such as a discernable primary entrance, often with glazed doors, interior space for visitors, such as product showrooms, building signage displaying a product name, and adjacent parking for visitors. Finally, some smaller commercial warehouse properties have less interior storage space and rely on paved outdoor lots or yards for mechanical equipment, materials, or vehicles (ICF 2021:5-2). The bulk of the properties north of Bear Creek appear to be light industrial and commercial warehouse buildings, including the old Ragu tomato processing plant at 1785 Ashby Road, as well as parcels along Cooper Avenue and SR 59.

3.5.3.3 Summary of Known CEQA Historical Resources and Unevaluated Resources

Archaeological Resources

As described in Section 3.5.3.1, *Cultural Resources Data Sources*, the record search conducted at the CCAIC did not identify any previously recorded archaeological resources within the archaeological resources study area or the ¼-mile buffer.

An archaeological pedestrian reconnaissance survey of the study area for the Project was conducted on May 2, 2024. The study area is characterized by a mix of railroad riprap, vegetated areas surrounding the railroad, and paved surfaces. No archaeological resources were observed during the survey.

Built Environment

A built environment reconnaissance survey of the built environment study area for the Project and Variants was conducted in August 2023. The built environment study area contains historic-period buildings and structures related to transportation, irrigation and agriculture, food processing, light industrial buildings, and warehouses. Railroad-related properties throughout the built environment study area include segments of the SPRR's San Joaquin Valley Railroad main line, and segments of the Burlington Northern Santa Fe Railroad (BNSF). An in-depth discussion of these historical resources, including their locations (assigned Map ID numbers), is provided in the Historical Resources Inventory and Evaluation Report in Appendix 3.5-1.

Overall, 12 historic-period built environment resources were identified in the built environment study area. Historic-period resources were defined as properties 45 years old or older at the time of the built environment reconnaissance survey and properties less than 45 years old with exceptional significance.

- 12 resources were previously recorded, including:
    - 5 resources were identified by CHRIS records searches; and
    - 7 resources were identified through supplemental research
- No resources were newly recorded as part of the Historical Resources Inventory and Evaluation Report prepared for the Project.

Of the 12 historic-period resources in the built environment study area:

- 1 resource is "listed in or eligible for the NRHP, CRHR, and/or local registers, either as individual resources or contributors to a district," and is considered historical resources for the purposes of CEQA; and
- 11 resources are ineligible for the NRHP, CRHR, and/or local registers.

Table 3.5-1 describes the built environment historical resource located within the built environment study area, which is the Central Pacific Railroad (San Joaquin Valley Main Line or Eastern Line)/ Southern Pacific Railroad San Joaquin Valley Main Line (P-24-000097; Map ID #82).

The previous studies of the San Joaquin Valley Main Line have noted the important role the line played not just in the commerce of the region but the broad role the railroad played in the pioneering era of settlement. The Southern Pacific created towns that today serve as major population centers in the San Joaquin Valley, such as Merced. The San Joaquin Valley Main Line served as the first all-weather transportation system within the valley, and eventually connected Southern California with both the San Joaquin Valley and Sacramento, as well as points east. The importance of this first line in the area is therefore significant to the agricultural, commercial, and community development of this region. Without it, many towns, other rail lines, industries, and agriculture within the valley would not have developed in the same way.

Table 3.5-1. CEQA Historical Resources (Built Environment) in the Study Area

Map ID#[a]	Resource Identifier	Address/Resource Name, Type, Description	City, County	Period of Significance	Current Evaluation CHR Status Code	Applicable Criteria	Nearest Project Facility
MR 82	P-24-000097	Central Pacific Railroad (San Joaquin Valley Main Line or Eastern Line)/ Southern Pacific Railroad San Joaquin Valley Main Line[b]	Multiple	1868-1874	3S, 3CS	NRHP A CRHR 1	New aerial guideway from the west side of the proposed integrated Merced HSR Station continuing parallel to the ACE UPRR corridor, spanning Bear Creek and the 16th Street/SR 59 intersection; spur realignment

Notes:

[a] Map ID#s correspond to location of resources provided in Figure 3.5-1 and the Historical Resources Inventory and Evaluation Report in Appendix 3.5-1.

[b] This is referred to as the ACE UPRR industrial spur throughout this EIR.

NRHP = National Register of Historic Places

CRHR = California Register of Historical Resources

CHR = California Historical Resource

CHR Status Codes (California Office of Historic Preservation 2003)

3S = Appears eligible for NRHP as an individual property through survey evaluation.

3CS = Appears eligible for CRHR as an individual property through survey evaluation.

The Southern Pacific San Joaquin Valley Main Line is eligible for listing in the NRHP and CRHR as an individual resource under Criterion A/1, at the local level of significance, as the pioneer railroad throughout the eastern San Joaquin Valley. Character-defining features for the resource include the railroad's alignment through the San Joaquin Valley, its continued function as a railroad, its heavy-gauge single track, and its setting within the rural and urban areas of the eastern San Joaquin Valley. The period of significance dates to the construction of the line throughout the San Joaquin Valley, 1868-1874, when the line's current alignment was established. The resource retains sufficient integrity to its period of significance (1868-1874). The resource retains its key aspects of integrity; its alignment (location), use (association), and setting are intact. The rail line remains a single track through the built environment study area.

3.5.4 Impact Analysis

This section describes the environmental impacts of the Project on cultural resources. This section also 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.

3.5.4.1 Methods for Analysis

Methods

This section describes the methods used to evaluate impacts on cultural resources.

Existing data pertaining to both historic built resources and archaeological resources were studied to determine the presence of cultural resources within the study area and to assess the impacts of the Project on those resources. Impacts were considered significant if construction or operation could cause a substantial adverse change in the significance of a historical resource. Substantial changes could be caused by direct and indirect impacts.

Activities that cause direct impacts on archaeological resources are typically associated with construction, including ground disturbance, or the material or physical alteration of the environment for excavation, staging, heavy equipment usage and movement, drilling, demolition, and relocation. Direct impacts on built environment resources result from physical changes to a property (such as demolition, physical alterations, or a partial right-of-way acquisition that could change the historic setback of built environment historical resources within a parcel), that would affect the character-defining features and integrity of the resource that conveys its significance. Other direct impacts on built-environment resources include those impacts that affect the setting and feeling of the historic resource, including visual, sound, and vibration impacts or changes resulting from construction or operation of the Project.

Potential indirect impacts include all potential impacts that may result from construction of the Project but would occur later in time or would be further removed in distance. Potential indirect impacts on archaeological resources would primarily result from increased human activity or population growth in the vicinity. Such activity could lead to increased construction and recreation in the area, which could potentially damage archaeological resources. Potential indirect impacts on built-environment historical resources would similarly result from changes in human activities. Both increased use could cause impacts, or decreased use could cause an impact through neglect. No potential for indirect impacts were identified at the time of preparing the Draft EIR.

The following Impact analysis has been completed for the purposes of CEQA and considers the impacts of the Project and variants on the cultural resources identified in the study area. The impact analysis considers whether the Project and variants would cause a substantial change in the significance of the identified cultural resources. The impact analysis assesses the temporary and permanent direct and indirect impacts from construction and operations and analyzes if the impacts are significant or less-than-significant . In general, impacts would be in the form of permanent impacts from the construction of the Project and variants, as opposed to its operations.

Principal Sources

In addition to the Historical Resources Inventory and Evaluation Report prepared for the Project (Appendix 3.5-1) and the Archaeological Resources Study Report prepared for the Project (Appendix 3.5-2), the following sources were consulted for the impact analysis:

- AECOM. 2018. *Historical Resource Inventory and Evaluation Report, ACE Extension Lathrop to Ceres/Merced*. Draft. Prepared for the Federal Railroad Administration and San Joaquin Regional Rail Commission.
- ICF. 2021. *ACE Ceres–Merced Extension Project. Historical Resource Inventory and Evaluation Report*. March. (ICF 00144.20) Sacramento, CA. Prepared for San Joaquin Regional Rail Commission, Stockton, CA.
- MITC Project Footprint KMZ file.

3.5.4.2 Thresholds of Significance

The CEQA Guidelines Appendix G (14 California Code of Regulations § 15000 et seq.) has identified significance criteria to be considered for determining whether a project could have significant impacts on cultural resources.

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

- Cause a substantial adverse change in the significance of a historical resource pursuant to Section 15064.5.
- Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5.
- Disturb any human remains, including those interred outside of dedicated cemeteries.

3.5.4.3 Impacts and Mitigation Measures

Impact CUL-1	Construction of the Project would not cause a substantial adverse change in the significance of a historical resource pursuant to Section 15064.5.
Level of Impact	**Less-than-significant impact**

Project

Impact Characterization

Direct impacts are defined as those resulting from building the Project, its associated infrastructure, and related physical changes. The Project would include the following improvements to the existing spur line of the SPRR (referred to as the ACE UPRR industrial spur throughout this EIR):

- Realignment of approximately 3,200 feet of ACE UPRR industrial spur from the UPRR mainline at MP 149.53 into the industrial park. For this location, the shifting would include construction of a new industrial spur in the proposed location adjacent to the existing track and removal of the old track.
- Replacement of the existing ACE UPRR industrial spur bridge crossing Bear Creek, which would include construction of a new bridge followed by demolition of the existing bridge.
- Modification of the 16th Street / SR 59 intersection due to the realignment of the industrial track crossing.

Additionally, a new elevated viaduct would be constructed over a section of the SPRR main line. Thus, construction of the Project would change the route and location of a spur line of the SPRR through the San Joaquin Valley (Map ID #82 in Figure 3.5-1). The SPRR main line is a historical resource. The spur line runs north from the main line and follows an alignment from the early 20th century. The spur line is carried over Bear Creek by a wood trestle bridge. Overall, as part of the Project, the alignment of this spur would be changed, the wood bridge would be demolished, and a new bridge would be constructed. No substantial changes would be made to the location where the spur connects with the main line. Several buildings and structures would also be demolished as part of the Project (refer to Section 2.6, *Right-of-Way and Easement Needs*, in Chapter 2, *Project Description*). However, these buildings and structures are not historical resources. Furthermore, there are no historical resources adjacent to other elements of the Project, such as the construction adjacent to the UPRR right-of-way and properties along W 16th Street.

Impact Details and Conclusions

Construction of the Project would directly affect a segment of the SPRR mainline through the San Joaquin Valley (Map ID #82 in Figure 3.5-1). The line is eligible under NRHP/CRHR Criteria A/1. The SPRR mainline through the San Joaquin Valley is eligible for listing in the NRHP/CRHR as an individual resource under NRHP/CRHR Criterion A/1 at the local level of significance as the pioneer railroad throughout the eastern San Joaquin Valley. Character-defining features for the resource include the railroad's alignment through the San Joaquin Valley, its continued function as a railroad, its heavy-gauge track, and its setting within the rural and urban areas of the eastern San Joaquin Valley. The period of significance dates to the construction of the line throughout the San Joaquin Valley, 1868–1874, when the line's current alignment was established. Overall, the route remains the same as during its initial phase of construction. The alignment runs from Lathrop to Los Angeles; therefore, the boundaries for the resource extend beyond the built environment study area. Only a segment of the railroad falls within the study area.

The Project would demolish a spur track and the wood trestle bridge that carries it over Bear Creek. Within the boundary and setting of the SPRR main line historical resource, the Project would construct a new bridge carrying the realigned spur across Bear Creek. Additionally, an elevated viaduct would cross over the main line south of W 16th Street and east of Bear Creek. Foundations for the aerial guideway would be constructed adjacent to the realigned spur track.

The changes to the alignment of the spur track as part of the Project would not diminish the integrity of the SPRR main line such that it would no longer convey significance. The spur track is not identified as a character-defining feature of the main line that reflects the significance of the main line under NRHP/CRHR Criterion A/1 as the pioneer railroad throughout the eastern San Joaquin Valley. The spur track within the study area serviced an area of Merced that remain vacant and undeveloped through the mid-20th century and did not influence the development of towns or industries within the San Joaquin Valley. Thus, it does not reflect or convey the same significance as the main line. Trestle bridges supporting spur lines have not been identified as character-defining features of the SPRR main line. These bridges are common accommodations for crossings. The SPRR derives its significance not from engineering or design, but for its influence over the development of the region, which is not reflected by the spur or bridge. The alignment and function of the main line would remain intact with the realignment of the spur and demolition of the bridge.

The Project could affect one of the resource's key aspects of integrity: setting. The setting could be compromised from its historic period by the construction of the proposed raised viaduct. Despite the addition of Highway 99 and larger towns and cities through which the rail passes, there is no doubt that the historic purpose of the rail line, which is to increase commerce, broaden the reach of transportation through California and the eastern San Joaquin Valley, and provide linkages to agricultural regions continues despite changes to the setting of the SPRR main line since its initial construction. The raised viaduct is consistent with the evolution of the resource's setting in the second half of the 20th century as highway infrastructure and expanding urban areas have changed the setting of the railroad, removed and altered spur lines, and crossed over segments of the line in urban environments. Despite these changes, the SPRR main line continues to convey historic significance through continued use, reasonably evolved setting, and location. The SPRR main line would retain the integrity needed to convey its significance and eligibility for listing in the NRHP and CRHR. Thus, the Project would not have a substantial adverse change in the significance of a historical resource and the impact of the Project would be less than significant.

Variant H1

Impact Characterization

Construction of Variant H1 would demolish a spur line on a wood trestle bridge connected to the SPRR mainline through the San Joaquin Valley (Map ID #82 in Figure 3.5-1), a historical resource. The variant would also construct a viaduct over the main line. The SPRR main line would continue to convey historic significance through continued use, reasonably evolved setting, and location.

Impact Details and Conclusions

The potential for impacts on historical resources under Variant H1 is the same as described for the Project and the impact would be less than significant.

Variant H2

Impact Characterization

Construction of Variant H2 would demolish a spur line on a wood trestle bridge connected to the SPRR mainline through the San Joaquin Valley (Map ID #82 in Figure 3.5-1), a historical resource. The variant would also construct a viaduct over the main line. The SPRR main line would continue to convey historic significance through continued use, reasonably evolved setting, and location.

Impact Details and Conclusions

The potential for impacts on historical resources under Variant H2 is the same as described for the Project and the impact would be less than significant.

Variant H3

Impact Characterization

Construction of Variant H3 would demolish a spur line on a wood trestle bridge connected to the SPRR mainline through the San Joaquin Valley (Map ID #82 in Figure 3.5-1), a historical resource. The variant would also construct a viaduct over the main line. The SPRR main line would continue to convey historic significance through continued use, reasonably evolved setting, and location.

Impact Details and Conclusions

The potential for impacts on historical resources under Variant H3 is the same as described for the Project and the impact would be less than significant.

Impact CUL-2	Construction of the Project could cause a substantial adverse change in the significance of a previously unrecorded archaeological resource pursuant to Section 15064.5.
Level of Impact	**Potentially significant impact**
Mitigation Measures	CUL-2.1: Stop Work if Archaeological Material or Features Are Encountered during Ground-Disturbing Activities
Level of Impact After Mitigation	**Less-than-significant impact**

Project

Impact Characterization

The Project footprint is generally located on lands that have been previously disturbed or within the existing UPRR and BNSF rights-of-way. Previous disturbance does not preclude the potential to affect cultural deposits, and, therefore, areas of heightened cultural sensitivity remain. No previously recorded archaeological resources were identified within the archaeological resources study area or the ¼-mile buffer.

Impact Details and Conclusions

Because there are no known archaeological resources within the study area, construction of the Project would not cause a substantial adverse change in the significance of a known archaeological resource pursuant to Section 15064.5. As a result of ground-disturbing activities, previously unrecorded archaeological resources could be encountered and adversely affected, which would be a potentially significant impact.

Mitigation Measures

Mitigation Measure CUL-2.1: Stop Work if Archaeological Material or Features Are Encountered during Ground-Disturbing Activities

If a potentially significant subsurface cultural resource is encountered during ground-disturbing activities on any parcel in the city or County, all construction activities within a 100-foot radius of the find will cease until a qualified archeologist (i.e., one who meets the Secretary of the Interior's professional qualifications for archaeology or one under the supervision of such a professional) that has been hired by the SJJPA or its contractor(s) determines whether the resource requires further study. Following notification, the qualified archaeologist should make a preliminary assessment of the discovery to determine monitoring and/or preparing a testing and data recovery plan. If the find is determined to be either isolated or recent, construction should be allowed to resume. Any previously undiscovered resources found during construction activities will be recorded on appropriate California Department of Parks and Recreation forms and evaluated for significance in terms of CEQA criteria by a qualified archeologist. If the resource is determined significant under CEQA, the qualified archaeologist will prepare and implement a research design and archaeological data recovery plan that will capture those categories of data for which the site is significant. The archaeologist will also perform appropriate technical analyses; prepare a comprehensive report complete with methods, results, and recommendations; and provide for the permanent curation of the recovered resources. The report will be submitted to the City of Merced, Northwest Information Center, and State Historic Preservation Officer, if required.

Significance with Application of Mitigation

With implementation of Mitigation Measure CUL-2.1, impacts related to archaeological resources during construction of the Project would be less than significant.

Variant H1

Impact Characterization

Variant H1 is generally located on lands that have been previously disturbed or within the existing UPRR and BNSF rights-of-way. Previous disturbance does not preclude the potential to affect cultural deposits, and, therefore, areas of heightened cultural sensitivity remain. Construction of Variant H1 would disturb an additional 15 acres and could result in increased potential to affect cultural deposits compared to the Project. No previously recorded archaeological resources were identified within the study area or the ¼-mile buffer.

Impact Details and Conclusions

The potential for impacts related to archaeological resources under Variant H1 is the same as described for the Project and would be a potentially significant impact.

Mitigation Measures

Mitigation Measure CUL-2.1: Stop Work if Archaeological Material or Features Are Encountered during Ground-Disturbing Activities

Significance with Application of Mitigation

With implementation of Mitigation Measure CUL-2.1, impacts related to archaeological resources during construction of Variant H1 would be less than significant.

Variant H2

Impact Characterization

Variant H2 is generally located on lands that have been previously disturbed or within the existing UPRR and BNSF rights-of-way. Previous disturbance does not preclude the potential to affect cultural deposits, and, therefore, areas of heightened cultural sensitivity remain. No previously recorded archaeological resources were identified within the study area or the ¼-mile buffer.

Impact Details and Conclusions

The potential for impacts related to archaeological resources under Variant H2 is the same as described for the Project and would be a potentially significant impact.

Mitigation Measures

Mitigation Measure CUL-2.1: Stop Work if Archaeological Material or Features Are Encountered during Ground-Disturbing Activities

Significance with Application of Mitigation

With implementation of Mitigation Measure CUL-2.1, impacts related to archaeological resources during construction of Variant H2 would be less than significant.

Variant H3

Impact Characterization

Variant H3 is generally located on lands that have been previously disturbed or within the existing UPRR and BNSF rights-of-way. Previous disturbance does not preclude the potential to affect cultural deposits, and, therefore, areas of heightened cultural sensitivity remain. No previously recorded archaeological resources were identified within the study area or the ¼-mile buffer.

Impact Details and Conclusions

The potential for impacts related to archaeological resources under Variant H3 is the same as described for the Project and would be a potentially significant impact.

Mitigation Measures

Mitigation Measure CUL-2.1: Stop Work if Archaeological Material or Features Are Encountered during Ground-Disturbing Activities

Significance with Application of Mitigation

With implementation of Mitigation Measure CUL-2.1, impacts related to archaeological resources during construction of Variant H3 would be less than significant.

Impact CUL-3	Construction of the Project could disturb previously undiscovered human remains, including those interred outside of dedicated cemeteries.
Level of Impact	**Potentially significant impact**
Mitigation Measures	CUL-3.1: Comply with State Laws Relating to Human Remains
Level of Impact After Mitigation	**Less-than-significant impact**

Project

Impact Characterization

The Project would be generally located on lands that have been previously disturbed or within the existing UPRR and BNSF rights-of-way. Previous disturbance does not preclude the potential to affect cultural deposits, and, therefore, areas of heightened cultural sensitivity remain. Construction of the Project would have the potential to damage previously undiscovered human remains during ground-disturbing activities.

Impact Details and Conclusions

As a result of ground-disturbing activities, human remains could be encountered and adversely affected, which would be a potentially significant impact.

Mitigation Measures

Mitigation Measure CUL-3.1: Comply with State Laws Relating to Human Remains

In the event that human remains are discovered during Project construction, the following protocol should be implemented:

- If human remains are encountered, State Health and Safety Code Section 7050.5 states that no further disturbance shall occur until the county coroner or medical examiner has made a determination of origin and disposition pursuant to PRC Section 5097.98. All construction activity should be immediately halted within 100 feet of the discovery and SJJPA should be informed. SJJPA should then immediately contact the Merced County Medical Examiner & Coroner as well as the qualified archaeologist, if not already present. The medical examiner shall have 2 working days to inspect the remains after receiving notification. During that time, all remains, associated soils, and artifacts should remain in situ and be protected from public viewing. SJJPA should take appropriate measures to protect the discovery site from disturbance during any negotiations. This may include restricting access to the discovery site and hiring 24-hour security.

- If the remains are determined to be Native American and not under the medical examiner's jurisdiction, within 24 hours, the medical examiner shall notify the NAHC, which shall determine and notify a Most Likely Descendant (MLD). With the permission of SJJPA, the MLD may inspect the site of the discovery. The MLD shall complete the inspection within 48 hours of notification by the NAHC. The MLD may recommend scientific removal and nondestructive analysis of human remains and items associated with Native American burials. Work should be suspended within a 100-foot radius of the human remains until the MLD's recommendations are implemented.
- The qualified archaeologist should work with the MLD with regard to the treatment of the remains and all associated funerary objects and ensure that any identified human remains are secured while they are left in place and treatment decisions are in progress. Information concerning the discovery shall not be disclosed pursuant to the specific exemption set forth in California Government Code Section 6254.5(e).

Significance with Application of Mitigation

With implementation of Mitigation Measure CUL-3.1, impacts related to human remains during construction of the Project would be less than significant.

Variant H1

Impact Characterization

Variant H1 is generally located on lands that have been previously disturbed or within the existing UPRR and BNSF rights-of-way. Previous disturbance does not preclude the potential to affect cultural deposits, and, therefore, areas of heightened cultural sensitivity remain. Construction of Variant H1 would disturb an additional 15 acres and could result in increased potential to encounter human remains compared to the Project. Construction of Variant H1 would have the potential to damage previously undiscovered human remains during ground-disturbing activities.

Impact Details and Conclusions

The potential for impacts related to human remains under Variant H1 is the same as described for the Project and would be a potentially significant impact.

Mitigation Measures

Mitigation Measure CUL-3.1: Comply with State Laws Relating to Human Remains

Significance with Application of Mitigation

With implementation of Mitigation Measure CUL-3.1, impacts related to human remains during construction of Variant H1 would be less than significant.

Variant H2

Impact Characterization

Variant H2 is generally located on lands that have been previously disturbed or within the existing UPRR and BNSF rights-of-way. Previous disturbance does not preclude the potential to affect cultural deposits, and, therefore, areas of heightened cultural sensitivity remain. Construction of

Variant H2 would have the potential to damage previously undiscovered human remains during ground-disturbing activities.

Impact Details and Conclusions

The potential for impacts related to human remains under Variant H2 is the same as described for the Project and would be a potentially significant impact.

Mitigation Measures

Mitigation Measure CUL-3.1: Comply with State Laws Relating to Human Remains

Significance with Application of Mitigation

With implementation of Mitigation Measure CUL-3.1, impacts related to human remains during construction of Variant H2 would be less than significant.

Variant H3

Impact Characterization

Variant H3 is generally located on lands that have been previously disturbed or within the existing UPRR and BNSF rights-of-way. Previous disturbance does not preclude the potential to affect cultural deposits, and, therefore, areas of heightened cultural sensitivity remain. Construction of Variant H3 would have the potential to damage previously undiscovered human remains during ground-disturbing activities.

Impact Details and Conclusions

The potential for impacts related to human remains under Variant H3 is the same as described for the Project and would be a potentially significant impact.

Mitigation Measures

Mitigation Measure CUL-3.1: Comply with State Laws Relating to Human Remains

Significance with Application of Mitigation

With implementation of Mitigation Measure CUL-3.1, impacts related to human remains during construction of Variant H3 would be less than significant.

Impact CUL-4	Operation of the Project would not cause a substantial adverse change in the significance of a historical resource pursuant to Section 15064.5.
Level of Impact	**No impact**

Project

Impact Details and Conclusions

During operation of the Project, the SPRR main line (ACE UPRR) would continue to convey historic significance through continued use, reasonably evolved setting, and location. Operation of the Project would not cause a substantial adverse change in the significance of a historical resource pursuant to Section 15064.5, and there would be no impact.

Variant H1

Impact Details and Conclusions

During operation of the Project, the SPRR main line (ACE UPRR) would continue to convey historic significance through continued use, reasonably evolved setting, and location. Operation of Variant H1 would not cause a substantial adverse change in the significance of a historical resource pursuant to Section 15064.5, and there would be no impact.

Variant H2

Impact Details and Conclusions

During operation of the Project, the SPRR main line (ACE UPRR) would continue to convey historic significance through continued use, reasonably evolved setting, and location. Operation of Variant H2 would not cause a substantial adverse change in the significance of a historical resource pursuant to Section 15064.5, and there would be no impact.

Variant H3

Impact Details and Conclusions

During operation of the Project, the SPRR main line (ACE UPRR) would continue to convey historic significance through continued use, reasonably evolved setting, and location. Operation of Variant H3 would not cause a substantial adverse change in the significance of a historical resource pursuant to Section 15064.5, and there would be no impact.

Impact CUL-5	Operation of the Project could cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5.
Level of Impact	**Potentially significant impact**
Mitigation Measures	CUL-2.1: Stop Work if Archaeological Material or Features Are Encountered during Ground-Disturbing Activities
Level of Impact After Mitigation	**Less-than-significant impact**

Project

Impact Characterization

No previously recorded archaeological resources were identified within the archaeological resources study area or the ¼-mile buffer. Therefore, ground disturbance associated with operation of the Project would not affect known archaeological resources.

Impact Details and Conclusions

Operation maintenance activities would include routine removal of woody debris, sediment, and other materials that accumulate near the piers of the bridges. Maintenance activities within the rail corridor also include tree pruning and removal, annual vegetation trimming, and herbicide application.

Precontact (Native American) archaeological sites are known to exist in the region. Therefore, although it is unlikely that ground disturbance associated with operation of the Project would affect unknown archaeological resources, the possibility cannot be eliminated. In the event that previously unknown archaeological resources are encountered during ground disturbance related to operation of the Project, a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5 could occur. This would be a potentially significant impact.

Mitigation Measures

Mitigation Measure CUL-2.1: Stop Work if Archaeological Material or Features Are Encountered during Ground-Disturbing Activities

Significance with Application of Mitigation

With implementation of Mitigation Measure CUL-2.1, impacts on archaeological resources during operation of the Project would be less than significant.

Variant H1

No previously recorded archaeological resources were identified within the study area or the ¼-mile buffer. However, as a result of ground-disturbing activities, previously unknown archaeological resources could be encountered and adversely affected.

Impact Details and Conclusions

In the event that previously unknown archaeological resources are encountered during ground disturbance related to operation of Variant H1, a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5 could occur. This would be a potentially significant impact.

Mitigation Measures

Mitigation Measure CUL-2.1: Stop Work if Archaeological Material or Features Are Encountered during Ground-Disturbing Activities

Significance with Application of Mitigation

With implementation of Mitigation Measure CUL-2.1, impacts on archaeological resources during operation of Variant H1 would be less than significant.

Variant H2

Impact Characterization

No previously recorded archaeological resources were identified within the study area or the ¼-mile buffer. However, as a result of ground-disturbing activities, previously unknown archaeological resources could be encountered and adversely affected.

Impact Details and Conclusions

In the event that previously unknown archaeological resources are encountered during ground disturbance related to operation of Variant H2, a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5 could occur. This would be a potentially significant impact.

Mitigation Measures

Mitigation Measure CUL-2.1: Stop Work if Archaeological Material or Features Are Encountered during Ground-Disturbing Activities

Significance with Application of Mitigation

With implementation of Mitigation Measure CUL-2.1, impacts on archaeological resources during operation of Variant H2 would be less than significant.

Variant H3

Impact Characterization

No previously recorded archaeological resources were identified within the study area or the ¼-mile buffer. However, as a result of ground-disturbing activities, previously unknown archaeological resources could be encountered and adversely affected.

Impact Details and Conclusions

In the event that previously unknown archaeological resources are encountered during ground disturbance related to operation of Variant H3, a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5 could occur. This would be a potentially significant impact.

Mitigation Measures

Mitigation Measure CUL-2.1: Stop Work if Archaeological Material or Features Are Encountered during Ground-Disturbing Activities

Significance with Application of Mitigation

With implementation of Mitigation Measure CUL-2.1, impacts on archaeological resources during operation of Variant H3 would be less than significant.

Impact CUL-6	Operation of the Project could disturb human remains, including those interred outside of dedicated cemeteries.
Level of Impact	**Potentially significant impact**
Mitigation Measures	CUL-3.1: Comply with State Laws Relating to Human Remains
Level of Impact After Mitigation	**Less-than-significant impact**

Project

Impact Characterization

Operation maintenance activities would include routine removal of woody debris, sediment, and other materials that accumulate near the piers of the bridges. Maintenance activities within the rail corridor also include tree pruning and removal, annual vegetation trimming, and herbicide application.

Impact Details and Conclusions

As a result of ground-disturbing activities during operation of the Project, human remains could be encountered, which would be a potentially significant impact.

Mitigation Measures

Mitigation Measure CUL-3.1: Comply with State Laws Relating to Human Remains

Significance with Application of Mitigation

With implementation of Mitigation Measure CUL-3.1, impacts related to human remains during operation of the Project would be less than significant.

Variant H1

Impact Characterization

Operation of Variant H1 would have the same impacts on human remains as discussed above for the Project.

Impact Details and Conclusions

As a result of ground-disturbing activities during operation of Variant H1, human remains could be encountered, which would be a potentially significant impact.

Mitigation Measures

Mitigation Measure CUL-3.1: Comply with State Laws Relating to Human Remains

Significance with Application of Mitigation

With implementation of Mitigation Measure CUL-3.1, impacts related to human remains during operation of Variant H1 would be less than significant.

Variant H2

Impact Characterization

Operation of Variant H2 would have the same impacts on human remains as discussed above for the Project.

Impact Details and Conclusions

As a result of ground-disturbing activities during operation of Variant H2, human remains could be encountered, which would be a potentially significant impact.

Mitigation Measures

Mitigation Measure CUL-3.1: Comply with State Laws Relating to Human Remains

Significance with Application of Mitigation

With implementation of Mitigation Measure CUL-3.1, impacts related to human remains during operation of Variant H2 would be less than significant.

Variant H3

Impact Characterization

Operation of Variant H3 would have the same impacts on human remains as discussed above for the Project.

Impact Details and Conclusions

As a result of ground-disturbing activities during operation of Variant H3, human remains could be encountered, which would be a potentially significant impact.

Mitigation Measures

Mitigation Measure CUL-3.1: Comply with State Laws Relating to Human Remains

Significance with Application of Mitigation

With implementation of Mitigation Measure CUL-3.1, impacts related to human remains during operation of Variant H3 would be less than significant.

3.6 Tribal Cultural Resources

3.6.1 Introduction

This section describes the regulatory and environmental setting for tribal cultural resources in the vicinity of the Project. It also describes the impacts on tribal cultural resources that would result from the Project and mitigation measures that would reduce significant impacts, where feasible and appropriate.

A tribal cultural resource is defined in Public Resources Code § 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:

- Listed or eligible for listing in the California Register of Historical Resources (CRHR), or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or
- A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code § 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code § 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.

Cumulative impacts on tribal cultural resources, in combination with planned, approved, and reasonably foreseeable projects, are discussed in Chapter 4, *Cumulative Impacts*.

3.6.2 Regulatory Setting

This section summarizes the federal, state, regional, and local regulations related to tribal cultural resources applicable to the Project.

3.6.2.1 Federal

Because federal permits would be required for the Project, compliance with the following applicable laws is required.

- Section 106 of the National Historic Preservation Act (NHPA) (16 United States Code [U.S.C.] § 470 et seq.)
- American Indian Religious Freedom Act (42 U.S.C. § 1996)
- Native American Graves Protection and Repatriation Act (25 U.S.C. §§ 3001–3013)

3.6.2.2 State

California Environmental Quality Act: The California Environmental Quality Act (CEQA) requires the lead agency to consider the effects of a project on tribal cultural resources. CEQA defines a tribal cultural resource as any one of the following (California Public Resources Code [PRC] § 21074):

- Sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe that are either (1) included in or eligible for inclusion in the CRHR, or (2) included in a local register of historical resources.
- A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Section 5024.1. The lead agency shall consider the significance of the resource to a California Native American tribe.
- A cultural landscape that meets the requirements listed above and is geographically defined in size and scope.

Archaeological sites, including those that qualify as historical resources (PRC § 21084.1), unique archaeological resources (PRC § 21083.2(g)), and non-unique archaeological resources (PRC § 21083.2(h)), may qualify as tribal cultural resources.

PRC Section 21080.3.1 requires that local agencies formally consult with recognized California Native American tribes during the CEQA process to discuss potential impacts on tribal cultural resources. Prior to the release of a Negative Declaration, Mitigated Negative Declaration, or EIR, the agency must initiate consultation with tribes that are traditionally and culturally affiliated with the geographic area of a proposed project if (1) the tribe requested of the agency, in writing, to be informed through formal notification of proposed projects in the geographic area that is traditionally and culturally affiliated with the tribe; and (2) the tribe responds, in writing, within 30 days of receipt of the formal notification of a proposed project and requests consultation with the agency (PRC § 21080.3.1(b)).

The California Office of Planning and Research's *Tribal Consultation Guidelines* define consultation as "a process in which both the tribe and local government invest time and effort into seeking a mutually agreeable resolution for the purpose of preserving or mitigating impacts to a cultural place, where feasible (California Office of Planning and Research 2005)." Consultation is concluded when the agency and tribe(s) agree to measures to mitigate or avoid significant effects on a tribal cultural resource, or if either party concludes that mutual agreement cannot be reached after a good-faith and reasonable effort (PRC § 21080.3.2(b)).

3.6.2.3 Regional and Local

The SJJPA, as a state joint powers agency, proposes improvements within and outside the Union Pacific Railroad (UPRR) and BNSF Railway (BNSF) rights-of-way. The Interstate Commerce Commission Termination Act (ICCTA) affords railroads that engage in interstate commerce considerable flexibility in making necessary improvements and modifications to rail infrastructure, subject to the requirements of the Surface Transportation Board. ICCTA broadly preempts state and local regulation of railroads; this preemption extends to the construction and operation of rail lines. As such, activities within the UPRR and BNSF rights-of-way are clearly exempt from local building and zoning codes as well as other land use ordinances. Project activities outside of the UPRR and BNSF rights-of-way, however, would be subject to regional and local plans and regulations. Though ICCTA broadly preempts state and local regulation of railroads, SJJPA intends to obtain local agency permits for construction of facilities that fall outside the UPRR and BNSF rights-of-way, even though SJJPA has not determined whether such permits are legally necessary or required.

Appendix 3.0-1 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 Project improvements would be located. Section 15125(d) of the State 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 Project would be consistent with the plans of relevant jurisdictions.[1] The Project would be generally consistent with the applicable goals, policies, and objectives related to tribal cultural resources identified in Appendix 3.0-1.

3.6.3 Environmental Setting

The Project is located in Merced County within lands of Townships 8 South, Range 13 East Mount Diablo Base Line and Meridian, as depicted in United States Geological Survey (USGS) *Atwater Calif.* and *Merced Calif.* 7.5-minute topographic quadrangles (USGS 1987a, 1987b). The easterly portion of the County is dominated by the foothills and mountains with the Sierra Nevada range and the western half of the county is dominated by largely rural agricultural land with a mix of open orchard lands, field crop areas, rural residential uses, small cities and communities. Bear Creek bisects the project area, and the northwestern perimeter of the project area is bordered by irrigation canals.

The environmental footprint of the project is comprised almost exclusively of developed areas with a mostly-flat topography at around 175 feet above sea level. Parking lots, roadways, buildings, railroad alignments, and modified irrigation landscapes largely form the current landscape present within the environmental footprint of the Project. The study area for tribal cultural resources is the environmental footprint of the Project and consists of those areas affected by physical changes, including both horizontal surface disturbance and vertical subsurface disturbance.

3.6.4 Impact Analysis

This section describes the environmental impacts of the Project on tribal cultural resources. This section also 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.

3.6.4.1 Methods for Analysis

This analysis of tribal cultural resources is based on two cultural resources records searches conducted at the California Historical Resources Information System - Central California Information Center (CHRIS-CCAIC) and a Sacred Lands File (SLF) search through the Native American Heritage Commission (NAHC). No previously recorded archaeological resources were identified within the study area. ICF reviewed available archival maps and aerial photographs.

ICF requested a review of the NAHC SLF on January 30, 2023, for any Native American cultural resources within the environmental footprint of the Project. ICF received a response on March 2, 2023, from Pricilla Torres-Fuentes, Cultural Resources Analyst at the NAHC, stating that, "The results of any Sacred Lands File (SLF) check conducted through the Native American Heritage Commission was negative." A list of eight tribal contacts and their information was also provided with the NAHC's response:

[1] 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.

- Valentin Lopez, Amah Mutsun Tribal Band
- Robert Ledger, Dumna Wo-Wah Tribal Government
- Elaine Fink, North Fork Rancheria of Mono Indians
- Katherine Perez, North Valley Yokuts Tribe
- Timothy Perez, North Valley Yokuts Tribe
- Sandra Chapman, Southern Sierra Miwuk Nation
- Neil Peyron, Tule River Indian Tribe
- Kenneth Woodrow, Wuksache Indian Tribe/Eshom Valley Band

On April 19, 2023, letters were sent to each of the eight contacts on the list provided by the NAHC informing them of the Project and inviting them to consultation per PRC Section 21080.3.1(i.e., Assembly Bill 52). To date, no responses have been received. The results of the SLF search and documents associated with NAHC consultation are included in Appendix 3.5-2 of this EIR, which contains the Archaeological Resources Study Report prepared for the Project

3.6.4.2 Thresholds of Significance

The CEQA Guidelines Appendix G (14 California Code of Regulations § 15000 et seq.) identified significance criteria to be considered for determining whether a project could have significant impacts on tribal cultural resources.

An impact would be considered significant if construction or operation of the Project would:

- Cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code § 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:

Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or

A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code § 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code § 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.

3.6.4.3 Impacts and Mitigation Measures

Impact TCR-1	Construction of the Project could cause a substantial adverse change in the significance of a tribal cultural resource.
Level of Impact	**Potentially significant impact**
Mitigation Measures	TCR-1.1: Stop Work if Tribal Cultural Resources Are Encountered during Ground-Disturbing Activities CUL-2.1: Stop Work if Archaeological Material or Features Are Encountered during Ground-Disturbing Activities CUL-3.1: Comply with State Laws Relating to Human Remains
Level of Impact After Mitigation	**Less-than-significant impact**

Project

Impact Characterization

No tribal cultural resources were identified within the environmental footprint of the Project. Therefore, ground disturbance associated with construction of the Project would not affect known tribal cultural resources.

Impact Details and Conclusions

Precontact (Native American) archaeological sites and tribal cultural resources are known to exist in the region. Therefore, although it is unlikely that ground disturbance associated with construction of the Project would affect unknown tribal cultural resources, the possibility cannot be eliminated. In the event that previously unknown tribal cultural resources are encountered during ground disturbance related to construction of the Project, a substantial adverse change in the significance of an as-yet-unknown tribal cultural resource could occur from its demolition, destruction, relocation, or alteration, and the significance of the resource could be materially impaired (State CEQA Guidelines § 15064.5[b][1]). This would be a potentially significant impact.

Mitigation Measures

Mitigation Measure CUL-2.1: Stop Work if Archaeological Material or Features Are Encountered during Ground-Disturbing Activities

Mitigation Measure CUL-3.1: Comply with State Laws Relating to Human Remains

Mitigation Measure TCR-1.1: Stop Work if Tribal Cultural Resources Are Encountered during Ground-Disturbing Activities and Apply Measures to Prevent an Adverse Effect

Prior to construction, the SJJPA shall identify relevant tribal contacts in the event of encountering potential tribal cultural resources, If Native American cultural resources are encountered during ground-disturbing activities, all ground-disturbing activities within the vicinity of find shall cease, and the archaeological consultant in consultation with the relevant tribe(s) shall review, identify, and evaluate the find to determine if the discovery could qualify as a tribal cultural resource, as defined in Public Resources Code Section 21074. If the discovery is determined to qualify as a tribal cultural resource, it shall be subject to treatment that prevents an adverse effect on the resource, in accordance with Public Resources Code Section 15064.5. Such measures may include avoidance, preservation in place, Phase III data recovery and associated documentation, or other appropriate measures. The measures shall be determined through consultation between the SJJPA and the relevant tribe(s).

Significance with Application of Mitigation

Implementation of Mitigation Measure CUL-2.1, presented in Section 3.5, *Cultural Resources*, would reduce impacts by requiring archaeological resources sensitivity training, allowing early detection of potential conflicts between development and tribal cultural resources during Project construction, and to stop applicable construction work and consult with the Native American tribes to determine appropriate treatment when a tribal cultural resource is encountered. In addition, implementation of Mitigation Measure CUL-3.1, presented in Section 3.5, would reduce impacts by establishing appropriate procedures in compliance with applicable regulations if human remains are encountered. Implementation of Mitigation Measure TCR-1.1 would reduce potential impacts to tribal cultural resources by detailing the appropriate procedure if tribal cultural resources are encountered. With implementation of Mitigation Measures CUL-2.1, CUL-3.1, and TCR-1.1, impacts on tribal cultural resources during construction of the Project would be less than significant.

Variant H1

Impact Characterization

There are no known tribal cultural resources within the environmental footprint of Variant H1. However, as a result of ground-disturbing activities, previously unknown tribal cultural resources could be encountered and adversely affected.

Impact Details and Conclusions

In the event that previously unknown tribal cultural resources are encountered during ground disturbance related to construction of Variant H1, a substantial adverse change in the significance of an as-yet-unknown tribal cultural resource could occur from its demolition, destruction, relocation, or alteration, and the significance of the resource could be materially impaired (State CEQA Guidelines § 15064.5[b][1]). This would be a potentially significant impact.

Mitigation Measures

Mitigation Measure CUL-2.1: Stop Work if Archaeological Material or Features Are Encountered during Ground-Disturbing Activities

Mitigation Measure CUL-3.1: Comply with State Laws Relating to Human Remains

Mitigation Measure TCR-1.1: Stop Work if Tribal Cultural Resources Are Encountered during Ground-Disturbing Activities

Significance with Application of Mitigation

With implementation of Mitigation Measures CUL-2.1, CUL-3.1, and TCR-1.1, impacts on tribal cultural resources during construction of Variant H1 would be less than significant.

Variant H2

Impact Characterization

There are no known tribal cultural resources within the environmental footprint of Variant H2. However, as a result of ground-disturbing activities, previously unknown tribal cultural resources could be encountered and adversely affected.

Impact Details and Conclusions

In the event that previously unknown tribal cultural resources are encountered during ground disturbance related to construction of Variant H2, a substantial adverse change in the significance of an as-yet-unknown tribal cultural resource could occur from its demolition, destruction, relocation, or alteration, and the significance of the resource could be materially impaired (State CEQA Guidelines § 15064.5[b][1]). This would be a potentially significant impact.

Mitigation Measures

Mitigation Measure CUL-2.1: Stop Work if Archaeological Material or Features Are Encountered during Ground-Disturbing Activities

Mitigation Measure CUL-3.1: Comply with State Laws Relating to Human Remains

Mitigation Measure TCR-1.1: Stop Work if Tribal Cultural Resources Are Encountered during Ground-Disturbing Activities

Significance with Application of Mitigation

With implementation of Mitigation Measures CUL-2.1, CUL-3.1, and TCR-1.1, impacts on tribal cultural resources during construction of Variant H2 would be less than significant.

Variant H3

Impact Characterization

There are no known tribal cultural resources within the environmental footprint of Variant H3. However, as a result of ground-disturbing activities, previously unknown tribal cultural resources could be encountered and adversely affected.

Impact Details and Conclusions

In the event that previously unknown tribal cultural resources are encountered during ground disturbance related to construction of Variant H3, a substantial adverse change in the significance of an as-yet-unknown tribal cultural resource could occur from its demolition, destruction, relocation, or alteration, and the significance of the resource could be materially impaired (State CEQA Guidelines § 15064.5[b][1]). This would be a potentially significant impact.

Mitigation Measures

Mitigation Measure CUL-2.1: Stop Work if Archaeological Material or Features Are Encountered during Ground-Disturbing Activities

Mitigation Measure CUL-3.1: Comply with State Laws Relating to Human Remains

Mitigation Measure TCR-1.1: Stop Work if Tribal Cultural Resources Are Encountered during Ground-Disturbing Activities

Significance with Application of Mitigation

With implementation of Mitigation Measures CUL-2.1, CUL-3.1, and TCR-1.1, impacts on tribal cultural resources during construction of Variant H3 would be less than significant.

Impact TCR-2	Operation of the Project could cause a substantial adverse change in the significance of a tribal cultural resource.
Level of Impact	**Potentially significant impact**
Mitigation Measures	TCR-1.1: Stop Work if Tribal Cultural Resources Are Encountered during Ground-Disturbing Activities CUL-2.1: Stop Work if Archaeological Material or Features Are Encountered during Ground-Disturbing Activities CUL-3.1: Comply with State Laws Relating to Human Remains
Level of Impact After Mitigation	**Less-than-significant impact**

Project

Impact Characterization

No tribal cultural resources were identified within the environmental footprint of the Project. Therefore, ground disturbance associated with operation of the Project would not affect known tribal cultural resources.

Impact Details and Conclusions

Operation maintenance activities would include routine removal of woody debris, sediment, and other materials that accumulate near the piers of the bridges. Maintenance activities within the rail corridor also include tree pruning and removal, annual vegetation trimming, and herbicide application.

Precontact (Native American) archaeological sites and tribal cultural resources are known to exist in the region. Therefore, although it is unlikely that ground disturbance associated with operation of the Project would affect unknown tribal cultural resources, the possibility cannot be eliminated. In the event that previously unknown tribal cultural resources are encountered during ground disturbance related to operation of the Project, a substantial adverse change in the significance of an as-yet-unknown tribal cultural resource could occur from its demolition, destruction, relocation, or alteration, and the significance of the resource could be materially impaired (State CEQA Guidelines § 15064.5[b][1]). This would be a potentially significant impact.

Mitigation Measures

Mitigation Measure CUL-2.1: Stop Work if Archaeological Material or Features Are Encountered during Ground-Disturbing Activities

Mitigation Measure CUL-3.1: Comply with State Laws Relating to Human Remains

Mitigation Measure TCR-1.1: Stop Work if Tribal Cultural Resources Are Encountered during Ground-Disturbing Activities

Significance with Application of Mitigation

Implementation of Mitigation Measure CUL-2.1, presented in Section 3.5, *Cultural Resources*, would reduce impacts by requiring archaeological resources sensitivity training, allowing early detection of potential conflicts between development and tribal cultural resources during Project construction, and to stop applicable construction work and consult with the Native American tribes to determine appropriate treatment when a tribal cultural resource is encountered. In addition, implementation of Mitigation Measure CUL-3.1, presented in Section 3.5, would reduce impacts by establishing appropriate procedures in compliance with applicable regulations if human remains are encountered. Implementation of Mitigation Measure TCR-1.1 would reduce potential impacts to tribal cultural resources by detailing the appropriate procedure if tribal cultural resources are encountered. With implementation of Mitigation Measures CUL-2.1, CUL-3.1, and TCR-1.1, impacts on tribal cultural resources during operation of the Project would be less than significant.

Variant H1

Impact Characterization

There are no known tribal cultural resources within the environmental footprint of Variant H1. However, as a result of ground-disturbing activities, previously unknown tribal cultural resources could be encountered and adversely affected.

Impact Details and Conclusions

In the event that previously unknown tribal cultural resources are encountered during ground disturbance related to operation of Variant H1, a substantial adverse change in the significance of an as-yet-unknown tribal cultural resource could occur from its demolition, destruction, relocation, or alteration, and the significance of the resource could be materially impaired (State CEQA Guidelines § 15064.5[b][1]). This would be a potentially significant impact.

Mitigation Measures

Mitigation Measure CUL-2.1: Stop Work if Archaeological Material or Features Are Encountered during Ground-Disturbing Activities

Mitigation Measure CUL-3.1: Comply with State Laws Relating to Human Remains

Mitigation Measure TCR-1.1: Stop Work if Tribal Cultural Resources Are Encountered during Ground-Disturbing Activities

Significance with Application of Mitigation

With implementation of Mitigation Measures CUL-2.1, CUL-3.1, and TCR-1.1, impacts on tribal cultural resources during operation of Variant H1 would be less than significant.

Variant H2

Impact Characterization

There are no known tribal cultural resources within the environmental footprint of Variant H2. However, as a result of ground-disturbing activities, previously unknown tribal cultural resources could be encountered and adversely affected.

Impact Details and Conclusions

In the event that previously unknown tribal cultural resources are encountered during ground disturbance related to operation of Variant H2, a substantial adverse change in the significance of an as-yet-unknown tribal cultural resource could occur from its demolition, destruction, relocation, or alteration, and the significance of the resource could be materially impaired (State CEQA Guidelines § 15064.5[b][1]). This would be a potentially significant impact.

Mitigation Measures

Mitigation Measure CUL-2.1: Stop Work if Archaeological Material or Features Are Encountered during Ground-Disturbing Activities

Mitigation Measure CUL-3.1: Comply with State Laws Relating to Human Remains

Mitigation Measure TCR-1.1: Stop Work if Tribal Cultural Resources Are Encountered during Ground-Disturbing Activities

Significance with Application of Mitigation

With implementation of Mitigation Measures CUL-2.1, CUL-3.1, and TCR-1.1, impacts on tribal cultural resources during operation of Variant H2 would be less than significant.

Variant H3

Impact Characterization

There are no known tribal cultural resources within the environmental footprint of Variant H3. However, as a result of ground-disturbing activities, previously unknown tribal cultural resources could be encountered and adversely affected.

Impact Details and Conclusions

In the event that previously unknown tribal cultural resources are encountered during ground disturbance related to operation of Variant H3, a substantial adverse change in the significance of an as-yet-unknown tribal cultural resource could occur from its demolition, destruction, relocation, or alteration, and the significance of the resource could be materially impaired (State CEQA Guidelines § 15064.5[b][1]). This would be a potentially significant impact.

Mitigation Measures

Mitigation Measure CUL-2.1: Stop Work if Archaeological Material or Features Are Encountered during Ground-Disturbing Activities

Mitigation Measure CUL-3.1: Comply with State Laws Relating to Human Remains

Mitigation Measure TCR-1.1: Stop Work if Tribal Cultural Resources Are Encountered during Ground-Disturbing Activities

Significance with Application of Mitigation

With implementation of Mitigation Measures CUL-2.1, CUL-3.1, and TCR-1.1, impacts on tribal cultural resources during construction of Variant H3 would be less than significant.

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3.7 Energy

3.7.1 Introduction

This section describes the regulatory and environmental setting for energy resources and energy use in the vicinity of the Project. It also describes the energy impacts that would result from the Project and mitigation measures that would reduce significant impacts, where feasible and appropriate. Appendix 3.3-1 of this environmental impact report (EIR), *Air Quality, Greenhouse Gas, and Health Risk Assessment Supporting Documentation*, contains additional technical information for this section.

Cumulative impacts on energy resources, in combination with planned, approved, and reasonably foreseeable projects, are discussed in Chapter 4, *Cumulative Impacts*.

3.7.2 Regulatory Setting

This section summarizes the federal, state, regional, and local regulations related to energy resources applicable to the Project.

3.7.2.1 Federal

Energy Policy Act of 1992

The Energy Policy Act of 1992 consists of 27 titles detailing various measures designed to lessen the Nation's dependence on imported energy, provide incentives for clean and renewable energy, and promote energy conservation in buildings. Title III of the act addresses alternative fuels. It gave the U.S. Department of Energy administration administrative power to regulate the minimum number of light-duty alternative fuel vehicles required in certain federal fleets beginning in fiscal year 1993. The primary goal of this program is to cut petroleum use in the United States by 2.6 billion gallons per year by 2020.

Energy Policy Act of 2005

The Energy Policy Act of 2005, which was intended to establish a comprehensive, long-term energy policy, is implemented by the U.S. Department of Energy. The act addresses energy production in the United States, including oil, gas, coal, and alternative forms of energy, as well as energy efficiency and tax incentives. Energy efficiency and tax incentive programs include credits for the construction of new energy-efficient houses, production or purchase of energy-efficient appliances, and loan guarantees for entities that develop or use innovative technologies that avoid the production of greenhouse gases (GHG). To reduce national energy consumption, the act also directed the National Highway Traffic Safety Administration (NHTSA) within the U.S. Department of Transportation to establish the Corporate Average Fuel Economy (CAFE) Program. Under the CAFE Program, NHTSA prescribes and enforces average fuel economy standards for passenger cars and light trucks sold in the United States.

Energy Independence and Security Act of 2007

The Energy Independence and Security Act of 2007 was intended to increase U.S. energy security, develop renewable fuel production, and improve vehicle fuel economy. The Energy Independence and Security Act of 2007 amended the Energy Policy Act of 2005 to introduce more aggressive requirements. The act's three key provisions strengthened the CAFE standards, the federal renewable fuel standard, and the federal energy efficiency standards for appliances and lighting.

Safer Affordable Fuel-Efficient Vehicles Rule

As discussed above, NHTSA sets CAFE standards to improve average fuel economy (i.e., reduce fuel consumption) and reduce GHG emissions generated by cars and light-duty trucks. NHTSA and the U.S. Environmental Protection Agency (USEPA) have proposed amendments to the current fuel efficiency standards for passenger cars and light-duty trucks and new standards for model years 2021 through 2026, known as the Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule. Under the SAFE Vehicles Rule, current 2020 standards would be maintained through 2026. California, 22 other states, the District of Columbia, and two cities filed suit against the proposed action on September 20, 2019 (*California et al. v. United States Department of Transportation et al.,* 1:19-cv-02826, U.S. District Court for the District of Columbia).[1] The lawsuit requests a "permanent injunction prohibiting defendants from implementing or relying on the preemption regulation" but does not say its implementation during legal deliberations. Part 1 of the SAFE Vehicles Rule went into effect on November 26, 2019, and Part 2 went into effect on March 30, 2020.[2] However, on April 22, 2021, NHTSA announced that it proposed repealing the SAFE Vehicles Rule, Part 1, allowing California the right to set its own standards (U.S. Department of Transportation 2021). On December 19, 2021, NHTSA finalized its vehicle efficiency standards rule to reach a projected industry-wide target of 40 miles per gallon by 2026, an approximately 25 percent increase over the prior SAFE Vehicles Rule. Lastly, on March 9, 2022, USEPA reinstated California's authority under the Clean Air Act to implement its own GHG emissions standards and sales mandate regarding zero-emission vehicles (ZEV). This action concluded USEPA's consideration of 2019's SAFE Vehicles Rule, Part 1, by finding that actions under the previous administration were decided in error; the actions are now rescinded.

3.7.2.2 State

California Green Buildings Standards

On July 17, 2008, the California Building Standards Commission adopted the Nation's first green building standards. California Code of Regulations (Cal. Code Regs.), Title 24, Part 11, known as

[1] On February 11, 2020, California et al. v. United States Department of Transportation et al. was pending resolution of the related litigation of Union of Concerned Scientists v. National Highway Traffic Safety Administration (19-1230, U.S. Court of Appeals for the District of Columba Circuit). The Union of Concerned Scientists, Environmental Defense Fund, and other groups filed a protective petition for review after the federal government sought to dismiss or transfer to the D.C. Circuit a case filed in federal court in D.C. challenging NHTSA's final rule withdrawing California's waiver for its GHG and zero-emission vehicle (ZEV) program and preempting state programs that regulate vehicle GHG emissions or create ZEV mandates. On February 8, 2021, the D.C. Circuit Court of Appeals issued an order, holding the cases in abeyance pending regulatory review.

[2] Of note, on January 20, 2021, President Biden released Executive Order 13990, which, among other things, calls for agency review of Part 1 of the SAFE Vehicles Rule by April 2021 and Part 2 by July 2021. The order states that agencies shall consider whether to propose, suspend, revise, or rescind these rules.

CALGreen, sets standards for sustainable building design for residential and non-residential buildings in California. This code sets forth sustainable construction practices applicable to planning and design, energy efficiency, water efficiency and conservation, material conservation and resource efficiency, and environmental quality. Effective January 1, 2014, 2013 CALGreen mandates permitted new residential and non-residential building construction, demolition, and certain additions and alteration projects to recycle and/or salvage for a reuse minimum of 50 percent of the nonhazardous construction and demolition debris generated during a project (CALGreen 4.408, 5.408, 301.1, and 301.3). 2016 CALGreen became effective January 1, 2017, and increased the recycle and/or salvage mandate to 65 percent for new residential and non-residential building construction, demolition, and certain additions and alteration project (2016 CALGreen 4.408 and 5.408). The 2022 standards improved upon the 2016 standards for new construction of, and additions and alterations to, residential and nonresidential buildings. The 2022 standards went into effect on January 1, 2023.

California Code of Regulations Title 20 and Title 24, Part 6

New buildings constructed in California must comply with the standards contained in Cal. Code Regs. Title 20, Energy Building Regulations, and Title 24, Energy Conservation Standards. Cal. Code Regs. Title 20 standards range from power plant procedures and siting to energy efficiency standards for appliances, ensuring reliable energy sources are provided and diversified through energy efficiency and renewable energy resources. Cal. Code Regs. Title 24 requires the design of building shells and building components to conserve energy. The Energy Conservation Standards for new residential and nonresidential buildings were adopted by the California Energy Resources Conservation and Development Commission in June 1977 and were most recently revised in 2022 (per Cal. Code Regs. Title 24, Part 6). These standards are updated periodically to allow for consideration and possible incorporation of new energy efficiency technologies and methods.

Senate Bill 1389, Chapter 568, Statutes of 2002

The California Energy Commission (CEC) is responsible for, among other things, forecasting future energy needs for the state and developing renewable energy resources and alternative renewable energy technologies for buildings, industry, and transportation. Senate Bill (SB) 1389 (Chapter 568, Statutes of 2002) requires the CEC to prepare biennial integrated energy policy assessing major energy trends and issues facing the state's electricity, natural gas, and transportation fuel sectors. The report is also intended to provide policy recommendations to conserve resources, protect the environment, and ensure reliable, secure, and diverse energy supplies. The 2022 Integrated Energy Policy Report Update, the most recent report required under SB 1389, was adopted in February 2023 (CEC 2023a).

Assembly Bill 2076—Reducing Dependence on Petroleum

The CEC and California Air Resources Board (CARB) are directed by Assembly Bill (AB) 2076 (passed in 2000) to develop and adopt recommendations for reducing dependence on petroleum. A performance-based goal was to reduce petroleum demand to 15 percent below 2003 demand by 2020. In addition, AB 2076 also includes the recommendation to increase the use of alternative fuels or on-road transportation fuel use by 20 percent in 2020, and 30 percent by 2030.

Assembly Bill 1493—Pavley Rules (2002, amendments 2009)/Advanced Clean Cars (2011)

Known as Pavley I, AB 1493 provided the Nation's first GHG standards for automobiles. AB 1493 required CARB to adopt vehicle standards to lower GHG emissions from automobiles and light-duty trucks to the maximum extent feasible beginning in 2009. In 2012, strengthening of the Pavley standards (referred to previously as Pavley II but now referred to as the Advanced Clean Cars measures) was adopted for vehicle model years 2017 through 2025. Together, the two standards are expected to increase average fuel economy to roughly 54.5 miles per gallon by 2025. The increase in fuel economy will help lower the demand for fossil fuels.

In August 2022, CARB board members voted to approve the Advanced Clean Cars II proposal, which aimed to dramatically reduce emissions from passenger cars (model years 2026 through 2035). This will require an increasing proportion of new vehicles to be zero-emission vehicles. The goal is to have 100 percent of new vehicles sold by 2035 classified as zero-emission vehicles.

CARB also adopted the Advanced Clean Truck Regulation to accelerate a large-scale transition to zero-emission medium- and heavy-duty vehicles. The regulation requires zero-emission medium- and heavy-duty vehicles to make up an increasing percentage of total annual vehicle sales in California between 2024 and 2035. By 2035, zero-emission truck/chassis sales would need to amount to 55 percent of Class 2b–3 truck sales, 75 percent of Class 4–8 straight truck sales, and 40 percent of truck tractor sales. By 2045, every new medium- and heavy-duty truck sold in California will be a zero-emission vehicle. Large employers, including retailers, manufacturers, brokers, and others, will be required to report information about shipments and shuttle services to ensure that fleets purchase available zero-emission trucks.

Assembly Bill 1279—The California Climate Crisis Act

AB 1279 declares the policy of the state both to achieve net zero greenhouse gas emissions no later than 2045, to achieve and maintain net negative GHG emissions thereafter, and to ensure that by 2045, statewide anthropogenic GHG emissions are reduced to at least 85 percent below 1990 levels.

Senate Bill 1020—The Clean Energy, Jobs, and Affordability Act of 2022

SB 1020 requires that eligible renewable energy resources and zero-carbon resources supply 90 percent of all retail sales of electricity to California end-use customers by December 31, 2035, 95 percent of all retail sales of electricity to California end-use customers by December 31, 2040, and 100 percent of all retail sales of electricity to California end-use customers by December 31, 2045. In addition, 100 percent of electricity procured to serve all state agencies must be provided by eligible renewable energy resources and zero-carbon resources by December 31, 2035.

Senate Bills 1078, 107, and 2—Renewable Portfolio Standard

SBs 1078 (2002), 107 (2006), and 2 (2011), California's Renewables Portfolio Standard (RPS), obligates investor-owned utilities, energy service providers, and Community Choice Aggregators to procure additional retail sales per year from eligible renewable sources with the long-range target of procuring 33 percent of retail sales from renewable resources by 2020. Electricity providers are also required to increase their renewable share by at least one percent every year. The California Public Utilities Commission (CPUC) and CEC are jointly responsible for implementing the program.

Senate Bills 350 and 100—De Leon (Clean Energy and Pollution Reduction Act of 2015, and 100 Percent Clean Energy Act of 2017)

SB 350 was approved be California Legislature in September 2015 and signed by Governor Brown in October 2015. Its key provisions are to require the following by 2030: (1) an RPS of 50 percent and (2) a doubling energy efficiency (electrical and natural gas) by 2030, including improvements to the efficiency of existing buildings. These mandates will be implemented by future actions of CPUC and CEC. SB 100 was approved by the California Legislature in August 2017 and signed by Governor Brown in September 2018. Its key provisions include updating the SB 350 RPS requirement from 50 to 60 percent by 2030 and creating the policy of planning to meet all the state's retail electricity supply with a mix of RPS-eligible and zero-carbon resources by December 31, 2045, for a total of 100 percent clean energy.

California Energy Action Plan

The CEC and CPUC are responsible for preparing the *State Energy Action Plan* (CEC and CPUC 2008), which identifies emerging trends related to energy supply, demand, conservation, public health and safety, and the maintenance of a healthy economy. The State Energy Action Plan calls for the state to assist in the transformation of its transportation system to improve air quality, reduce congestion, and increase the efficient use of fuel supplies with the fewest environmental and energy costs. First-priority actions to address California's increasing energy demands are energy efficiency and demand response (i.e., reduction of customer electricity usage during peak periods to address system reliability and support the best use of energy infrastructure). Additional priorities include the use of renewable sources of power and distributed generation (i.e., the use of relatively small power plants near or at centers of high demand). To further this policy, the *State Energy Action Plan* identifies several strategies, including aiding public agencies and fleet operators.

Executive Orders B-16-12 (2012) and N-79-20 (2020)

Under the direction of the governor, Executive Order (EO) B-16-12 orders state entities, including CARB, CEC, and CPUC to support rapid commercialization of ZEVs. It also directs these entities to achieve various benchmarks related to ZEVs.

On September 23, 2020, Governor Newson issued EO N-79-20, directing the state to require that, by 2035, all new cars and passenger trucks sold in California be ZEVs. The EO also directs state agencies to develop strategies for building "an integrated, statewide rail and transit network, consistent with the California State Rail Plan, to provide seamless, affordable multimodal travel options for all" (Executive Department—State of California 2020).

3.7.2.3 Regional and Local

The San Joaquin Joint Powers Authority (SJJPA), as a state joint powers agency, proposes improvements within and outside the Union Pacific Railroad (UPRR) and BNSF rights-of-way. The Interstate Commerce Commission Termination Act (ICCTA) affords railroads that engage in interstate commerce considerable flexibility in making necessary improvements and modifications to rail infrastructure, subject to the requirements of the Surface Transportation Board. ICCTA broadly preempts state and local regulation of railroads; this preemption extends to the construction and operation of rail lines. As such, activities within the UPRR and BNSF rights-of-way are clearly exempt from local building and zoning codes as well as other land use ordinances. Project activities outside of the UPRR and BNSF rights-of-way, however, would be subject to regional and local plans and regulations. Though ICCTA broadly preempts state and local regulation of railroads, SJJPA intends to obtain local agency permits for construction of facilities that fall outside the UPRR and BNSF rights-of-way, even though SJJPA has not determined whether such permits are legally necessary or required.

Appendix 3.0-1 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 Project improvements would be 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 Project would be consistent with the plans of relevant jurisdictions.[3] The Project would be generally consistent with the applicable goals, policies, and objectives related to resource title identified in Appendix 3.0-1.

3.7.3 Environmental Setting

This section describes the environmental setting related to energy resources and energy for the Project. For the purpose of this analysis, the study area for energy use is defined as the service area of identified energy providers that currently provide service to San Joaquins trains or would provide service to the Project, or the No Project Alternative. This section begins with an overview of energy consumption in the state, followed by a detailed description of existing petroleum, natural gas, and electricity use in the study area. The information presented in this section was obtained from many sources, including the following:

- U.S. Energy Information Administration energy data statistics and websites.
- California Energy Commission energy data statistics and websites.
- *Transportation Energy Data Book—Edition 40*, Stacy C. Davis and Robert G. Boundy (Davis & Boundy 2022).
- PG&E and MID websites.

3.7.3.1 Overview of Energy Consumption in the State

Energy resources in California include natural gas, electricity, water, wind, oil, coal, solar, geothermal, and nuclear resources. Energy production and energy use both result in the depletion of nonrenewable resources, such as oil, natural gas, and coal, and the emission of pollutants.

California's diverse portfolio of energy resources produced approximately 2,190.2 trillion British thermal units (BTUs) in 2020 (U.S. Energy Information Administration [U.S. EIA] 2022a). According to CEC, total electric generation for California in 2021 (the most recent year for which data are available) was approximately 277,764 gigawatt hours. California's non-carbon-dioxide-emitting electric generation categories, including nuclear, hydroelectric, and renewable generation, accounted for approximately 49 percent of total in-state generation in 2021, which is a 2 percent decrease from 2020 due to impacts on hydroelectric power and other forms of renewable energy

[3] 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.

from California's ongoing drought. California's in-state electric generation was approximately 194,127 gigawatt hours (CEC 2023b). Excluding offshore areas, the state ranked seventh in the Nation in crude oil production in 2020 (the most recent year for which data are available), producing the equivalent of approximately 814.5 trillion BTUs (U.S. EIA 2022b). Other energy sources in the state include natural gas (192.1 trillion BTUs), nuclear (169.8 trillion BTUs), and biofuel (20.3 trillion BTUs) (U.S. EIA 2022a and 2022b). No coal production occurs in California.

With a relatively mild Mediterranean climate and strict energy-efficiency requirements, California has lower energy consumption rates than other parts of the United States. According to the U.S. EIA, California consumed approximately 6,922.8 trillion BTUs of energy in 2020 (U.S. EIA 2022c).[4] California's per capita energy consumption of approximately 175.3 million BTUs was ranked third lowest in the nation as of 2020 (U.S. EIA 2022d).

In 2020, the transportation sector consumed the greatest amount of energy (2,355.5 trillion BTUs, or 34 percent), followed by the industrial (1,701.2 trillion BTUs, or 24 percent), residential (1,507.7 trillion BTUs, or 22 percent), and commercial (1,358.3 trillion BTUs, or 20 percent) sectors (U.S. EIA 2022c). Table 3.7-1 compares various modes of passenger travel in the United States and the approximate energy use for each mode. Intercity passenger rail energy use per passenger mile was less than cars, personal trucks, and transit buses in 2019. In other words, intercity passenger rail is more energy efficient per passenger mile than other common transportation modes for intercity passenger trips.

Table 3.7-1. 2019 U.S. Passenger Travel Mode and Energy Use

			Energy Consumption	
Travel Mode	**Vehicle Miles (Millions)**	**Passenger Miles (millions)**	**(BTU per vehicle mile)**	**(BTU per passenger mile)**
Cars	1,374,305	2,116,430	4,292	2,787
Personal Trucks	1,293,053	2,353,356	5,845	3,212
Motorcycles	19,688	23,626	2,844	2,370
Buses (Transit)	2,566	19,311	34,877	4,634
Rail (Intercity—Amtrak)	279	6,479	34,987	1,506
Rail (Transit)	843	19,859	20,040	851
Rail (Commuter)	382	12,928	53,587	1,583

Source: Davis & Boundy 2022.
BTU= British thermal unit

3.7.3.2 Petroleum, Renewable Diesel, Hydrogen, Electricity and Natural Gas

Among the various types of energy sources, petroleum (diesel fuel) is the primary fuel consumed, in terms of operational energy demand, and is used to propel locomotives on their scheduled runs (Diesel Technology Forum 2023). Renewable diesel and hydrogen are also used to a lesser extent for the operation of locomotives. Of the other primary energy sources, electricity is used principally for

[4] One British thermal unit is the amount of energy required to heat 1 pound of water by 1°F at sea level. British thermal unit is the standard unit of energy used in the United States and based on the English system of units (foot-pound-second system).

the existing stations and maintenance facility, and natural gas is not used. Each of these fuel sources and the providers are described in the following sections.

Petroleum and Renewable Diesel

California's crude oil production has declined overall in the past 30 years; however, it remains one of the top producers of crude oil in the Nation, accounting for approximately 3 percent of the total U.S. production in 2020 (U.S. EIA 2022b). California ranks seventh in the Nation in petroleum refining capacity and accounts for approximately one-tenth of the total U.S. capacity (U.S. EIA 2022e). Alternatively, California accounts for the majority of renewable diesel consumption in the U.S., with consumption growing from 1 million barrels to 28 million barrels per year between 2011 and 2021 (U.S. EIA 2023a). Six states produce all of the renewable diesel in the U.S., with California ranking third and producing approximately 3,328 thousand barrels of the total 20,503 thousand barrels produced in 2021 (U.S. EIA 2023b). Renewable diesel consumption in the U.S. is expected to grow in the coming years, and production capacity is expected to double from 2022 year-end totals to approximately 384,000 barrels per day, or 5.9 billion gallons per year, by the end of 2025 (U.S. EIA 2023c).

Pinnacle provides diesel fuel for the operation of San Joaquins trains. In 2022, San Joaquins diesel fuel consumption was approximately 2,822,357 gallons to power seven weekday roundtrips between Bakersfield to Oakland, and Bakersfield to Sacramento.

Hydrogen

Hydrogen fuel consumption and production is growing across the U.S. and California. Hydrogen fuel can be produced through multiple resources, including natural gas, nuclear power, biomass, solar power, and wind power; however, approximately 95 percent of the hydrogen fuel produced today comes from natural gas reforming (U.S. Department of Energy 2024a). Approximately 9 million tons per year of hydrogen are produced in the U.S. Of the total hydrogen production, approximately 766,604 tons per year are produced in California to support the state's total demand of 2 million tons of hydrogen per year (Gilani and Sanchez 2020). As of February 2024, there are approximately 84 hydrogen alternative fuel stations across the U.S., with 65 stations located throughout California (U.S. Department of Energy 2024b). The hydrogen fueling network in California is currently growing, and is projected to increase from approximately 37,000 kg/day at the end of 2022 to approximately 133,000 kg/day in 2029 (CARB 2023).

Electricity

California's electricity use is assessed annually by the California Independent System Operator (CAISO) and CPUC. CAISO is a not-for-profit corporation in charge of operating the long-distance, high-voltage power lines that deliver electricity, and CPUC publishes the *Long-Term Procurement Plan*, which aims to implement a safe, reliable, and cost-effective electricity supply in California. CAISO works with state agencies, generation and transmission owners, load-serving entities, and other balancing authorities to identify any issues regarding upcoming operating conditions. Significant amounts of new renewable generation have reached commercial operation, and this trend is expected to continue as new renewable generation comes online to meet the state's renewable energy requirements.

Electricity use for the Project would occur largely within the city of Merced, and a small portion outside of city limits, but within Merced County, both of which are served by Pacific Gas and Electric Company (PG&E) and Merced Irrigation District (MID). Table 3.7-2 provides information on peak energy demand and electricity consumption for PG&E and MID.

Table 3.7-2. Electricity Consumption and Peak Energy Demand by Electricity Providers

Electricity Provider	Electricity Consumption (GWh) in 2021	Peak Demand (MW) in 2018
PG&E	78,588	10,976
MID	514	109

Source: California Energy Commission 2019, 2022a, 2022b
GWh= gigawatt hour
MW= megawatt
PG&E= Pacific Gas and Electric Company
MID= Merced Irrigation District

Pacific Gas and Electric

PG&E provides electricity to Merced County through its distribution system. Historically, PG&E has provided natural gas and electricity services to the vast majority of Northern California, including Merced County and the Project site. PG&E is a publicly traded utility company that, under contract with CPUC, generates, purchases, and distributes energy. PG&E's service area covers 70,000 square miles, roughly extending north to south from Eureka to Bakersfield and east to west from the Sierra Nevada to the Pacific Ocean. PG&E's electricity distribution system consists of 106,681 circuit miles of electric distribution lines and 18,466 circuit miles of interconnected transmission lines (PG&E 2023a).

PG&E's, electricity is generated from a combination of traditional sources, such as coal-fired plants, nuclear power plants, and hydroelectric dams, as well as newer sources of energy, such as wind turbines and photovoltaic plants, or solar farms. "The grid," or bulk electric grid, is a network of high-voltage transmission lines that link power plants to the PG&E system. The distribution system, comprising lower-voltage secondary lines, is at the street and neighborhood level. It consists of overhead or underground distribution lines, transformers, and individual service drops that connect to individual customers.

In PG&E's service area, total electricity consumption was 78,588 gigawatt hours in 2021 (CEC 2022a). CEC reported that peak demand in the PG&E service area was approximately 11,000 megawatts in 2018. Peak demand is important in evaluating system reliability, identifying congestion points on the electrical grid, and designing required system upgrades. At the end of 2020, the net operating capacity of PG&E-owned generation facilities was 7,662 megawatts. In addition, in 2020, PG&E generated 29,326 gigawatt hours through its own facilities, and purchased 24,602 gigawatt hours to meet the demand of its customers (PG&E 2021).

Merced Irrigation District

MID provides electric power to those portions of Merced County that are not served by PG&E. MID provides electricity to approximately 13,000 customers in eastern Merced County, including the cities of Livingston, Atwater, and Merced, as well as Castle Airport and the Aviation Development Center (MID 2023a). From its hydroelectric generating facilities on the Merced River, including

Exchequer Dam, MID has built a sophisticated distribution system. Furthermore, the district maintains its own transmission lines and substations. Most recently, MID completed a 34-mile transmission loop that acts as a backup for its customers in case of prolonged power outages (MID 2023b).

The total electricity consumption in 2021 in MID's service area was 514 gigawatt hours (CEC 2022b). The most recent peak demand figures from 2018 total 109 megawatts (CEC 2019).

Natural Gas

PG&E is the only natural gas service provider for Merced County. PG&E's natural gas (i.e., methane) delivery system includes 42,141 miles of natural gas distribution pipelines and 6,438 miles of transmission pipelines (PG&E 2023a). PG&E's gas transmission system is operated under an inspection and monitoring program in real time on a 24-hour basis, with leak inspections, surveys, and patrols continuously taking place along the pipelines. Gas delivered by PG&E originates in gas fields in California, the Southwest, the Rocky Mountains, and Canada. Transmission pipelines send natural gas from the fields and storage facilities. The smaller distribution pipelines deliver gas to individual businesses or residences (PG&E 2023b). PG&E serves approximately 6 million gas customers, and delivers 970 billion cubic feet of gas per year, or 2.6 billion cubic feet per day (PG&E 2023c).

3.7.4 Impact Analysis

This section describes the environmental impacts of the Project on energy. This section also 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.

3.7.4.1 Methods for Analysis

The methods used to evaluate impacts on energy are described below. Energy impacts associated with construction and operation of the Project were assessed and quantified, using standard and accepted software tools and techniques. The analysis also considered the list of energy impact possibilities and potential conservation measures included in Appendix F of the CEQA Guidelines for determining whether a project would result in the wasteful, inefficient, or unnecessary consumption of energy resources. The methodology is described in this section, and model assumptions and inputs used to inform the energy impact analysis can be found in Appendix 3.3-1, *Air Quality, Greenhouse Gas, Health Risk Assessment, and Energy Supporting Documentation*.

Construction

Construction of the Project would use energy in the form of diesel fuel and gasoline fuel for off-road construction equipment, haul trucks, workers' trips, and freight deliveries. Of the total fuel consumed for construction equipment and vehicles, it is assumed that diesel fuel would comprise approximately 90 percent of total fuel consumption, and gasoline fuel would comprise approximately 10 percent of fuel consumption. The construction schedule, equipment operating details, trip numbers and lengths, and material quantities were provided by the Project engineering team. The calculation of energy consumption from vehicles, in the form of fuel use, was based on the number of trips and vehicle miles traveled (VMT), along with fuel efficiency data from EMFAC2021. Trip counts were provided by the Project engineering team for hauling and trips by workers.

California Emissions Estimator Model (CalEEMod) defaults were used for worker trip lengths and Project-specific information was provided for hauling trips and freight deliveries.

For ease of comparison across construction energy consumption amounts, gallons of diesel were converted to BTUs assuming a factor of 137,381 BTU per 1 gallon of diesel fuel. In addition, gallons of gasoline fuel were converted to BTUs assuming a factor of 120,214 BTU per 1 gallon of gasoline fuel. Detailed model assumptions and inputs used to inform the Project's construction and operational energy use can be found in Appendix 3.3-1, *Air Quality, Greenhouse Gas, Health Risk Assessment, and Energy Supporting Documentation*.

Operations

Operation of the Project would increase intercity passenger rail ridership on San Joaquins and Altamont Corridor Express (ACE)[5] between the San Joaquin Valley, Sacramento Region, and Bay Area. The infrastructure improvements implemented under the Project would not change the intensity or frequency of passenger train activities (including San Joaquins and ACE locomotive movement, idling, and station and maintenance facility operations) relative to the future No Project condition. In other words, the future locomotive fleet mix and service operating hours across San Joaquins and ACE would be the same with or without the Project. However, with the Project, the location and need for connecting bus transit in Merced would be created by the proposed intercity rail connection.

Energy use associated with each of the Project components, as described below, were modeled for the following three conditions: (1) existing (2022);[6] (2) first year of full operation (2032)[7] with and without the Project; and (3) horizon (2040) year with and without the Project. In addition, energy reductions achieved by increased passenger rail ridership, which would result in a corresponding reduction in automobile VMT and trips, and consequently energy consumed in the form of gasoline and electricity, were also quantified.

For ease of comparison across all energy consumption amounts, all energy inputs were converted to BTUs. The analysis assumes a factor of 137,381 BTU per 1 gallon of diesel fuel; 130,817 BTU per 1 gallon of renewable diesel fuel; 120,214 BTU per 1 gallon of gasoline fuel; 2.20 pounds (lb) per 1 kilogram (kg) of hydrogen; 61,013 BTU per 1 lb of hydrogen; 3,412 BTU per 1 kilowatt-hour (kWh) of electricity; and 100,000 BTU per 1 therm of natural gas.

Locomotive Operations and Idling

As discussed above, the Project would not increase San Joaquins or ACE movement, or idling hours compared to future operating conditions without the Project. However, the location of San Joaquins operations would shift within the MITC environmental footprint. Project variants (i.e., Variant H1, Variant H2, and Variant H3) and a No Project Hydrogen Variant are also being analyzed in this EIR, which consider future use of San Joaquins hydrogen (i.e., ZE) locomotives, as discussed under *Hydrogen Variants*. San Joaquins operating energy use was therefore quantified to enable a

[5] The increase in ACE ridership is minor and a result of some passengers transferring from San Joaquins trains (no change in ridership to ACE trains at Merced).

[6] For the purpose of this analysis, existing conditions are 2022 because the preparation of this EIR began in 2023 and 2022 is the most recent year for which complete data is available.

[7] The projected start for operational service is between 2030 to 2033. This analysis uses 2032 as the first year of full operation, which falls within this time period.

comparison between the diesel and hydrogen fuel options being considered by the Project and Project variants, respectively. Energy use from ACE operation was not assessed because neither the Project nor Project variants would change the operating conditions (including locomotive fuel type).

As discussed above, energy use from San Joaquins operating hours were evaluated under existing (2022), opening (2032), and horizon (2040) year conditions. The future service schedule assumes five daily roundtrips from Oakland to Merced, two daily roundtrips from Sacramento to Merced, and one daily roundtrip from Natomas to Merced. The opening (2032) and horizon (2040) year energy use analyses assume all locomotives would operate Tier 4 certified engines fueled by renewable diesel. This assumption is conservative given that an increasing percentage of zero-emission locomotives would operate statewide, due in part to regulatory mandates required by the In-Use Locomotive Regulation (see Section 3.3.2.2, *State,* in Section 3.3*, Air Quality and Greenhouse Gas Emissions*), and SJJPA's commitment to work with the state to transition to zero-emission trainsets as soon as practicable. The use of hydrogen locomotives is assessed under the Project variants.

Diesel fuel combustion would occur while locomotives idle loading passengers at stations, when at the end of the line, and warming up after receiving routine maintenance.[8] San Joaquins locomotives currently layover and receive maintenance in Bakersfield, but this service would shift to the ACE Merced Layover and Maintenance Facility following its completion in 2030-2033.[9] Under the Project, station idling (and diesel fuel combustion) would move from the existing Merced station to the new integrated downtown Merced station.

Bus Bridge

Under future No Project conditions (i.e., 2032 opening year and 2040 horizon year conditions), a bus bridge would be provided to transfer high-speed rail passengers from the proposed integrated station to the existing Merced station for connections to San Joaquins and ACE service. Based on the ridership forecast and distance between the two stations, the bus bridge would operate 80 daily trips and result in 88 daily VMT. Resulting energy use in the form of diesel fuel and electricity were quantified using EMFAC2021. The bus bridge would be operational from the year that the high-speed rail integrated Merced station opens until the Project's anticipated opening year (i.e., 2032). With the Project, the bus bridge would no longer be provided.

Connecting Bus Transit

Merced's Regional Transit System, known as the "The Bus", provides local public transit for all of Merced County. The Bus currently stops at the existing Merced station and the Merced Transpo Center, which is adjacent to the proposed integrated station. With the Project, The Bus service to the Merced Station would no longer be provided, eliminating 164 daily weekday stops and 30 weekend stops (AECOM personal communication). Elimination of the Merced Station stop would reduce bus idling, but would not materially change VMT (and thus energy consumption in the form of mobile

[8] Subsequent to preparation of this analysis, it was determined that the Project would require the use of wayside power at the proposed integrated Merced HSR Station, as discussed in Section 2.4.3, *Energy Consumption*, in Chapter 2, *Project Description*. This would result in a minor decrease in diesel locomotive idling compared to the scenario that was modeled. Thus, the analysis of energy used during locomotive idling presented in this analysis is conservative.

[9] For the purposes of this analysis, it is assumed that the ACE Merced Layover and Maintenance Facility will be completed in 2032.

gasoline and diesel use) since the number of trips and overall route mileage would remain unchanged.

Increases in passenger rail ridership with buildout of the integrated station under future No Project and Project conditions would have corresponding effects on the demand for connecting bus service at the Merced Transpo Center stop. Based on future planned frequencies and route distances, an additional seven daily trips are expected across routes that connect to the Merced Transpo Center, resulting in 172 daily VMT (AECOM personal communication). Energy use in the form of mobile diesel fuel and electricity from changes in bus idling at the existing Merced station and connecting transit service to the Merced Transpo Center under future with and without Project conditions were quantified using EMFAC2021.

Station and Facility Operations

Station and maintenance facility operations would use energy in the form of utilities (e.g., electricity, water, natural gas), solid waste generation, employee and delivery vehicle trips, stationary sources (e.g., emergency generators), and routine building upkeep. As discussed in Chapter 2, *Project Description*, the Project only includes the track connection and the San Joaquins platform at the proposed integrated station, which would be maintained and operated by California High-Speed Rail. Likewise, the ACE Merced Layover and Maintenance Facility has already been analyzed and approved as part of the San Joaquin Regional Rail Commission (SJRRC) *ACE Ceres-Merced Extension EIR* (SJJPA 2021). The modifications proposed by the Project would not change facility operations and associated energy use relative to what was disclosed in the *ACE Ceres-Merced Extension EIR* and would occur under the future No Project condition.

While the extent of future station and maintenance facility operational activities would not materially change between future Project and No Project conditions, the location of the buildings would change among existing and future conditions, as described under *Locomotive Operations and Idling*, above. Likewise, the frequency of future operational activities would increase compared to existing conditions. Accordingly, similar to San Joaquins operations, station and maintenance facility energy use was quantified to evaluate energy consumption under each of the analysis conditions. Energy use was estimated using CalEEMod version 2022 with Project-specific inputs on electricity, natural gas, waste, water, vehicle trips, and emergency generators, provided by the Project engineering team.

Reduced Vehicle Miles Traveled and Trips

Operation of the Project would improve intercity passenger rail service between the San Joaquin Valley, Sacramento Region, and Bay Area, providing a transportation alternative to the automobile that reduces VMT and trips, and consequently energy consumption in the form of mobile fuel use (AECOM 2024). Total annual reduced VMT and trips under existing (2022), opening (2032), and horizon (2040) year conditions were calculated by AECOM. The analysis accounts for increased ridership across San Joaquins and ACE (including passenger transfers from connecting transit, such as high-speed rail). Energy use reductions achieved by reduced VMT and trips were estimated using EMFAC2021. Refer to Appendix 3.3-1, *Air Quality, Greenhouse Gas, Health Risk Assessment, and Energy Supporting Documentation*, for the vehicle data used in the analysis.

Hydrogen Variants

The three Project variants include operation of San Joaquins hydrogen trains are being evaluated in this EIR. As discussed above and in Chapter 2, *Project Description*, SJJPA is committed to transitioning to ZE trainsets as soon as practicable, although the timeframe for full fleet conversion depends on many factors. Based on current procurements and technologies, the opening (2032) year analysis accounts for operation of three San Joaquins hydrogen trains. The horizon (2040) year analysis evaluates two transition scenarios. The first scenario conservatively assumes no additional ZE trainsets will be deployed, and the three opening year hydrogen trains would continue to operate under 2040 conditions. The second scenario assumes full ZE deployment with operation of eight San Joaquins hydrogen trains. While the precise future ZE transition schedule is not yet defined, the two horizon (2040) year scenarios evaluate the minimum and maximum ZE penetration for the Project variant conditions. Henceforth, this chapter refers to the three-train and eight-train hydrogen deployment scenarios as “limited” and “full,” respectively.

Utilizing hydrogen fuel would increase hydrogen fuel use and reduce San Joaquins diesel fuel use relative to the Project. The hydrogen variants would not change station and maintenance facility operations (except for water consumption), the need for connecting bus transit, or the reduction in automobile VMT and trips relative to the Project analysis. Variant H1 would include construction of a solar field and consume an additional 1,648 gallons of water annually to support on-site hydrogen production.[10] Variant H2 and Variant H3 would require haul trips and freight rail trips, respectively, to transport hydrogen produced off-site to the ACE Merced Layover and Maintenance Facility. Variant H1 under the full hydrogen deployment scenario would also require off-site hydrogen transport by haul truck.

The energy analysis of the three Project variants accounts for the reduction in San Joaquins diesel fuel use and the increase in hydrogen fuel use. Construction emissions for the on-site solar facility under Variant H1 were quantified using CalEEMod, version 2022. CalEEMod was also used to quantify energy usage from additional water consumption under Variant H1. EMFAC2021 was used to quantify off-site hydrogen fuel transport energy use under Variant H1 (full hydrogen deployment scenario only) and Variant H2. Freight rail energy use from offsite hydrogen fuel transport under Variant H3 were quantified using USEPA’s locomotive emissions standards and factors (USEPA 1998, 2023). The off-site hydrogen is likely to be sourced from one or more processing facilities, although the specific location is currently unknown. For the purposes of this analysis, potential transportation requirements for off-site hydrogen were estimated based on the location of existing hydrogen production facilities throughout California. The analysis considers the maximum transport distance of the locations assessed, which is from Palm Springs to the ACE Merced Layover and Maintenance Facility, to evaluate the energy use that would occur from the transport of fuel between Palm Springs and Merced. Potential transportation requirements for off-site hydrogen are discussed further in Appendix 3.3-1, *Air Quality, Greenhouse Gas, Health Risk Assessment, and Energy Supporting Documentation*. Modeled energy use for each variant was combined with energy use estimated for the Project.

Principal Sources

Principal sources consulted for the impact analysis are as follows.

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[10] The amount of on-site hydrogen production is limited to support three trains and thus would not change under the limited or full hydrogen deployment scenarios.

- *Air Quality, Greenhouse Gas, Health Risk Assessment, and Energy Supporting Documentation* prepared by ICF (Appendix 3.3-1)
- MITC engineering data provided by AECOM (personal communication)
- SJRRC *ACE Ceres-Merced Extension EIR* (SJJPA 2021)
- Technical models, including EMFAC2021 and CalEEMod version 2022

3.7.4.2 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 energy.

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

- Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during Project construction or operation.
- Conflict with or obstruct a state or local plan for renewable energy or energy efficiency.

3.7.4.3 Impacts and Mitigation Measures

Impact EN-1	Construction of the Project would not result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources during Project construction.
Level of Impact	**Less-than-significant impact**

Project

Impact Characterization

Construction impacts are defined as those resulting from building the Project, its associated infrastructure, and related physical changes. During construction of the Project, energy in the form of gasoline and diesel would be consumed to produce and transport construction materials, operate and maintain construction equipment, and transport construction workers to and from Project construction sites. Natural gas is not typically used during construction, and none of the construction equipment identified for construction of the Project would require the use of electricity. Energy consumed during Project construction would be temporary, and would cease once all construction activities are complete.

Table 3.7-3 summarizes the estimated usage of diesel and gasoline fuel during construction of the Project. The analysis assumes that of the total fuel used for construction equipment/vehicles, approximately 90 percent of the total would be diesel fuel and 10 percent would be gasoline fuel. Total gasoline and diesel fuel use for construction of the Project would be approximately 282,218 gallons for a total of approximately 38.4 billion BTUs.

Table 3.7-3. Construction Fuel Consumption for Project

Year	Equipment/Vehicles Fuel Consumption, Diesel and Gasoline (gallons)[a]	Freight Delivery Fuel Consumption, Diesel (gallons)	BTU (billion)
2029	16,057	0	2.2
2030	72,401	7,200	10.8
2031	97,646	16,876	15.6
2032	61,012	11,026	9.8
Total	*247,116*	*35,102*	*38.4*

Source: ICF 2024.
Notes:
1 gallon of diesel fuel= 137,281 BTU
1 gallon of gasoline fuel = 120,214 BTU
[a] Assumes a total fuel mix of 90 percent diesel fuel and 10 percent gasoline fuel.

Impact Details and Conclusions

The use of energy during Project construction would be temporary and limited to the duration of the approximately 4-year construction period. In addition, many financial incentives are offered by government and utility companies to support energy-efficient investments. Thus, it is anticipated that Project construction materials built and purchased from off-site suppliers would be efficiently produced based on the economic incentive for efficiency. Additionally, the Project would adhere to state and local reuse and recycling requirements, such as CALGreen, which would require a minimum of 65 percent of the nonhazardous construction and demolition debris generated during Project construction to be recycled or salvaged. Compliance with the recycling and reuse requirements would reduce the inherent energy cost of Project construction materials. Thus, energy resources would not be consumed in a wasteful, inefficient, or unnecessary manner during Project construction, and impacts would be less than significant.

Variant H1

Impact Characterization

Like the Project, construction of Variant H1 would consume energy in the form of gasoline and diesel to produce and transport construction materials, operate and maintain construction equipment, and transport construction workers to and from construction sites. Energy consumed during construction of Variant H1 would be temporary, and would cease once all construction activities are complete. However, unlike the Project, construction of Variant H1 would include the construction of a solar facility to support on-site hydrogen production.

Table 3.7-4 summarizes the estimated usage of diesel and gasoline fuel during construction of Variant H1. Similar to the Project, the analysis assumes that of the total fuel used for construction equipment/vehicles, approximately 90 percent of the total would be diesel fuel and 10 percent would be gasoline fuel. Total gasoline and diesel fuel use for construction of the Project would be approximately 292,409 gallons for a total of approximately 39.7 billion BTUs.

Table 3.7-4. Construction Fuel Consumption for Variant H1

Year	Equipment/Vehicles Fuel Consumption, Diesel and Gasoline (gallons)[a]	Freight Delivery Fuel Consumption, Diesel (gallons)	BTU (billion)
2029	16,057	0	2.2
2030	72,401	7,200	10.8
2031	106,838	16,876	16.8
2032	62,011	11,026	9.9
Total	*257,307*	*35,102*	*39.7*

Source: ICF 2024.
Notes:
1 gallon of diesel fuel= 137,281 BTU
1 gallon of gasoline fuel = 120,214 BTU
[a] Assumes a total fuel mix of 90 percent diesel fuel and 10 percent gasoline fuel.

Impact Details and Conclusions

Compared to the Project, construction of Variant H1 would result in slightly higher energy consumption due to the inclusion and construction of the solar facility to support the production of on-site hydrogen. Construction energy consumption would increase by approximately 1.3 billion BTUs from 38.4 billion BTUs under the Project to 39.7 billion BTUs under Variant H1. However, like the Project, Variant H1 would adhere to state and local reuse and recycling requirements, such as CALGreen, which would require a minimum of 65 percent of the nonhazardous construction and demolition debris generated during construction to be recycled or salvaged. Compliance with the recycling and reuse requirements would reduce the inherent energy cost of construction materials. Therefore, energy resources would not be consumed in a wasteful, inefficient, or unnecessary manner during construction of Variant H1, and impacts would be less than significant.

Variant H2

Impact Characterization

The impact characterization would be the same as described above for the Project.

Impact Details and Conclusions

Variant H2 would not have an appreciable effect on construction-related energy usage compared to the Project, and energy consumed during construction of Variant H2 would be temporary and would cease once construction activities are complete. Similar to the Project, construction under Variant H2 would adhere to state and local reuse and recycling requirements, such as CALGreen, which would reduce the inherent energy cost of Project construction materials. Therefore, construction of Variant H2 would not change environmental impacts related to the wasteful, inefficient, or unnecessary consumption of energy resources, and impacts would be less than significant.

Variant H3

Impact Characterization

The impact characterization would be the same as described above for the Project.

Impact Details and Conclusions

Variant H3 would not have an appreciable effect on construction-related energy usage compared to the Project, and energy consumed during construction of Variant H3 would be temporary and would cease once construction activities are complete. Similar to the Project, construction under Variant H3 would adhere to state and local reuse and recycling requirements, such as CALGreen, which would reduce the inherent energy cost of Project construction materials. Therefore, construction of Variant H3 would not change environmental impacts related to the wasteful, inefficient, or unnecessary consumption of energy resources, and impacts would be less than significant.

Impact EN-2	Operation of the Project would not result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during Project operation.
Level of Impact	**Less-than-significant impact (beneficial)**

Project

Impact Characterization

Operational energy impacts are those resulting from ongoing, routine, and occasional maintenance activities associated with operation of the Project. During operations, the Project would increase intercity passenger rail ridership on San Joaquins and ACE between the San Joaquin Valley, Sacramento Region, and Bay Area, but would not change the intensity or frequency of passenger train activities (i.e., locomotive movement, idling, and station and maintenance facility operations) relative to the future No Project condition. This means that the future locomotive fleet mix and service operating hours across San Joaquins and ACE would be the same with or without the Project. However, there would be increases in passenger rail ridership with buildout of the integrated station under future No Project and Project conditions (i.e., 2032 opening year and 2040 horizon year conditions), which would have corresponding effects on the demand for connecting bus service in Merced, specifically at the Merced Transpo Center stop, and would result in the need for additional trips for routes that connect to the Merced Transpo Center.

In addition, while the extent of future station and maintenance of facilities operational activities would not materially change between future Project and No Project conditions, the frequency of future operational activities would increase compared to existing conditions, resulting in the consumption of energy in the form of utilities (e.g., electricity, water, natural gas), solid waste generation, employee and delivery vehicle trips, stationary sources (e.g., emergency generators), and routine building upkeep.

As discussed above, energy use from San Joaquins operating hours were evaluated under existing (2022), opening (2032), and horizon (2040) year conditions. The future service schedule assumes five daily roundtrips from Oakland to Merced, two daily roundtrips from Sacramento to Merced, and one daily roundtrip from Natomas to Merced. The opening (2032) and horizon (2040) year energy use analyses assume all locomotives would operate Tier 4 certified engines fueled by renewable diesel. In addition, the new service and accessibility to passenger rail services would encourage the diversion of travelers and commuters from automobiles to passenger rail. The reduction in automobile VMT and the related decrease in fuel consumption would offset energy demands for the Project, and result in a net energy savings relative to existing (2022) year and opening (2032) No Project conditions.

As described in Section 3.7.4.1, *Methods for Analysis*, the analysis of energy demand associated with the Project considers the following components:

- Fuel consumption (diesel) from operation of passenger rail service.
- Fuel consumption (diesel and electricity) from expanded connecting transit service at Merced Transpo Center due to increased ridership with the Project.
- Consumption of diesel, electricity, and natural gas associated with the station and maintenance of facilities operations.
- Reduced automobile VMT and savings in automobile fuel consumption (i.e., diesel, gasoline, electricity) due to modal shift to commuter rail transit.

Table 3.7-5 through Table 3.7-8 summarize the annual locomotive fuel consumption and associated diesel used under existing (2022), opening (2032), and horizon (2040) year conditions. Under existing 2022 conditions, locomotives would use diesel fuel; however, under opening (2032) and horizon (2040) condition, renewable diesel fuel would be used. New operations of passenger rail services would result in decreased consumption of diesel fuel compared to existing conditions. In addition, diesel consumption from operations of passenger rail services would remain the same under future Project conditions (i.e., 2032 opening year and 2040 horizon year conditions) when compared to the No Project conditions.

Operation of the Project would result in expanded connecting transit service at the Merced Transpo Center due to increased ridership. Expanded connecting transit service would increase fuel consumption of diesel and electricity. Table 3.7-9 through Table 3.7-12 summarize the annual diesel and electricity use of connecting transit vehicle shuttles/bus bridges under existing (2022), opening (2032), and horizon (2040) year conditions. Connecting transit and bus bridges due to operation of the Project would result in a decrease of diesel and electricity by approximately 11.1 billion BTU in 2032 compared to existing (2022) year conditions, and approximately 0.7 billion BTU in 2032 compared to the No Project condition.

Operation of the Project would also result in the consumption of diesel fuel, electricity, and natural gas associated with the station and facility maintenance activities. While the extent of future station and maintenance facilities operational activities would not materially change between future Project and No Project conditions, the frequency of future operational activities would increase compared to existing conditions, resulting in the consumption of energy. Table 3.7-13 through Table 3.7-16 summarize the energy use anticipated for the station and maintenance of facilities operational activities included as part of the Project. As shown in Table 3.7-14, operation of the Project would result in an increase in energy demand of approximately 2.6 billion BTU in opening (2032) year conditions when compared to existing (2022) year conditions. However, energy demand between the Project under opening (2032) year conditions and No Project conditions would remain the same. There would be no increase or decrease in energy consumption between these two conditions.

Table 3.7-5. Annual Locomotive Fuel Consumption

Condition	Diesel (gallons/year)[a]	Hydrogen (kg/year)	Total Energy Consumption (Billion BTU)
Existing (2022)	2,822,357	-	387.7
Opening (2032) No Project	1,647,517	-	215.5
Hydrogen Variant (limited)	1,016,086	219,000	162.4
Opening (2032) Project[b]	1,647,517	-	215.5
Variant H1 (limited)	1,016,086	219,000	162.4
Variant H2 (limited)	1,016,086	219,000	162.4
Variant H3 (limited)	1,016,086	219,000	162.4
Horizon (2040) No Project	1,647,517	-	215.5
Hydrogen Variant (limited)	1,016,086	219,000	162.4
Hydrogen Variant (full)	-	584,000	78.6
Horizon (2040) Project[b]	1,647,517	-	215.5
Variant H1 (limited)	1,016,086	219,000	162.4
Variant H1 (full)	-	584,000	78.6
Variant H2 (limited)	1,016,086	219,000	162.4
Variant H2 (full)	-	584,000	78.6
Variant H3 (limited)	1,016,086	219,000	162.4
Variant H3 (full)	-	584,000	78.6

Source: ICF 2024

Notes:

[a] Under existing conditions, diesel fuel would be used, however, under future conditions renewable diesel fuel would be used.

[b] As noted in Section 3.7.4.1, *Methods for Analysis*, subsequent to preparation of this analysis, it was determined that the Project would require the use of wayside power at the proposed integrated Merced HSR Station. This would result in a minor decrease in the amount of operational diesel and a minor increase in the amount of operational electricity used compared to the scenario that was modeled.

1 gallon diesel fuel = 137,381 BTU

1 gallon of renewable diesel fuel = 130,817 BTU

1 kg of hydrogen = 2.20462 pounds of hydrogen; 1 pound of hydrogen = 61,013 BTU

Table 3.7-6. 2032 Annual Locomotive Fuel Consumption Compared to 2022 Existing Conditions

Condition	Fuel Consumption (Billion BTU)
Opening (2032) Project	-172.2
Variant H1 (limited)	-225.3
Variant H2 (limited)	-225.3
Variant H3 (limited)	-225.3

Source: ICF 2024
Notes:
1 gallon diesel fuel = 137,381 BTU
1 gallon of renewable diesel fuel = 130,817 BTU
1 kg of hydrogen = 2.20462 pounds of hydrogen; 1 pound of hydrogen = 61,013 BTU

Table 3.7-7. 2032 Locomotive Fuel Consumption Compared to 2032 No Project Conditions

Condition	Fuel Consumption (Billion BTU)
Opening (2032) Project	0
Variant H1	0
Variant H2	0
Variant H3	0

Source: ICF 2024
Notes:
1 gallon diesel fuel = 137,381 BTU
1 gallon of renewable diesel fuel = 130,817 BTU
1 kg of hydrogen = 2.20462 pounds of hydrogen; 1 pound of hydrogen = 61,013 BTU

Table 3.7-8. 2040 Locomotive Fuel Consumption Compared to 2040 No Project Conditions

Condition	Fuel Consumption (Billion BTU)
Horizon (2040) Project	0
Variant H1 (limited)	0
Variant H1 (full)	0
Variant H2 (limited)	0
Variant H2 (full)	0
Variant H3 (limited)	0
Variant H3 (full)	0

Source: ICF 2024
Notes:
1 gallon diesel fuel = 137,381 BTU
1 gallon of renewable diesel fuel = 130,817 BTU
1 kg of hydrogen = 2.20462 pounds of hydrogen; 1 pound of hydrogen = 61,013 BTU

Table 3.7-9. Annual Hydrogen Fuel Transport, Connecting Transit, and Bus Bridge Fuel Consumption

Condition	Hydrogen Fuel Transport		Bus Bridge		Connecting Transit		Total Energy Consumption (Billion BTU)
	Diesel (gal/yr)	Electricity (kWh/yr)	Diesel (gal/yr)	Electricity (kWh/year)	Diesel (gal/yr)	Electricity (kWh/yr)	
Existing (2022)	-	-	-	-	494,474	-	67.9
Opening (2032) No Project	-	-	5,026	2,517	408,117	204,361	57.5
Hydrogen Variant (limited)	60,375	117,010	5,026	2,517	408,117	204,361	66.2
Opening (2032) Project	-	-	-	-	408,117	204,361	56.8
Variant H1 (limited)	-	-	-	-	408,117	204,361	56.8
Variant H2 (limited)	60,375	117,010	-	-	408,117	204,361	65.5
Variant H3 (limited)	5,955	-	-	-	408,117	204,361	57.6
Horizon (2040) No Project	-	-	4,083	6,491	331,554	527,131	47.9
Hydrogen Variant (limited)	41,376	307,902	4,083	6,491	331,554	527,131	54.7
Hydrogen Variant (full)	111,297	821,072	4,083	6,491	331,554	527,131	66.0
Horizon (2040) Project	-	-	-	-	331,554	527,131	47.3
Variant H1 (limited)	-	-	-	-	331,554	527,131	47.3
Variant H1 (full)	69,560	513,170	-	-	331,554	527,131	58.7
Variant H2 (limited)	41,376	307,902	-	-	331,554	527,131	54.1
Variant H2 (full)	111,297	821,072	-	-	331,554	527,131	65.4

Condition	Hydrogen Fuel Transport		Bus Bridge		Connecting Transit		Total Energy Consumption (Billion BTU)
	Diesel (gal/yr)	Electricity (kWh/yr)	Diesel (gal/yr)	Electricity (kWh/year)	Diesel (gal/yr)	Electricity (kWh/yr)	
Variant H3 (limited)	5,955	-	-	-	331,554	527,131	48.2
Variant H3 (full)	15,880	-	-	-	331,554	527,131	49.5

Source: ICF 2024.
Notes:
1 gallon diesel fuel = 137,381 BTU
1 kWh electricity = 3,412 BTU

Table 3.7-10. 2032 Hydrogen Fuel Transport, Connecting Transit, and Bus Bridge Fuel Consumption Compared to 2022 Existing Conditions

Condition	Fuel Consumption (Billion BTU)
Opening (2032) Project	-11.1
Variant H1 (limited)	-11.1
Variant H2 (limited)	-2.4
Variant H3 (limited)	-10.3

Source: ICF 2024.
Notes:
1 gallon diesel fuel = 137,381 BTU
1 kWh electricity = 3,412 BTU

Table 3.7-11. 2032 Hydrogen Fuel Transport, Connecting Transit, and Bus Bridge Fuel Consumption Compared to 2032 No Project Conditions

Condition	Fuel Consumption (Billion BTU)
Opening (2032) Project	-0.7
Variant H1 (limited)	-9.4
Variant H2 (limited)	-0.7
Variant H3 (limited)	-8.6

Source: ICF 2024.
Notes:
1 gallon diesel fuel = 137,381 BTU
1 kWh electricity = 3,412 BTU

Table 3.7-12. 2040 Hydrogen Fuel Transport, Connecting Transit, and Bus Bridge Fuel Consumption Project Conditions Compared to 2040 No Project Conditions

Condition	Fuel Consumption (Billion BTU)
Horizon (2040) Project	-0.6
Variant H1 (limited)	-7.4
Variant H1 (full)	-7.3
Variant H2 (limited)	-0.6
Variant H2 (full)	-11.9
Variant H3 (limited)	-6.5
Variant H3 (full)	-16.5

Source: ICF 2024.
Notes:
1 gallon diesel fuel = 137,381 BTU
1 kWh electricity = 3,412 BTU

Table 3.7-13. Station and Maintenance Activities Energy Use

Condition	Diesel (gal/yr)	Electricity (kWh/yr)	Natural Gas (therms/year)	Total Energy Consumption (Billion BTU)
Existing (2022)	1,515	54,500	-	0.4
Opening (2032) No Project/ Hydrogen Variant (limited)	3,113	424,500	11,700	3.0
Opening (2032) Project[a]	3,113	397,250	11,700	3.0
Variant H1 (limited)	3,113	397,250	11,700	3.0
Variant H2 (limited)	3,113	397,250	11,700	3.0
Variant H3 (limited)	3,113	397,250	11,700	3.0
Horizon (2040) No Project/ Hydrogen Variant (limited or full)	2,880	424,500	11,700	3.0
Horizon (2040) Project[a]	2,880	397,250	11,700	2.9
Variant H1 (limited or full)	2,880	397,250	11,700	2.9
Variant H2 (limited or full)	2,880	397,250	11,700	2.9
Variant H3 (limited or full)	2,880	397,250	11,700	2.9

Source: ICF 2024.
Note:
[a] As noted in Section 3.7.4.1, *Methods for Analysis*, subsequent to preparation of this analysis, it was determined that the Project would require the use of wayside power at the proposed integrated Merced HSR Station. This would result in a minor decrease in the amount of operational diesel and a minor increase in the amount of operational electricity used compared to the scenario that was modeled.
1 gallon diesel fuel = 137,381 BTU
1 kWh electricity = 3,412 BTU
1 therm of natural gas = 100,000 BTU

Table 3.7-14. 2032 Station and Maintenance Energy Consumption Compared to 2022 Existing Conditions

Condition	Energy Consumption (Billion BTU)
Opening (2032) Project	2.6
Variant H1 (limited)	2.6
Variant H2 (limited)	2.6
Variant H3 (limited)	2.6

Source: ICF 2024.
Note:
1 gallon diesel fuel = 137,381 BTU
1 kWh electricity = 3,412 BTU
1 therm of natural gas = 100,000 BTU

Table 3.7-15. 2032 Station and Maintenance Energy Consumption Compared to 2032 No Project Conditions

Condition	Energy Consumption (Billion BTU)
Opening (2032) Project	0
Variant H1 (limited)	0
Variant H2 (limited)	0
Variant H3 (limited)	0

Source: ICF 2024.
Note:
1 gallon diesel fuel = 137,381 BTU
1 kWh electricity = 3,412 BTU
1 therm of natural gas = 100,000 BTU

Table 3.7-16. 2040 Station and Maintenance Consumption Compared to 2040 No Project Condition

Condition	Energy Consumption (Billion BTU)
Horizon (2040) Project	-0.1
Variant H1 (limited or full)	-0.1
Variant H2 (limited or full)	-0.1
Variant H3 (limited or full)	-0.1

Source: ICF 2024.
Note:
1 gallon diesel fuel = 137,381 BTU
1 kWh electricity = 3,412 BTU
1 therm of natural gas = 100,000 BTU

Operation of the Project would also result in reduced automobile VMT and savings in automobile fuel consumption in the form of diesel, gasoline, and electricity, due to the modal shift to commuter rail transit. This modal shift would offset the energy demands associated with overall operation of the Project. Table 3.7-17 through Table 3.7-20 present the annual energy reductions from reduced automobile VMT due to modal shift for 2032 and 2040. Based on the projected ridership resulting from operation of the Project, the mode switch from vehicle to commuter rail transit is estimated to reduce energy consumption from VMT, and thus diesel, gasoline, and electricity, annually by approximately 2.1 billion BTU in 2032 and 2040, compared to existing conditions. In addition, the Project would reduce energy consumption from VMT annually by approximately 0.4 billion BTU in 2032 and 2040, compared to No Project conditions.

Table 3.7-17. Annual Total Automobile VMT Reduced

Condition	Diesel/Gasoline (gal/yr)[a]	Electricity (kWh)/yr	Total Energy Consumption Reduction (Billion BTU)
Existing (2022)	10,832	2,591	1.3
Opening (2032) No Project/Hydrogen Variant (limited)	24,153	23,554	3.0
Opening (2032) Project[b]	27,240	26,542	3.4
Variant H1 (limited)	27,240	26,542	3.4
Variant H2 (limited)	27,240	26,542	3.4
Variant H3 (limited)	27,240	26,542	3.4
Horizon (2040) No Project/ Hydrogen Variant (limited or full)	24,103	30,447	3.0
Horizon (2040) Project[b]	27,168	34,307	3.4
Variant H1 (limited or full)	27,168	34,307	3.4
Variant H2 (limited or full)	27,168	34,307	3.4
Variant H3 (limited or full)	27,168	34,307	3.4

Source: ICF 2024.
Notes:
[a] Assumes a total mix of 5% diesel fuel and 95% gasoline fuel.
[b] As noted in Section 3.7.4.1, *Methods for Analysis*, subsequent to preparation of this analysis, it was determined that the Project would require the use of wayside power at the proposed integrated Merced HSR Station. This would result in a minor decrease in the amount of operational diesel and a minor increase in the amount of operational electricity used compared to the scenario that was modeled.
1 gallon diesel fuel = 137,381 BTU
1 kWh electricity = 3,412 BTU
1 therm of natural gas = 100,000 BTU

Table 3.7-18. 2032 Automobile VMT Reduction Compared to 2022 Existing Conditions

Condition	Total Energy Consumption Reduction (Billion BTU)
Opening (2032) Project	2.1
Variant H1 (limited)	2.1
Variant H2 (limited)	2.1
Variant H3 (limited)	2.1
Horizon (2040) Project	2.1
Variant H1 (limited or full)	2.1
Variant H2 (limited or full)	2.1
Variant H3 (limited or full)	2.1

1 gallon diesel fuel = 137,381 BTU
1 kWh electricity = 3,412 BTU
1 therm of natural gas = 100,000 BTU

Table 3.7-19. 2032 Automobile VMT Reduction Consumption Compared to 2032 No Project Conditions

Condition	Total Energy Consumption Reduction (Billion BTU)
Opening (2032) Project	0.4
Variant H1 (limited)	0.4
Variant H2 (limited)	0.4
Variant H3 (limited)	0.4

Source: ICF 2024.
Note:
1 gallon diesel fuel = 137,381 BTU
1 kWh electricity = 3,412 BTU
1 therm of natural gas = 100,000 BTU

Table 3.7-20. 2040 Automobile VMT Reduction Compared to 2040 No Project Conditions

Condition	*Billion BTU*
Horizon (2040) Project	0.4
Variant H1 (limited or full)	0.4
Variant H2 (limited or full)	0.4
Variant H3 (limited or full)	0.4

Source: ICF 2024.
Note:
1 gallon diesel fuel = 137,381 BTU
1 kWh electricity = 3,412 BTU
1 therm of natural gas = 100,000 BTU

Overall, operation of the Project would result in net energy reductions. As shown in Table 3.7-21 through Table 3.7-24 the annual net energy reductions from operation of the Project would be approximately 180.7 billion BTU per year in 2032, and approximately 190.3 billion BTU per year in 2040, compared to existing conditions. In addition, the Project would result in annual net energy reduction of approximately 0.7 billion BTU per year in 2032, and approximately 0.7 billion BTU per year in 2040, compared to No Project conditions.

Table 3.7-21. Summary of Annual Energy Demand

Condition	Gasoline/Diesel (gal/yr)[a]	Hydrogen (kg/yr)	Electricity (kWh/yr)	Natural Gas (therms/yr)	Total Energy Consumption (Billion BTU)
Existing (2022)	3,307,514	-	51,909	-	456.0
Opening (2032) No Project	2,039,620	-	605,307	11,700	276.0
Hydrogen Variant (limited)	1,468,564	219,000	-	-	-
Opening (2032) Project[b]	2,031,507	-	575,069	11,700	275.3
Variant H1 (limited)	1,400,076	219,000	575,069	11,700	222.2
Variant H2 (limited)	1,460,451	219,000	575,069	11,700	230.9
Variant H3 (limited)	1,406,031	219,000	575,069	11,700	223.0
Horizon (2040) No Project	1,961,931	-	921,184	11,700	266.4
Hydrogen Variant (limited)	1,371,876	219,000	-	-	-
Hydrogen Variant (full)	425,711	584,000	-	-	-
Horizon (2040) Project[b]	1,954,783	-	890,074	11,700	265.7
Variant H1 (limited)	1,323,352	219,000	890,074	11,700	212.6
Variant H1 (full)	376,826	584,000	-	-	-
Variant H2 (limited)	1,364,728	219,000	890,074	11,700	219.4
Variant H2 (full)	418,563	584,000	-	-	-
Variant H3 (limited)	1,329,317	219,000	890,074	11,700	213.5
Variant H3 (full)	323,156	584,000	-	-	-

Source: ICF 2024.

Notes:

[a] See Table 3.7-4 through Table 3.7-8 for splits of diesel vs. renewable diesel vs. gasoline.

[b] As noted in Section 3.7.4.1, *Methods for Analysis*, subsequent to preparation of this analysis, it was determined that the Project would require the use of wayside power at the proposed integrated Merced HSR Station. This would result in a minor decrease in the amount of operational diesel and a minor increase in the amount of operational electricity used compared to the scenario that was modeled.

1 gallon diesel fuel = 137,381 BTU

1 gallon renewable diesel = 130,817 BTU

1 gallon of gasoline fuel = 120,214 BTU

1 kg of hydrogen = 2.20462 pounds of hydrogen; 1 pound of hydrogen = 61,013 BTU

1 kWh electricity = 3,412 BTU

1 therm of natural gas = 100,000 BTU

Table 3.7-22. 2032 Annual Energy Consumption Compared to 2022 Existing Conditions

Condition	Gasoline/Diesel (gal/yr)[a]	Hydrogen (kg/yr)	Electricity (kWh/yr)	Natural Gas (therms/yr)	Total Energy Consumption (Billion BTU)
Opening (2032) Project	-1,276,007	-	523,160	11,700	-180.7
Variant H1 (limited)	-1,907,438	219,000	523,160	11,700	-233.8
Variant H1 (full)	0	-	-	-	-
Variant H2 (limited)	-1,847,063	219,000	523,160	11,700	-225.1
Variant H2 (full)	-	-	-	-	-
Variant H3 (limited)	-1,901,483	219,000	523,160	11,700	-233.0
Variant H3 (full)	-	-	-	-	-
Horizon (2040) Project	-1,352,731	-	838,165	11,700	-190.3
Variant H1 (limited)	-1,984,162	219,000	838,165	11,700	-243.4
Variant H1 (full)	-	-	-	-	-
Variant H2 (limited)	-1,942,786	219,000	838,165	11,700	-236.6
Variant H3 (full)	0				
Variant H3 (limited)	-1,978,197	219,000	838,165	11,700	-242.5

Source: ICF 2024.

Notes:

[a] See Table 3.7-4 through Table 3.7-8 for splits of diesel vs. renewable diesel vs. gasoline.

[b] As noted in Section 3.7.4.1, *Methods for Analysis*, subsequent to preparation of this analysis, it was determined that the Project would require the use of wayside power at the proposed integrated Merced HSR Station. This would result in a minor decrease in the amount of operational diesel and a minor increase in the amount of operational electricity used compared to the scenario that was modeled.

1 gallon diesel fuel = 137,381 BTU

1 gallon renewable diesel = 130,817 BTU

1 gallon of gasoline fuel = 120,214 BTU

1 kg of hydrogen = 2.20462 pounds of hydrogen; 1 pound of hydrogen = 61,013 BTU

1 kWh electricity = 3,412 BTU

1 therm of natural gas = 100,000 BTU

Table 3.7-23. 2032 Annual Energy Consumption Compared to 2032 No Project Conditions

Condition	Gasoline/Diesel (gal/yr)[a]	Hydrogen (kg/yr)	Electricity (kWh/yr)	Natural Gas (therms/yr)	Total Energy Consumption (Billion BTU)
Opening (2032) Project	-8,113	0	-30,238	0	-0.7
Variant H1 (limited)	-639,544	219,000	-30,238	0	-53.8

Condition	Gasoline/Diesel (gal/yr)[a]	Hydrogen (kg/yr)	Electricity (kWh/yr)	Natural Gas (therms/yr)	Total Energy Consumption (Billion BTU)
Variant H2 (limited)	-579,169	219,000	-30,238	0	-45.1
Variant H3 (limited)	-633,589	219,000	-30,238	0	-53.0

Source: ICF 2024.
Notes:
[a] See Table 3.7-4 through Table 3.7-8 for splits of diesel vs. renewable diesel vs. gasoline.
[b] As noted in Section 3.7.4.1, *Methods for Analysis*, subsequent to preparation of this analysis, it was determined that the Project would require the use of wayside power at the proposed integrated Merced HSR Station. This would result in a minor decrease in the amount of operational diesel and a minor increase in the amount of operational electricity used compared to the scenario that was modeled.
1 gallon diesel fuel = 137,381 BTU
1 gallon renewable diesel = 130,817 BTU
1 gallon of gasoline fuel = 120,214 BTU
1 kg of hydrogen = 2.20462 pounds of hydrogen; 1 pound of hydrogen = 61,013 BTU
1 kWh electricity = 3,412 BTU
1 therm of natural gas = 100,000 BTU

Table 3.7-24. 2040 Annual Energy Consumption Compared to 2040 No Project Conditions

Condition	Gasoline/Diesel (gal/yr)[a]	Hydrogen (kg/yr)	Electricity (kWh/yr)	Natural Gas (therms/yr)	Total Energy Consumption (Billion BTU)
Horizon (2040) Project	-7,148	0	-31,110	0	-0.7
Variant H1 (limited)	-638,579	219,000	-31,110	0	-53.8
Variant H1 (full)	0	0	0	0	0
Variant H2 (limited)	-597,203	219,000	-31,110	0	-47.0
Variant H2 (full)	0	0	0	0	0
Variant H3 (limited)	-632,614	219,000	-31,110	0	-52.9
Variant H3 (full)	0	0	0	0	0

Source: ICF 2024.
Notes:
[a] See Table 3.7-4 through Table 3.7-8 for splits of diesel vs. renewable diesel vs. gasoline.
[b] As noted in Section 3.7.4.1, *Methods for Analysis*, subsequent to preparation of this analysis, it was determined that the Project would require the use of wayside power at the proposed integrated Merced HSR Station. This would result in a minor decrease in the amount of operational diesel and a minor increase in the amount of operational electricity used compared to the scenario that was modeled.
1 gallon diesel fuel = 137,381 BTU
1 gallon renewable diesel = 130,817 BTU
1 gallon of gasoline fuel = 120,214 BTU
1 kg of hydrogen = 2.20462 pounds of hydrogen; 1 pound of hydrogen = 61,013 BTU
1 kWh electricity = 3,412 BTU
1 therm of natural gas = 100,000 BTU

Impact Details and Conclusions

As shown in Table 3.7-1, rail travel per passenger mile is less energy intensive than by car, personal truck, and transit buses. With the Project, additional travelers could choose to ride passenger rail transit instead of an alternative form of transportation that could consume more energy. Therefore, despite increased energy demand as a result of additional expanded connecting transit services and increased frequency of future operational activities associated with the station and maintenance of facilities operations, the Project would reduce automobile VMT and consequently reduce energy consumption per passenger mile. This change in energy consumption due to the Project would be an environmental benefit.

Overall, as shown in Table 3.7-21 through Table 3.7-24, operation of the Project would result in a net energy savings compared to existing conditions and No Project conditions. Energy use benefits achieved through operation of the Project would offset the short-term construction energy use in less than a year. Energy savings achieved thereafter would contribute to reductions in energy use. Energy demand from operations of the Project would result in less energy use than existing (2022) year and opening year (2032) No Project conditions. As such, the Project would result in a beneficial impact on the environment, and therefore, the environmental impacts associated with the wasteful, inefficient, or unnecessary consumption of energy resources would be less than significant.[11]

Variant H1

Impact Characterization

Under the full hydrogen deployment scenario, Variant H1 would use a combination of hydrogen produced on-site and sourced from off-site locations. Table 3.7-5 summarizes the annual locomotive fuel consumption and associated diesel used under existing (2022), opening (2032), and horizon (2040) year conditions. Under existing 2022 conditions, locomotives would use diesel fuel; however, under opening (2032) and horizon (2040) conditions, renewable diesel fuel and hydrogen fuel would be used. New operations of passenger rail services under Variant H1 would result in decreased consumption of diesel fuel and overall energy consumption compared to existing conditions. Specifically, Variant H1 (limited) would result in an approximately 225.3 billion BTU decrease in energy consumption from operations of passenger rail services under future conditions when compared to existing conditions, while Variant H1 (full) would result in an approximately 309.1 billion BTU decrease.

Table 3.7-9 summarizes the annual diesel and electricity use of connecting transit vehicle shuttles/bus bridges under existing (2022), opening (2032), and horizon (2040) year conditions from expanded connecting transit service under Variant H1. Connecting transit and bus bridges due to operation of Variant H1 (limited) would result in a decrease of diesel and electricity by approximately 11.1 billion BTU in 2032 compared to existing (2022) year conditions, and approximately 9.4 billion BTU in 2032 compared to No Project conditions. Variant H1 (limited) would result in a decrease of approximately 7.4 billion BTU in 2040 compared to No Project conditions, and Variant H1 (full) would result in a decrease of approximately 7.3 billion BTU.

[11] Subsequent to preparation of this analysis, it was determined that the Project would require the use of wayside power at the proposed integrated Merced HSR Station, as discussed in Section 2.4.3, *Energy Consumption*, in Chapter 2, *Project Description*. This would result in a minor increase in the amount of energy required by the Project during operation compared to the scenario that was modeled. Thus, the use of wayside power would not result in any change to the level of impact of the Project.

Table 3.7-13 summarizes the energy use anticipated for the station and maintenance of facilities operational activities under Variant H1. Operation of Variant H1 (limited) would result in an increase in energy demand of approximately 2.6 billion BTU in opening (2032) year conditions when compared to existing (2022) year conditions. However, energy demand between Variant H1 (limited) under opening (2032) year conditions and No Project conditions would remain the same. There would be no increase or decrease in energy consumption between these two conditions. Furthermore, Variant H1 (limited or full) under horizon (2040) year conditions would result in a decrease of approximately 0.1 billion BTU.

Operation of Variant H1 would also result in reduced automobile VMT and savings in automobile fuel consumption in the form of diesel, gasoline, and electricity, due to the modal shift to commuter rail transit. Table 3.7-17 presents the annual energy reductions from reduced automobile VMT due to modal shift for 2032 and 2040. Based on the projected ridership resulting from operation of Variant H1, the mode switch from vehicle to commuter rail transit is estimated to reduce energy consumption from VMT, and thus diesel, gasoline, and electricity, annually by approximately 2.1 billion BTU in 2032 and 2040, compared to existing conditions. In addition, Variant H1 (limited) would reduce energy consumption from VMT annually by approximately 0.4 billion BTU in 2032 compared to No Project conditions, and Variant H1 (limited or full) would reduce energy consumption by approximately 0.4 billion BTU in 2040 No Project conditions.

Impact Details and Conclusions

Overall, as shown in Table 3.7-21, operation of Variant H1 would result in a net energy savings compared to existing conditions and the No Project conditions. Like the Project, energy use benefits achieved through operation of Variant H1 would offset the short-term construction energy use in less than a year. Energy savings achieved thereafter would contribute to reductions in energy use. In addition, energy used under Variant H1 would result in a decrease of approximately 53.8 billion BTUs compared to opening (2032) and future (2040) Project conditions. Furthermore, under Variant H1, additional travelers could choose to ride passenger rail transit instead of an alternative form of transportation that could consume more energy. Therefore, despite increased energy demand as a result of additional expanded connecting transit services, operation of the solar facility, use of hydrogen fuel, and increased frequency of future operational activities associated with the station and maintenance of facilities operations, Variant H1 would reduce automobile VMT and consequently reduce energy consumption per passenger mile. As such, Variant H1 would result in a beneficial impact on the environment, and therefore, the environmental impacts associated with the wasteful, inefficient, or unnecessary consumption of energy resources would be less than significant.

Variant H2

Impact Characterization

Variant H2 would not operate an on-site solar facility and instead would use on-road trucks to transport all required hydrogen from off-site production locations to the ACE Merced Layover and Maintenace Facility. Table 3.7-5 summarizes the annual locomotive fuel consumption and associated diesel used under existing (2022), opening (2032), and horizon (2040) year conditions. Under existing 2022 conditions, locomotives would use diesel fuel; however, under opening (2032) and horizon (2040) year conditions, renewable diesel fuel and hydrogen fuel would be used. New operations of passenger rail services under Variant H2 would result in decreased consumption of diesel fuel and overall energy consumption compared to existing conditions. Specifically, Variant H2 (limited) would result in an approximately 225.3 billion BTU decrease in energy consumption from operations of passenger rail services under future conditions when compared to existing No Project conditions, while Variant H2 (full) would result in an approximately 309.1 billion BTU decrease. However, energy demand between Variant H2 (limited or full) under opening (2032) year and horizon (2040) year conditions and No Project conditions would remain the same. There would be no increase or decrease in energy consumption between these two conditions.

Table 3.7-9 summarizes the annual diesel and electricity use of connecting transit vehicle shuttles/bus bridges under existing, opening, and horizon year conditions from expanded connecting transit service under Variant H2. Connecting transit and bus bridges due to operation of Variant H2 (limited) would result in a decrease of diesel and electricity by approximately 2.4 billion BTU in 2032 compared to existing year conditions, and approximately 0.7 billion BTU in 2032 compared to No Project conditions. Variant H2 (limited) would result in a decrease of approximately 0.6 billion BTU in 2040 compared to No Project conditions, and Variant H2 (full) would result in a decrease of approximately 11.9 billion BTU.

Table 3.7-13 summarizes the energy use anticipated for the station and maintenance of facilities operational activities under Variant H2. As shown, operation of Variant H2 (limited) would result in an increase in energy demand of approximately 2.6 billion BTU in opening year conditions when compared to existing conditions. However, energy demand between Variant H2 (limited) under opening year conditions and No Project conditions would remain the same. There would be no increase or decrease in energy consumption between these two conditions. Furthermore, Variant H2 (limited or full) under horizon (2040) year conditions would result in a decrease of approximately 0.1 billion BTU.

Table 3.7-17 presents the annual energy reductions from reduced automobile VMT due to modal shift for 2032 and 2040 under Variant H2. Based on the projected ridership resulting from operation of Variant H2, the mode switch from vehicle to commuter rail transit is estimated to reduce energy consumption from VMT, and thus diesel, gasoline, and electricity, annually by approximately 2.1 billion BTU in 2032 and 2040, compared to existing conditions. In addition, Variant H2 (limited) would reduce energy consumption from VMT annually by approximately 0.4 billion BTU in 2032 compared to No Project conditions, and Variant H2 (limited or full) would reduce energy by approximately 0.4 billion BTU in 2040 No Project conditions.

Impact Details and Conclusions

Overall, as shown in Table 3.7-21, operation of Variant H2 would result in a net energy savings compared to existing conditions and the No Project conditions. Like the Project, energy use benefits achieved through operation of Variant H2 would offset the short-term construction energy use in less than a year. Energy savings achieved thereafter would contribute to reductions in energy use. In addition, energy used under Variant H2 would result in a decrease of approximately 45.1 billion BTUs and approximately 47 billion BTUs compared to opening (2032) and future (2040) Project conditions, respectively. Furthermore, with Variant H2, additional travelers could choose to ride passenger rail transit instead of an alternative form of transportation that could consume more energy. Therefore, despite increased energy demand as a result of additional expanded connecting transit services, truck transportation and use of hydrogen fuel, and increased frequency of future operational activities associated with the station and maintenance of facilities operations, Variant H2 would reduce automobile VMT and consequently reduce energy consumption per passenger mile. As such, Variant H2 would result in a beneficial impact on the environment, and therefore the environmental impacts associated with the wasteful, inefficient, or unnecessary consumption of energy resources would be less than significant.

Variant H3

Impact Characterization

Variant H3 would use freight rail to transport off-site hydrogen to the ACE Merced Layover and Maintenance Facility. Table 3.7-5 summarizes the annual locomotive fuel consumption and associated diesel used under existing (2022), opening (2032), and horizon (2040) year conditions. Under existing 2022 conditions, locomotives would use diesel fuel; however, under opening (2032) and horizon (2040) condition, renewable diesel fuel and hydrogen fuel would be used. New operations of passenger rail services under Variant H2 would result in decreased consumption of diesel fuel and overall energy consumption compared to existing and Project conditions. Specifically, Variant H3 (limited) would result in an approximately 225.3 billion BTU decrease in energy consumption from operations of passenger rail services under future conditions when compared to No Project conditions, while Variant H3 (full) would result in an approximately 309.1 billion BTU decrease. However, energy demand between Variant H3 (limited or full) under opening (2032) year and horizon (2040) year conditions and No Project conditions would remain the same. There would be no increase or decrease in energy consumption between these two conditions.

Table 3.7-9 summarizes the annual diesel and electricity use of connecting transit vehicle shuttles/bus bridges under existing, opening, and horizon year conditions from expanded connecting transit service under Variant H3. Connecting transit and bus bridges due to operation of Variant H3 (limited) would result in a decrease of diesel and electricity by approximately 10.3 billion BTU in 2032 compared to existing year conditions, and approximately 8.6 billion BTU in 2032 compared to No Project conditions. Variant H3 (limited) would result in a decrease of approximately 6.5 billion BTU in 2040 compared to No Project conditions, and Variant H3 (full) would result in a decrease of approximately 16.5 billion BTU.

Table 3.7-13 summarizes the energy use anticipated for the station and maintenance of facilities operational activities under Variant H3. As shown, operation of Variant H3 (limited) would result in an increase in energy demand of approximately 2.6 billion BTU in opening year conditions when compared to existing year conditions. However, energy demand between Variant H3 (limited) under opening year conditions and No Project conditions would remain the same. There would be no increase or decrease in energy consumption between these two conditions. Furthermore, Variant H3 (limited or full) under horizon (2040) year conditions would result in a decrease of approximately 0.1 billion BTU.

Table 3.7-17 presents the annual energy reductions from reduced automobile VMT due to modal shift for 2032 and 2040 under Variant H3. Based on the projected ridership resulting from operation of Variant H3, the mode switch from vehicle to commuter rail transit is estimated to reduce energy consumption from VMT, and thus diesel, gasoline, and electricity, annually by approximately 2.1 billion BTU in 2032 and 2040, compared to existing conditions. In addition, Variant H3 (limited) would reduce energy consumption from VMT annually by approximately 0.4 billion BTU in 2032 compared to No Project conditions, and Variant H3 (limited or full) would reduce energy by approximately 0.4 billion BTU in 2040.

Impact Details and Conclusions

Overall, as shown in Table 3.7-21**,** operation of Variant H3 would result in a net energy savings compared to existing conditions and No Project conditions. Like the Project, energy use benefits achieved through operation of Variant H3 would offset the short-term construction energy use in less than a year. Energy savings achieved thereafter would contribute to reductions in energy use. In addition, energy used under Variant H3 would result in a decrease of approximately 53 billion BTU and approximately 52.9 billion BTU compared to opening (2032) and future (2040) Project conditions, respectively. Furthermore, under Variant H3, additional travelers could choose to ride passenger rail transit instead of an alternative form of transportation that could consume more energy. Therefore, despite increased energy demand as a result of additional expanded connecting transit services, rail transportation and use of hydrogen fuel, and increased frequency of future operational activities associated with the station and maintenance of facilities operations, Variant H3 would reduce automobile VMT and consequently reduce energy consumption per passenger mile. As such, Variant H3 would result in a beneficial impact on the environment, and therefore, the environmental impacts associated with the wasteful, inefficient, or unnecessary consumption of energy resources would be less than significant.

Impact EN-3	Construction and operation of the Project would not conflict with or obstruct a state or local plan for renewable energy or energy efficiency.
Level of Impact	**Less-than-significant impact**

Project

Impact Characterization

There are various state and local plans that contain policies about clean energy and energy efficiency. The *State Energy Action Plan* calls for the state to assist in the transformation of its transportation system to improve air quality, reduce congestion, and increase the efficient use of fuel supplies with the fewest environmental and energy costs (CEC and CPUC 2008). The Regional Transportation Plan/Sustainable Communities Strategy for Merced County, including the city of Merced, contains a goal to reduce usage of nonrenewable energy resources for transportation purposes. The general plans for Merced County and the City of Merced contain policies related to clean energy and energy efficiency. These policies are contained in Appendix 3.0-1, *Regional Plans and Local General Plans*, and generally relate to promoting energy efficiency and clean energy in building design and transportation.

Impact Details and Conclusions

As discussed in Impact EN-1, during construction of the Project, energy would be consumed in the form of gasoline and diesel fuel to transport construction materials, to operate and maintain construction equipment, and transport construction workers to and from Project construction sites. Freight deliveries during Project construction would use diesel fuel. Overall, energy consumption would involve primarily diesel fuel for construction equipment and transport, and no natural gas or electricity would be consumed during construction of the Project. Therefore, as there would be no electricity consumed during construction, the Project would not affect the ability of PG&E or MID to serve the region with existing supplies or obstruct the ability of these electricity providers to comply with applicable state or local plan requirements regarding clean energy. In addition, energy consumed during Project construction would be temporary, and would cease once all construction activities are complete.

Operation of the Project would result in a decrease in overall energy consumption when compared to existing (2022) year, and opening (2032), and horizon (2040) year No Project conditions. Despite increased energy demand as a result of additional expanded connecting transit services and increased frequency of future operational activities associated with the station and maintenance of facilities operations, the Project would reduce automobile VMT and consequently reduce energy consumption per passenger mile. Station and maintenance facility operations would use energy in the form of electricity and natural gas from regional and local providers. However, the energy used during operation would not result in a substantial increase in energy demand and would not obstruct the ability of energy providers to comply with state and local plan requirements regarding clean energy. In addition, all locomotives would operate Tier 4 certified engines fueled by renewable diesel in the opening (2032) and horizon (2040) year conditions. Use of the Tier 4 engines proposed as part of the Project is conservative given that an increasing percentage of zero-emission locomotives would operate statewide and become increasingly more efficient, due in part to regulatory mandates required by the In-Use Locomotive Regulation (see Section 3.3.2.2, *State,* in Section 3.3*, Air Quality and Greenhouse Gas Emissions*). As discussed in Impact EN-2, energy use benefits achieved through operation of the Project would offset the short-term construction energy use in less than a year. Furthermore, as shown in Table 3.7-21 through Table 3.7-24, operation of the Project would result in a net energy reduction compared to existing conditions and No Project conditions, and would therefore support state and local goals related to increased energy efficiency.

Overall, the Project would not obstruct the ability of energy providers to comply with state and local plan requirements regarding renewable energy or energy efficiency, and impacts would be less than significant.

Variant H1

Impact Characterization

The impact characterization would be the same as described above for the Project.

Impact Details and Conclusions

Similar to the Project, Variant H1 would not obstruct the ability of energy providers to comply with state and local plan requirements regarding clean energy. Compared to the Project, construction of the solar facility to support on-site hydrogen production under Variant H1 would result in slightly greater construction energy consumption. However, like the Project, energy consumption under Variant H1 would be limited to diesel and gasoline fuel, and no natural gas or electricity would be consumed during construction. As such, Variant H1 would not affect the ability of energy services providers PG&E and MID to serve the region with existing supplies, and would not obstruct the ability of these providers to comply with applicable state or local plan requirements regarding energy efficiency and clean energy.

Under Variant H1, locomotives would operate Tier 4 certified engines fueled either by renewable diesel or hydrogen fuel in the opening and horizon year conditions. The use of hydrogen fuel by the locomotives, which would be provided by the on-site solar facility, would further statewide goals related to energy efficiency and increasing the use of renewable energy by expanding the supply and implementation of hydrogen as a fuel. The use of hydrogen fuel as part of Variant H1 would also be consistent with the California Department of Transportation (Caltrans) Operations and Maintenance, Division of Rail and Maintenance plan to convert its full fleet of locomotives to zero-emission hydrogen vehicles by 2035. Furthermore, as shown in Table 3.7-21 through Table 3.7-24, operation of Variant H1 would result in a net energy reduction compared to existing conditions, No Project conditions, and Project conditions, and would therefore support state and local goals related to increased energy efficiency. Therefore, Variant H1 would not change environmental impacts related to a potential conflict with state or local plan for renewable energy or energy efficiency. The impact would be less than significant.

Variant H2

Impact Characterization

The impact characterization would be the same as described above for the Project.

Impact Details and Conclusions

The impact details for Variant H2 are the same as described above for Variant H1 except for the construction of the solar facility. Variant H2 would not construct an on-site solar facility, and thus would have the same potential to conflict with applicable state or local plan requirements regarding energy efficiency and clean energy. Like Variant H1, locomotives would operate Tier 4 certified engines fueled either by renewable diesel or hydrogen fuel in the opening and horizon year conditions under Variant H2. The use of hydrogen fuel by the locomotives, which would be provided by truck trips, would further statewide goals related to energy efficiency and increasing the use of renewable energy by expanding the supply and implementation of hydrogen as a fuel. The use of hydrogen fuel as part of Variant H2 would also be consistent with the Caltrans Operations and Maintenance, Division of Rail and Maintenance plan to convert its full fleet of locomotives to zero-emission hydrogen vehicles by 2035. Furthermore, as shown in Table 3.7-21 through Table 3.7-24 operation of Variant H2 would result in a net energy reduction compared to existing conditions, No Project conditions, and Project conditions, and would therefore support state and local goals related to increased energy efficiency. Therefore, Variant H2 would not change environmental impacts related to a potential conflict with state or local plan for renewable energy or energy efficiency. The impact would be less than significant.

Variant H3

Impact Characterization

The impact characterization would be the same as described above for the Project.

Impact Details and Conclusions

The impact details for Variant H3 are the same as described above for Variant H1 except for the construction of the solar facility. Variant H3 would not construct an on-site solar facility, and thus would have the same potential to conflict with applicable state or local plan requirements regarding energy efficiency and clean energy as the Project. Like the above variants, locomotives would operate Tier 4 certified engines fueled either by renewable diesel or hydrogen fuel in the opening and horizon year conditions under Variant H3. The use of hydrogen fuel by the locomotives, which would be provided by rail, would further statewide goals related to energy efficiency and increasing the use of renewable energy by expanding the supply and implementation of hydrogen as a fuel. The use of hydrogen fuel as part of Variant H3 would also be consistent with the Caltrans Operations and Maintenance, Division of Rail and Maintenance plan to convert its full fleet of locomotives to zero-emission hydrogen vehicles by 2035. Furthermore, as shown in Table 3.7-21 through Table 3.7-24, operation of Variant H3 would result in a net energy reduction compared to existing conditions, No Project conditions, and Project conditions, and would therefore support state and local goals related to increased energy efficiency. Therefore, Variant H3 would not change environmental impacts related to a potential conflict with state or local plan for renewable energy or energy efficiency. The impact would be less than significant.

3.8 Geology, Seismicity, Soils, and Paleontological Resources

3.8.1 Introduction

This section describes the regulatory and environmental setting for geology, soils, seismicity, and paleontological resources in the vicinity of the Project. It also describes the impacts related to geology and soils and on paleontological resources that would result from the Project and mitigation measures that would reduce significant impacts, where feasible and appropriate.

Cumulative impacts related to geology and soils and on paleontological resources, in combination with planned, approved, and reasonably foreseeable projects, are discussed in Chapter 4, *Cumulative Impacts*.

3.8.2 Regulatory Setting

This section summarizes the federal, state, regional, and local regulations related to geology, seismicity, soils, and paleontological resources applicable to the Project.

3.8.2.1 Federal Regulations

Geology and Soils

Federal Railroad Administration

Section 213.239, Special Inspections, of 49 Code of Federal Regulations (C.F.R.) Part 213 requires that, in the event of a natural disaster, such as an earthquake or flooding, the Federal Railroad Administration (FRA) and the rail operator will conduct a special inspection of the track involved as soon as possible after the occurrence, and, if possible, before the operation of any train over the track.

Paleontological Resources

Although the Project would not occur on federal land, the Project may receive federal funds in the future, and thus federal regulations related to paleontological resources would apply if that occurs.

Paleontological Resources Preservation Act of 2009

The Paleontological Resources Preservation Act of 2009 (Public Law [PL] No. 111-11, Subtitle D) includes provisions for the protection and preservation of paleontological resources. The law also prohibits the collection of paleontological resources from federal land without a permit, except in the case of noncommercial collecting that complies with other regulations for that federal land.

Federal Antiquities Act

The Federal Antiquities Act of 1906 (PL 59-209, 16 United States Code [USC] 431–433) prohibits appropriation, excavation, injury, or destruction of “any historic or prehistoric ruin or monument, or any object of antiquity” located on lands owned or controlled by the federal government, without permission of the Secretary of Agriculture or Secretary of the Interior. It also establishes criminal penalties, including fines or imprisonment, for these acts, and sets forth a permit requirement for collection of antiquities on federally owned lands. Neither the Antiquities Act itself nor its implementing regulations (43 C.F.R. § 3) specifically mentions paleontological resources. However, several federal agencies—including the National Park Service, U.S. Bureau of Land Management, and U.S. Forest Service—have interpreted "objects of antiquity" to include fossils. See the description of the Archaeological and Paleontological Salvage Statute and Federal-Aid Highway Act for the applicability of this law to the Project.

Archaeological and Paleontological Salvage Statute and Federal-Aid Highway Act

The Archaeological and Paleontological Salvage Statute (23 USC 305) amended the Antiquities Act of 1906 with the following text.

> Funds authorized to be appropriated to carry out this title to the extent approved as necessary, by the highway department of any State, may be used for archaeological and paleontological salvage in that state in compliance with the Act entitled "An Act for the preservation of American Antiquities," approved June 8, 1906 (PL 59-209; 16 USC 431-433), and State laws where applicable.

The Federal-Aid Highway Act of 1935 (20 USC 78) gives authority to use federal funds for salvage of paleontological sites affected by highway projects. Together, the Archaeological and Paleontological Salvage Statute and Federal-Aid Highway Act permit paleontological resources salvage to be carried out under federal highway project funding, as long as the excavated materials and any information recovered from them are made available to the public and not for private gain.

3.8.2.2 State Regulations

Geology and Soils

Alquist-Priolo Earthquake Fault Zoning Act

The Alquist-Priolo Earthquake Fault Zoning Act was enacted as the Special Studies Zones Act in 1971 to prevent the construction of structures for human occupancy directly across the trace of active faults. The law required the State Geologist to delineate approximately 0.25-mile-wide zones along surface traces of active faults. The act defines an active fault as one that has ruptured the ground surface within the past 11,700 years. Prior to approving construction of structures for human occupancy, permit authorities must require a project's applicant to submit a fault investigation report for review and approval by the local jurisdiction.

Seismic Hazards Mapping Act

The Seismic Hazards Mapping Act was enacted in 1990 to address areas with a potential for ground deformation related to seismic activity. The Seismic Hazards Mapping Act requires that the State Geologist issue Official Seismic Hazard Zones Maps that delineate zones within which there may be a potential for earthquake-induced landslides or liquefaction. Prior to approving specific types of development, local permit authorities require a project's applicant to submit a geotechnical investigation report for review and approval by the jurisdiction.

California Building Standards Code

Cal. Code Regs., Title 24, the California Building Standards Code, governs the design and construction of buildings, associated facilities, and equipment and applies to most buildings in California. Standards cover general building design and construction requirements related to fire and life safety, structural safety, and access compliance.

Each jurisdiction in California may adopt its own building code, based on the current California Building Standards Code. Local codes are permitted to be more stringent than the current California Building Standards Code but, at a minimum, are required to meet all State standards and enforce the regulations of the current California Building Standards Code. The City of Merced has adopted the 2022 California Building Standards Code and local amendments.

Paleontological Resources

California Public Resources Code

Several sections of the California Public Resources Code protect paleontological resources. Section 5097.5 prohibits knowing and willful excavation, removal, destruction, injury, and defacement of any paleontological feature on public lands (lands under state, county, city, district, or public authority jurisdiction, or the jurisdiction of a public corporation), except where the agency with jurisdiction has granted express permission. Section 30244 requires reasonable mitigation for impacts on paleontological resources, if such resources have been identified by the State Historic Preservation Officer, that occur as a result of development on public lands.

3.8.2.3 Regional and Local Regulations

The San Joaquin Joint Powers Authority (SJJPA), as a state joint powers agency, proposes improvements within and outside the Union Pacific Railroad (UPRR) and BNSF Railway (BNSF) rights-of-way. The Interstate Commerce Commission Termination Act (ICCTA) affords railroads that engage in interstate commerce considerable flexibility in making necessary improvements and modifications to rail infrastructure, subject to the requirements of the Surface Transportation Board. ICCTA broadly preempts state and local regulation of railroads; this preemption extends to the construction and operation of rail lines. As such, activities within the UPRR and BNSF rights-of-way are clearly exempt from local building and zoning codes as well as other land use ordinances. Project activities outside of the UPRR and BNSF rights-of-way, however, would be subject to regional and local plans and regulations. Though ICCTA broadly preempts state and local regulation of railroads, SJJPA intends to obtain local agency permits for construction of facilities that fall outside the UPRR and BNSF rights-of-way, even though SJJPA has not determined whether such permits are legally necessary or required.

Appendix 3.0-1 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 Project improvements would be 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 Project would be consistent with the plans of relevant jurisdictions.[1] The Project would be generally consistent with the applicable goals, policies, and objectives related to geology, soils, seismicity, and paleontological resources identified in Appendix 3.0-1.

3.8.2.4 Industry Design Standards and Guidelines

The design and construction of the Project would conform to industry-wide engineering design guidelines and standards.

These guidelines and standards define the parameters for the design and construction of facilities that protect the users of the facilities and others that may be affected by public use of the facility. Each improvement associated with the Project would be designed to handle normal operating loads from the weight of the structure or train, as well as loads from environmental conditions, such as seismic shaking and wind forces. At locations where geologic conditions present a hazard, the guidelines and standards identify minimum requirements for characterizing the geologic conditions and then addressing the design issue, such as the stability of slopes, the corrosion of materials, and best management practices (BMPs) for water and wind erosion, stream sedimentation, or dust control.

These guidelines and standards provide requirements for evaluating soil conditions, defining seismic loads, and evaluating the response of the foundation systems. Minimum performance requirements are also provided. The guidelines and standards also provide direction when minimum performance requirements are not met.

Engineering geologists and geotechnical engineers who assist in the design of the Project are obligated to use these guidelines and standards. To meet professional licensing requirements, contract design documents would have to be signed and stamped by engineering geologists, civil engineers, and geotechnical engineers registered in California, certifying that the designs have been completed in a manner that meets minimum standards and is protective of the public.

Primary guidelines and standards that would be incorporated as part of the Project design to reduce risks associated with geology, soils, and seismicity include the following:

- **Expansive Soils**—Treat soil to reduce expansive characteristics, excavate expansive soil, and replace with non-expansive soil.
- **Corrosive Soils—**Provide cathodic protection and/or increase dimensions of foundation elements, and coat buried steel.
- **Erosion**—Protect sloping embankment fill surfaces, armor stream banks, and control surface runoff in concrete V-ditches.
- **Landslides—**Excavate and/or stabilize (e.g., with retaining walls, tie backs, soil nails, buttress, dewater, control of surface runoff) unstable materials.
- **Subsidence**—Raise track elevation through re-ballasting.

[1] 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.

American Association of State Highway and Transportation Officials Standards

2023 American Association of State Highway and Transportation Officials Load and Resistance Factor Design Bridge Design Specifications (9th Edition) and the American Association of State Highway and Transportation Officials Guide Specifications for Load and Resistance Factor Seismic Bridge Design (3rd Edition) provide guidance for characterization of soils, as well as methods to be used in the design of bridge foundations and structures, retained cuts and retained fills, at-grade segments, and buried structures. These design specifications would provide minimum specifications for evaluating the seismic response of soil and structures.

Federal Highway Administration Circulars and Reference Manuals

These documents provide detailed guidance on the characterization of geotechnical conditions at sites, methods for performing foundation design, and recommendations on foundation construction. These guidance documents include methods for designing retaining walls used for retained cuts and retained fills, foundations for elevated structures, and at-grade segments. Some of the documents include guidance on methods of design to reduce the risk of geologic hazards that are encountered during design.

American Railroad Engineering and Maintenance-of-Way Association Manual

The American Railroad Engineering and Maintenance-of-Way Association (AREMA) guidelines deal with rail systems. Although these guidelines cover many of the same general topics as the American Association of State Highway and Transportation Officials (AASHTO), they are more focused on best practices for rail systems. The manual includes principles, data, specifications, plans, and economics pertaining to the engineering, design, and construction of railways.

Union Pacific Railroad Design and Construction Standards

These guidelines are specific to any work that will take place within or affect facilities owned and operated by UPRR. In general, UPRR relies on the current guidance provided by the most recent version of AREMA, while applying its own criteria to be applied to its assets as it deems necessary. Where a conflict between the current UPRR criteria and the AREMA guidelines arises, the UPRR criteria will govern for facilities or resources within its right-of-way.

California Department of Transportation Design Standards

The California Department of Transportation (Caltrans) has specific minimum design and construction standards for all aspects of transportation system design, ranging from geotechnical explorations to construction practices. Caltrans design standards include state-specific amendments to the AASHTO Load and Resistance Factor Design (LRFD) Bridge Design Specifications and Guide Specifications for LRFD Seismic Bridge Design. These amendments provide specific guidance for the design of deep foundation used to support elevated structures, for design of mechanically stabilized earth walls used for retained fills, and for design of various types of cantilever (e.g., soldier pile, secant pile, and tangent pile) and tie-back walls used for retained cuts.

American Society for Testing and Materials International

American Society for Testing and Materials (ASTM) International has developed standards and guidelines for all types of material testing, from soil classifications to pile load testing or compaction testing through to concrete strength testing. The ASTM standards also include minimum performance requirements for materials. Most of the guidelines and standards cited in the preceding sections use ASTM or a corresponding series of standards from AASHTO to achieve the required and intended quality in the constructed project.

3.8.3 Environmental Setting

This section describes the environmental setting related to geology, soils, and paleontological resources for the Project. For the purposes of this analysis, the study area for geology, soils, and paleontological resources is defined as follows.

- Underlying geology and soils within 2 miles of the environmental footprint of the Project.
- Paleontological resources within 150 feet of the environmental footprint of the Project (horizontal study area) and extending below-ground to the maximum depth of disturbance to include all geologic units below the horizontal study area that could be encountered during construction or operation (vertical study area).

Information presented in this section related to geology, soils, and paleontological resources was obtained from the following sources. Locations of undisturbed land were determined through the use of geographic information systems (GIS).

- Geology and seismicity: California Department of Water Resources (DWR) groundwater levels; City of Merced, Merced Vision 2030 General Plan; Merced County, 2030 Merced County General Plan; Merced County, Merced County Multi-Jurisdictional Hazard Mitigation Plan; Natural Resources Conservation Service, Web Soil Survey; U.S. Geological Survey (USGS), Quaternary fault and fold database for the United States.
- Soils: United States Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS). Gridded Soil Survey Geographic (gSSURGO) Database for California; Gridded Soil Survey Geographic (gSSURGO) Database for California.
- Paleontological Resources: University of California Museum of Paleontology fossil database and geologic data from the California Geological Survey.

3.8.3.1 Geology

Geomorphic Setting

The Project is located in Merced County, almost entirely within the city limits of the city of Merced, in the San Joaquin Valley along the western slope of the Sierra Nevada mountain range, and within the Great Valley geomorphic province. The Great Valley geomorphic province is a long alluvial plain, approximately 400 miles long and 50 miles wide, stretching between the Sacramento and San Joaquin Valleys (California Geological Survey 2002). Sediments have been continuously deposited in the Great Valley since the Jurassic (about 160 million years ago).

Local Geology

Underlying the disturbed surface of the environmental footprint of the Project are Holocene alluvium and the Pleistocene Modesto and Riverbank Formations. Holocene alluvium consists of unconsolidated gravel, sand and silt deposited in active or recently active floodplains. The Pleistocene Modesto Formation consists of arkosic alluvial sand, silt, and clay, either representing glacial outwash from the Sierra Nevada or other sediment sources. The Pleistocene Riverbank Formation consists of arkosic sand, silt, and minor gravel forming alluvial fan remnants or terraces above the Modesto Formation (Wills et al. 2022).

Geologic Hazards

Landslides and Debris Flow

Landslides occur when the force of gravity overcomes the strength of the soil or rock within a hillside or a built embankment. The presence of groundwater can reduce the shear strength of the subsurface materials. Excavation or erosion of material at the toe of a slope can destabilize the slope above it. Placement of fill on the upper portion of a slope can overload the soil or rock within the slope and cause it to fail. Landslides can be of several types: falls, slides, slumps, or flows. They can move very rapidly (within seconds or minutes), or slowly (over days or years). Landslide movements often result in significant deformation of the ground surface, producing open cracks, with vertical and horizontal displacements measured in a few inches to multiple feet. All or portions of an existing landslide can be reactivated by any of the landslide causes. New landslides can occur on slopes with geologic conditions similar to those within existing landslides. Therefore, the best available predictor of future landslide movement is the distribution of past movements (Nilsen et al. 1975).

There are currently no landslide inventory maps for Merced County. As the majority of the county is located within a relatively flat, low-lying area, with slopes between 0 and 3 percent, the risk of landslides is considered low.

Land Subsidence

Land subsidence is the lowering of the ground surface elevation as a result of volume-reducing changes that take place underground. Common causes of land subsidence are pumping of water, oil, or gas from underground reservoirs; dissolution of limestone aquifers and collapse of the overlying soils into the resulting caves (sinkholes); collapse of underground mines; oxidation of organic soils; and initial wetting of certain sensitive soils (hydro-compaction). Land subsidence can cause many problems, including changes in elevation and slope of streams, canals, and drains; damage to bridges, roads, railroads, storm drains, sanitary sewers and pipelines, canals, and levees; damage to private and public buildings; and failure of well casings.

Subsidence due to groundwater withdrawal within the San Joaquin Valley has been a problem for decades, with the main subsidence bowls being centered around Corcoran, extending approximately 60 miles, and El Nido, extending approximately 25 miles, both south of the City of Merced (Farr et al. 2015). Subsidence due to withdrawal of groundwater can be arrested by artificially recharging the aquifers with enough water to compensate for the amount being pumped out of them.

No known subsidence has occurred within the environmental footprint of the Project or has accompanied groundwater withdrawal within the City of Merced (Merced County 2012).

3.8.3.2 Soils

Soil type is one criterion used to evaluate potential impacts of development on the environment. Depending on type, some soils are susceptible to erosion or expansive behavior, while others are more suitable for construction. Soil type mapping, emphasizing a soil's agricultural and engineering properties, is conducted typically on a countywide (or geographic) basis using nomenclature that changes with time.

As shown in Figure 3.8-1, the environmental footprint of the Project is underlain by soils defined as Wyman-Yokoni_Marguerite Soil Association (Merced County 2012), consisting primarily of Landlow clay, Wyman clay loam, Wyman clay loam over hardpan, Honcut silty clay loam, Honcut silt loam, and Yokohl clay loam (NRCS 2024). Soils are relatively deep, with the depth to restrictive feature between 40 to 60 feet for Wyman clay loam and more than 80 feet for the other soil associations. Underlying soils vary from well drained (Honcut silt loam, Wyman clay loam, Yokohl clay loam) to somewhat poorly drained (Landlow clay, Burchell silty clay loam) (NRCS 2024).

Soil Conditions

This section provides descriptions of soil properties in the environmental footprint of the Project that can be detrimental to civil construction projects, including expansive soils, corrosive soils, collapsible soifigls, and erodible soils.

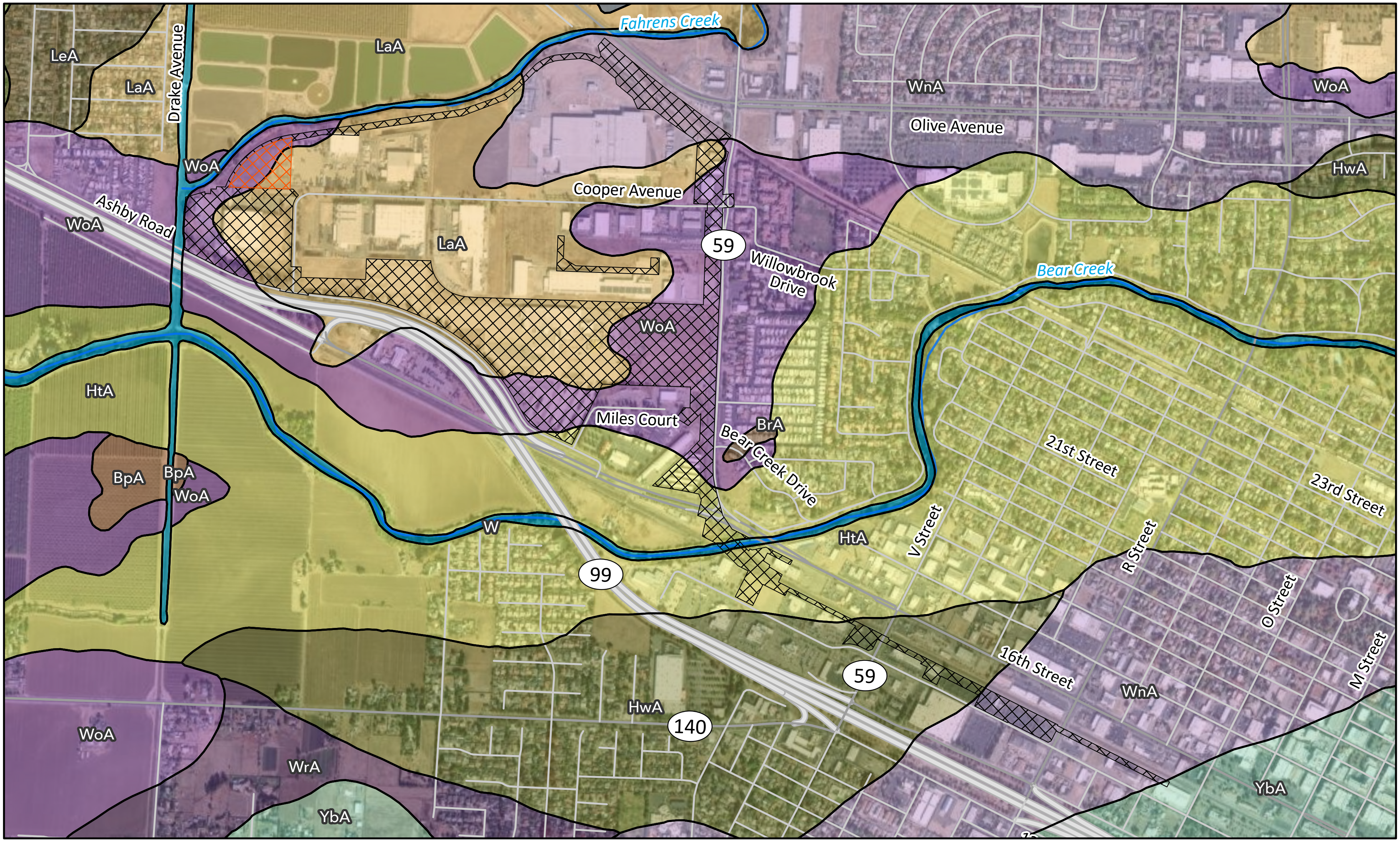
Expansive Soils

The shrink-swell potential is a reflection of the ability of some soils with high clay content to change in volume with a change in moisture content. Plasticity Index (PI) can serve as an indicator for the potential for soils to swell when wetted and shrink when dried. Expansive soils are subject to shrinking and swelling with seasonal changes in moisture content. Soil expansion and contraction can cause damage or failure of foundations, utilities, and pavements. Soil below the depth of the permanent water table or that is inundated is not subject to shrinking and swelling. The Natural Resources Conservation Service (NRCS) has determined the PI for each soil unit. A Low PI generally corresponds to a low shrink-swell potential, and a High PI generally corresponds to a high shrink-swell potential.

As shown in Figure 3.8-2, the environmental footprint of the Project is generally underlain by soils with a very low to low soil PI, with high PI soils underlying the area west of Drake Avenue and north of Ashby Road.

Corrosive Soils

Soil corrosivity measures the potential for corrosion of concrete and steel caused by contact with some types of soil. Knowledge of potential soil corrosivity is often critical for the effective design parameters associated with cathodic protection of buried steel and concrete mix design for plain or reinforced concrete buried project elements. Several factors—including soil composition, soil and pore water chemistry, moisture content, and pH—affect the response of concrete and steel to soil corrosion. Soils with high moisture content, high electrical conductivity, high acidity, and high dissolved salts content are most corrosive. In general, sandy soils have high resistivity and are the least corrosive. Clayey soils, including those that contain interstitial saltwater, can be highly corrosive.



MITC Environmental Footprint

Variant H1 Additional Environmental Footprint

Soil Map Unit

- BpA - Burchell silty clay loam, slightly saline-alkali (0 to 1 percen slopes)
- BrA - Burchell silty clay loam, moderately saline-alkali (0 to 1 percent slopes)
- GeA - Greenfield sandy loam, deep over hardpan, poorly drained varian (0 to 1 percent slopes)
- GfA - Greenfield sandy loam, deep over hardpan (0 to 3 percent slopes)
- HtA - Honcut silt loam (0 to 1 percent slopes)
- HwA - Honcut silty clay loam (0 to 1 percent slopes)
- LaA - Landlow clay (0 to 1 percent slopes)
- LeA - Landlow silty clay loam (0 to 1 percent slopes)
- SbB - San Joaquin loam (3 to 8 percent slopes)
- W - Water
- WnA - Wyman clay loam, deep over hardpan (0 to 1 percent slopes)
- WoA - Wyman clay loam (0 to 3 percent slopes)
- WrA - Wyman loam (0 to 3 percent slopes)
- YbA - Yokohl clay loam (0 to 3 percent slopes)

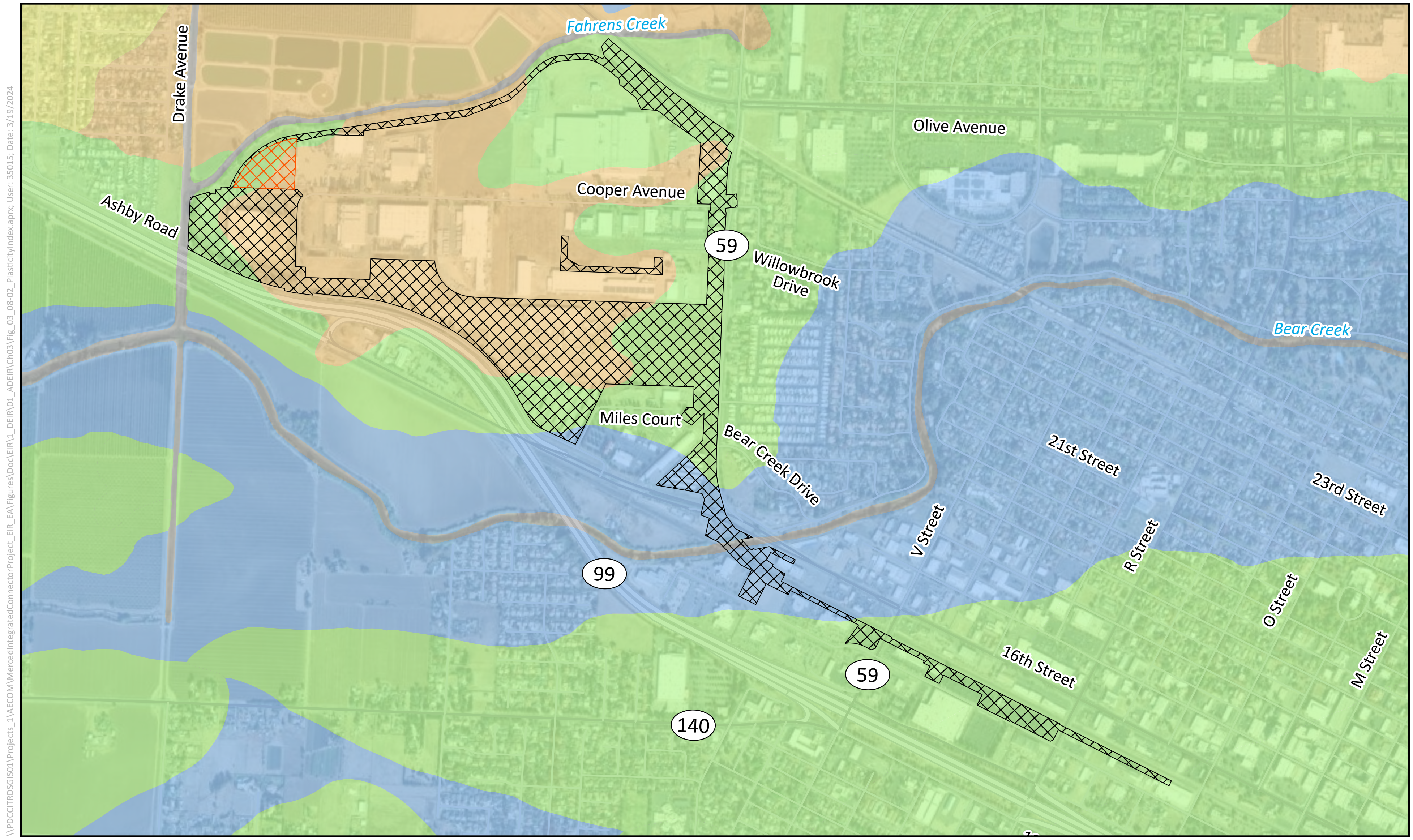
0 1,000 2,000 Feet

N

Data Source: AECOM 2024, NRCS 2023.

Figure 3.8-1
Soil Survey Units
Merced Intermodal Track Connection Project

MITC



MITC Environmental Footprint

Variant H1 Additional Environmental Footprint

Plasticity Index (Surface)

- Very Low (PI: 0 - 10)
- Low (PI: 10.1 - 15)
- Medium (PI: 15.1 - 25)
- High (PI: 25.1 - 35)
- Not Rated

0 1,000 2,000 Feet

N

Data Source: AECOM 2024, NRCS 2023.

Figure 3.8-2
Plasticity Index
Merced Intermodal Track Connection Project

MITC

As shown in Figure 3.8-3, the environmental footprint of the Project is underlain by soils that present a low to moderate risk of corrosion for concrete, with low-risk soils predominating.

As shown in Figure 3.8-4, a majority of the environmental footprint of the Project is underlain by soils that present a high risk of corrosion for steel, with a few areas exhibiting a moderate risk.

Collapsible Soils

Collapsible soils are soils that undergo volume reduction or settlement upon the addition of water, which weakens or destroys soil particle bonds of loosely packed structure, reducing the bearing capacity of the soil. Other mechanisms for soil collapse include the sudden closure of voids in a soil, whereby the sudden decrease in volume results in loss of the soil's internal structure, causing the soil to collapse. Specific soil types, such as loess and other fine-grained aeolian soils, are most susceptible to collapse, although certain coarser-grained, rapidly deposited alluvial soils can also be susceptible. Location-specific data on the collapsible soils is generally collected during geotechnical investigations.

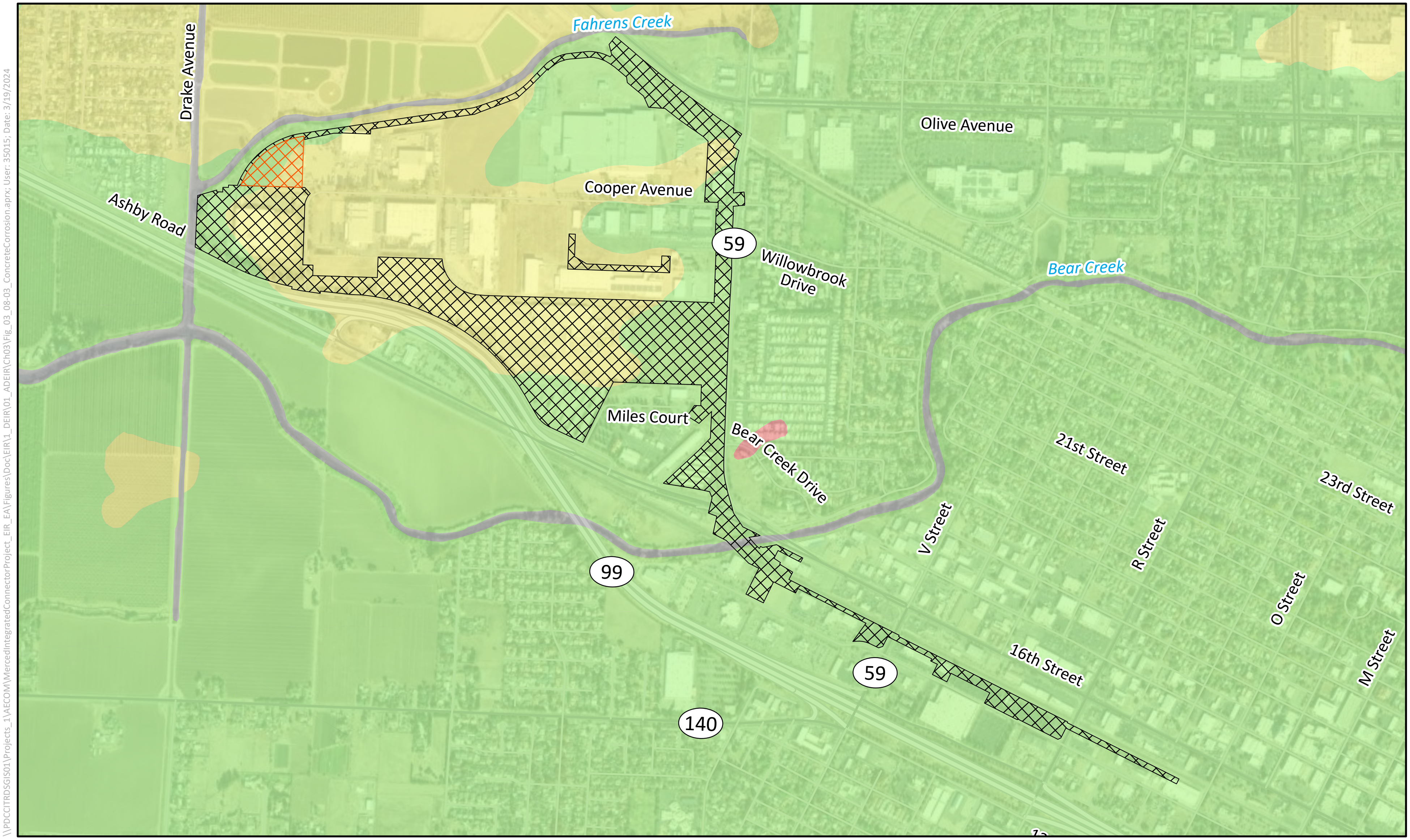
Erodible Soils

The potential for erosion by water or wind is a function of the cohesiveness of the soil particles. The NRCS has quantified the potential for erosion by water with the K factor, with lower K factor values indicating soils resistant to detachment and not easily susceptible to movement by water (erosion) and high K factor values indicating soils are more easily detached by water and therefore are more erodible. Soils on steep slopes are often erodible, especially during heavy rain events. The wind erodibility index is a numerical value indicating the susceptibility of soil to wind erosion - the higher the wind erodibility index, the higher susceptibility to wind erosion.

Figure 3.8-5 and Figure 3.8-6 show the potential for erosion in the soils underlying the environmental footprint of the Project by water and wind, respectively. As shown in Figure 3.8-5, the area is generally underlain by soils with a low to moderate susceptibility to erosion by water with the exception of the area south of Miles Court and around Bear Creek, where susceptibility to erosion by water is high. As shown in Figure 3.8-6, the environmental footprint of the Project is underlain by a mixture of soils with a low, moderate, and high susceptibility to erosion by wind, with the soils exhibiting the highest risk underlying the area north of Ashby Road and south of Fahrens Creek.

3.8.3.3 Seismicity

In the past, numerous moderate to large earthquakes have originated from some of the active faults in Central California where the Project is located, including a magnitude 3.2 earthquake occurring southwest of the City of Patterson in 2023, approximately 30 miles west of the Project (USGS 2024b). It is anticipated that seismic events will continue to occur within the region at approximately the same rate and on some of the same faults as in the past. The nearest active fault is the Ortigalita fault, a latest Quaternary fault approximately 37 miles west of the environmental footprint. There are no Alquist-Priolo Earthquake Fault Zones (EFZs) in the vicinity of the Project (CGS 2024a). Although there are no EFZs in the vicinity of the Project, the Project would be subject to ground shaking as a result of regional earthquakes, depending on magnitude. Table 3.8-1 and Figure 3.8-7 depict the fault locations nearest to the environmental footprint of the Project.



MITC Environmental Footprint

Variant H1 Additional Environmental Footprint

Corrosivity to Concrete

- High
- Moderate
- Low
- Not Rated

Figure 3.8-3

Corrosivity to Concrete

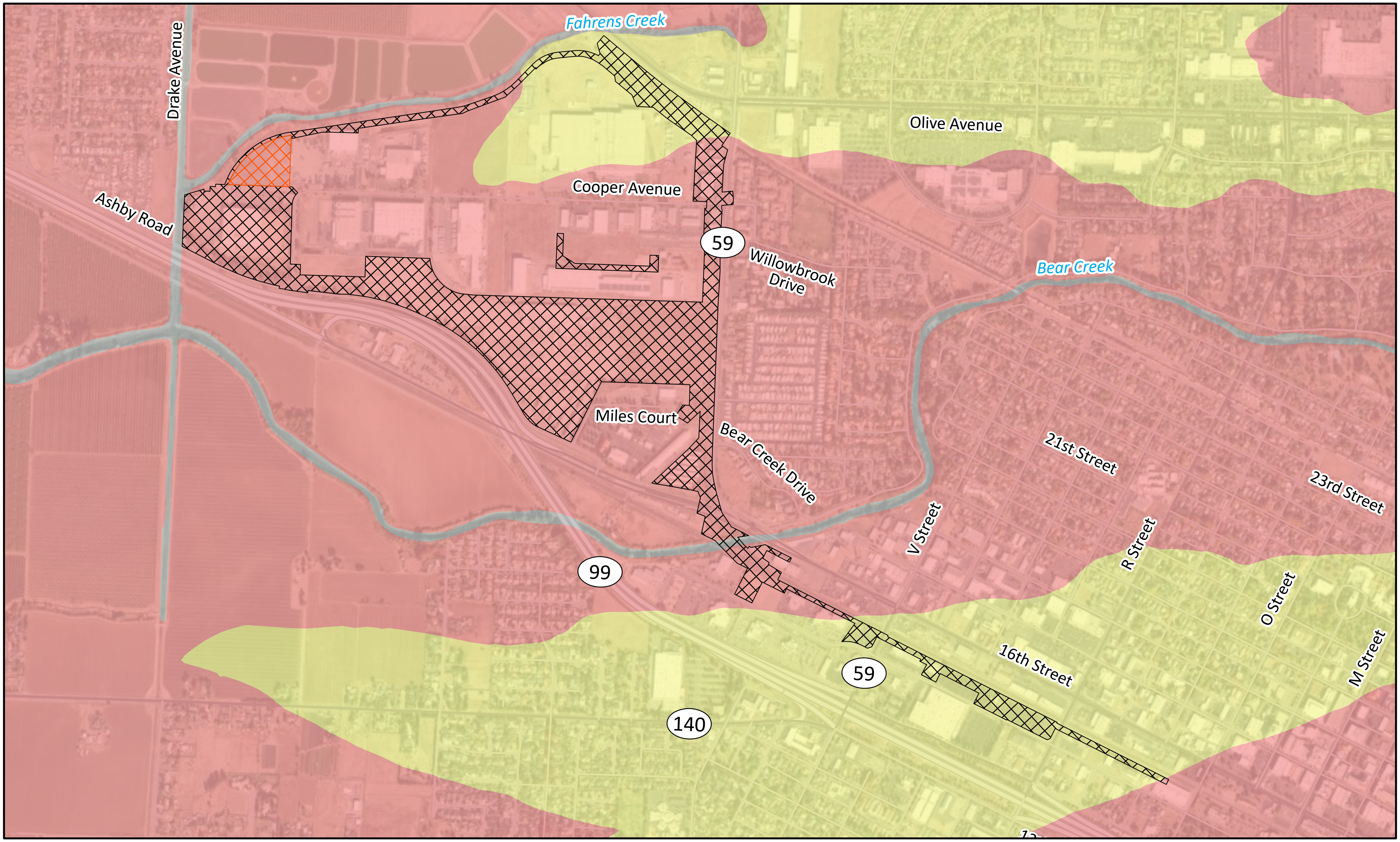
Merced Intermodal Track Connection Project

0 1,000 2,000 Feet

N

Data Source: AECOM 2024, NRCS 2023.

MITC



MITC Environmental Footprint
Variant H1 Additional Environmental Footprint

Corrosivity to Steel
High
Moderate
Not Rated

0 1,000 2,000 Feet

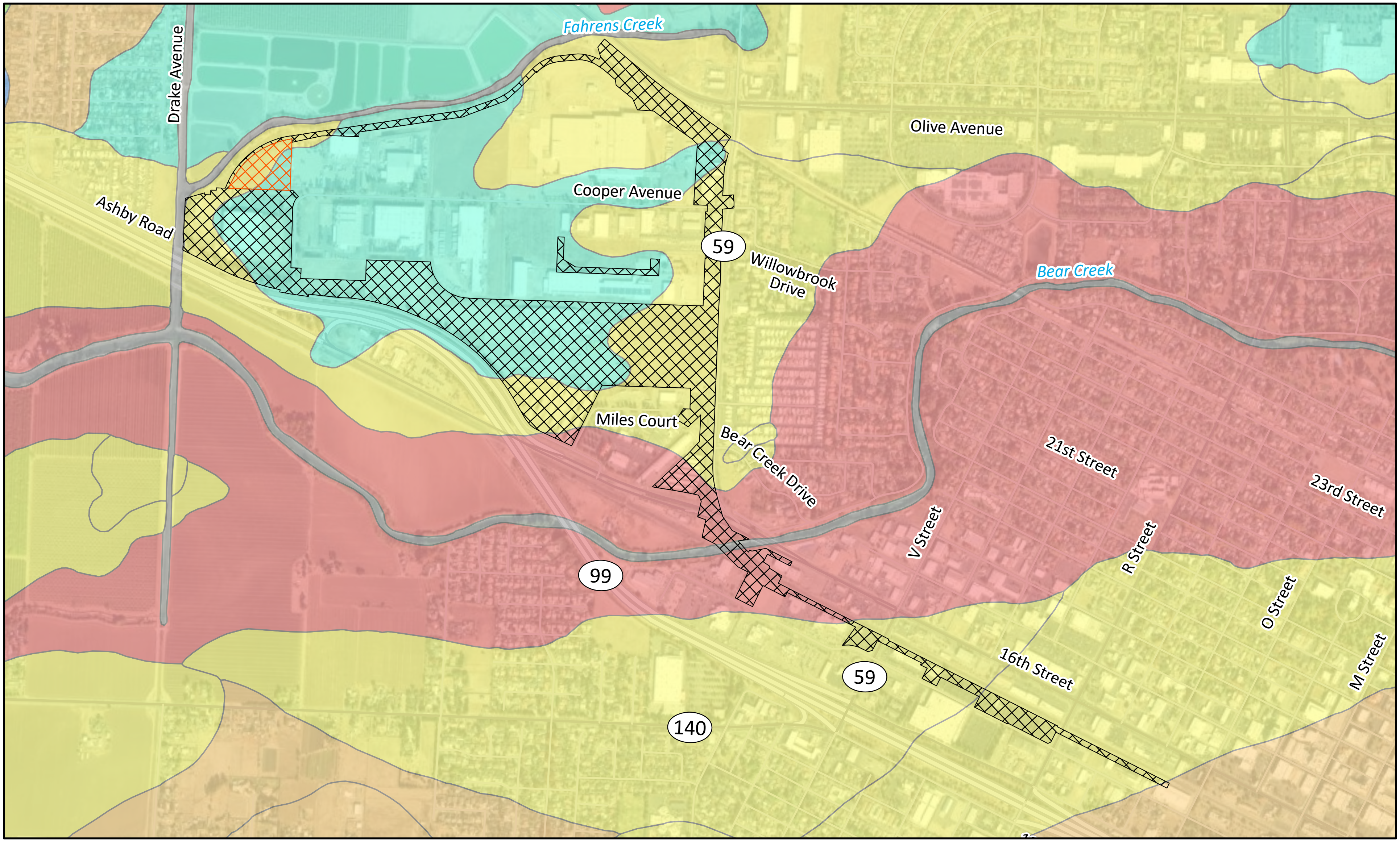
N

Data Source: AECOM 2024, NRCS 2023.

Figure 3.8-4
Corrosivity to Steel
Merced Intermodal Track Connection Project

MITC

\\PDCCITRDSGIS01\Projects_1\AECOM\MercedIntegratedConnectorProject_EIR_EA\Figures\Doc\EIR\1_DEIR\01_ADEIR\Ch03\Fig_03_08-04_SteelCorrosion.aprx; User: 35015; Date: 3/19/2024



MITC Environmental Footprint
Variant H1 Additional Environmental Footprint

K Factor (Rock Free)
0.1825
0.2
0.28
0.32
0.37
0.43
Not Rated

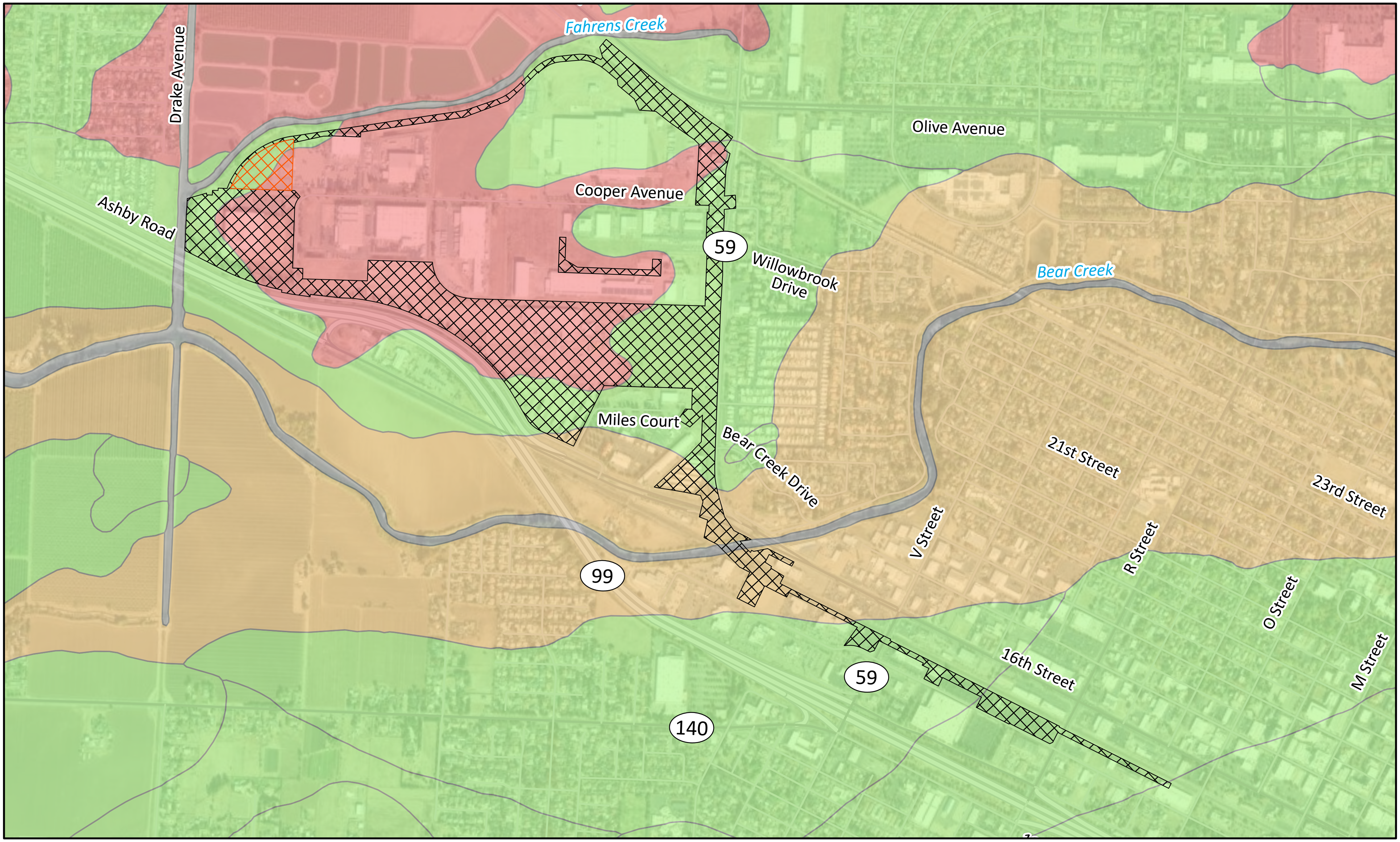
0 1,000 2,000 Feet

N

Data Source: AECOM 2024, NRCS 2023.

Figure 3.8-5
Erodibility by Water
Merced Intermodal Track Connection Project

MITC



MITC Environmental Footprint
Variant H1 Additional Environmental Footprint

Wind Erodibility Index

48
56
86
Not Rated

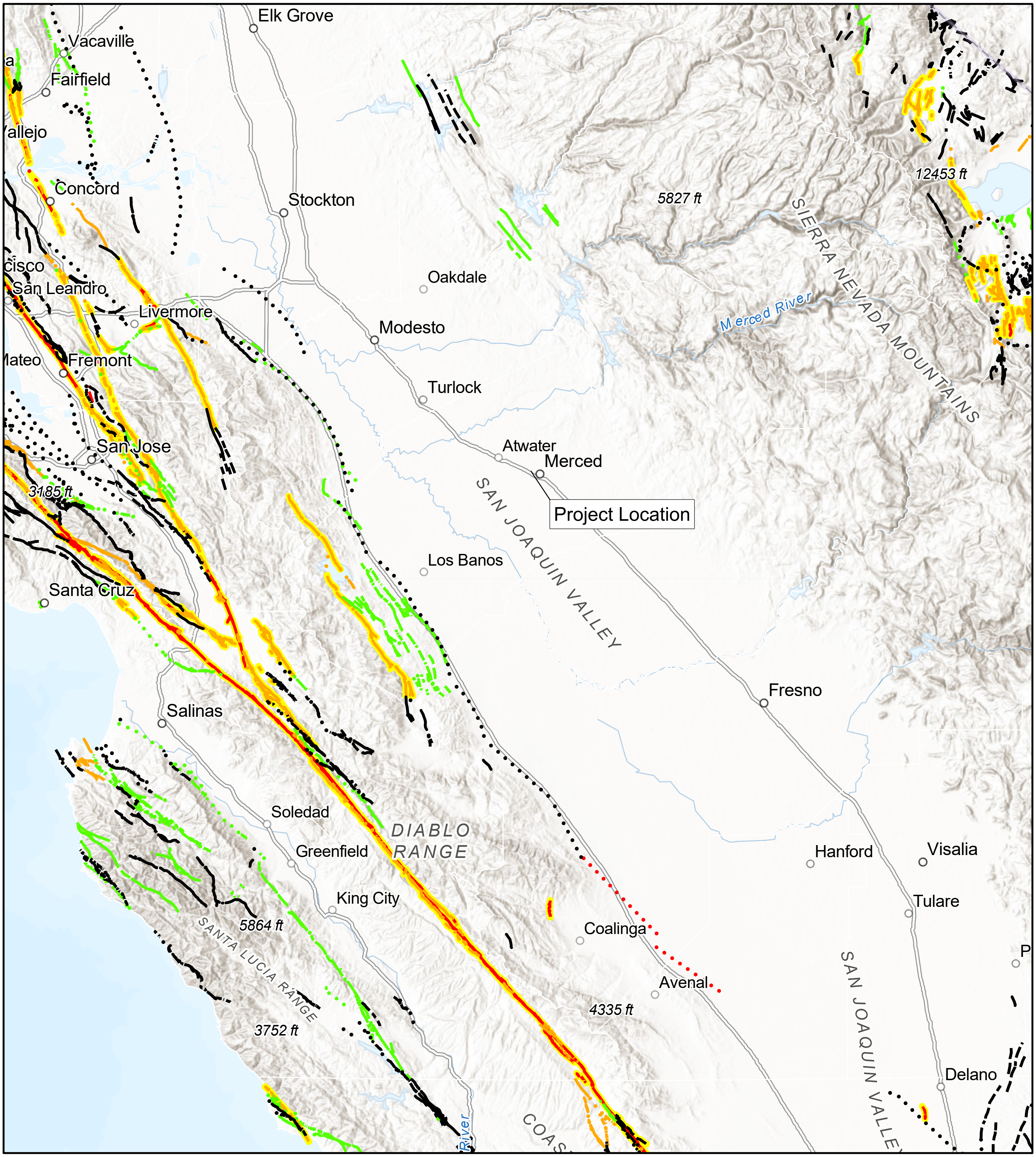
0 1,000 2,000 Feet

N

Data Source: AECOM 2024, NRCS 2023.

Figure 3.8-6
Erodibility by Wind
Merced Intermodal Track Connection Project

MITC



Alquist-Priolo Fault Zone

Based on time of most recent surface deformation

Historical (<150 years)

Latest Quaternary (<15,000 years)

Late Quaternary (<130,000 years)

Undifferentiated Quaternary (<1.6 million years)

Well Constrained Location

Moderately Constrained Location

Inferred Location

0 10 20 Miles

N

Data Source: AECOM 2024, USGS 2024, CADOC 2022.

Figure 3.8-7
Fault Map
Merced Intermodal Track Connection Project

MITC

Table 3.8-1. Closest Active Fault to the Project Footprint

Fault (closest to farthest)	Distance from Study Area (miles)	Faulting Style
Ortigalita fault zone (latest Quaternary) Alquist-Priolo Earthquake Fault Zone	37 miles west	Strike-slip

Source: U.S. Geological Survey (USGS). 2024. Quaternary fault and fold database for the United States.

Primary Seismic Hazards

Surface Fault Rupture

When a fault ruptures, the displacement of one rock mass relative to an opposing rock mass may extend to the ground surface. The resulting surface rupture can produce a variety of effects including the shearing of structures that were built across the fault's surface traces. Such surface fault ruptures can measure a few inches or several feet.

As shown in Figure 3.8-7, the environmental footprint of the Project is not located in an EFZ and the nearest active fault zone is the Ortigalita fault zone, approximately 37 miles west of the environmental footprint of the Project. Therefore, the risk of fault rupture is considered low.

Seismic Ground Motion

The environmental footprint of the Project would likely be subjected to strong ground shaking during seismic events originating from faults to the west of the City of Merced. Ground shaking occurs when the elastic energy stored in strained bedrock is suddenly released. The strength of the shaking can be measured in terms of its percentage of the acceleration due to earth's gravity. Strong earthquake ground shaking can make slopes fail, cause liquefaction with related ground deformation, and can damage built structures that were not designed and constructed to resist or accommodate the shaking.

The Project site, while distant from a known, active fault, is located in an area which could experience low to moderate ground shaking during a seismic event (Branum et al. 2016).

Secondary Seismic Hazards

Liquefaction and Lateral Spreading

Liquefaction is a process by which water-saturated materials lose strength and may fail during strong ground shaking, when granular materials are transformed from a solid state into a liquefied state as a result of increased pore-water pressure. The susceptibility of an area to liquefaction is determined largely by the depth to groundwater and the properties (e.g., grain size, density, and degree of consolidation) of the soil and sediment within and above the groundwater. The sediments most susceptible to liquefaction are saturated, unconsolidated sand and silt within 50 feet of the ground surface (California Geological Survey 2008:35–36).

Lateral spreading is a finite, lateral displacement of gently sloping ground that occurs from liquefaction or pore-pressure build up in a shallow underlying deposit during an earthquake. Lateral spreading generally occurs on mild slopes of 0.3 to 5.0 percent that are underlain by loose soil deposits and a shallow water table.

There are no USGS Liquefaction Susceptibility or California Geological Survey (CGS) Seismic Hazard Zones maps for the project area. While the geologic units underlying the majority of the project area (Modesto and Riverbank Formation) are fairly well consolidated, the Young alluvium underlying the south eastern portion of the Project area consists of unconsolidated gravel, sand and silt (Wills et al. 2022). The depth to groundwater varies across the region. Recent groundwater levels at the well closest to the environmental footprint, approximately 1 mile to the northeast, describe a groundwater level range between 25 and 100 feet below ground surface (BGS) (DWR 2024). As active seismic sources are located over 30 miles away, the groundwater levels in the Project area are relatively deep (25 – 100 feet BGS), and the majority of sediments underlying the Project area are well consolidated, the risk of liquefaction is low. While a free face (Bear Creek) is located within the environmental footprint of the Project, the low level of liquefaction susceptibility reduces the risk associated with lateral spreading in this area.

Seismically Induced Landslides

Landslides triggered by earthquakes have historically been a significant source of damage in California. Areas that are most susceptible to earthquake-induced landslides are steep slopes in poorly cemented or highly fractured rocks, areas underlain by loose, weak soils, and areas on or adjacent to existing landslide deposits. The probability for earthquake-induced landslides in the environmental footprint of the Project is low because the area is relatively flat.

3.8.3.4 Paleontological Resources

Paleontological resources, commonly referred to as fossils, are the remains, traces, imprints, or life history artifacts (e.g., nests) of prehistoric plants and animals found in ancient sediments, which may be either unconsolidated or lithified (i.e., either poorly or well cemented). Fossils are considered nonrenewable scientific and educational resources. Fossils include the bones and teeth of animals, the casts and molds of ancient burrows and animal tracks, and very small remains such as the bones of birds and rodents. They also include plant remains such as logs, prehistoric leaf litter, and seeds.

The determination of paleontological sensitivity is a qualitative assessment, based on the paleontological resource potential of the stratigraphic units present, the local geology and geomorphology, and other factors relevant to fossil preservation and potential yield. According to the Society of Vertebrate Paleontology (SVP) (SVP 2010), standard considerations for determining sensitivity are (1) the potential for a geological unit to yield abundant or significant vertebrate fossils or to yield a few significant fossils, large or small, of vertebrate, invertebrate, or paleobotanical remains and (2) the importance of recovered evidence with respect to new and significant taxonomic, phylogenetic, paleoecological, or stratigraphic data. Table 3.8-2 provides definitions for the SVP paleontological sensitivity ratings which are used in this impact analysis.

Unlike archaeological sites, which are narrowly defined, paleontological sites are defined by the entire extent (both areal and stratigraphic) of a unit or formation. In other words, once a unit is identified as containing vertebrate fossils, or other rare fossils, the entire unit is considered to be paleontologically sensitive. For this reason, the paleontological sensitivity of geologic units is described and analyzed broadly.

The surficial area of the environmental footprint of the Project has been disturbed by previous construction. Railroad tracks, concrete, pavement, and buildings cover much of the environmental footprint of the Project.

Table 3.8-2. Paleontological Sensitivity Ratings

Potential	Definition
High	Rock units from which vertebrate or significant invertebrate, plant, or trace fossils have been recovered are considered to have high potential with respect to containing additional significant paleontological resources. Paleontological potential considers both (a) the potential for yielding abundant or significant vertebrate fossils or a few significant fossils, large or small, of vertebrate, invertebrate, plant, or trace fossils and (b) the importance of recovered evidence with respect to new and significant taxonomic, phylogenetic, paleoecologic, taphonomic, biochronologic, or stratigraphic data.
Undetermined	Rock units for which little information is available concerning their paleontological content, geologic age, and depositional environment are considered to have undetermined potential. Further study is necessary to determine if these rock units have high or low potential with respect to containing significant paleontological resources.
Low	Reports in the paleontological literature or field surveys by a qualified professional paleontologist may allow a determination that some rock units have low potential for yielding significant fossils. Such rock units will be poorly represented by fossil specimens in institutional collections or, based on general scientific consensus, will preserve fossils only in rare circumstances. The presence of fossils is the exception, not the rule.
None	Some rock units, such as high-grade metamorphic rocks (e.g., gneisses and schists) and plutonic igneous rocks (e.g., granites and diorites), have no potential to contain significant paleontological resources. Rock units with no potential require neither protection nor mitigation measures relative to paleontological resources.

Source: Society of Vertebrate Paleontology 2010:1–2.

Underlying the disturbed surface of the Project area are Holocene alluvium and the Pleistocene Modesto and Riverbank Formations. See *Local Geology* in Section 3.8.3.1, Geology, for a description of these units. Holocene deposits are generally too young to contain fossils and those fossils that might be present represent the remains of extant, modern taxa, which are not considered *unique* paleontological resources. The older Modesto and Riverbank Formations comprise broad alluvial fans that occur throughout the Project area and represent glacial outwash from the Sierra Nevada. California's Pleistocene sedimentary units—especially those that, like the Riverbank and Modesto Formations, record deposition in continental settings—are typically considered highly sensitive for paleontological resources because of the large number of recorded fossil finds in such units throughout the state.

Numerous vertebrate fossils are documented from the Modesto Formation, which is the younger of the two Pleistocene units. These fossils include mammoth (*Mammuthus*), bison (*Bison*), camel (*Camelops*), horse (*Equus*), and ground sloth (*Megalonyx*), and fossil sites include localities in San Joaquin, Stanislaus, and Fresno Counties. Because of the vertebrate fossils documented from the Modesto Formation, the unit is considered to have a high sensitivity for paleontological resources (University of California Museum of Paleontology 2024).

An even greater abundance of vertebrate fossils are documented in the Riverbank Formation. Records of fossils discovered in the Riverbank from the University of California Museum of Paleontology (2024) database include ground sloth (*Glossotherium harlani*), dire wolf (*Canis dirus*), horse (*Equus*), rabbit (*Sylvilagus*), bird (*Aves*), rodents (e.g., *Neotoma*, *Reithrodontomys*, *Thomomys*, *Microtus*, and *Spermophilus*), bison (*Bison*), camel (*Camelops hesternus*), coyote (*Canis latrans*), mammoth (*Mammuthus columbi*), and fish (*Osteichthyes*). Because of the large number of vertebrate fossils documented from the Riverbank Formation, the unit is considered to have a high sensitivity for paleontological resources (University of California Museum of Paleontology 2024).

3.8.4 Impact Analysis

This section describes the environmental impacts of the Project on geology, soils, and paleontological resources. This section also 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.

3.8.4.1 Methods for Analysis

The methods used to evaluate impacts on geology, soils, and paleontological resources are described in the following subsections.

Geology, Soils, and Seismicity Impacts

Geology, soils, and seismicity impacts are analyzed qualitatively, based on a review of published geologic and soils information for the area of the environmental footprint of the Project and on professional judgment, in accordance with the current standard of care for geotechnical engineering and engineering geology. The analysis focuses on the potential of the Project, during construction and operation, to increase the risk of personal injury, loss of life, and damage to property as a result of existing geologic conditions in the study area.

Paleontology

The primary source of information used in developing the paleontological resources analysis is the paleontological database at the University of California Museum of Paleontology. Effects on paleontological resources were analyzed qualitatively, based on professional judgment and the SVP guidelines below.

SVP's *Standard Procedures for the Assessment and Mitigation of Adverse Impacts to Paleontological Resources* provides standard guidelines that are widely followed (SVP 2010:1–11). The SVP guidelines identify two key phases in the process for protecting paleontological resources from project impacts (SVP 2010:1).

- Assess the likelihood that the project's area of potential effect contains significant nonrenewable paleontological resources that could be directly or indirectly impacted, damaged, or destroyed as a result of the project.
- Formulate and implement measures to mitigate potential adverse impacts.

3.8.4.2 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 geology, soils, and paleontological resources.

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

- Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving.
  - Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map, issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.
  - Strong seismic ground shaking.
  - Seismic-related ground failure, including liquefaction.
  - Landslides.
- Result in substantial soil erosion or the loss of topsoil.
- Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the Project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse.
- Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property.
- Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater.
- Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.

There are no unique geologic features within the environmental footprint of the Project. Therefore, the Project would result in no impact on unique geologic features. This issue is not discussed further in this EIR.

3.8.4.3 Impacts and Mitigation Measures

Impact GEO-1	Construction of the Project would not directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving seismic hazards from surface fault rupture, strong seismic ground shaking, liquefaction, seiches, landslides, or subsidence and settlement, and erosion.
Level of Impact	**Less-than-significant impact**

Project

Impact Characterization

Project construction would include activities such as grading, excavating, installing concrete ties, ballast tamping, and pile driving, which could directly or indirectly cause substantial adverse effects by potentially exposing people or infrastructure to geologic hazards as discussed below.

Impact Details and Conclusions

The Project area is not located in an EFZ and the nearest active fault is approximately 37 miles from the environmental footprint of the Project; therefore, the risk of fault rupture affecting construction of the Project is low. As discussed in *Environmental Setting*, the risk of liquefaction is considered low in the Project area as seismic sources are over 30 miles west, underlying soils are generally consolidated, and groundwater levels are deep; the risk of landslide is considered low as the area is generally flat; the risk of subsidence is low as no known subsidence has occurred in the Project area or the city of Merced. Construction of the Project would expose soils, including highly erodible soils, to erosion through grading, excavation, and stockpiling activities. However, as described in Section 3.10, *Hydrology and Water Quality*, the Project would adhere to the County's grading requirements and the National Pollutant Discharge Elimination System (NPDES) Construction General Permit, both of which require BMPs for erosion and sediment controls, which would reduce potential impacts from erosion. Therefore, impacts from the construction of the Project would be less than significant.

Variant H1

Impact Characterization

Construction of Variant H1 would include activities such as grading, excavating, installing concrete ties, ballast tamping, pile driving, and also include the construction of photovoltaic (solar) panels for the purpose of fueling future hydrogen-powered trains. These activities could directly or indirectly cause substantial adverse effects by potentially exposing people or infrastructure to geologic hazards.

Impact Details and Conclusions

The Variant H1 construction area is not located in an EFZ; therefore, the risk of fault rupture affecting construction is low. As discussed in *Environmental Setting*, the risk of liquefaction is considered low in the Project area as seismic sources are over 30 miles west, underlying soils are generally consolidated, and groundwater levels are deep; the risk of landslide is considered low as the area is generally flat; the risk of subsidence is low as no known subsidence has occurred in the Project area or the city of Merced. Construction of Variant H1 would expose soils, including highly erodible soils, to erosion through grading, excavation, and stockpiling activities. However, as described in Section 3.10, *Hydrology and Water Quality*, Variant H1 would adhere to the County's grading requirements and the National Pollutant Discharge Elimination System (NPDES) Construction General Permit, both of which require BMPs for erosion and sediment controls, which would reduce potential impacts from erosion. Therefore, impacts from the construction of Variant H1 would be less than significant.

Variant H2

Impact Characterization

Construction of Variant H2 would include activities such as grading, excavating, installing concrete ties, ballast tamping, pile driving, and also construction necessary for the storage of hydrogen within the project area. These activities could directly or indirectly cause substantial adverse effects by potentially exposing people or infrastructure to geologic hazards.

Impact Details and Conclusions

The Variant H2 construction area is not located in an EFZ; therefore, the risk of fault rupture affecting construction is low. As discussed in *Environmental Setting*, the risk of liquefaction is considered low in the Project area as seismic sources are over 30 miles west, underlying soils are generally consolidated, and groundwater levels are deep; the risk of landslide is considered low as the area is generally flat; the risk of subsidence is low as no known subsidence has occurred in the Project area or the city of Merced. Construction of Variant H2 would expose soils, including highly erodible soils, to erosion through grading, excavation, and stockpiling activities. However, as described in Section 3.10, *Hydrology and Water Quality*, Variant H2 would adhere to the County's grading requirements and the National Pollutant Discharge Elimination System (NPDES) Construction General Permit, both of which require BMPs for erosion and sediment controls, which would reduce potential impacts from erosion. Therefore, impacts from the construction of Variant H2 would be less than significant.

Variant H3

Impact Characterization

Construction of Variant H3 would include activities such as grading, excavating, installing concrete ties, ballast tamping, pile driving, and also construction necessary for the storage of hydrogen within the project area. These activities could directly or indirectly cause substantial adverse effects by potentially exposing people or infrastructure to geologic hazards.

Impact Details and Conclusions

The Variant H3 construction area is not located in an EFZ; therefore, the risk of fault rupture affecting construction is low. As discussed in *Environmental Setting*, the risk of liquefaction is considered low in the Project area as seismic sources are over 30 miles west, underlying soils are generally consolidated, and groundwater levels are deep; the risk of landslide is considered low as the area is generally flat; the risk of subsidence is low as no known subsidence has occurred in the Project area or the city of Merced. Construction of Variant H3 would expose soils, including highly erodible soils, to erosion through grading, excavation, and stockpiling activities. However, as described in Section 3.10, *Hydrology and Water Quality*, Variant H3 would adhere to the County's grading requirements and the National Pollutant Discharge Elimination System (NPDES) Construction General Permit, both of which require BMPs for erosion and sediment controls, which would reduce potential impacts from erosion. Therefore, impacts from the construction of Variant H3 would be less than significant.

Impact GEO-2	Construction of the Project would not result in substantial soil erosion or the loss of topsoil.
Level of Impact	**Less-than-significant impact**

Project

Impact Characterization

Construction of the Project could result in substantial soil erosion or loss of topsoil. As described under *Erodible Soils*, portions of the environmental footprint are underlain by soils that are highly erodible. The area south of Miles Court around Bear Creek is highly susceptible to erosion by water, while the area north of Ashby Road and south of Fahrens Creek is highly susceptible to erosion by wind. Other portions of the environmental footprint generally exhibit low to moderate risk of erodibility.

Impact Details and Conclusions

Construction activities would include grading for the track subgrade with graders and excavators, stockpiling of soil materials, and other earth-disturbing activities that could expose soils to erosion. However, as discussed in Section 3.10, *Hydrology and Water Quality*, the Project would be required to adhere to the County's grading requirements and the NPDES Construction General Permit. The County requires all construction projects having soil disturbances to implement BMPs for erosion and sediment controls, such as desilting basins, silt fences, hay bales, fabric and sand filters, sandbags, swales, and/or sumps. The Construction General Permit would also require use of BMPs to restrict soil erosion and sedimentation. Therefore, with adherence to County grading requirements and the NPDES Construction General Permit, impacts during construction related to erosion would be less than significant.

Variant H1

Impact Characterization

Construction of Variant H1 would include activities such as grading, excavating, installing concrete ties, ballast tamping, pile driving, and the construction of photovoltaic (solar) panels for the purpose of fueling future hydrogen-powered trains. These activities could result in substantial soil erosion or loss of topsoil as the area south of Miles Court around Bear Creek is highly susceptible to erosion by water and the area north of Ashby Road and south of Fahrens Creek is highly susceptible to erosion by wind.

Impact Details and Conclusions

The Variant H1 construction area includes areas underlain by highly erodible soils. Construction of Variant H1 would expose soils, including highly erodible soils, to erosion through grading, excavation, and stockpiling activities. However, Variant H1 would be required to adhere to the County grading requirements and the NPDES Construction General Permit, which would reduce impacts related to erosion to a less-than-significant level.

Variant H2

Impact Characterization

Construction of Variant H2 would include activities such as grading, excavating, installing concrete ties, ballast tamping, pile driving, and also construction necessary for the storage of hydrogen within the project area. These activities could result in substantial soil erosion or loss of topsoil as the area south of Miles Court around Bear Creek is highly susceptible to erosion by water, while the area north of Ashby Road and south of Fahrens Creek is highly susceptible to erosion by wind.

Impact Details and Conclusions

The Variant H2 construction area includes areas underlain by highly erodible soils. Construction of Variant H2 would expose soils, including highly erodible soils, to erosion through grading, excavation, and stockpiling activities. However, Variant H2 would be required to adhere to the County grading requirements and the NPDES Construction General Permit, which would reduce impacts related to erosion to a less-than-significant level.

Variant H3

Impact Characterization

Construction of Variant H3 would include activities such as grading, excavating, installing concrete ties, ballast tamping, pile driving, and also construction necessary for the storage of hydrogen within the project area. These activities could result in substantial soil erosion or loss of topsoil as the area south of Miles Court around Bear Creek is highly susceptible to erosion by water, while the area north of Ashby Road and south of Fahrens Creek is highly susceptible to erosion by wind.

Impact Details and Conclusions

The Variant H3 construction area includes areas underlain by highly erodible soils. Construction of Variant H3 would expose soils, including highly erodible soils, to erosion through grading, excavation, and stockpiling activities. However, Variant H3 would be required to adhere to the County grading requirements and the NPDES Construction General Permit, which would reduce impacts related to erosion to a less-than-significant level.

Impact GEO-3	Construction and operation of the Project may be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the Project, but would not result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse.
Level of Impact	**Less-than-significant impact**

Project

Impact Characterization

Construction and operation of the Project could potentially locate structures or equipment on an unstable geologic unit or one that would become unstable as a result of construction of the Project.

Impact Details and Conclusions

Neither construction nor operation of the Project would result in on- or off-site landslide as the area is flat and no known landslides are present. The presence of a free face (Bear Creek) presents the risk of lateral spreading; however, as discussed in *Environmental Setting*, seismic sources are over 30 miles away, groundwater levels are deep, and the majority of underlying sediments are well consolidated, therefore the risk of liquefaction is likely low, which reduces the risk of lateral spreading. In addition, a geotechnical investigation would be conducted to determine the potential for construction or operation activities to be susceptible to or increase the risk of liquefaction or lateral spreading, and the potential for liquefaction and lateral spreading at the creek banks would be addressed by industry design standards and guidelines that would be contained in the geotechnical report. As discussed in *Environmental Setting*, no known subsidence has occurred within the environmental footprint of the Project or has accompanied groundwater withdrawal within the City of Merced; therefore subsidence is not considered a risk in the environmental footprint or the immediate Project area. The presence of collapsible soils, if any, will be identified during the geotechnical investigation, which is currently underway and will contain measures to address any collapsible soils (such as compaction, surcharging, or replacement), as well as any potential impacts resulting from other unstable units. Therefore, while construction and operation of the Project would locate on an unstable geologic unit or soil, it would not result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse and impact would be less than significant.

Variant H1

Impact Characterization

Construction of Variant H1 would include activities such as grading, excavating, installing concrete ties, ballast tamping, pile driving, and also include the construction of photovoltaic (solar) panels for the purpose of fueling future hydrogen-powered trains. Operation of Variant H1 would include processing and storing green hydrogen at the approved ACE Merced Layover and Maintenance Facility. Construction and operation of Variant H1 could potentially locate structures or equipment on an unstable geologic unit or one that would become unstable as a result of construction and operation.

Impact Details and Conclusions

Neither operation nor construction of Variant H1 would result in on- or off-site landslide as the area is flat and no known landslides are present. The presence of a free face (Bear Creek) presents the risk of lateral spreading; however, the risk of liquefaction is likely low, which reduces the risk of lateral spreading. In addition, a geotechnical investigation would be conducted to determine the potential for construction or operation activities to be susceptible to or increase the risk of liquefaction or lateral spread, and the potential for liquefaction and lateral spread at the creek banks would be addressed by industry design standards and guidelines. Subsidence is not considered a risk in the environmental footprint or the immediate Variant H1 area. The presence of collapsible soils, if any, will be identified during the geotechnical investigation, which is currently underway and will contain measures (such as compaction, surcharging, or replacement) to address any collapsible soils, as well as any potential impacts resulting from other unstable units. Therefore, while construction and operation of Variant H1 would locate on an unstable geologic unit or soil, it would not result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse and impact would be less than significant.

Variant H2

Impact Characterization

Construction of Variant H2 would include activities such as grading, excavating, installing concrete ties, ballast tamping, pile driving, and also construction necessary for the storage of hydrogen within the project area. Operation of Variant H2 would include processing and storing green hydrogen at the approved ACE Merced Layover and Maintenance Facility. Construction and operation of Variant H2 could potentially locate structures or equipment on an unstable geologic unit or one that would become unstable as a result of construction and operation.

Impact Details and Conclusions

Neither construction nor operation of Variant H2 would result in on- or off-site landslide as the area is flat and no known landslides are present. The presence of a free face (Bear Creek) presents the risk of lateral spreading; however, the risk of liquefaction is likely low, which reduces the risk of lateral spreading. In addition, a geotechnical investigation would be conducted to determine the potential for construction or operation activities to be susceptible to or increase the risk of liquefaction or lateral spread, and the potential for liquefaction and lateral spread at the creek banks would be addressed by industry design standards and guidelines. Subsidence is not considered a risk in the environmental footprint or the immediate Variant H2 area. The presence of collapsible soils, if any, will be identified during the geotechnical investigation, which is currently underway and will contain measures to address any collapsible soils, as well as any potential impacts resulting from other unstable units. Therefore, while construction and operation of Variant H2 would locate on an unstable geologic unit or soil, it would not result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse and impact would be less than significant.

Variant H3

Impact Characterization

Construction of Variant H2 would include activities such as grading, excavating, installing concrete ties, ballast tamping, pile driving, and also construction necessary for the storage of hydrogen within the project area. Operation of Variant H3 would include processing and storing green hydrogen at the approved ACE Merced Layover and Maintenance Facility. Construction and operation of the Project could potentially locate structures or equipment on an unstable geologic unit or one that would become unstable as a result of construction and operation.

Impact Details and Conclusions

Neither operation nor construction of Variant H3 would result in on- or off-site landslide as the area is flat and no known landslides are present. The presence of a free face (Bear Creek) presents the risk of lateral spreading; however, the risk of liquefaction is likely low, which reduces the risk of lateral spreading. In addition, a geotechnical investigation would be conducted to determine the potential for construction or operation activities to be susceptible to or increase the risk of liquefaction or lateral spread, and the potential for liquefaction and lateral spread at the creek banks would be addressed by industry design standards and guidelines. Subsidence is not considered a risk in the environmental footprint or the immediate Variant H3 area. The presence of collapsible soils, if any, will be identified during the geotechnical investigation, which is currently underway and will contain measures to address any collapsible soils, as well as any potential impacts resulting from other unstable units. Therefore, while construction and operation of Variant H3 would locate on an unstable geologic unit or soil, it would not result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse and impact would be less than significant.

Impact GEO-4	Construction of the Project would be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994; creating substantial direct or indirect risks to life or property.
Level of Impact	**Less-than-significant impact**

Project

Impact Characterization

Project construction could expose people or infrastructure to geologic hazards from expansive soils. As described above under *Expansive Soils*, and shown in Figure 3.8-2, the environmental footprint of the Project includes portions underlain by soils with a high potential for expansion.

Impact Details and Conclusions

As shown in Figure 3.8-2, construction-related activities for the Project could be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code(1994). However, before construction activities commence, the Project would be required to complete a detailed site-specific geotechnical investigation as required by the California Building Code. The site-specific geotechnical investigation would provide an analysis of the plasticity of the soil underlying the Project site, and would provide, if appropriate, specific recommendations regarding how to reduce risk associated with expansive soils. Recommendations for minimizing risks associated with expansive soils could include treating soils with additives, such as cement of lime, or removing and replacing expansive soils. Implementing recommendations included in the site-specific geotechnical investigation both before and during construction activities would minimize expansive soil-related impacts to people or structure to a less-than-significant level.

Variant H1

Impact Characterization

Construction activities association with Variant H1 could expose people or infrastructure to geologic hazards from expansive soils. As shown in Figure 3.8-2, areas with a high PI number includes the areas identified for construction within Variant H1.

Impact Details and Conclusions

As shown in Figure 3.8-2, construction-related activities for Variant H1 could be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994). However, before construction activities commence, Variant H1 would be required to complete a detailed site-specific geotechnical investigation as required by the California Building Code. The site-specific geotechnical investigation would provide an analysis of the plasticity of the soil underlying Variant H1, and would provide, if appropriate, specific recommendations regarding how to reduce risk associated with expansive soils. Recommendations for minimizing risks associated with expansive soils could include treating soils with additives, such as cement of lime, or removing and replacing expansive soils. Implementing recommendations included in the site-specific geotechnical investigation both before and during construction activities would minimize expansive soil-related impacts to people or structure to a less-than-significant level.

Variant H2

Impact Characterization

Construction activities association with Variant H2 could expose people or infrastructure to geologic hazards from expansive soils. As shown in Figure 3.8-2, areas with a high PI number includes the areas identified for construction within Variant H2.

Impact Details and Conclusions

As shown in Figure 3.8-2, construction-related activities for Variant H2 could be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994). However, before construction activities commence, Variant H2 would be required to complete a detailed site-specific geotechnical investigation as required by the California Building Code. The site-specific geotechnical investigation would provide an analysis of the plasticity of the soil underlying Variant H2, and would provide, if appropriate, specific recommendations regarding how to reduce risk associated with expansive soils. Recommendations for minimizing risks associated with expansive soils could include treating soils with additives, such as cement of lime, or removing and replacing expansive soils. Implementing recommendations included in the site-specific geotechnical investigation both before and during construction activities would minimize expansive soil-related impacts to people or structure to a less-than-significant level.

Variant H3

Impact Characterization

Construction activities associated with Variant H3 could expose people or infrastructure to geologic hazards from expansive soils. As shown in Figure 3.8-2, areas with a high PI number includes the areas identified for construction within Variant H3.

Impact Details and Conclusions

As shown in Figure 3.8-2, construction-related activities for Variant H3 could be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994). However, before construction activities commence, Variant H3 would be required to complete a detailed site-specific geotechnical investigation as required by the California Building Code. The site-specific geotechnical investigation would provide an analysis of the plasticity of the soil underlying Variant H3, and would provide, if appropriate, specific recommendations regarding how to reduce risk associated with expansive soils. Recommendations for minimizing risks associated with expansive soils could include treating soils with additives, such as cement of lime, or removing and replacing expansive soils. Implementing recommendations included in the site-specific geotechnical investigation both before and during construction activities would minimize expansive soil-related impacts to people or structure to a less-than-significant level.

Impact GEO-5	Construction and operation of the Project may occur on soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater.
Level of Impact	**No impact**

Project

Impact Characterization

Construction and operation of the Project would not require the use of septic tanks or alternative wastewater disposal systems.

Impact Details and Conclusions

Because the Project would not use a septic or alternative water disposal system, there would be no impact.

Variant H1

Impact Characterization

Construction and operation of Variant H1 would not require the use of septic tanks or alternative wastewater disposal systems.

Impact Details and Conclusions

Because Variant H1 would not use a septic or alternative water disposal system, there would be no impact.

Variant H2

Impact Characterization

Construction and operation of Variant H2 would not require the use of septic tanks or alternative wastewater disposal systems.

Impact Details and Conclusions

Because Variant H2 would not use a septic or alternative water disposal system, there would be no impact.

Variant H3

Impact Characterization

Construction and operation of Variant H3 would not require the use of septic tanks or alternative wastewater disposal systems.

Impact Details and Conclusions

Because Variant H3 would not use a septic or alternative water disposal system, there would be no impact.

Impact GEO-6	Construction of the Project could directly or indirectly destroy a unique paleontological resource or site.
Level of Impact	**Potentially significant impact**
Mitigation Measures	GEO-6.1: Monitor for Discovery of Paleontological Resources, Evaluate Found Resources, and Prepare and Follow a Recovery Plan for Found Resources
Level of Impact After Mitigation	**Less-than-significant impact**

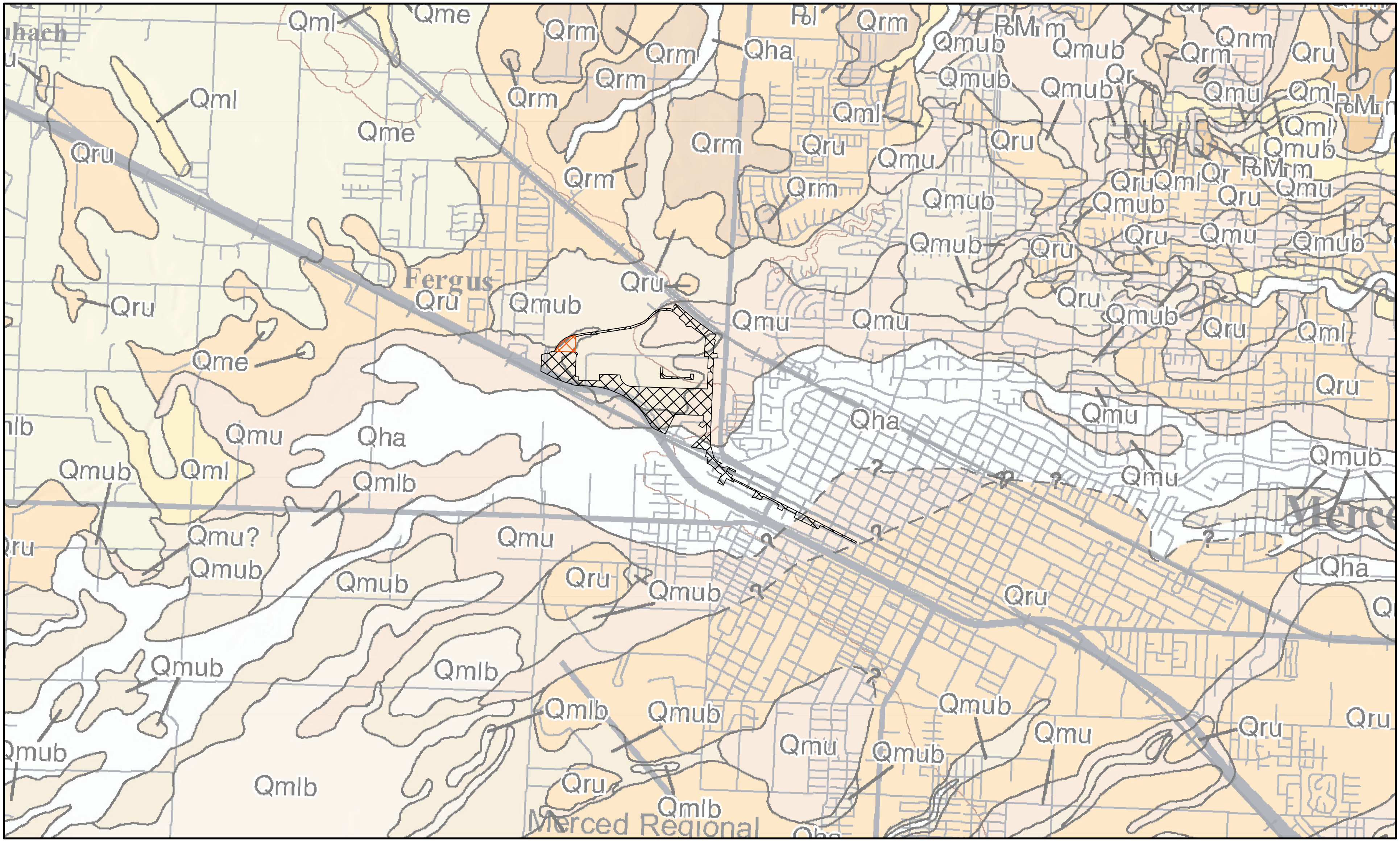
Project

Impact Characterization

The potential for impacts on paleontological resources is associated with ground-disturbing activities and the paleontological sensitivity of the geologic units that would be disturbed. As shown in Figure 3.8-8, the Project would be located in areas underlain by the Modesto Formation and Riverbank Formation, both geologic units with a high sensitivity for paleontological resources. Construction-related ground disturbance, such as excavation, could result in destruction of paleontological resources where:

- Geologic units with high paleontological sensitivity (i.e., the Modesto Formation or Riverbank Formation) are exposed at the ground surface.
- Geologic units with high paleontological sensitivity (i.e., the Modesto Formation or Riverbank Formation) are overlain by units not sensitive for paleontological resources (i.e., disturbed sediments or sediments too young to contain fossils) but are present in the shallow subsurface and therefore could be encountered during project-related earthmoving activities.

Pile driving is not considered to have an impact on paleontological resources because of limited area of disturbance.



Quaternary to Pilocene Surficial Deposits

- Qha - Young allvium
- Qmu - Modesto Formation, upper member, undifferentiated
- Qmub - Modesto Formation, upper member, basin deposits
- Qme - Modesto Formation, eolian deposits undifferentiated
- Qml - Modesto Formation lower member; undifferentiated
- Qmlb - Modesto Formation, lower member, basin deposits
- Qru - Riverbank Formation, upper member
- Qrm - Riverbank Formation, middle member
- Qnm - North Merced Gravel
- Pol - Laguna Formation

Cenozoic Sedimentary and Volcanic Paleochannel Deposits

- PoMim - Mehrten Formation

0 2,000 4,000 Feet

N

Data Source: AECOM 2024, Willis et. al. 2022

Figure 3.8-8
Paleontological Study Area
Merced Intermodal Track Connection Project

MITC

Table 3.8-3 identifies geologic units that would be affected by construction activities.

Table 3.8-3. Ground-Disturbing Construction Activities and the Paleontological Sensitivity of Affected Geologic Units

Project Component	Construction Activities That Could Affect Paleontological Resources	Geologic Unit Affected	Paleontological Sensitivity of Units Affected
Platform	No ground-disturbing activities as part of MITC	None	N/A
Trackwork	Grading 0–5 feet bgs for the track subgrade	Previously disturbed sediments	None
	Excavation 10–15 feet bgs for trackway retained fill foundations	Modesto Formation Riverbank Formation	High
Bear Creek Bridge	Excavation 10–15 feet bgs for bridge abutments	Modesto Formation Riverbank Formation	High
	Grading 0–5 feet bgs for foundations and access roads	Holocene alluvium	Low
Aerial Guideway	Excavation more than 20 feet bgs	Modesto Formation Riverbank Formation	High
	Grading 0–5 feet bgs for access roads	Previously disturbed sediments	None
Modifications to At-Grade Crossings	Grading 0–5 feet bgs for installation of track, concrete crossing panels, relocation of signals, guards, gates, and signal houses, and stop bars.	Previously disturbed sediments	None

bgs = below ground surface.

As shown in Table 3.8-3, although many construction activities would involve ground disturbance of less than 5 feet bgs and would likely be limited to previously disturbed sediments, which are not sensitive for paleontological resources, construction of the trackway retained fill foundations, bridge abutments, and bridge abutments would extend 10 to 20 feet bgs and would occur in the Modesto and Riverbank Formations, which have a high sensitivity for paleontological resources. Construction in these formations could therefore cause destruction of paleontological resources. This impact would be potentially significant.

Mitigation Measures

Mitigation Measure GEO-6.1: Monitor for Discovery of Paleontological Resources, Evaluate Found Resources, and Prepare and Follow a Recovery Plan for Found Resources

Given the potential for unique paleontological resources to be present in construction areas at the ground surface and at excavation depths in sensitive geologic units in the study area, the following measures will be undertaken to avoid any accidental damage to or destruction of paleontological resources.

Before the start of any ground-disturbing activities, SJJPA's contractor will retain a qualified paleontologist, as defined by SVP, who is experienced in teaching non-specialists. The qualified paleontologist will train all construction personnel involved with earthmoving activities, including the site superintendent, regarding the possibility of encountering fossils, the appearance and types of fossils that are likely to be seen during construction, and proper notification procedures should fossils be encountered. Procedures to be conveyed to workers include halting construction within 50 feet of any potential fossil find and notifying a qualified paleontologist, who will evaluate the significance of the find.

Where project-related earthmoving activities have the potential to encounter native Pleistocene-age sediments, the qualified paleontologist will conduct periodic on-site monitoring during construction activities. If paleontological resources are discovered during earthmoving activities, the construction crew will immediately cease work near the find and notify SJJPA. Construction work in the affected areas will remain stopped or be diverted to allow recovery of fossil remains in a timely manner. SJJPA's contractor will retain a qualified paleontologist to evaluate the resource and prepare a recovery plan in accordance with SVP Standard Guidelines (SVP 2010). The recovery plan may include a field survey, construction monitoring, sampling and data recovery procedures, museum storage coordination for any specimen recovered, and a report of findings. Recommendations in the recovery plan that are determined by SJJPA to be necessary and feasible will be implemented before construction activities can resume at the site where the paleontological resources were discovered. SJJPA's contractor will be responsible for ensuring that the monitor's recommendations regarding treatment and reporting are implemented.

Significance with Application of Mitigation

Mitigation Measure GEO-6.1 requires training by a qualified paleontologist for construction crews to recognize paleontological resources, stopping work in case of discovering such resources, evaluating those resources by a qualified paleontologist and, as appropriate, preparing and implementing a recovery plan. This measure would ensure that excavation would not result in accidental damage to or destruction of unique paleontological resources, and therefore potential construction impacts would be less than significant for the Project.

Variant H1

Impact Characterization

Construction of Variant H1 would include activities such as grading, excavating, installing concrete ties, ballast tamping, pile driving, and also include the construction of photovoltaic (solar) panels for the purpose of fueling future hydrogen-powered trains. These activities would occur in an area underlain by the Modesto Formation, which is sensitive for paleontological resources and could cause destruction of paleontological resources.

Impact Details and Conclusions

Variant H1 would be located in areas underlain by the Modesto Formation, which has a high sensitivity for paleontological resources. Construction-related ground disturbance, such as grading and excavation, could result in destruction of paleontological resources. Most construction activities associated with Variant H1 would involve ground disturbance of less than 5 feet bgs and would likely be limited to previously disturbed sediments, which are not sensitive for paleontological resources. Should excavation extend more than 5 feet bgs, it could occur in the Modesto Formation, which has a high sensitivity for paleontological resources, and could cause destruction of paleontological resources. This impact would be potentially significant.

Mitigation Measures

Mitigation Measure GEO-6.1: Monitor for Discovery of Paleontological Resources, Evaluate Found Resources, and Prepare and Follow a Recovery Plan for Found Resources

Significance with Application of Mitigation

With implementation of Mitigation Measure GEO-6.1, impacts on paleontological resources under Variant H1 would be less than significant.

Variant H2

Impact Characterization

Construction of Variant H2 would include activities such as grading, excavating, installing concrete ties, ballast tamping, pile driving, and also construction necessary for the storage of hydrogen within the project area. These activities would occur in an area underlain by the Modesto Formation, which is sensitive for paleontological resources and could cause destruction of paleontological resources.

Impact Details and Conclusions

Variant H2 would be located in areas underlain by the Modesto Formation, which has a high sensitivity for paleontological resources. Construction-related ground disturbance, such as grading and excavation, could result in destruction of paleontological resources. Most construction activities associated with Variant H1 would involve ground disturbance of less than 5 feet bgs and would likely be limited to previously disturbed sediments, which are not sensitive for paleontological resources. Should excavation extend more than 5 feet bgs, it could occur in the Modesto Formation, which has a high sensitivity for paleontological resources, and could cause destruction of paleontological resources. This impact would be potentially significant.

Mitigation Measures

Mitigation Measure GEO-6.1: Monitor for Discovery of Paleontological Resources, Evaluate Found Resources, and Prepare and Follow a Recovery Plan for Found Resources

Significance with Application of Mitigation

With implementation of Mitigation Measure GEO-6.1, impacts on paleontological resources under Variant H2 would be less than significant.

Variant H3

Impact Characterization

Construction of Variant H3 would include activities such as grading, excavating, installing concrete ties, ballast tamping, pile driving, and also construction necessary for the storage of hydrogen within the project area. These activities would occur in an area underlain by the Modesto Formation, which is sensitive for paleontological resources and could cause destruction of paleontological resources.

Impact Details and Conclusions

Variant H3 would be located in areas underlain by the Modesto Formation, which has a high sensitivity for paleontological resources. Construction-related ground disturbance, such as grading and excavation, could result in destruction of paleontological resources. Most construction activities associated with Variant H1 would involve ground disturbance of less than 5 feet bgs and would likely be limited to previously disturbed sediments, which are not sensitive for paleontological resources. Should excavation extend more than 5 feet bgs, it could occur in the Modesto Formation, which has a high sensitivity for paleontological resources, and could cause destruction of paleontological resources. This impact would be potentially significant. However, Variant H3 would be required to implement Mitigation Measure GEO-6.1 to reduce impacts on paleontological resources. This impact would be less than significant with mitigation.

Mitigation Measures

Mitigation Measure GEO-6.1: Monitor for Discovery of Paleontological Resources, Evaluate Found Resources, and Prepare and Follow a Recovery Plan for Found Resources

Significance with Application of Mitigation

With implementation of Mitigation Measure GEO-6.1, impacts on paleontological resources under Variant H3 would be less than significant.

Impact GEO-7	Operation of the Project would not directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving surface fault rupture, strong seismic ground shaking, liquefaction, seiches, landslides, subsidence and settlement, expansive soils, corrosive soils, and erosion.
Level of Impact	**Less-than-significant impact**

Project

Impact Characterization

Operation of the Project would include use of the new rail connection, operation of the ACE Merced Layover and Maintenance Facility, and use of the new aerial guideway and surface parking area. Operations could directly or indirectly cause substantial adverse effects by potentially exposing people or infrastructure to geologic hazards as discussed below.

Impact Details and Conclusions

The environmental footprint of the Project is not located in an EFZ and the nearest active fault is approximately 30 miles from the environmental footprint; therefore, the risk of fault rupture affecting Project operations is low. The Project could experience strong ground shaking originating from regional seismic events, which could potentially affect the operation of trains, the ACE Merced Layover and Maintenance Facility, and the aerial guideway; however, the San Joaquin Regional Rail Commission and UPRR have practices in place for track inspection pursuant to 49 C.F.R. Section 213.239, which would ensure train operators are notified in advance of any track damage, such as from an earthquake. In addition, structures and facilities would be designed to safely withstand or adapt to shear forces and displacements caused by seismic ground shaking during Project operations. The environmental footprint of the Project is not considered at risk of liquefaction hazards. The environmental footprint is generally flat with no previous landslide occurrences in the area; therefore, landslides are not considered a risk. While land subsidence is a problem in the San Joaquin Valley, it has not occurred within the environmental footprint or generally within the city of Merced. Furthermore, no pumping of water or oil would result from operation of the Project; therefore, the risk of subsidence is considered low. Although expansive soils underly portions of the environmental footprint, these soils would either be treated or removed in accordance with industry design standards and guidelines by the time the Project is in operation; therefore, risks resulting from expansive soils are considered low. Soils known to be corrosive to concrete and steel underly the environmental footprint; however, consistent with industry guidelines and standards, these soils will be treated or excavated as appropriate during construction and would not affect operations of the Project. Furthermore, a site-specific geotechnical investigation would be required which include recommendations for dealing with expansive or corrosive soils (such as treatment or replacement) which would reduce associated risks. Operation of the Project would not require earth-disturbing activities and would have no impacts regarding erosion such that would directly or indirectly cause potential substantial adverse effects. Therefore, impacts from operation of the Project would be less than significant.

Variant H1

Impact Characterization

Operation of Variant H1 would include processing and storing green hydrogen at the approved ACE Merced Layover and Maintenance Facility as well as the operation of 28 acres of photovoltaic (solar) panels. These activities could directly or indirectly cause substantial adverse effects by potentially exposing people or infrastructure to geologic hazards.

Impact Details and Conclusions

The Variant H1 operation area is not located in an EFZ; therefore, the risk of fault rupture affecting operation is low. As discussed in *Environmental Setting*, the risk of liquefaction is considered low in the Project area as seismic sources are over 30 miles west, underlying soils are generally consolidated, and groundwater levels are deep; the risk of landslide is considered low as the area is generally flat; the risk of subsidence is low as no known subsidence has occurred in the Project area or the city of Merced. Expansive and corrosive soils underly portions of the environmental footprint, but these will be either treated or removed in accordance with industry design standards and guidelines; therefore, risks resulting from expansive or corrosive soils are considered low. Furthermore, a site-specific geotechnical investigation would be required which include recommendations for dealing with expansive or corrosive soils (such as treatment or replacement) which would reduce associated risks. The operation of Variant H1 would not include any earth disturbing activities which would expose soils to erosion. Therefore, impacts from the operation of Variant H1 would be less than significant.

Variant H2

Impact Characterization

Operation of Variant H2 would include the trucking of green hydrogen to the Project site and the storing of green hydrogen at the approved ACE Merced Layover and Maintenance Facility. These activities could directly or indirectly cause substantial adverse effects by potentially exposing people or infrastructure to geologic hazards.

Impact Details and Conclusions

The Variant H2 operation area is not located in an EFZ; therefore, the risk of fault rupture affecting operation is low. As discussed in *Environmental Setting*, the risk of liquefaction is considered low in the Project area as seismic sources are over 30 miles west, underlying soils are generally consolidated, and groundwater levels are deep; the risk of landslide is considered low as the area is generally flat; the risk of subsidence is low as no known subsidence has occurred in the Project area or the city of Merced. Expansive and corrosive soils underly portions of the environmental footprint, but these will be either treated or removed in accordance with industry design standards and guidelines; therefore, risks resulting from expansive or corrosive soils are considered low. Furthermore, a site-specific geotechnical investigation would be required which include recommendations for dealing with expansive or corrosive soils (such as treatment or replacement) which would reduce associated risks. The operation of Variant H2 would not include any earth disturbing activities which would expose soils to erosion. Therefore, impacts from the operation of Variant H1 would be less than significant.

Variant H3

Impact Characterization

Operation of Variant H3 would include the transportation by rail of green hydrogen to the Project site and the storing of green hydrogen at the approved ACE Merced Layover and Maintenance Facility. These activities could directly or indirectly cause substantial adverse effects by potentially exposing people or infrastructure to geologic hazards.

Impact Details and Conclusions

The Variant H3 operation area is not located in an EFZ; therefore, the risk of fault rupture affecting operation is low. As discussed in *Environmental Setting*, the risk of liquefaction is considered low in the Project area as seismic sources are over 30 miles west, underlying soils are generally consolidated, and groundwater levels are deep; the risk of landslide is considered low as the area is generally flat; the risk of subsidence is low as no known subsidence has occurred in the Project area or the city of Merced. Expansive and corrosive soils underly portions of the environmental footprint, but these will be either treated or removed in accordance with industry design standards and guidelines; therefore, risks resulting from expansive or corrosive soils are considered low. Furthermore, a site-specific geotechnical investigation would be required which include recommendations for dealing with expansive or corrosive soils (such as treatment or replacement) which would reduce associated risks. The operation of Variant H3 would not include any earth disturbing activities which would expose soils to erosion. Therefore, impacts from the operation of Variant H3 would be less than significant.

Impact GEO-8	Operation of the Project would not result in substantial soil erosion or the loss of topsoil.
Level of Impact	**Less-than-significant impact**

Project

Impact Characterization

Operation of the Project would include the operation of a new passenger rail connection for the San Joaquins Intercity Service from BNSF north of State Route (SR) 59 to the southern terminus at the proposed integrated station; a new aerial guideway that would connect the high-speed rail (HSR) platform and the integrated station, and the modification of the ACE Merced Layover and Maintenance Facility.

Impact Details and Conclusions

Operation of the Project would not include any earth-disturbing activities which would expose soils to erosion, with the exception of minor maintenance of way activities. Therefore, operation of the Project would have a less than significant impact related to soil erosion or the loss of topsoil.

Variant H1

Impact Characterization

Operation of Variant H1 would include processing and storing green hydrogen at the approved ACE Merced Layover and Maintenance Facility as well as the operation of 28 acres of photovoltaic (solar) panels. Operations may include small amounts of ground disturbance for regular maintenance and repair.

Impact Details and Conclusions

Operation of Variant H1 would not include any earth-disturbing activities which would expose soils to erosion, with the exception of minor maintenance of way activities. Therefore, operation of Variant H1 would have a less than significant impact related to soil erosion or the loss of topsoil.

Variant H2

Impact Characterization

Operation of Variant H2 would include the trucking of green hydrogen to the Project site and the storing of green hydrogen at the approved ACE Merced Layover and Maintenance Facility. Operations may include small amounts of ground disturbance for regular maintenance and repair.

Impact Details and Conclusions

Operation of Variant H2 would not include any earth-disturbing activities which would expose soils to erosion, with the exception of minor maintenance of way activities. Therefore, operation of Variant H2 would have a less than significant impact related to soil erosion or the loss of topsoil.

Variant H3

Impact Characterization

Operation of Variant H3 would include the transportation by rail of green hydrogen to the Project site and the storing of green hydrogen at the approved ACE Merced Layover and Maintenance

Facility. Operations may include small amounts of ground disturbance for regular maintenance and repair.

Impact Details and Conclusions

Operation of Variant H3 would not include any earth-disturbing activities which would expose soils to erosion, with the exception of minor maintenance of way activities. Therefore, operation of Variant H3 would have a less than significant impact related to soil erosion or the loss of topsoil.

Impact GEO-9	Operation of the Project would not be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property.
Level of Impact	**Less-than-significant impact**

Project

Impact Characterization

Operation of the Project could expose people or infrastructure to geologic hazards from expansive soils. The environmental footprint of the Project includes portions underlain by highly expansive soils, including those underlying the location of the approved ACE Merced Layover and Maintenance Facility. Expansive soils can shrink and swell, resulting in differential movements, which can damage structures. Operation of the Project could therefore potentially be affected by expansive soils, causing structural damage or affecting the operation of trains, which could result in injury or death of persons.

Impact Details and Conclusions

While the Project is underlain by expansive soils, the Project would be designed and constructed in accordance with industry standards and guidelines. Under these industry standards, expansive soils would either be treated with an additive (e.g., cement or lime) to reduce expansive characteristics, or the expansive soils would be removed and replaced with nonexpansive soil. Furthermore, a site-specific geotechnical investigation would be required which include recommendations for dealing with expansive (such as treatment or replacement) which would reduce associated risks. As expansive soils would either be treated on-site or excavated and replaced before the operation of the Project, impacts related to expansive soils would be reduced to less than significant.

Variant H1

Impact Characterization

Operation of Variant H1 would include processing and storing green hydrogen at the approved ACE Merced Layover and Maintenance Facility as well as the operation of 28 acres of photovoltaic (solar) panels. As shown in Figure 3.8-2, highly expansive soils underly the environmental footprint of Variant H1, including the areas identified for solar panels. The shrink and swell action of expansive soils could result in differential movement, which could damage structures such as equipment and infrastructure necessary for rail operation or solar power generation.

Impact Details and Conclusions

Operation activities associated with Variant H1 would be located in areas underlain by expansive soils. However, a site-specific geotechnical investigation would be required which include recommendations for dealing with expansive (such as treatment or replacement) which would reduce associated risks. Therefore, operational impacts related to expansive soils would be less than significant.

Variant H2

Impact Characterization

Operation of Variant H2 would include the trucking of green hydrogen to the Project site and the storing of green hydrogen at the approved ACE Merced Layover and Maintenance Facility. It would not include any additional areas for infrastructure or equipment. As shown in Figure 3.8-2, highly expansive soils underly the footprint of Variant H2.

Impact Details and Conclusions

Operation activities associated with Variant H2 would be located in areas underlain by expansive soils. However, a site-specific geotechnical investigation would be required which include recommendations for dealing with expansive (such as treatment or replacement) which would reduce associated risks. Therefore, operational impacts related to expansive soils would be less than significant.

Variant H3

Impact Characterization

Operation of Variant H3 would include the transportation by rail of green hydrogen to the Project site and the storing of green hydrogen at the approved ACE Merced Layover and Maintenance Facility. It would not include any additional areas for infrastructure or equipment. As shown in Figure 3.8-2, highly expansive soils underly the footprint of Variant H3.

Impact Details and Conclusions

Operation activities associated with Variant H3 would be located in areas underlain by expansive soils. However, a site-specific geotechnical investigation would be required which include recommendations for dealing with expansive (such as treatment or replacement) which would reduce associated risks. Therefore, operational impacts related to expansive soils would be less than significant.

Impact GEO-10	Operation of the Project would not directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.
Level of Impact	**No impact**

Project

Impact Characterization

Operation of the Project would include use of the new rail connection, operation of the ACE Merced Layover and Maintenance Facility, and use of the new aerial guideway and surface parking area. No ground-disturbing activities would occur.

Impact Details and Conclusions

Operation of the Project would not include any ground-disturbing activities that could result in the destruction of paleontological resources. Therefore, operation of the Project would have no impact on paleontological resources.

Variant H1

Impact Characterization

Operation of Variant H1 would include processing and storing green hydrogen at the approved ACE Merced Layover and Maintenance Facility as well as the operation of 28 acres of photovoltaic (solar) panels. No ground-disturbing activities would occur.

Impact Details and Conclusions

Operation of Variant H1 would not include any ground-disturbing activities that could result in the destruction of paleontological resources. Therefore, operation of the Project would have no impact on paleontological resources.

Variant H2

Impact Characterization

Operation of Variant H2 would include the trucking of green hydrogen to the Project site and the storing of green hydrogen at the approved ACE Merced Layover and Maintenance Facility. No ground-disturbing activities would occur.

Impact Details and Conclusions

Operation of Variant H2 would not include any ground-disturbing activities that could result in the destruction of paleontological resources. Therefore, operation of the Project would have no impact on paleontological resources.

Variant H3

Impact Characterization

Operation of Variant H3 would include the transportation by rail of green hydrogen to the Project site and the storing of green hydrogen at the approved ACE Merced Layover and Maintenance Facility. No ground-disturbing activities would occur.

Impact Details and Conclusions

Operation of Variant H3 would not include any ground-disturbing activities that could result in the destruction of paleontological resources. Therefore, operation of the Project would have no impact on paleontological resources.

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3.9 Hazards and Hazardous Materials

3.9.1 Introduction

This section describes the regulatory and environmental setting for hazards and hazardous materials in the vicinity of the Project. It also describes the impacts on hazards and hazardous materials that would result from the Project and mitigation measures that would reduce significant impacts, where feasible and appropriate. Appendix 3.9-1 of this environmental impact report (EIR), *Supporting Hazards and Hazardous Materials Information,* contains additional technical information for this section, including the EDR Area/Corridor Report prepared for the Project.

The term hazardous material is defined in this section as any material that, because of its quantity, concentration, or physical or chemical characteristics, poses a significant present or potential hazard to human health and safety or to the environment if released into the workplace or the environment (abbreviated from the California Health and Safety Code 25501). The term hazardous waste generally refers to a hazardous material that has been used for its original purpose and is about to be discarded or recycled. In California, a hazardous waste is defined as a waste, or combination of wastes, that due to tis quantity, concentration, or physical, chemical, or infectious characteristics may do one of the following:

- Cause, or significantly contribute to an increase in mortality or in increase in serious irreversible, or incapacitating reversible, illness.
- Pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, disposed of, or otherwise managed (abbreviated from Health and Safety Code 25141).

Cumulative impacts on hazards and hazardous materials, in combination with planned, approved, and reasonably foreseeable projects, are discussed in Chapter 4, *Cumulative Impacts*.

3.9.2 Regulatory Setting

This section summarizes the federal, state, regional, and local regulations related to hazards and hazardous materials applicable to the Project.

3.9.2.1 Federal

Federal Toxic Substances Control Act/Resource Conservation and Recovery Act/Hazardous and Solid Waste Act

The federal Toxic Substances Control Act of 1976 and the Resource Conservation and Recovery Act of 1976 (RCRA) established a U.S. Environmental Protection Agency (USEPA)-administered program for regulating the generation, transport, treatment, storage, and disposal of hazardous waste. The RCRA was amended in 1984 by the Hazardous and Solid Waste Act, which affirmed and extended the “cradle to grave” system of regulating hazardous wastes.

Comprehensive Environmental Response, Compensation, and Liability Act/Superfund Amendments and Reauthorization Act

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), commonly known as "Superfund," was enacted by Congress on December 11, 1980. This law (42 United States Code [U.S.C.] § 103) provides broad federal authority to respond directly to releases or threatened releases of hazardous substances that may endanger public health or the environment. CERCLA establishes requirements concerning closed and abandoned hazardous waste sites, provides for the liability of persons responsible for releases of hazardous waste at these sites, and establishes a trust fund to provide for cleanup when no responsible party can be identified. CERCLA also enabled the revision of the National Contingency Plan (NCP). The NCP (40 Code of Federal Regulations [CFR] § 300) provides the guidelines and procedures needed to respond to releases and threatened releases of hazardous substances, pollutants, and/or contaminants. The NCP also established the National Priorities List. CERCLA was amended by the Superfund Amendments and Reauthorization Act on October 17, 1986.

Occupational Safety and Health Administration

The Occupational Safety and Health Administration's (OSHA's) mission is to ensure the safety and health of American workers by setting and enforcing standards; providing training, outreach, and education; establishing partnerships; and encouraging continual improvement in workplace safety and health. OSHA establishes and enforces protective standards and reaches out to employers and employees through technical assistance and consultation programs. OSHA standards are listed in 29 CFR Part 1910.

Department of Transportation Hazardous Materials Regulations

In 49 CFR Parts 100–185, the U.S. Department of Transportation hazardous materials regulations cover packaging, handling, and transporting such materials. These regulations include Parts 107 (Hazard Materials Program), 130 (Oil Spill Prevention and Response), 172 (Emergency Response), 173 (Packaging Requirements), 174 (Rail Transportation), 176 (Vessel Transportation), 177 (Highway Transportation), 178 (Packaging Specifications), and 180 (Packaging Maintenance).

Lead-Based Paint Elimination Final Rule

In 24 CFR Part 33, regulations for lead-based paint are specified in the Lead-Based Paint Elimination Final Rule, which is governed by the U.S. Department Housing and Urban Development. The rule requires sellers and lessors to disclose known lead-based paint and lead-based paint hazards to perspective purchasers and lessees. In addition, all lead-based paint abatement activities must be in compliance with state and federal OSHA requirements as well as those from the California Department of Public Health. Only trained and certified lead-based paint personnel are allowed to perform abatement. All lead-based paint removed from structures must be hauled and disposed of by a transportation company that has been licensed to transport this type of material to a landfill or receiving facility that has been licensed to accept the waste.

3.9.2.2 State

California Environmental Protection Agency

The California Environmental Protection Agency (CalEPA) was created in 1991. It unified California's environmental authority in a single cabinet-level agency and placed the California Air Resources Board, State Water Resources Control Board (SWRCB), Regional Water Quality Control Boards, the California Department of Resources Recycling and Recovery, California Department of Toxic Substances Control (DTSC), the Office of Environmental Health Hazard Assessment, and the Department of Pesticide Regulation under one agency. These agencies were placed under the CalEPA umbrella to protect human health and the environment and ensure the coordinated deployment of state resources. Their mission is to restore, protect, and enhance the environment and ensure public health, environmental quality, and economic vitality.

Department of Toxic Substances Control

DTSC, a department of CalEPA, is the primary statewide agency in California for regulating hazardous waste, cleaning up existing contamination, and finding ways to reduce the amount of hazardous waste produced in California. DTSC regulates hazardous waste primarily under the authority of the federal RCRA and the California Health and Safety Code (Health & Saf. Code) (primarily Division 20, Chapters 6.5 through 10.6, and Title 22, Division 4.5). Other laws regarding hazardous waste are specific to handling, storage, transportation, disposal, treatment, reduction, cleanup, and emergency planning.

California Government Code Section 65962.5(a) (commonly referred to as the Cortese List) encompasses DTSC-listed hazardous waste facilities and sites, lists of contaminated drinking water wells, sites listed by the State Water Resources Control Board as having underground storage tank leaks or a discharge of hazardous wastes or materials into the water or groundwater and lists from local regulatory agencies of sites with a known migration of hazardous waste/material.

Hazardous Waste Control Act

DTSC is responsible for enforcing the Hazardous Waste Control Act of 1972 (Health & Saf. Code § 25100 et seq.), which creates the framework under which hazardous wastes are managed in California. The law provides for the development of a state hazardous waste program that administers and implements the provisions of the federal RCRA's cradle-to-grave waste management system in California. It also provides for the designation of California-only hazardous waste and development of standards that are equal to or, in some cases, more stringent than federal requirements.

Unified Hazardous Waste and Hazardous Materials Management Regulatory Program

The Unified Hazardous Waste and Hazardous Materials Management Regulatory Program (Unified Program) (Health & Saf. Code Chapter 6.11, §§ 25404–25404.9) consolidates, coordinates, and makes consistent the administrative requirements, permits, inspections, and enforcement activities of environmental and emergency response programs (e.g., the Hazardous Materials Business Plan [HMBP] Program, California Accidental Release Prevention Program, Underground Storage Tank Program, Aboveground Storage Tank Program, Hazardous Waste Generator Program, Hazardous

Waste Onsite Treatment/Tiered-Permitting Program) and provides authority to the Certified Unified Program Agency (CUPA). The CUPA for Mered is the Merced County Department of Public Health, Division of Environmental Health.

California Code of Regulations, Title 8—Industrial Relations

Occupational safety standards exist in federal and state laws to minimize worker safety risks from both physical and chemical hazards in the workplace. The California Division of Occupational Safety and Health (Cal/OSHA) and OSHA are the agencies responsible for ensuring safety in the workplace. Cal/OSHA assumes primary responsibility for developing and enforcing standards for safe workplaces and work practices.

California Labor Code (Division 5, Parts 1, 6, 7, and 7.5)

The California Labor Code is a collection of regulations pertaining to appropriate training for using and handling hazardous materials as well as operating equipment and machines that use, store, transport, or dispose of hazardous materials. Division 5, Part 1, Chapter 2.5, ensures that employees who are in charge of handling hazardous materials are properly trained and informed about the materials they handle. Division 5, Part 7, ensures that employees who work with volatile flammable liquids are outfitted with appropriate safety gear and clothing.

State Water Resources Control Board General Construction Permit

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 General Permit for Discharges of Storm Water Associated with Construction Activity Construction General Permit Order 2009-0009-DWQ (SWRCB 2024). Construction activity subject to this permit includes clearing, grading and disturbances to the ground such as stockpiling, or excavation, but does not include regular maintenance activities performed to restore the original line, grade, or capacity of the facility.

The Construction General Permit requires the development of a stormwater pollution prevention plan (SWPPP) by a certified Qualified SWPPP Developer. The SWPPP specifies best management practices (BMP) to prevent pollutants from contacting stormwater. BMPs are effective, practical, structural or nonstructural methods used to prevent or reduce the movement of sediments, nutrients, and pollutants from land to surface waters. The intent of the SWPPP and BMPs is to keep aforementioned materials from moving off-site into receiving waters, eliminate or reduce non-stormwater discharges to storm sewer systems and other waters of the United States, and perform sampling and analysis to determine the effectiveness of BMPs in reducing the volume of pollutants (even if not visually detectable) in stormwater discharges and preventing them from causing or contributing to violations of water quality objectives.

California Department of Pesticide Regulation, Department of Food and Agriculture, and the Department of Public Health

The California Department of Pesticide Regulations, a division of CalEPA, in coordination with the California Department of Food and Agriculture and the California Department of Public Health, has primary responsibility for pesticide use, vector control, and the safety of food and drinking water.

The department registers pesticides. Pesticide use is tracked at the county level. Title 22 of the California Code of Regulations regulates both small and large water systems.

3.9.2.3 Regional and Local

The SJJPA, as a state joint powers agency, proposes improvements within and outside the Union Pacific Railroad (UPRR) and BNSF Railway (BNSF) rights-of-way. The Interstate Commerce Commission Termination Act (ICCTA) affords railroads that engage in interstate commerce considerable flexibility in making necessary improvements and modifications to rail infrastructure, subject to the requirements of the Surface Transportation Board. ICCTA broadly preempts state and local regulation of railroads; this preemption extends to the construction and operation of rail lines. As such, activities within the UPRR and BNSF rights-of-way are clearly exempt from local building and zoning codes as well as other land use ordinances. Project activities outside of the UPRR and BNSF rights-of-way, however, would be subject to regional and local plans and regulations. Though ICCTA broadly preempts state and local regulation of railroads, SJJPA intends to obtain local agency permits for construction of facilities that fall outside the UPRR and BNSF rights-of-way, even though SJJPA has not determined whether such permits are legally necessary or required.

Appendix 3.0-1 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 Project improvements would be located. Section 15125(d) of the State 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 Project would be consistent with the plans of relevant jurisdictions.[1] The Project would be generally consistent with the applicable goals, policies, and objectives related to hazards and hazardous materials identified in Appendix 3.0-1.

3.9.3 Environmental Setting

This section describes the environmental setting related to hazards and hazardous materials for the Project.

Hazardous Materials Database Results

An environmental database search was conducted by Environmental Data Resources and is included in Appendix 3.9-1. Multiple listings were identified within the Project footprint and off-site. Table 3.9-1 contains the listings identified in the Project site with a history of release(s). Table 3.9-2 contains the off-site listings within a 0.25-mile radius of the Project footprint and with a history of release(s). Sites within this radius were analyzed because they are the most likely to have a deleterious effect on the Project footprint. Only listings and databases containing information regarding potential releases into the environment or significant violations (with the potential to impact the Project) were included.

[1] 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.

Table 3.9-1. Hazardous Materials Listings with a History of Release Identified Within the Project Footprint

Site	Address	Distance from the Project Footprint	Databases	Site Status Summary
Sierra Beverage Company	2651 Cooper Avenue	Within the Project footprint	CA LUST, CA RGA LUST, CA Cortese	LUST case involving a gasoline release to groundwater. The case was opened in August of 1990 and was granted closure by Central Valley Regional Water Quality Control Board (RWQCB) in August of 1996. No other releases to the environment were identified.
State Route 59 Property	2777 North Highway 59	Within the Project footprint	CPS-SLIC	SLIC case involving a dichloroethene (DCE), other chlorinated hydrocarbons, tetrachloroethylene (PCE), and total petroleum hydrocarbons (TPH) release to groundwater. The case was opened in May of 2011 and was granted closure by Central Valley RWQCB in February of 2018. No other releases to the environment were identified.
Unilever Supply Chain, Inc.	1785 Ashby Road	Within the Project footprint	CA LUST, CA Cortese, CA HIST Cortese	LUST case involving a diesel release to groundwater. The case was opened in December of 1985 and was granted closure by Central Valley RWQCB in July of 2000. No other releases to the environment were identified.
Concrete Pipe	1775 Ashby Road	Within the Project footprint	CA LUST, CA Cortese, CA HIST Cortese	LUST case involving a gasoline release to soil. The case was opened in January of 1986 and was granted closure by Merced County in July of 1990. No other releases to the environment were identified.

Table 3.9-2. Hazardous Materials Listings with a History of Release Identified Outside the Project Footprint

Site	Address	Distance from the Project Footprint	Databases	Site Status Summary
Redevelopment Agency of Merced Brownfield	1159 W 15th Street	0.002 mi to the south, southwest	US Brownsfields	Listed in the US Brownsfields database. Currently used as an asphalt paved parking lot. It was formerly owned by the California Tomato Growers as a tomato processing facility. It is currently owned by the Redevelopment Agency of Merced. The listing did not include information associated with a release onsite.

Site	Address	Distance from the Project Footprint	Databases	Site Status Summary
Pacific Bell	1202 W 15th Street	0.008 mi to the south, southwest	CA LUST, CA Cortese, CA HIST Cortese	LUST case involving a gasoline release to soil. The case was opened in September of 1993 and was granted closure by Merced County in August of 1994. No other releases to the environment were identified.
Smith Van and Storage	1120 W 15th Street	0.010 mi to the south, southwest	CA LUST, CA Cortese,	LUST case involving a gasoline release to groundwater. The case was opened in April of 2006 and was granted closure by Central Valley RWQCB in August of 2014. No other releases to the environment were identified.
Tinetti-Williams Property	855 W 15th Street	0.024 mi to the south, southeast	CA LUST, CA Cortese, CA HIST Cortese	LUST case involving a gasoline release to groundwater. The case was opened in May of 1987 and was granted closure by Merced County in September of 1996. No other releases to the environment were identified.
City Auto Body	1200 16th Street	0.032 mi to the north, northeast	CA LUST, CA Cortese, CA HIST Cortese	LUST case involving a gasoline release to soil. The case was opened in February of 1988 and was granted closure by Merced County in April of 1988. No other releases to the environment were identified.
Quick Lube & Oil	1440 V Street	0.038 mi to the south, southeast	CA LUST, CA Cortese, CA HIST Cortese	LUST case involving a waste/motor /hydraulic /lubricating oil release to soil. The case was opened in December of 1991 and was granted closure by Merced County in May of 1993. No other releases to the environment were identified.

Site	Address	Distance from the Project Footprint	Databases	Site Status Summary
CARDGAS, Inc./ Pacific Pride Cardlock Station	1455 R Street (approx. 0.10 mile from Costco Wholesale at 1445 R Street)	0.040 mi to the south, southwest	CA LUST, CA Cortese, CA HIST Cortese	An active LUST case involving a gasoline release to groundwater. The case was opened in January of 2002 and is listed with an *Open - Verification Monitoring* status as of December of 2011. The case was opened following an unauthorized release from an underground storage tank system. Corrective action is underway as directed by the Central Valley RWQCB. A review of the *Groundwater Monitoring Report Second Quarter 2013 Former Exxon and Pacific Pride UST Site* (Provost & Pritchard 2013) via Geotracker identified shallow groundwater (down to 65 feet below ground surface or bgs) flowing northeast, in the direction of the project. According to the August 2021 *Groundwater Monitoring Report, First Semi-Annual 2021, Former Exxon and Pacific Pride UST Site, 1415 and 1455 R Street, Merced, California,* given the results of groundwater monitoring data, there is no threat to sensitive receptors located downgradient, including no threat to drinking water source receptors. The report recommended site closure. However, given the proximity to the Project footprint and the fact that the site has not been granted closure by the applicable oversight agencies, groundwater impacts are possible if dewatering is required in the area.
UNOCAL Bulk Plant #0420	1590 16th Street West	0.041 mi to the north, northeast	CA LUST, CA Cortese, CA HIST Cortese	LUST case involving a diesel, gasoline, and waste oil/motor/hydraulic /lubricating oil release to groundwater. The case was opened in January 1986 and was granted closure by the Central Valley RWQCB in July of 2018. No other releases to the environment were identified.
Shell Service Station	1480 16th Street	0.043 mi to the north, northeast	CA LUST, CA Cortese, CA HIST Cortese	LUST case involving a gasoline release to groundwater. The case was opened in February 1989 and was granted closure by Merced County in May of 1996. No other releases to the environment were identified.

Site	Address	Distance from the Project Footprint	Databases	Site Status Summary
Rancher Tractor Co.	1486 HWY 59 South	0.047 mi to the south	CA LUST, CA CPS-SLIC, CA Cortese, CA HIST Cortese	LUST case involving a waste/motor /hydraulic/lubricating oil release to groundwater. The case was opened in September 1988 and was granted closure by Merced County in June of 1996. A second listing under CPS-SLIC identified the site with a waste/motor /hydraulic /lubricating oil release to soil. The release was identified in July of 2011 and the site was granted closure by Merced County in January of 2012.
Bianchi & Sons Packing Co.	1975 Olive Avenue	0.048 mi to the north, northeast	CA LUST, CA HIST Cortese	LUST case involving a gasoline release to groundwater. The case was opened in February 1991 and was granted closure by Merced County in November 2011. No other releases to the environment were identified.
Chevron Abandoned S/S #9-9682.	2060 16th Street	0.052 mi to the west, southwest	CA LUST, CA Cortese, CA HIST Cortese	LUST case involving a gasoline release to groundwater. The case was opened in June 1986 and was granted closure by Merced County in May 1996. No other releases to the environment were identified.
R Street Texaco (AKA R Street EXXON).	1415 R Street (approx. 0.12 mile from Costco Wholesale at 1445 R Street)	0.061 mi to the west, southwest	CA LUST, CA Cortese, CA HIST Cortese	LUST case involving a tetrachloroethylene (PCE), gasoline, MTBE/TBA/other fuel oxygenates release to groundwater. The case was opened in December 1990 and is listed with an *Open - Verification Monitoring* status as of July 2017. The case was opened following an unauthorized release from an underground storage tank system. Corrective action is underway as directed by the Central Valley RWQCB. Contamination for this site is associated with the CARDGAS, Inc./ Pacific Pride Cardlock Station described above. Given the proximity to the Project footprint and the fact that the site has not been granted closure by the applicable oversight agencies, groundwater impacts are possible if dewatering is required in the area.

Site	Address	Distance from the Project Footprint	Databases	Site Status Summary
Former Westgate Chevron	1055 16th Street	0.061 mi to the north, northeast	CA LUST, CA Cortese, CA HIST Cortese	LUST case involving a gasoline release to groundwater. The case was opened in August 1989 and was granted closure by Merced County in September of 1996. No other releases to the environment were identified.
Merced Mart	1055 16th Street	0.061 mi to the north, northeast	CA LUST, CA Cortese, CA HIST Cortese	LUST case involving a gasoline release to groundwater. The case was opened in August 1989 and was granted closure by Merced County in September of 1996. A second listing was identified and (also) involved a gasoline release to groundwater. The case was identified in March of 1992 and was granted closure by the Central Valley RWQCB in August of 2020.
UNOCAL #5179	1411 V Street	0.063 mi to the south, southwest	CA LUST	LUST case involving a gasoline release to groundwater. The case was opened in March of 1993 and was granted closure by the Central Valley RWQCB in August of 2020. No other releases to the environment were identified.
Gas N Save	963 16th Street West	0.070 mi to the north, northeast	CA LUST, CA Cortese, CA HIST Cortese	LUST case involving a gasoline release to groundwater. The case was opened in December 1990 and was granted closure by the Central Valley RWQCB in June of 2010. No other releases to the environment were identified.
RBJ Trucking	1735 Ashby Road	0.072 mi to the east, southeast	CA LUST, CA Cortese, CA HIST Cortese	LUST case involving a diesel release to groundwater. The case was opened in June 1987 and was granted closure by Merced County in August of 1995. No other releases to the environment were identified.
Castle AFB ILS Outer Marker Annex	Not listed	0.073 mi to the east	FUDS, CA Envirostor	Formerly Used Defense Site. The site was used by the Air Force as an off-base instrument landing facility for Castle Air Force Base (CAFB). The Air Force installed compass locators in support of aircraft landings. Now a privately owned site. Listed with an *Inactive-Action Required* status under *Envirostor* (as of July 2015). Potential impacts on onsite soils are being investigated.

Site	Address	Distance from the Project Footprint	Databases	Site Status Summary
Merced Honda	1775 V Street	0.078 mi to the north, northeast	CA LUST, CA Cortese, CA HIST Cortese	LUST case involving a gasoline release to soil. The case was opened in March of 1986 and was granted closure by Merced County in January of 1987. No other releases to the environment were identified.
Merced Chrysler Plymouth	1600 West Main Street	0.124 mi to the east, northeast	CA LUST, CA Cortese, CA HIST Cortese	LUST case involving a gasoline release to soil. The case was opened in July of 1990 and was granted closure by Merced County in May of 1998. No other releases to the environment were identified.
Merced PCE Sites - Merced PCE- Bel Air Cleaners	946 West Main Street	0.125 mi to the north, northeast	CA CPS-SLIC	CPS-SLIC site with a PCE release to groundwater. The release was identified in January of 1989 and the site remains active with an *Open- Site Assessment* status (as of January 1989). The site is part of a larger regional contaminant plume involving several drycleaner sites. Some of which are listed in this table. According to the *Groundwater Monitoring Report, First Quarter 2023, Merced PCE Projects* (Provost & Pritchard 2023) report (reviewed via Geotracker), groundwater at the Bel Air Cleaners site flows to the south and southeast, potentially overlapping with the southeastern terminus of the project footprint.
Spriggs Stationary, Inc	928 Main Street West	0.125 mi to the north, northeast	CA LUST, CA Cortese, CA HIST Cortese	LUST case involving a gasoline release to groundwater. The case was opened in January 1989 and was granted closure by the Central Valley RWQCB in June of 2015. No other releases to the environment were identified.

Site	Address	Distance from the Project Footprint	Databases	Site Status Summary
Sunshine Cleaners	1227 West Main Street	0.144 mi to the north, northeast	CA CPS-SLIC, CA Envirostor	CPS-SLIC site with a PCE release to groundwater. The release was identified in January of 1989 and the site remains active with an *Open-Remediation* status (as of September 2016). The site is part of a larger regional contaminant plume involving several drycleaner sites (the Merced PCE sites). Also associated with the Bel Air Cleaners mentioned above. According to the *Groundwater Monitoring Report, First Quarter 2023, Merced PCE Projects* (Provost & Pritchard 2023) report (reviewed via *Geotracker*), groundwater at the Sunshine Cleaners site flows to the south, southeast and east, potentially overlapping with the southeastern terminus of the project footprint.
Dave Cook, Front End Shop	704 16th Street	0.145 mi to the east	CA LUST, CA Cortese, CA HIST Cortese	LUST case involving a diesel release to soil. The case was opened in August of 1987 and was granted closure by Merced County in July of 1996. No other releases to the environment were identified.
Former Valley Pontiac	1021 Main Street West	0.146 mi to the north, northeast	CA LUST, CA Cortese, CA HIST Cortese	LUST case involving a diesel release to soil. The case was opened in May of 1990 and was granted closure by Merced County in May of 1992. No other releases to the environment were identified.
Former Mitchell House Movers	729 14th Street West	0.159 mi to the south, southeast	CA LUST, CA Cortese, CA HIST Cortese	LUST case involving a gasoline release to groundwater. The case was opened in July of 1987 and was granted closure by Merced County in January 1998. No other releases to the environment were identified.
Westgate Exxon	1720 R Street	0.169 mi to the north, northeast	CA LUST, CA Cortese, CA HIST Cortese	LUST case involving a gasoline release to groundwater. The case was opened in August of 1985 and was granted closure by Merced County in April 1996. No other releases to the environment were identified.

Site	Address	Distance from the Project Footprint	Databases	Site Status Summary
Bank of America	710 West Main Street	0.170 mi to the east, northeast	CA LUST, CA Cortese,	LUST case involving a crude oil/gasoline release to groundwater. The case was opened in October of 2003 and was granted closure by the Central Valley RWQCB in March of 2023. No other releases to the environment were identified.
Briceno Air Conditioning	1427 N Street	0.173 mi to the southeast	CA LUST, CA Cortese, CA HIST Cortese	LUST case involving a gasoline release to groundwater. The case was opened in November of 1989 and was granted closure by Merced County in November 1998. No other releases to the environment were identified.
ARCO Station #237	1625 McSwain Highway 140	0.179 mi to the south, southwest	CA LUST, CA Cortese, CA HIST Cortese	LUST case involving a gasoline release to groundwater. The case was opened in August of 1989 and was granted closure by Merced County in September 2011. No other releases to the environment were identified.
Shell Oil Co.	1245 R Street	0.180 mi to the south, southwest	CA LUST, CA Cortese, CA HIST Cortese	LUST case involving a gasoline release to groundwater. The case was opened in March of 1990 and was granted closure by Merced County in September 1997. No other releases to the environment were identified.
Bottling Co.	1414 13th Street West	0.188 mi to the south	CA LUST, CA Cortese, CA HIST Cortese	LUST case involving a gasoline release to soil. The case was opened in March of 1986 and was granted closure by Merced County in January 1991. No other releases to the environment were identified.
California Collision Inc.	1330 West 18th Street	0.199 mi to the south, southwest	CA LUST, CA Cortese, CA HIST Cortese	LUST case involving a gasoline release to groundwater. The case was opened in May of 1990 and was granted closure by Merced County in March 2010. No other releases to the environment were identified.
Circle ‘R” Minimart/ Beacon 3389	1210 R Street	0.217 mi to the south, southwest	CA LUST, CA HIST Cortese	LUST case involving a gasoline release to groundwater. The case was opened in August of 1990 and was granted closure by Merced County in November 1998. No other releases to the environment were identified.

Site	Address	Distance from the Project Footprint	Databases	Site Status Summary
Former Standard Oil of California Station/Tune-Up Masters	608 West 16th Street	0.223 mi to the east, southeast	CA LUST, CA Cortese, CA HIST Cortese	LUST case involving a gasoline release to groundwater. The case was opened in May of 1990 and was granted closure by the Central Valley RWQCB in October of 2015. A second listing was identified for the site under Tune-Up Masters. The release involved waste oil/motor/hydraulic /lubricating oil release to soil. The case was opened in May of 1990 and was granted closure by Merced County in September 1996.
One Hour Martinizing	1818 R Street	0.241 mi to the north, northeast	CA Envirostor, CA CPS-SLIC	CPS-SLIC site with a PCE release to groundwater. The release was identified in March of 2003 and the site remains active with an *Open- Site Assessment* status (as of November 2009). The site is part of a larger regional contaminant plume involving several drycleaner sites (the Merced PCE sites). Also associated with the Bel Air and Sunshine Cleaners mentioned above. Groundwater flow was not provided in the *Groundwater Monitoring Report, First Quarter 2023, Merced PCE Projects* (Provost & Pritchard 2023) report (reviewed via *Geotracker*), however, other sites in the area also part of the Merced PCE sites feature flows heading south, southeast and east, potentially overlapping with the southeastern terminus of the project footprint.

Site	Address	Distance from the Project Footprint	Databases	Site Status Summary
Simpson's Cleaners	618 West Main Street	0.250 mi to the east	CA Envirostor, CA CPS-SLIC	Site listed in *Envirostor* involving a PCE release to soil. The case was listed with a *Refer: RWQCB* status. These are sites that, given the onsite conditions, are better supervised by the regional board. Also listed as an EPA lead site. Furthermore, the site is also listed a CPS-SLIC site with a PCE release to groundwater. The release was identified in January of 1989 and the site remains active with an *Open- Site Assessment* status (as of April 2010). The site is part of a larger regional contaminant plume involving several drycleaner sites (the Merced PCE sites). Also associated with the Bel Air and Sunshine Cleaners, and One Hour Martinizing site mentioned above. According to the *Groundwater Monitoring Report, First Quarter 2023, Merced PCE Projects* (Provost & Pritchard 2023) report (reviewed via Geotracker), groundwater at the Simpson's Cleaners site flows to the southeast and away from the Project footprint.

Proximity to Schools

Valley High School, located at 632 W 13th Street, approximately 0.25 mile from the southeastern portion of the Project footprint. Other nearby schools include John C. Fremont Elementary School, located at 2150 S Street, approximately 0.4 mile from the Project footprint; Galen Clark Preschool, located at 211 E 11th Street, approximately 1 mile from the Project footprint; and Stowell Elementary School, located at 251 E. 11th Street, approximately 1 mile from the Project footprint.

Proximity to Airports and Airstrips

The Project footprint is within 2 miles of the Merced Regional Airport, and portions of the Project are in Zone D of the airport's airport influence area[2] (AIA) and also in the airport's Federal Aviation Regulations (FAR) Part 77 Obstruction Surfaces[3] area. Furthermore, the Project footprint is not within 2 miles of the Castle Airport, but is in the southeastern most portion of the airport's AIA, in

[2] The AIA is an area in which current or future airport related noise, overflight, safety, or airspace protection factors may significantly affect land uses or necessitate restrictions on those uses. The AIA constitutes the area within which certain land use actions are subject to Airport Land Use Commission review to determine consistency with applicable policies.

[3] FAR Part 77: Deals with objects affecting navigable airspace in the vicinity of airports. Objects that exceed the Part 77 height limits constitute airspace obstructions.

Zone C and D. The Project footprint is also in the Castle Airport's FAR Part 77 Obstruction Surfaces area.

Area C is denoted as the *Extended Approach/Departure Area and Primary Traffic Patterns* Zone with a moderate noise impact and low to moderate risk level. Traffic patterns lie mostly outside of the 55 dB contour; however, land uses are subjected to frequent aircraft noise. Object height is not restricted to less than 100 feet in Area C.

Area D is listed as the *Other Overflight Areas* Zone with a low noise impact and low risk level. Noise level is typically less than CNEL 55 dB and height concerns consist of tall (>150 feet) single objects (e.g. antennas).

FAR Part 77 establishes standards for identifying obstructions to navigable airspace, sets forth requirements for notice to the FAA of certain proposed construction or alteration, and provides for aeronautical studies of obstructions to determine their effect on the safe and efficient use of airspace.

Emergency Response

The Merced Office of Emergency Services (OES) provides preparedness before, and coordination direction during, large-scale emergencies and disasters. OES coordinates with partner agencies including the six incorporated cities in the county, special districts, and key private agencies in providing planning, response, recovery, and mitigation activities as a result of disaster-related incidents (Merced County 2024).

Merced County Multi-Jurisdictional Hazard Mitigation Plan

Merced County, including participating jurisdictions, have prepared a multi-jurisdictional hazard mitigation plan to guide hazard mitigation planning to better protect the people and property of the county from the effects of hazard events, including those associated with hazardous materials (Merced County 2021).

Wildfires

According to the *California Department of Forestry and Fire Protection's State Responsibility Area Fire Hazard Severity Zones—Merced County* (CalFIRE 2007), the Project footprint is not in a fire hazard severity zone. The Project footprint is in a semi-developed area of Merced and not within or immediately adjacent to wildlands.

3.9.4 Impact Analysis

This section describes the environmental impacts of the Project on hazards and hazardous materials. This section also 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.

3.9.4.1 Methods for Analysis

Methods

The following information resources were relied upon in the evaluation of potential for the Project to result in impacts involving hazards or hazardous materials: a current government database search conducted via EDR Lightbox; scope of the proposed project; results of background and site research; and review of applicable regulations.

Principal Sources

Principal sources consulted for the impact analysis are listed below.

- EDR Area / Corridor Report Inquiry Number: 7551141.2s.

3.9.4.2 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 hazards and hazardous materials.

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

- Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials.
- Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment.
- Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within 0.25 mile of an existing or proposed school.
- Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment.
- For a project located within an airport land use plan area or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, result in a safety hazard or excessive noise for people residing or working in the area.
- Impair or physically interfere with an adopted emergency response plan or emergency evacuation plan.
- Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires.

3.9.4.3 Impacts and Mitigation Measures

Impact HAZ-1	Construction of the Project would not create a significant hazard to the public or the environment through the routine transport, use, or disposal, or accidental release of hazardous materials.
Level of Impact	**Less-than-significant impact**

Project

Impact Characterization

Project construction would involve routine transport, use, and disposal of hazardous materials such as solvents, paints, oils, grease, and caulking. Such transport, use, and disposal must comply with applicable regulations such as those discussed under Section 3.9.2, *Regulatory Setting*. Although solvents, paints, oils, grease, and caulking would be transported, used, and disposed of during the construction phase, these materials are handled on a temporary basis and are typically used in construction projects and thus, would not represent the routine transport, use, and disposal of acutely hazardous materials. Any spills or releases involving these materials are expected to be small, localized and cleaned as they occur.

Impact Details and Conclusions

Project construction would not create a significant hazard for the public or the environment through the routine transport, use, or disposal of hazardous materials during construction, and this impact would be less than significant.

Variant H1

Impact Characterization

Variant H1 would involve the generation, processing and storage of green hydrogen at the approved ACE Merced Layover and Maintenance Facility. Construction of the required infrastructure for this variant would require a similar type of hazardous materials use as what was described for the Project.

Impact Details and Conclusions

Variant H1 construction would not create a significant hazard for the public or the environment through the routine transport, use, or disposal of hazardous materials during construction, and this impact would be less than significant.

Variant H2

Impact Characterization

Variant H2 would involve the off-site processing and transportation (via truck) of either green hydrogen or grey hydrogen to the approved ACE Merced Layover and Maintenance Facility, where it would be stored. Variant H2 would include the construction of fueling and storage infrastructure and thus would also involve the routine transport, use, and disposal of hazardous materials such as the materials mentioned under the Project analysis.

Impact Details and Conclusions

Variant H2 construction would not create a significant hazard for the public or the environment through the routine transport, use, or disposal of hazardous materials during construction, and this impact would be less than significant.

Variant H3

Impact Characterization

Variant H3 would involve the off-site processing and transportation (via rail) of either green hydrogen or grey hydrogen to the approved ACE Merced Layover and Maintenance Facility, where it would be stored. Variant H3 would include the construction of fueling and storage infrastructure and thus would also involve the routine transport, use, and disposal of hazardous materials such as the materials mentioned under the Project analysis.

Impact Details and Conclusions

Variant H3 construction would not create a significant hazard for the public or the environment through the routine transport, use, or disposal of hazardous materials during construction, and this impact would be less than significant.

Impact HAZ-2	Construction of the Project could create a significant hazard to the public or the environment involving reasonably foreseeable upset conditions or the disturbance of existing hazardous materials.
Level of Impact	**Potentially significant impact**
Mitigation Measures	HAZ-2.1: Site Management Plan HAZ-2.2 Conduct a Hazardous Building Materials Survey prior to Demolition Activities
Level of Impact After Mitigation	**Less-than-significant impact**

Project

Impact Characterization

Environmental Database Listings

As discussed in Section 3.9.3*, Environmental Setting*, several sites within the Project footprint have a history of contamination. Sites identified within the project footprint with a history of release are summarized in Table 3.9-1*.* As identified in Table 3.9-1, three sites were listed with a release to groundwater and one to soil. All sites were identified as *closed cases* because they have been remediated to the satisfaction of the applicable oversight agency. Although these sites have been granted closure by the oversight agencies, due to the environmental history of the sites in question, there is some potential for construction personnel to be exposed to residual contamination and/or undocumented subsurface conditions.

Thirty-eight offsite locations were identified within a 0.25-mile radius from the Project footprint with a history of releases into the environment. Out of the 38 sites listed, all have received a *case closure* status from the applicable oversight agencies with the exception of seven. Five of the seven *active* sites were identified with groundwater impacts with the potential to affect the Project (if dewatering is to be conducted in the vicinity of the Project footprint). The sites are the following:

- CARDGAS, Inc./ Pacific Pride Cardlock Station, 1455 R Street (approximately 0.10 mile from Costco Wholesale at 1445 R Street).
- R Street Texaco (AKA R Street EXXON), 1415 R Street (approximately 0.12 mile from Costco Wholesale at 1445 R Street).
- Merced PCE Sites/Merced PCE/ Bel Air Cleaners, 946 West Main Street.
- Sunshine Cleaners, 1227 West Main Street.
- One Hour Martinizing, 1818 R Street.

Of the remaining two active sites, one was listed with groundwater impacts (with groundwater flow away from the Project site) and the other was a soil only site. Thus, it was determined that there is a low likelihood of these two sites affecting the Project footprint.

Demolition

Replacement of the existing ACE/Union Pacific Railroad (UPRR) industrial spur bridge crossing Bear Creek would include demolition of an existing bridge. Additionally, several buildings would also be demolished as part of the Project (refer to Section 2.6, *Right-of-Way and Easement Needs*, in Chapter 2, *Project Description*). As a result, it is possible that construction personnel would be exposed to hazardous building materials such as asbestos-containing building materials and lead-based paint. However, as required by Mitigation Measure HAZ-2.2 prior to obtaining a demolition permit from the City of Merced, a building materials survey/investigation could be required (at the discretion of the San Joaquin Valley Air Pollution Control District (SJVAPCD) and/or City)to check for asbestos-containing materials and lead-based paint. If found, construction worker health and safety regulations, as well as material removal and disposal regulations, would be implemented in accordance with applicable federal and state standards, including Cal/OSHA and SJVAPCD regulations. The potential for exposure to asbestos-containing building materials and lead-based paint represents a potentially significant condition.

Impact Details and Conclusions

As mentioned, several sites within and adjacent to the Project footprint have a history of contamination, including soil and groundwater impacts. In addition, there is potential for exposure to asbestos-containing building materials and lead-based paint during demolition activities. Exposure to residual contamination, undocumented subsurface conditions and asbestos-containing building materials and lead-based paint represent a potentially significant impact.

Mitigation Measures

Mitigation Measure HAZ-2.1: Site Management Plan

Prior to issuance of a grading permit, the Project sponsor will retain the services of a qualified environmental engineering firm to prepare and implement, during site preparation and grading activities, a Site Management Plan (SMP). The SMP will be designed to protect human health and the environment and include protocols (including sampling, as necessary), measures, and techniques for the proper handling, management, and disposition of affected media (soil and groundwater) found on the site during site preparation, grading, excavating and other earth-/groundwater-disturbing activities. The SMP will also be designed to protect workers and off-site receptors during site activities and ensure the proper characterization, management, and/or disposal of contaminated environmental media that is above applicable Environmental Screening Levels. The SMP will be prepared by a commercial environmental engineering firm with demonstrated expertise and experience in the preparation of SMPs and be stamped by an appropriately licensed professional. The SMP will be implemented throughout all ground-disturbing work.

The SMP will establish protocols and measures for addressing the discovery of presently unknown environmental conditions or subsurface structures such as underground storage tanks or sumps. If the environmental engineering firm subsequently identifies the need for further sampling, the Project sponsor will implement this and any other requirements identified in the SMP. If unknown environmental conditions or subsurface structures are uncovered and directed by an oversight agency, additional site investigation and characterization may be required prior to construction to ensure that hazardous materials in the soil, soil vapor, and/or groundwater do not exceed applicable regulatory thresholds. If additional site investigation and characterization is required prior to construction, the Project sponsor will implement said studies (and their respective recommendations, if necessary) prior to construction. Prior to issuance of the grading permit, the Project sponsor will provide the City of Merced with a copy of the approved SMP and implement the SMP during site preparation and grading under the approving agency's oversight.

Mitigation Measure HAZ-2.2 Investigate and Address Hazardous Building Materials as Needed

Prior to property acquisitions and as part of SJJPA's standard due diligence associated with the Project, a Phase I Environmental Site Assessment (Phase I ESA) will be conducted to identify environmental conditions with the potential to impact Project implementation. If the potential for hazardous building materials is identified during the preparation of the aforementioned Phase I ESA, a hazardous building materials survey would be implemented as part of a Phase II Environmental Site Assessment.

If the potential for hazardous building materials is identified by the Phase I ESA, a hazardous building materials survey will be conducted by a licensed contractor during Project design. Should the survey confirm that lead-based paint, asbestos, or other hazardous building materials are present, the following actions will be implemented by the SJJPA or its contractor(s) or the property owner (as negotiated) if the property is to be acquired:

- Acquire necessary approvals from the City for specifications or commencement of abatement activities. Abatement activities will be conducted by a licensed contractor. A notification must be submitted to SJVAPCD 10 working days prior to the commencement of any regulated asbestos abatement.
- Asbestos will be disposed of at a licensed disposal facility. Section 19827.5 of the Health & Saf. Code, adopted January 1, 1991, requires that local agencies not issue demolition or alteration permits until an applicant has demonstrated compliance with notification requirements under applicable federal regulations regarding hazardous air pollutants, including asbestos.
    - The local office of Cal/OSHA will be notified of asbestos abatement activities.

- Asbestos abatement contractors will follow state regulations contained in 8 CCR Section 1529 and 8 CCR Sections 341.6 through 341.14 where there is asbestos-related work involving 100 square feet or more of asbestos-containing material.
- Asbestos removal contractors will be certified as such by the Contractors Licensing Board of the State of California. The owner of the property where abatement is to occur will have a Hazardous Waste Generator Number assigned by and registered with the Office of the California Department of Health Services in Sacramento.

- The contractor and hauler of hazardous building materials will file a Hazardous Waste Manifest that details the hauling of the material from the site and the disposal of it. Pursuant to California law, the City will not issue a required demolition permit when appropriate until the applicant has complied with the notice requirements described above.

Significance with Application of Mitigation

With implementation of Mitigation Measures HAZ-2.1 and HAZ-2.2, impacts associated with a significant hazard to the public or the environment involving reasonably foreseeable upset conditions or the disturbance of existing hazardous material during construction of the Project would be less than significant.

Variant H1

Impact Characterization

Variant H1 would involve the generation, processing and storage of green hydrogen at the approved ACE Merced Layover and Maintenance Facility. Construction of the infrastructure needed for Variant H1would involve similar activities to what was discussed above for the Project.

Impact Details and Conclusions

Several sites within and adjacent to the Project footprint have a history of contamination. Exposure to residual contamination and undocumented subsurface conditions represent a potentially significant impact.

Mitigation Measures

Mitigation Measure HAZ-2.1: Site Management Plan

Mitigation Measure HAZ-2.2 Investigate and Address Hazardous Building Materials as Needed

Significance with Application of Mitigation

With implementation of Mitigation Measures HAZ-2.1 and HAZ-2.2, impacts associated with a significant hazard to the public or the environment involving reasonably foreseeable upset conditions or the disturbance of existing hazardous material during construction of the Project would be less than significant.

Variant H2

Impact Characterization

Variant H2 would involve the off-site processing and transportation (via truck) of either green hydrogen or grey hydrogen to the approved ACE Merced Layover and Maintenance Facility, where it would be stored. Construction of the infrastructure needed for Variant H2 would involve similar activities to what was discussed above for the Project.

Impact Details and Conclusions

Several sites within and adjacent to the Project footprint have a history of contamination. Exposure to residual contamination and undocumented subsurface conditions represent a potentially significant impact.

Mitigation Measures

Mitigation Measure HAZ-2.1: Site Management Plan

Mitigation Measure HAZ-2.2 Investigate and Address Hazardous Building Materials as Needed

Significance with Application of Mitigation

With implementation of Mitigation Measures HAZ-2.1 and HAZ-2.2, impacts associated with a significant hazard to the public or the environment involving reasonably foreseeable upset conditions or the disturbance of existing hazardous material during construction of the Project would be less than significant.

Variant H3

Impact Characterization

Variant H3 would involve the off-site processing and transportation (via rail) of either green hydrogen or grey hydrogen to the approved ACE Merced Layover and Maintenance Facility, where it would be stored. Construction of the infrastructure needed for Variant H2 would involve similar activities to what was discussed above for the Project.

Impact Details and Conclusions

Several sites within and adjacent to the Project footprint have a history of contamination. Exposure to residual contamination and undocumented subsurface conditions represent a potentially significant impact.

Mitigation Measures

Mitigation Measure HAZ-2.1: Site Management Plan

Mitigation Measure HAZ-2.2 Investigate and Address Hazardous Building Materials as Needed

Significance with Application of Mitigation

With implementation of Mitigation Measures HAZ-2.1 and HAZ-2.2, impacts associated with a significant hazard to the public or the environment involving reasonably foreseeable upset conditions or the disturbance of existing hazardous material during construction of the Project would be less than significant.

Impact HAZ-3	Construction of the Project could be affected by being located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment.
Level of Impact	**Potentially significant impact**
Mitigation Measures	HAZ-2.1: Site Management Plan
Level of Impact After Mitigation	**Less-than-significant impact**

Project

Impact Characterization

U.S.C. Section 65962.5 (Cortese List) includes DTSC-listed hazardous waste facilities and sites, Department of Health Services lists of contaminated drinking water wells, sites listed by SWRCB as having underground storage tank leaks or a discharge of hazardous wastes or materials into the water or groundwater, and lists from local regulatory agencies of sites with a known migration of hazardous waste/material. Specifically, the following resources provide information regarding facilities meeting “Cortese List” requirements:

- List of hazardous waste and substances sites from DTSC’s EnviroStor database.
- List of leaking underground storage tank sites from SWRCB’s GeoTracker database.
- List of solid waste disposal sites identified by SWRCB with waste constituents above hazardous waste levels.
- List of “active” cease and desist orders and cleanup and abatement orders from SWRCB.
- List of hazardous waste facilities subject to corrective action pursuant to Section 25187.5 of the Health & Saf. Code, identified by DTSC.

As discussed under Impact HAZ-2, several sites within the Project footprint have had a history of environmental releases. Sites identified within the Project footprint with a history of release are summarized in Table 3.9-1 and were identified in the leaking underground storage tank database, which are sites that also qualify as Cortese List sites. All sites were identified as closed cases and have been presumably remediated to the satisfaction of the applicable oversight agencies; however, given the environmental history of the Project site, there is potential for construction personnel to be exposed to residual contamination and/or undocumented subsurface conditions.

Impact Details and Conclusions

Several sites within the Project footprint have had a history of environmental releases, including sites that qualify as Cortese List sites. Exposure to residual contamination and/or undocumented subsurface conditions represent a potentially significant impact.

Mitigation Measures

Mitigation Measure HAZ-2.1: Site Management Plan

Significance with Application of Mitigation

With implementation of Mitigation Measure HAZ-2.1, potential impacts associated with construction of the project on a site which is included on the Cortese List would be reduced to less than significant.

Variant H1

Impact Characterization

Construction of the infrastructure needed for Variant H1 (including a solar farm and hydrogen fueling and storage facilities) would involve similar construction activities to what was discussed above for the Project.

Impact Details and Conclusions

Several sites within the Project footprint have had a history of environmental releases, including sites that qualify as Cortese List sites. Exposure to residual contamination and/or undocumented subsurface conditions represent a potentially significant impact.

Mitigation Measures

Mitigation Measure HAZ-2.1: Site Management Plan

Significance with Application of Mitigation

With implementation of Mitigation Measure HAZ-2.1, potential impacts associated with construction of the project on a site which is included on the Cortese List would be reduced to less than significant.

Variant H2

Impact Characterization

Construction of the infrastructure (fueling and storage) needed for Variant H2 would involve similar activities to what was described for the Project.

Impact Details and Conclusions

Several sites within the Project footprint have had a history of environmental releases, including sites that qualify as Cortese List sites. Exposure to residual contamination and/or undocumented subsurface conditions represent a potential impact.

Mitigation Measures

Mitigation Measure HAZ-2.1: Site Management Plan

Significance with Application of Mitigation

With implementation of Mitigation Measure HAZ-2.1, potential impacts associated with construction of the project on a site which is included on the Cortese List would be reduced to less than significant.

Variant H3

Impact Characterization

Construction of the infrastructure (fueling and storage) needed for Variant H2 would involve similar activities to what was described for the Project.

Impact Details and Conclusions

Several sites within the Project footprint have had a history of environmental releases, including sites that qualify as Cortese List sites. Exposure to residual contamination and/or undocumented subsurface conditions represent a potential impact.

Mitigation Measures

Mitigation Measure HAZ-2.1: Site Management Plan

Significance with Application of Mitigation

With implementation of Mitigation Measure HAZ-2.1, potential impacts associated with construction of the project on a site which is included on the Cortese List would be reduced to less than significant.

Impact HAZ-4	Construction and operation of the Project could emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within 0.25 mile of an existing or proposed school.
Level of Impact	**Potentially significant impact**
Mitigation Measures	HAZ-2.1: Site Management Plan HAZ-2.2 Conduct a Hazardous Building Materials Survey prior to Demolition Activities
Level of Impact After Mitigation	**Less-than-significant impact**

Project

Impact Characterization

Valley High School, located at 632 W 13th Street, is approximately 0.25 mile from the Project footprint. As discussed under Impact HAZ-1, Project construction would involve routine transport, use, and disposal of hazardous materials typically used in construction projects. Handling of these hazardous materials would be temporary, would comply with applicable regulations and would not include the handling of acutely hazardous materials. During operations, maintenance activities (described under Impact HAZ-7) would involve the use of a wide variety of commercial products that are formulated with hazardous materials. Such materials are considered common and are unlikely to be stored or used in large quantities. Releases involving these materials would be small and localized and would be cleaned up as they occur. Compliance with applicable regulations would ensure that all safety precautions are taken during the handling of these materials.

As discussed under both Impact HAZ-2 and Impact HAZ-3, several sites within and adjacent to the Project footprint have a history of contamination and could result in exposure risks to construction personnel and the surrounding environment. In addition, there is potential for exposure to asbestos-containing building materials and lead-based paint during demolition activities. Thus, exposure to residual contamination, undocumented subsurface conditions and asbestos-containing building materials and lead-based paint were identified as potential impacts. However, the implementation of Mitigation Measures HAZ-2.1 and HAZ-2.2 would reduce the potential risk of exposure to these features and materials.

Impact Details and Conclusions

Several sites within and adjacent to the Project footprint have a history of contamination, including soil and groundwater impacts. In addition, there is potential for exposure to asbestos-containing building materials and lead-based paint during demolition activities. Exposure to residual contamination, undocumented subsurface conditions and asbestos-containing building materials and lead-based paint represent a potentially significant impact to the surrounding environment, including nearby schools.

Mitigation Measures

Mitigation Measure HAZ-2.1: Site Management Plan

Mitigation Measure HAZ-2.2 Conduct a Hazardous Building Materials Survey prior to Demolition Activities

Significance with Application of Mitigation

With implementation of Mitigation Measures HAZ-2.1 and HAZ-2.2, impacts associated with the handling of hazardous materials, substances, or waste within 0.25 mile of a school would be less than significant.

Variant H1

Impact Characterization

Variant H1 would involve the generation, processing and storage of green hydrogen at the approved ACE Merced Layover and Maintenance Facility. Construction of the required infrastructure for this variant would require a similar type of hazardous materials use as what was described for the Project. In addition, construction activities associated with Variant H1 could encounter residual contamination, undocumented subsurface conditions and asbestos-containing building materials and lead-based paint.

As discussed under Impact HAZ-7, Variant H1 would involve the onsite production and storage of hydrogen fuel. Similar to the Project analysis above, mandatory compliance with all applicable federal, State and local regulations pertaining to the safe use, storage, transport and disposal of hazardous materials would be required. In addition, handling hydrogen fuel would require the Project to enroll in the HMBP program of the Merced County Department of Public Health, Division of Environmental Health. Furthermore, adhering to hydrogen-specific codes and standards would minimize potential hazards, such as fires and explosions, associated with the handling and storage of hydrogen fuel on-site (additional details are presented in Impact HAZ-7).

Impact Details and Conclusions

Several sites within and adjacent to the Project footprint have a history of contamination, including soil and groundwater impacts. In addition, there is potential for exposure to asbestos-containing building materials and lead-based paint during demolition activities. Exposure to residual contamination, undocumented subsurface conditions and asbestos-containing building materials and lead-based paint represent a potentially significant impact to the surrounding environment, including nearby schools. Furthermore, the handling of hydrogen fuel represents a combustion and explosion risk that could also impact nearby schools.

Mitigation Measures

Mitigation Measure HAZ-2.1: Site Management Plan

Mitigation Measure HAZ-2.2 Conduct a Hazardous Building Materials Survey prior to Demolition Activities

Significance with Application of Mitigation

Implementation of Mitigation Measures HAZ-2.1 and HAZ-2.2, along with mandatory compliance with all applicable federal, state, and local regulations pertaining to the safe use, storage, transport and disposal of hazardous materials, including hydrogen-specific requirements, along with enrollment in the MCDEH HMBP program would ensure that the Variant H1 would not create a significant hazard associated with the handling of hazardous materials, substances, or waste within 0.25 mile of a school, and impacts would be less than significant.

Variant H2

Impact Characterization

Variant H2 would involve the off-site processing and transportation (via truck) of either green hydrogen or grey hydrogen to the approved ACE Merced Layover and Maintenance Facility, where it would be stored (a daily average of approximately 600 kg of hydrogen fuel would be required on-site).

Impact Details and Conclusions

Several sites within and adjacent to the Project footprint have a history of contamination, including soil and groundwater impacts. In addition, there is potential for exposure to asbestos-containing building materials and lead-based paint during demolition activities. Exposure to residual contamination, undocumented subsurface conditions and asbestos-containing building materials and lead-based paint represent a potentially significant impact to the surrounding environment, including nearby schools. Furthermore, the handling of hydrogen fuel represents a combustion and explosion risk that could also impact nearby schools.

Mitigation Measures

Mitigation Measure HAZ-2.1: Site Management Plan

Mitigation Measure HAZ-2.2 Conduct a Hazardous Building Materials Survey prior to Demolition Activities

Significance with Application of Mitigation

Implementation of Mitigation Measures HAZ-2.1 and HAZ-2.2, along with mandatory compliance with all applicable federal, state, and local regulations pertaining to the safe use, storage, transport and disposal of hazardous materials, including hydrogen-specific requirements, along with enrollment in the MCDEH HMBP program would ensure that Variant H2 would not create a significant hazard associated with the handling of hazardous materials, substances, or waste within 0.25 mile of a school, and impacts would be less than significant.

Variant H3

Impact Characterization

Variant H3 would involve the off-site processing and transportation (via rail) of either green hydrogen or grey hydrogen to the approved ACE Merced Layover and Maintenance Facility, where it would be stored (a daily average of approximately 600 kg of hydrogen fuel would be required on-site).

Impact Details and Conclusions

Several sites within and adjacent to the Project footprint have a history of contamination, including soil and groundwater impacts. In addition, there is potential for exposure to asbestos-containing building materials and lead-based paint during demolition activities. Exposure to residual contamination, undocumented subsurface conditions and asbestos-containing building materials and lead-based paint represent a potentially significant impact to the surrounding environment, including nearby schools. Furthermore, the handling of hydrogen fuel represents a combustion and explosion risk that could also impact nearby schools.

Mitigation Measures

Mitigation Measure HAZ-2.1: Site Management Plan

Mitigation Measure HAZ-2.2 Conduct a Hazardous Building Materials Survey prior to Demolition Activities

Significance with Application of Mitigation

Implementation of Mitigation Measures HAZ-2.1 and HAZ-2.2, along with mandatory compliance with all applicable federal, state, and local regulations pertaining to the safe use, storage, transport and disposal of hazardous materials, including hydrogen-specific requirements, along with enrollment in the MCDEH HMBP program would ensure that Variant H3 would not create a significant hazard associated with the handling of hazardous materials, substances, or waste within 0.25 mile of a school, and impacts would be less than significant.

Impact HAZ-5	Construction and operation of the Project could impair or physically interfere with an adopted emergency response plan or emergency evacuation plan.
Level of Impact	**Potentially significant impact**
Mitigation Measures	TR-1.1: Transportation Management Plan (TMP) for Project construction
Level of Impact After Mitigation	**Less-than-significant impact**

Project

Impact Characterization

Construction

As discussed in Section 3.16, *Transportation*, the existing roadway network in the Project area adequately enables emergency vehicle response but could experience potential delays during the Project's construction. However, Mitigation Measure TR-5.1 presented in Section 3.16 would address emergency vehicle access during the construction phase of the Project.

Construction would require changes that may cause some minor effects on emergency vehicle response in some situations, but emergency vehicles would not be subject to traffic control devices such as stop signs or traffic signals and would be able to bypass other vehicles. Larger construction vehicles entering and exiting the site would be guided by personnel using signs and flags to direct traffic. Additionally, the Project would not include any characteristics (e.g., permanent road closures, long-term blocking of road access) that would physically impair or otherwise interfere with emergency response or evacuation in the vicinity of the Project footprint.

As discussed in Section 3.16, construction activities at the 16th Street and State Route 59 intersection for the aerial guideway and the ACE/UPRR at-grade guideway parallel to 16th Street will ensure construction vehicle and truck access points do not affect major intersections utilized for regional emergency vehicle access.

Operations

The existing roadway network in the Project area enables emergency vehicle response. Emergency vehicles often identify and use multiple routes dependent on time of day and traffic conditions. Peak period traffic congestion generally does not cause obstructions for emergency vehicles, which have the right-of-way and often utilize multilane major arterials for access.

The Project would construct new (or modify existing) at-grade crossings and intersections to provide vehicle, bicycle, and pedestrian access, and may redistribute and/or increase vehicle, bicycle, and pedestrian activity where necessary. These changes may cause some minor effects on emergency vehicle response in some situations, but emergency vehicles would not be subject to traffic control devices such as stop signs or traffic signals, and would be able to bypass other vehicles, which would be required to yield right-of-way per California Vehicle Code Section 21806.

As described in Section 3.16, *Transportation*, the Project would substantially reduce long-term overall vehicle miles traveled in the Project area, which would correspond to a general reduction in overall traffic congestion on the roadway network. This broad-based congestion improvement is expected to more than offset the localized effects at individual stations or support facilities, resulting in a net improvement in emergency response times.

Impact Details and Conclusions

The area around the Project could experience potential delays and require changes to local traffic that may cause minor effects on emergency vehicle response during the Project's construction. Potential delays and changes to local traffic conditions represent a potentially significant impact.

Mitigation Measures

Mitigation Measure TR-1.1: Transportation Management Plan (TMP) for Project construction

Significance with Application of Mitigation

With implementation of Mitigation Measure TR-1.1, along with construction traffic best management practices, construction of the Project would not impair or physically interfere with an adopted emergency response plan or emergency evacuation plan (including the Merced County Multi-Jurisdictional Hazard Mitigation Plan) and impacts would be less than significant.

Variant H1

Impact Characterization

Construction of Variant H1 would occur within the Project area and thus, would also be subject to the requirements, best management practices discussed above for the Project. In addition, the analysis for Variant H1 operations would be similar to what was discussed above for the Project and would result in a reduction of VMT within the Project area.

Impact Details and Conclusions

The area around Variant H1 could experience potential delays and require changes to local traffic that may cause minor effects on emergency vehicle response during construction. Potential delays and changes to local traffic conditions represent a potentially significant impact.

Mitigation Measures

Mitigation Measure TR-1.1: Transportation Management Plan (TMP) for Project construction

Significance with Application of Mitigation

With implementation of Mitigation Measure TR-1.1, along with construction traffic best management practices, construction of Variant H1 would not impair or physically interfere with an adopted emergency response plan or emergency evacuation plan (including the Merced County Multi-Jurisdictional Hazard Mitigation Plan) and impacts would be less than significant.

Variant H2

Impact Characterization

Construction of Variant H2 would occur within the Project area and thus, would also be subject to the requirements, best management practices discussed above for the Project. In addition, the analysis for Variant H2 operations would be similar to what was discussed above for the Project and would result in a reduction of VMT within the Project area.

Impact Details and Conclusions

The area around Variant H2 could experience potential delays and require changes to local traffic that may cause minor effects on emergency vehicle response during construction. Potential delays and changes to local traffic conditions represent a potentially significant impact.

Mitigation Measures

Mitigation Measure TR-1.1: Transportation Management Plan (TMP) for Project construction

Significance with Application of Mitigation

With implementation of Mitigation Measure TR-1.1, along with construction traffic best management practices, construction of Variant H2 would not impair or physically interfere with an adopted emergency response plan or emergency evacuation plan (including the Merced County Multi-Jurisdictional Hazard Mitigation Plan) and impacts would be less than significant.

Variant H3

Impact Characterization

Construction of Variant H3 would occur within the Project area and thus, would also be subject to the requirements, best management practices discussed above for the Project. In addition, the analysis for Variant H3 operations would be similar to what was discussed above for the Project and would result in a reduction of VMT within the Project area.

Impact Details and Conclusions

The area around Variant H3 could experience potential delays and require changes to local traffic that may cause minor effects on emergency vehicle response during construction. Potential delays and changes to local traffic conditions represent a potentially significant impact.

Mitigation Measures

Mitigation Measure TR-1.1: Transportation Management Plan (TMP) for Project construction

Significance with Application of Mitigation

With implementation of Mitigation Measure TR-1.1, along with construction traffic best management practices, construction of Variant H3 would not impair or physically interfere with an adopted emergency response plan or emergency evacuation plan (including the Merced County Multi-Jurisdictional Hazard Mitigation Plan) and impacts would be less than significant.

Impact HAZ-6	Construction and operation of the Project would not expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires.
Level of Impact	**No impact**

Project

Impact Characterization

The Project footprint is not in a fire hazard severity zone as depicted in the *California Department of Forestry and Fire Protection's State Responsibility Area Fire Hazard Severity Zones—Merced County* map (CalFIRE 2007). The Project footprint is in a semi-developed area of Merced and not within or immediately adjacent to wildlands.

Impact Details and Conclusions

There would be no impact.

Variant H1

Impact Characterization

Variant H1 would not be located in a fire hazard severity zone and is not within or near any wildlands.

Impact Details and Conclusions

There would be no impact.

Variant H2

Impact Characterization

Variant H2 would not be located in a fire hazard severity zone and is not within or near any wildlands.

Impact Details and Conclusions

There would be no impact.

Variant H3

Impact Characterization

Variant H3 would not be located in a fire hazard severity zone and is not within or near any wildlands.

Impact Details and Conclusions

There would be no impact.

Impact HAZ-7	Operation of the Project would not create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials.
Level of Impact	**Less-than-significant impact**

Project

Impact Characterization

The Project would consist of a new passenger rail connection for the San Joaquins, a new aerial guideway and modifications to the approved ACE Merced Layover and Maintenance Facility. Maintenance activities would include track, station, and fleet maintenance and would involve the use of hazardous chemicals that are typical for that type of use. Maintenance on the project site would require the use of a wide variety of commercial products that are formulated with hazardous materials (e.g., fuels, cleaners and degreasers, solvents, paints, lubricants, adhesives, sealers, pesticides/herbicides). Such materials are considered common and are unlikely to be stored or used in large quantities. Any spills involving these materials would be small and localized and would be cleaned up as they occur. Compliance with the California Department of Transportation regulations would ensure that all necessary safety precautions would be taken during transport of hazardous materials during all phases of the Project.

Impact Details and Conclusions

Mandatory compliance with all applicable federal, state, and local regulations pertaining to the safe use, storage, transport and disposal of hazardous materials would ensure that the project would not create a significant hazard for the public or the environment through the routine transport, use, or disposal of hazardous materials during operation, and this impact would be less than significant.

Variant H1

Impact Characterization

Variant H1 would involve the generation, processing and storage of green hydrogen at the approved ACE Merced Layover and Maintenance Facility. Operational activities for this variant would require a similar type of hazardous materials use as what was described for the Project and thus, the analysis would be applicable here as well. In addition, Variant H1 would involve the onsite production and storage of approximately 600 kilograms (kg) of hydrogen fuel. Similar to the Project analysis, mandatory compliance with all applicable federal, State and local regulations pertaining to the safe use, storage, transport and disposal of hazardous materials would be required. Moreover, handing that amount of hydrogen fuel would require the ACE Merced Layover and Maintenance Facility to enroll in the HMBP program (California Governor's Office of Emergency Services 2014) of the Merced County Department of Public Health, Division of Environmental Health or MCDEH (HMBP program thresholds are: 55 gallons of liquids, 500 pounds of solids, or 200 cubic feet for a compressed gas). The HMBP's objective is to provide basic information necessary for use by first responders in order to prevent or mitigate damage to the public health and safety and to the environment from a release or threatened release of a hazardous material. The HMBP would require an annual update and program enrollees are subject to inspections by the CUPA entity to determine if the business is in compliance with the HMBP requirements (Health & Saf. Code § 25511).

Hydrogen is a flammable fuel and must be handled appropriately as it can behave dangerously under specific conditions. The storage of hydrogen is also considered a hazardous risk due to the combustible and explosive nature of the fuel. Hydrogen is combustible; however, hydrogen's buoyancy, diffusivity and small molecular size make it difficult to contain and create a combustible situation. An adequate concentration of hydrogen, the presence of an ignition source and the right amount of oxidizer (like oxygen) must be present for combustion to occur (US Department of Energy 2024).

An explosion involving hydrogen can occur when an oxidizer, such as oxygen, is present. Hydrogen can be explosive at concentrations of 18.3- 59% and although the range is wide, gasoline presents a more dangerous explosion risk as explosions occur at much lower concentrations. Accidental explosions scenarios involving hydrogen fuel can include Vapor Cloud Explosions (VCEs) and boiling liquid expanding vapor explosions (BLEVE). A VCE results from the ignition of a cloud of flammable vapor, gas, or mist, in which flame speeds accelerate to sufficiently high velocities to produce significant overpressure. A BLEVE event describes the instantaneous vaporization and rapid expansion of a stored superheated liquid (SBCTA 2021). Although the storage and handling of hydrogen does come with some risk, hydrogen-specific codes, and standards (such as those from United States Department of Energy, National Fire Protection Association, etc.) help dictate safe practices. Safe practices (in accordance with applicable codes and standards) to minimize hazards, such as explosions, associated with the handling and storage of hydrogen fuel on-site would be implemented as part of the project's final design and also included as part of the HMBP (in the form of a required emergency response plan and procedures to be followed in the event of a reportable release or threatened release).

Impact Details and Conclusions

Mandatory compliance with all applicable federal, state, and local regulations pertaining to the safe use, storage, transport and disposal of hazardous materials, including hydrogen-specific requirements, along with enrollment in the MCDEH HMBP program would ensure that the project would not create a significant hazard for the public or the environment through the routine transport, use, or disposal of hazardous materials during operation, and this impact would be less than significant.

Variant H2

Impact Characterization

Variant H2 would involve the off-site processing and transportation (via truck) of either green hydrogen or grey hydrogen to the approved ACE Merced Layover and Maintenance Facility, where it would be stored (a daily average of approximately 600 kg of hydrogen fuel would be required on-site).

Impact Details and Conclusions

Mandatory compliance with all applicable federal, state, and local regulations pertaining to the safe use, storage, transport and disposal of hazardous materials, including hydrogen-specific requirements, along with enrollment in the MCDEH HMBP program would ensure that the project would not create a significant hazard for the public or the environment through the routine transport, use, or disposal of hazardous materials during operation, and this impact would be less than significant.

Variant H3

Impact Characterization

Variant H3 would involve the off-site processing and transportation (via rail) of either green hydrogen or grey hydrogen to the approved ACE Merced Layover and Maintenance Facility, where it would be stored (a daily average of approximately 600 kg of hydrogen fuel would be required on-site).

Impact Details and Conclusions

Mandatory compliance with all applicable federal, state, and local regulations pertaining to the safe use, storage, transport and disposal of hazardous materials ,including hydrogen-specific requirements, along with enrollment in the MCDEH HMBP program would ensure that the project would not create a significant hazard for the public or the environment through the routine transport, use, or disposal of hazardous materials during operation, and this impact would be less than significant.

Impact HAZ-8	Operation of the Project would not create a significant hazard to the public or the environment involving reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment.
Level of Impact	**No impact**

Project

Impact Characterization

As previously mentioned, maintenance activities would involve the use of hazardous chemicals. These activities would require the use of a wide variety of commercial products that are formulated with hazardous materials. However, these materials are considered common and are unlikely to be stored or used in large quantities. Any spills involving these materials would be small and localized and would be cleaned up as they occur. Moreover, compliance with applicable regulations would ensure that all necessary safety precautions would be taken during transport of hazardous materials.

Impact Details and Conclusions

Mandatory compliance with all applicable federal, state, and local regulations pertaining to the use of hazardous materials would ensure that the project would not create a significant hazard to the public or the environment involving reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment, and this impact would be less than significant.

Variant H1

Impact Characterization

Variant H1 would involve the generation, processing and storage of green hydrogen at the approved ACE Merced Layover and Maintenance Facility. Accident conditions involving the use of hydrogen can occur (as described in Impact HAZ-7), however, mandatory compliance with all applicable federal, state and local regulations pertaining to the handling of hazardous materials would be required. Also, the ACE Merced Layover and Maintenance Facility would be required to enroll in MCDEH's HMBP program and adhere to hydrogen-specific codes, and standards. Safe practices to minimize hazards associated with the handling of hydrogen fuel on-site would be implemented as part of the project's final design and also addressed as part of the Project's HMBP.

Impact Details and Conclusions

Mandatory compliance with all applicable federal, state, and local regulations pertaining to the safe use of hazardous materials, including hydrogen-specific requirements, along with enrollment in the MCDEH HMBP program would ensure that the project would not create a significant hazard to the public or the environment involving reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment, and this impact would be less than significant.

Variant H2

Impact Characterization

Variant H2 would involve the off-site processing and transportation (via truck) of either green hydrogen or grey hydrogen to the approved ACE Merced Layover and Maintenance Facility, where it would be stored (a daily average of approximately 600 kg of hydrogen fuel would be required on-site).

Impact Details and Conclusions

Mandatory compliance with all applicable federal, state, and local regulations pertaining to the safe use of hazardous materials, including hydrogen-specific requirements, along with enrollment in the MCDEH HMBP program would ensure that the project would not create a significant hazard to the public or the environment involving reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment, and this impact would be less than significant.

Variant H3

Impact Characterization

Variant H3 would involve the off-site processing and transportation (via rail) of either green hydrogen or grey hydrogen to the approved ACE Merced Layover and Maintenance Facility, where it would be stored (a daily average of approximately 600 kg of hydrogen fuel would be required on-site).

Impact Details and Conclusions

Mandatory compliance with all applicable federal, state, and local regulations pertaining to the safe use of hazardous materials, including hydrogen-specific requirements, along with enrollment in the MCDEH HMBP program would ensure that the project would not create a significant hazard to the public or the environment involving reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment, and this impact would be less than significant.

Impact HAZ-9	Operation of the Project would not result in potential impacts associated with being located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, create a significant hazard to the public or the environment.
Level of Impact	**No impact**

Project

Impact Characterization

Potential impacts associated with the Project being implemented on a site included on the Cortese List would occur during the construction phase of the Project and are described in detail under Impact HAZ-3. No impacts would occur during operations.

Impact Details and Conclusions

There would be no impact.

Variant H1

Impact Characterization

Potential impacts associated with Variant H1 being implemented on a site included on the Cortese List would occur during the construction phase.

Impact Details and Conclusions

There would be no impact.

Variant H2

Impact Characterization

Potential impacts associated with Variant H2 being implemented on a site included on the Cortese List would occur during the construction phase.

Impact Details and Conclusions

There would be no impact.

Variant H3

Impact Characterization

Potential impacts associated with Variant H3 being implemented on a site included on the Cortese List would occur during the construction phase.

Impact Details and Conclusions

There would be no impact.

Impact HAZ-10	The Project would not be located within an airport land use plan area or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, result in a safety hazard or excessive noise for people residing or working in the area.
Level of Impact	**Less-than-significant impact**

Project

Impact Characterization

As discussed under Section 3.9.3, *Environmental Setting*, the Project footprint is within 2 miles of the Merced Regional Airport, and portions of the Project footprint are in Zone D of the airport's AIA and also in the airport's FAR Part 77 Obstruction Surfaces area.[4] The Project footprint is not within 2 miles of the Castle Airport; however, the Project footprint is located in the southeastern most portion of the airport's AIA, in Zone C and D, and within its FAR Part 77 Obstruction Surfaces area. Zone C is a zone of moderate noise impact and low to moderate risk level. Object height is restricted for objects 100 feet or taller in Area C. Area D is listed as a zone of low noise impact and low risk level. Height concerns in Zone D consist of objects with a height of 150 feet or greater.

The Project would consist of a new passenger rail connection, new aerial guideway, and modification of the approved ACE Merced Layover and Maintenance Facility and thus, height limitations and restrictions (of 100 feet in Area C and 150 feet in Area D) would not be exceeded. The types of uses proposed by the Project would be compatible with airport land use compatibility plan (ALUCP) noise contours. Pending consultation with the FAA, it is expected that the Project would be compatible with the applicable land use compatibility policies under the Merced County ALUCP.

Impact Details and Conclusions

Development of the Project would be required to comply with the FAA and ALUCP building height regulations and would otherwise be compatible with the land uses contemplated for the project site under the ALUCP; as such, the project would not pose a safety hazard or generate excessive noise for people working in the project area. Impacts would be less than significant.

Variant H1

Impact Characterization

Variant H1 would involve the generation, processing and storage of green hydrogen at the approved ACE Merced Layover and Maintenance Facility. Construction of the infrastructure needed for Variant H1would occur in the same area as described for the Project and would be subject to the same requirements.

Impact Details and Conclusions

Development of the Variant H1 would be required to comply with the FAA and ALUCP building height regulations and would otherwise be compatible with the land uses contemplated for the

[4] If a project contains proposed structures or other objects that may exceed the height standards defined in FAR Part 77, Subpart C, the project proponent must submit notification of the proposal to the FAA where required by the provisions of FAR Part 77, Subpart B, and by the California Public Utilities Code Sections 21658 and 21659.

project site under the ALUCP; as such, Variant H1 would not pose a safety hazard or generate excessive noise for people working in the project area. Impacts would be less than significant.

Variant H2

Impact Characterization

Variant H2 would involve the off-site processing and transportation (via truck) of either green hydrogen or grey hydrogen to the approved ACE Merced Layover and Maintenance Facility, where it would be stored. Construction of the infrastructure needed for Variant H2 would occur in the same area as described for the Project and would be subject to the same requirements.

Impact Details and Conclusions

Development of the Variant H2 would be required to comply with the FAA and ALUCP building height regulations and would otherwise be compatible with the land uses contemplated for the project site under the ALUCP; as such, Variant H2 would not pose a safety hazard or generate excessive noise for people working in the project area. Impacts would be less than significant.

Variant H3

Impact Characterization

Variant H3 would involve the off-site processing and transportation (via train) of either green hydrogen or grey hydrogen to the approved ACE Merced Layover and Maintenance Facility, where it would be stored. Construction of the infrastructure needed for Variant H3 would occur in the same area as described for the Project and would be subject to the same requirements.

Impact Details and Conclusions

Development of the Variant H3 would be required to comply with the FAA and ALUCP building height regulations and would otherwise be compatible with the land uses contemplated for the project site under the ALUCP; as such, Variant H3 would not pose a safety hazard or generate excessive noise for people working in the project area. Impacts would be less than significant.

3.10 Hydrology and Water Quality

3.10.1 Introduction

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

Cumulative impacts on hydrology and water quality, in combination with planned, approved, and reasonably foreseeable projects, are discussed in Chapter 4, *Cumulative Impacts.*

3.10.2 Regulatory Setting

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

3.10.2.1 Federal Regulations

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 (SWRCB).

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 Project is conducted by the Central Valley Regional Water Quality Control Board (Central Valley Water Board) (refer to *State* section). To identify candidate water bodies for TMDL analysis, SWRCB generates a list of water quality–impaired segments. 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 water body 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.

SWRCB developed a statewide 2020–2022 California Integrated Report based on the Integrated Reports from each of the nine geographically separated Regional Water Quality Control Boards (Regional Water Boards). USEPA approved I 2020–2022 California Integrated Report on May 11, 2022.

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, SWRCB would issue the Water Quality Certification.

As described in Chapter 2, *Project Description*, construction of the Project may require a Water Quality Certification if permanent facilities or construction disturbance are proposed in 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 (§ 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 (SWRCB 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 NPDES General Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities (Order 2022-0057-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 manage the line, grade, or capacity of the facility. The Project would require a Construction General Permit because more than 1 acre of ground would be disturbed, 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, 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 as amended by Order 2015-0122-DWQ and Order WQ 2018-0028-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, and best conventional pollutant control technology 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 (SWRCB 2018). 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 Section 122.6 and remains in full force and effect. The Industrial Storm Water General Permit, as amended by Order 2015-0122-DWQ and Order 2018-0028-DWQ, includes new requirements effective as of July 1, 2020. The new requirements include sufficiently sensitive analytical test method implementation, TMDL applicability and implementation, and compliance options to incentivize stormwater 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.

SWRCB 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, 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 is not actively regulated under municipal NPDES permits because UPRR is not included on the list of nontraditional Small MS4 Permittees (SWRCB 2013a). The various NPDES permits that would be applicable are those associated with stations and are discussed in this section.

Stormwater discharges in the Central Valley Region (which includes 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, SWRCB Order No. R5-2016-0040, known as the Central Valley Permit) became effective for the Central Valley Region (including Merced County) beginning on October 1, 2016 (Central Valley Water Board 2016). The Central Valley Water Board administers the Central Valley Permit. 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 SWRCB'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 Project 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 Water Board 2016). Improvements associated with the proposed integrated station and expansion of 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 SWRCB's Statewide General Phase II MS4 NPDES Permit No. CAS000004, SWRCB Order No. 2013-0001-DWQ (Small MS4 Permit) (SWRCB 2013b). 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 proposed integrated station and expansion of the layover and maintenance facility for the Project would be regulated projects because they add or create more than 5,000 square feet of impervious surface.

Limited Threat Discharges to Surface Water

Discharges of treated or untreated groundwater generated from permanent or temporary dewatering operations or other applicable wastewater discharges not specifically covered in other general or individual NPDES permits are currently regulated under a regional general permit, Waste Discharge Requirements Limited Threat Discharges to Surface Waters (Order No. R5-2022-0006, NPDES No. CAG995002 and amended by Order R5-2023-0058). Construction dewatering wastes (except stormwater) are regulated as low threat discharges to surface waters. An NOI and report of waste discharge must be submitted to the Central Valley Water Board to comply with this general permit.

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.

A Section 404 Permit would be required for the 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 Project because portions of the corridor are in FEMA-designated SFHAs, as discussed in *Flood Hazards* in Section 3.10.3. 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 Regulations

Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act of 1969 (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 Report of Waste Discharge with the appropriate Regional Water Board. The Porter-Cologne Act also requires that SWRCB 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 Project, 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 2019 (Central Valley Water Board 2019).

Regional Water Boards designate beneficial uses for all water body 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 water body–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 Water Board 2019).

In addition, SWRCB 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 Code 1602

Under Chapter 6 of the California Fish and Game 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 Project would involve permanent and temporary disturbances to the bed and banks of a creek for the construction of a bridge. Therefore, written notification of the construction activities would be provided to CDFW, in accordance with the notification requirements described in Fish and Game 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

The 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 SWRCB signed a Management Agency Agreement. The Management Agency Agreement, and its companion document, The California Pesticide Management Plan for Water Quality, 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 right-of-way. 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 (GSA), which are required to adopt groundwater sustainability plans (GSP) 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 Project overlie the Merced Subbasin of the larger San Joaquin Valley Groundwater Basin. The Merced Subbasin is a high-priority basin. Groundwater in the Merced Subbasin is 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 DWR by the January 31, 2020, deadline. The Merced Groundwater Subbasin GSP was revised in July 2022, and GSP Annual Reports submitted in April 2020, 2021, and 2022 contain the most recent information on basin conditions and GSP implementation status (Woodard & Curran 2022).

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, is threefold:

- Control flooding along the Sacramento and San Joaquin Rivers and their tributaries in cooperation with the U.S. Army Corps of Engineers
- 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 Project would require encroachment permits from CVFPB because a new rail connection, aerial guideway, and new railroad bridge would be constructed 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. The CVFPP was updated in 2022 (DWR 2022). 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 Project would encroach on 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 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 (refer to 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:

- If the project would exacerbate existing environmental hazards (such as exposing hazardous waste that is currently buried)
- If the project qualifies for certain specified exemptions (certain housing projects and transportation priority projects per California Public Resources Code [PRC] §§ 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))
- If the project is exposed to potential noise and safety impacts on the project occupants due to proximity to an airport (per PRC § 21096)
- School projects requiring specific assessment of certain environmental hazards (per PRC § 21151.8)

3.10.2.3 Regional and Local Regulations

The San Joaquin Joint Powers Authority (SJJPA), as a state joint powers agency, proposes improvements within and outside the Union Pacific Railroad (UPRR) and BNSF rights-of-way. The Interstate Commerce Commission Termination Act (ICCTA) affords railroads that engage in interstate commerce considerable flexibility in making necessary improvements and modifications to rail infrastructure, subject to the requirements of the Surface Transportation Board. ICCTA broadly preempts state and local regulation of railroads; this preemption extends to the construction and operation of rail lines. As such, activities within the UPRR and BNSF rights-of-way are clearly exempt from local building and zoning codes as well as other land use ordinances. Project activities outside of the UPRR and BNSF rights-of-way, however, would be subject to regional and local plans and regulations. Though ICCTA broadly preempts state and local regulation of railroads, SJJPA intends to obtain local agency permits for construction of facilities that fall outside the UPRR and BNSF rights-of-way, even though SJJPA has not determined whether such permits are legally necessary or required.

Appendix 3.0-1 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 Project improvements would be located. Section 15125(d) of the State 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 Project would be consistent with the plans of relevant jurisdictions.[1] The Project would be generally consistent with the applicable goals, policies, and objectives related to hydrology and water quality identified in Appendix 3.0-1.

3.10.3 Environmental Setting

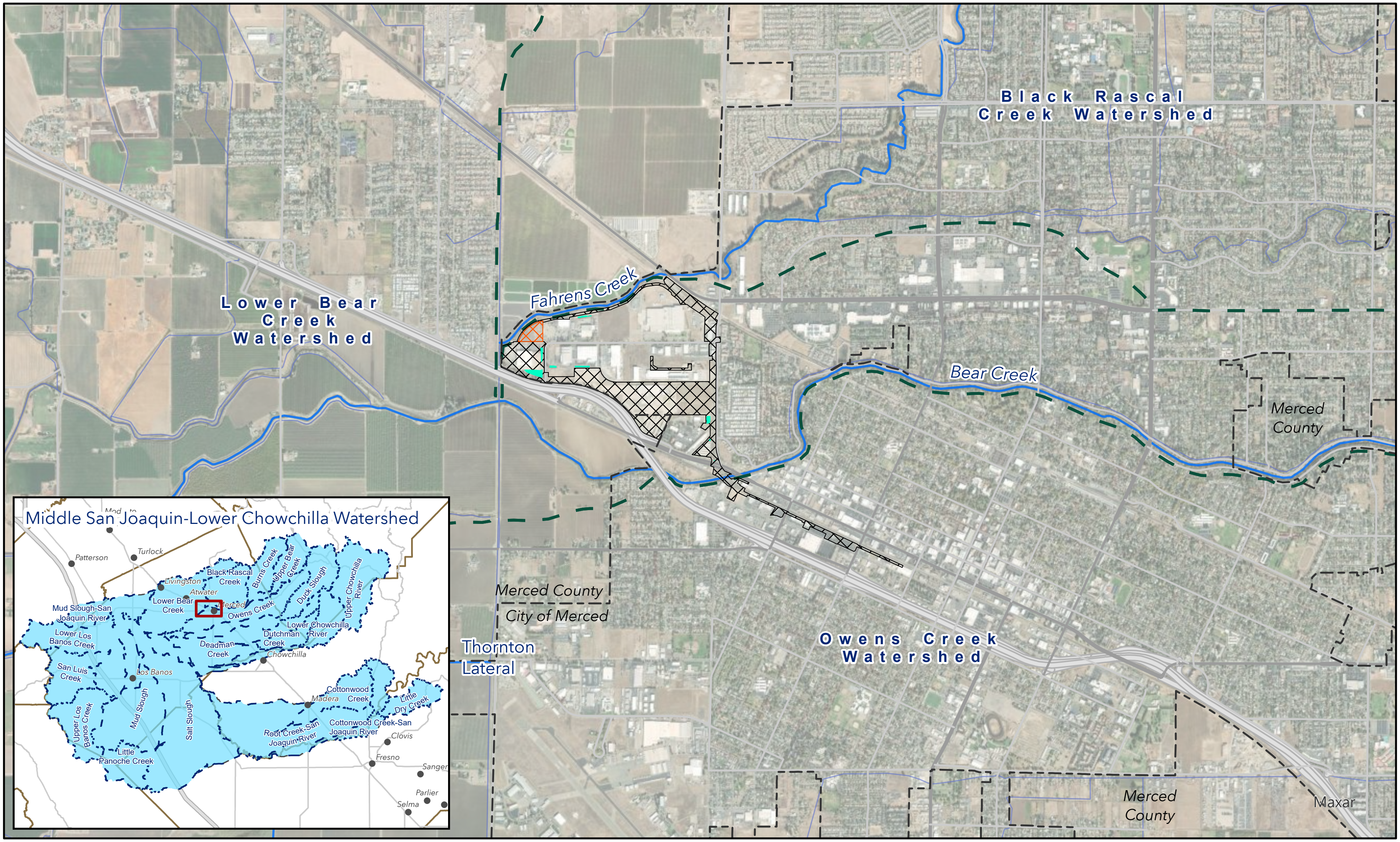
This section describes the environmental setting related to hydrology and water quality for the Project. For the purposes of this analysis, the study area for hydrology and water quality includes the environmental footprint of the Project as well as the watersheds, tributaries, and receiving streams that are connected to the environmental footprint. Figure 3.10-1 depicts hydrologic features in the vicinity of the environmental footprint of the Project and the boundaries of the Middle San Joaquin-Lower Chowchilla watershed. Figure 3.10-2 depicts the groundwater basin and subbasins in the region. Figure 3.10-3 depicts the flood zones in the vicinity of the environmental footprint of the Project and in the vicinity of the City.

Surface Hydrology

The Project is in the Lower Bear Creek and Owens Creek watersheds, both in the larger Middle San Joaquin-Lower Chowchilla watershed of the San Joaquin River Basin, as shown on Figure 3.10-1. 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. The San Joaquin River ultimately discharges to San Francisco Bay via the Sacramento–San Joaquin Delta (Delta). 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. As illustrated on Figure 3.10-1, water bodies in the environmental footprint of the Project include Bear Creek and Black Rascal Creek, also referred to as Fahrens Creek. The San Joaquin River is approximately 14 miles southwest of the Project. The Thornton Lateral and Hartley Slough are located 1.3 miles and 1.9 miles southwest, respectively. Black Rascal Creek is immediately north of the environmental footprint of the Project.

Eight detention basins are located in the environmental footprint of the Project, five of which are located in the industrial area around Cooper Avenue. A series of three connected detention basins north of West 16th Street ultimately drain to Bear Creek. The detention basins drain runoff following storm events. Wastewater treatment ponds are located outside of the project footprint. These ponds are part of the Franklin County Water District sewer/stormwater treatment area which operate year-round and maintained for water treatment.

[1] 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.



MITC Environmental Footprint
Variant H1 Additional Environmental Footprint
City of Merced Boundary

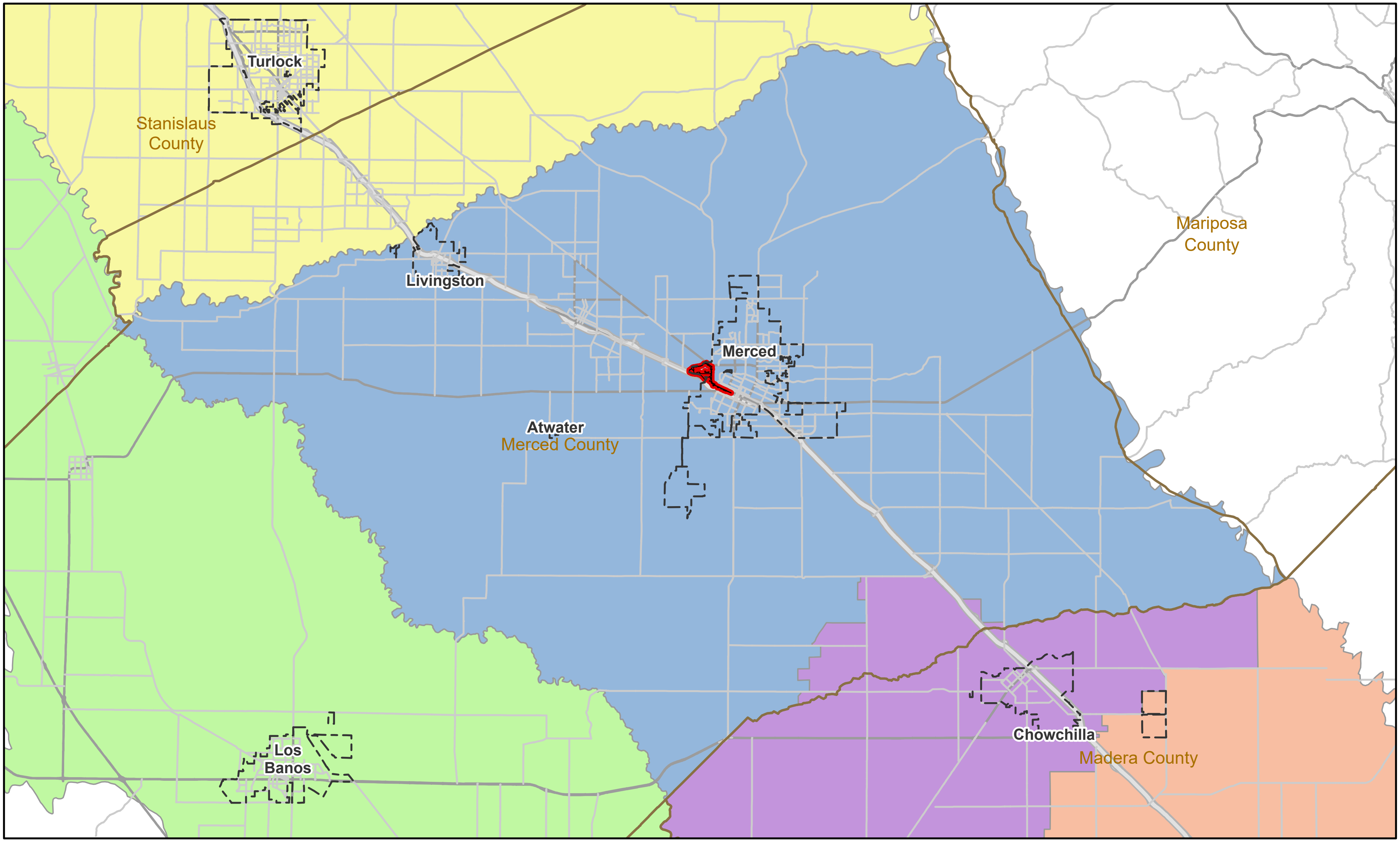
Hydrologic Features
Watershed Boundary
Creek
Other Creek
Detention Basin

0 2,000 4,000 Feet
N

Data Source: AECOM 2024, USGS 2023.

Figure 3.10-1
Hydrologic Features
Merced Intermodal Track Connection Project

MITC



MITC Environmental Footprint
City Boundary
County Boundary

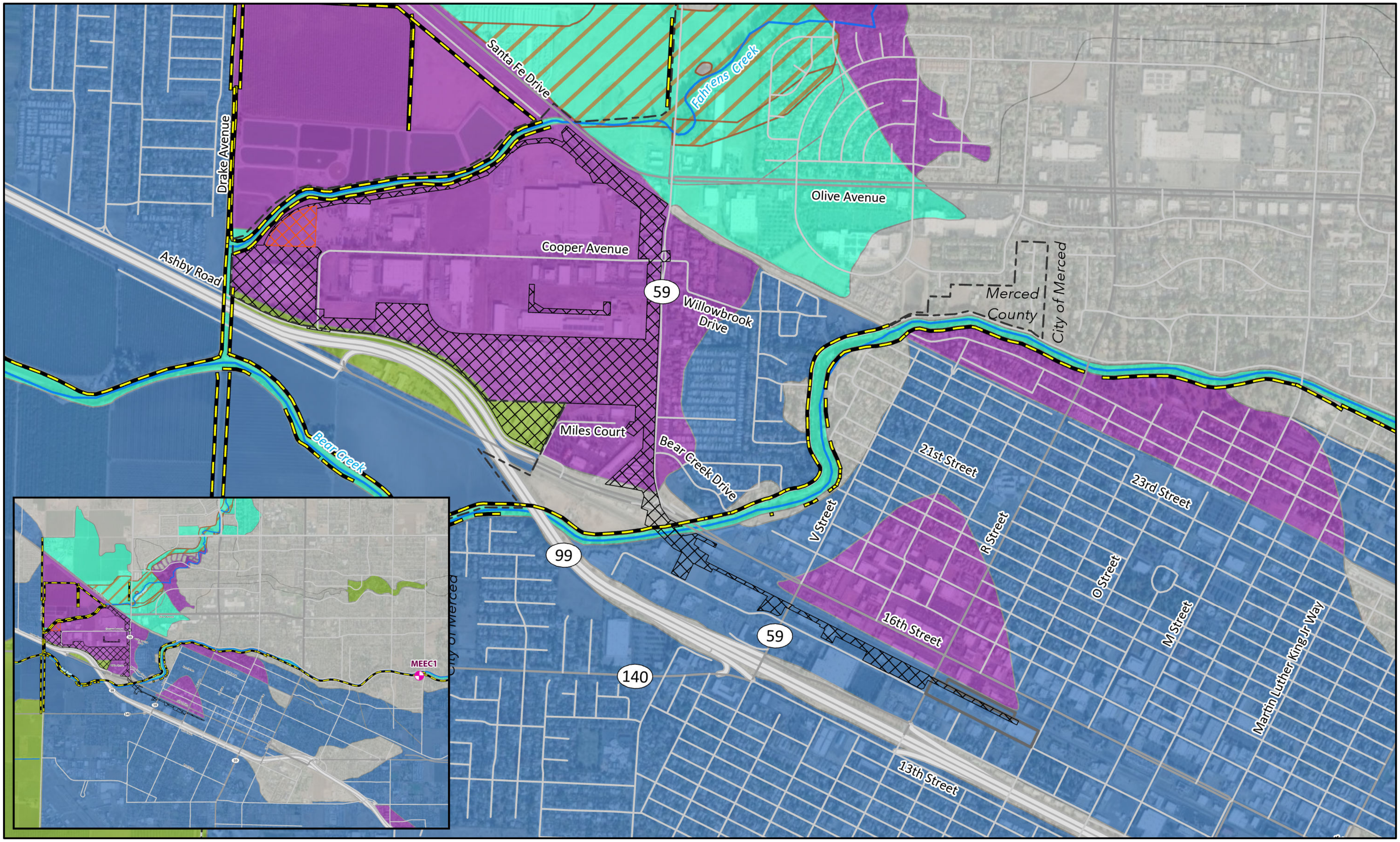
Subbains in the San Joaquin Valley Groundwater Basin
Merced
Chowchilla
Delta-Mendota
Madera
Turlock

0 5 10 Miles

Data Source: AECOM 2024, DWR 2021.

Figure 3.10-2
Groundwater Subbasins
Merced Intermodal Track Connection Project

MITC



MITC Environmental Footprint
Variant H1 Additional Environmental Footprint
City of Merced Boundary
Levee, Dike or Floodwall
National Weather Service Gauge

FEMA Flood Zones

The FEMA 100-year flood zone includes Zones A, AO, AH, and AE.

Zone A (areas without known base flood elevations)
Zone AO (river or stream flood hazard areas with known average flood depths)
Zone AH (areas of shallow flooding with known base flood elevations)
Zone AE (areas with known base flood elevations)
Zone X (areas of minimal flood hazard)
Regulatory Floodway

0 1,000 2,000 Feet

Data Source: AECOM 2024, FEMA 2022.

Figure 3.10-3
FEMA Flood Zones
Merced Intermodal Track Connection Project

\\PDCCITRDSGIS01\Projects_1\AECOM\MercedIntegratedConnectorProject_EIR_EA\Figures\Doc\EIR\1_DEIR\01_ADEIR\Ch03\Fig_03_10-03_FloodZones.aprx; User: 35015; Date: 5/23/2024

Groundwater

The Project is in the Merced Subbasin of the larger San Joaquin Valley Groundwater Basin (DWR 2020). The Merced Subbasin covers an area of approximately 491,000 acres. It is bound on the west by the Coast Ranges, by the San Emigdio and Tehachapi Mountains to the south, by the Sierra Nevada to the east, and by the Delta and Sacramento Valley to the north. Groundwater flow is generally to the southwest. Recharge of the subbasin includes infiltration of rainfall and irrigation water although artificial recharge also occurs (DWR 2004).

Generally, groundwater level declines were observed in water year (WY) 2022, a critical dry year. Continued groundwater level declines are expected in much of the subbasin while projects and management actions are developed and implemented, and due to hydrologic uncertainty. Many representative monitoring wells were below their minimum threshold when the sustainable management criteria were revised in July 2022. Thus, the interim milestones for groundwater levels allow for temporary further groundwater level decline below the minimum threshold. The cumulative change in storage from WYs 2006 to WY 2022 was estimated as -2.68 million acre-feet, or an average reduction of 158 thousand acre-feet per year. During WY 2022, the cumulative change in storage was estimated as -262 thousand-acre-feet. The average annual reduction of 192 thousand-acre-feet per year established in the GSP using the hydrologically balanced period of WYs 2006 to 2015 remains the current estimate of long-term overdraft in the subbasin (Woodard & Curran 2023). The estimated depth to groundwater in the environmental footprint of the Project is approximately 90 feet below ground surface (bgs).

Water Quality

Bear Creek is a tributary to Cache Creek. Both water bodies have no beneficial uses identified in the Central Valley Basin Plan. Surface water beneficial uses in the San Joaquin River Basin are 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. The primary pollutant sources of the San Joaquin River are the 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. SWRCB has listed various segments of the San Joaquin River as an impaired water body due to impacts from pollutants. The San Joaquin River Basin has TMDL projects currently underway as well as completed TMDL projects (Central Valley Water Board 2019). Pollutants causing impairment in the environmental footprint of the Project are listed in Table 3.10-1.

Table 3.10-1. Water Quality Impairments in Bear Creek[a]

Listed 303(d) Impairments	Potential Sources	Estimated USEPA TMDL Report Completion
Bifenthrin	Unknown	2035
Indicator Bacteria	Unknown	2021
Pyrethroids	Unknown	2035
Toxicity	Unknown	2021

Source: SWRCB 2022.
USEPA = United States Environmental Protection Agency
TMDL = Total maximum daily load
[a] Bear Creek from Bear Valley to San Joaquin River, with Mariposa and Merced Counties

All groundwater in the San Joaquin River Basin is considered suitable or potentially suitable, at a minimum, for municipal and domestic supply, agricultural supply, industrial service supply, industrial process supply beneficial uses, unless otherwise designated by the Central Valley Water Board (Central Valley Water Board 2019). Generally, 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. A minimum threshold of 1,000 milligrams per liter of total dissolved solids (TDS) has been established at representative monitoring sites as a degraded water quality sustainability indicator.

Out of the seven TDS measurements in WY 2022, none exceeded the minimum threshold but three exceeded the measurable objective of 500 milligrams per liter TDS. Areas of the subbasin are known to have elevated TDS concentrations. Water use behaviors have changed to accommodate these concentrations including agriculture focusing on salt-tolerant crops, and blending more saline water supplies with less saline water supplies. Electric conductivity, pH, dissolved oxygen, temperature, and nitrite + nitrate as nitrogen are also monitored in Merced County east of the San Joaquin River (Woodard & Curran 2023). Other groundwater quality constituents of concern include inorganic constituents. One or more inorganic constituents are present at high and moderate concentrations in 18 percent and 44 percent of the primary aquifer, respectively. Most inorganic constituents are naturally present in groundwater and can be affected by natural processes or human activity. Trace elements are naturally present in rocks, soils and minerals, and in the water that comes into contact with those materials. Trace elements are present at high or 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 benchmarks (Belitz and Landon 2010).

Flood Hazards

Flood hazards can potentially occur in the Central Valley Region, where the Project would be located, as a result of storms, dam or levee failure. Because the Project would not be in coastal areas, the Project would not be subject to tsunamis, extreme high tide, or sea level rise, and these topics are not discussed.

Flood hazards are a concern throughout Merced. Storm-related flooding can occur as a result of heavy rainfall and overflowing of watercourses. A National Weather Service flood gauge is located on Bear Creek at McKee Road. The flood stage at the gauge location is 23 feet. A record flood event occurred on January 10, 2023, with a recorded flood stage of 26.18 feet at the gauge (National Weather Service 2020). Bear Creek overtopped at several locations, including flood waters observed up to the top of the levee system at the north end of Morse Drive and Thurman Court and minor overtopping along Black Rascal Creek and Cottonwood Creek. Prolonged storms resulted in localized flooding and loaded the city’s drainage systems, causing issues citywide. Due to the volume and high flow rate, temporary emergency walls did not hold back flows (Merced County Times 2023). The vicinity of the environmental footprint of the Project also experienced flooding during the January 10, 2023, flood event at North Bear Creek Drive and 16th Street. Figure 3.10-4 depicts flooding within and in the vicinity of the environmental footprint of the Project as a result of the January 10, 2023, flood event. Since this flood event, the levee system has been raised to 27.2 feet. Other notable historic flood events recorded at the Bear Creek/McKee Road gauge include 24 feet on April 4, 2006; 22.90 feet on December 15, 1955; and 21.72 feet on March 22, 2018 (National Weather Service 2020).

Photo 1:

Flooding in the neighborhoods east of State Route 59 and the approved ACE Merced Layover and Maintenance Facility looking north.

Source: Getty Images

Photo 2:

Flooding in the neighborhoods east of State Route 59 and the approved ACE Merced Layover and Maintenance Facility looking west.

Source: Getty Images

Photo 3:

Flooding along State Route 99 and in the approved ACE Merced Layover and Maintenance Facility looking west.

Source: County of Merced Facebook page

Note: These images show flooding in the vicinity of the Project footprint during the January 10, 2023, flood event.

Graphics ...104197 (04-22-2024) JC

MITC
Merced Intermodal Track Connection

Figure 3.10-4
Images of Flooding in Vicinity of Project Footprint
Merced Intermodal Track Connection Project

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 (DWR 2022). The storm-related flooding hazards for the study area are based on information obtained from FEMA's National Flood Hazard Layer and DWR's Best Available Maps (DWR 2019). 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 (DWR 2019).

As shown on Figure 3.10-3, the environmental footprint of the Project is predominantly in the FEMA 100-year floodplain, within FEMA Zone AH (areas of shallow flooding with known base flood elevations), Zone A (no known depths or base flood elevations), Zone AO (river or stream flood hazard areas with known average flood depths), and Zone AE (areas with known base flood elevations). A small portion of the environmental footprint of the Project is in Zone X, areas of minimal flood hazard, usually depicted on FIRMs as above the 500-year flood level (FEMA 2008). The area surrounding the proposed integrated Merced HSR Station, including the access roads to the station are also predominantly within the FEMA 100-year floodplain (FEMA Zone AO), although a small area on West 24th Street at G Street adjacent to the Amtrak Station is in an area of minimal flood hazard (Zone X).

3.10.4 Impact Analysis

This section describes the environmental impacts of the Project on hydrology and water quality. This section also 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

Methods

The methods used to evaluate impacts on hydrology and water quality are described below.

- **Surface Water Hydrology**. The surface water hydrology impact analysis considers changes in impervious surfaces and drainage patterns. Information on the change in impervious surface, runoff quantities, and drainage patterns is evaluated.
- **Groundwater Hydrology.** Potential impacts on groundwater supply and recharge are analyzed using information from publicly available publications and site-specific technical reports. The potential impacts associated with construction dewatering are evaluated.
- **Surface and Groundwater Quality.** Impacts on surface water and groundwater quality are analyzed using information on potential existing sources of pollution generated by activities, such as rail use, rail and building maintenance, pesticide use, trash, and material storage and site-specific technical reports. Additional information on hazardous materials with potential to affect the Project is provided in Section 3.9, *Hazards and Hazardous Materials,* of this EIR. These impacts are compared to potential Project-related sources of pollution during Project construction, such as sediments and other construction materials, and during Project operation,

such as rail use, rail and building maintenance, pesticide use, trash, and storage of hazardous materials.

- The impact analysis for flood risk uses FEMA mapping to determine the existing flood zone that may affect flooding risk.

Principal Sources

Principal sources consulted for the impact analysis are as follows.

- Central Valley Basin Plan (Central Valley Water Board 2019)
- 2020–2022 California Integrated (CWA Section 303(d) List/305(b)) Report (SWRCB 2022)
- DWR reports including Groundwater reports and Flood Protection Plans
- Merced Groundwater Subbasin GSP (Woodard & Curran 2022)
- FEMA National Flood Hazard Layer (FEMA 2008)

3.10.4.2 Thresholds of Significance

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

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

- Violate any water quality standards or WDRs or otherwise substantially degrade surface water or groundwater quality.
- Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the Project may impede sustainable groundwater management of the basin.
- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition impervious surfaces, in a manner which would:
    - Result in substantial erosion or siltation on-site or off-site.
    - Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on-site or off-site.
    - Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff.
    - 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 rely 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 will not increase the water surface elevation of the 100-year flood by more than 1 foot in floodplains and 0.1 foot 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 from encroachment into a floodplain, the Project will not increase the water surface elevation of the 200-year flood by more than 1 foot in floodplains and 0.1 foot in floodways.

3.10.4.3 Impacts and Mitigation Measures

Impact HYD-1	Construction of the Project would not violate water quality standards or WDRs or otherwise substantially degrade surface or groundwater quality.
Level of Impact	**Less-than-significant impact**

Project

Impact Characterization

Surface Water Quality

Project construction activities, including grading, stockpiling of soil materials, and other construction-related earth-disturbing activities could result in short-term water quality impacts associated with soil erosion and subsequent sediment transport to adjacent properties, roadways, or watercourses via storm drains. Sediment transport to local drainage facilities such as drainage inlets, culverts, and storm drains could result in reduced storm flow capacity, resulting in localized ponding or flooding during storm events. Dredge and fill activities could occur temporarily during construction of the new bridge piers for the relocated UPRR bridge. Dredging and filling has the potential to degrade water quality during and after construction because fill materials may be discharged to surface waters.

Project construction would also involve use of motorized heavy equipment including trucks and dozers that require fuel, lubricating grease and other fluids. Accidental chemical release or spill from a vehicle or equipment could affect surface water. These construction activities could also generate dust, settlement, litter, oil, and other pollutants that could temporarily contaminate water runoff from the environmental footprint of the Project. Construction activities must comply with the NPDES Construction General Permit, the MS4 Permit, and the governing city's municipal code, which contain standards to ensure that water quality is not degraded. As part of the Construction General Permit, standard erosion control measures and BMPs would be identified in a SWPPP and would be implemented during construction to reduce sedimentation of waterways and loss of topsoil.

Compliance with the County's grading requirements and the Construction General Permit would require use of BMPs to restrict soil erosion and sedimentation and restrict non-stormwater discharges from the construction site as well as release of hazardous materials. The County requires all construction projects having soil disturbances to implement BMPs for erosion and sediment controls, such as desilting basins, silt fences, hay bales, fabric and sand filters, sandbags, swales, and/or sumps. As a performance standard, BMPs to be selected would represent the best available technology that is economically achievable and best conventional pollutant control technology to reduce pollutants.

Other potential water quality impacts include chemical spills into storm drains or groundwater aquifers if proper minimization measures are not implemented. However, BMPs as required by the Construction General Permit would be implemented to reduce pollutants in stormwater and other nonpoint-source runoff. Measures range from source control to treatment of polluted runoff. BMPs can include watering active construction areas to control dust generation during earthmoving activities; using water sweepers to sweep streets and haul routes; and installing erosion control measures (e.g., silt fences, staked straw bales/wattles, silt/sediment basins and traps, check dams, geofabric, sandbag dikes) to prevent silt runoff to public roadways, storm drains, or waterways. As appropriate, disturbed soil would be revegetated as soon as possible with the appropriate selection and schedule of plants.

No disturbed or graded surfaces would be left without erosion control measures in place during the rainy season, which generally occurs between October 15 and April 15. In addition to compliance with the Construction General Permit, the Project would also be required to comply with local stormwater and construction site runoff ordinances. These requirements involve implementing sediment control and stormwater management BMPs to minimize water quality impacts related to spills or other activities that could contaminate water quality.

Groundwater Quality

The maximum depth of excavation is anticipated to be at least 20 feet bgs, specifically for aerial guideway foundations and bridge piers. Construction dewatering may be required during construction such as pile driving. Dewatering could result in the exposure of pollutants from spills or other activities and may contaminate groundwater. Untreated water from construction site dewatering may contain pollutants that, if discharged to a storm drain system or natural watercourse, may exceed water quality standards of the receiving water. Typical pollutants that may be encountered include sediment (the most common pollutant associated with dewatering operations), high levels of pH, and contaminant pollutants associated with current or past use of the site or adjacent land. Release of these pollutants into receiving waters could potentially harm wildlife. Discharging contaminated or sediment-laden water from a dewatering site into any water of the state without treatment is prohibited.

The Construction General Permit includes dewatering activities, including discharge to surface waters provided that dischargers prove the quality of water to be adequate and not likely to affect beneficial uses. For water to be discharged to surface waters, the contractor would notify the Central Valley Water Board and comply with the board’s requirements related to the quality of water and discharges (Order No. R5-2022-0006), as required. Groundwater sampling and/or treatment may be required to ensure compliance with applicable construction dewatering discharge permitting. If contaminated groundwater is encountered, compliance with discharge sampling, monitoring, and reporting requirements is also required. If it is found that the groundwater does not meet water quality standards, it must either be treated prior to discharge so that all applicable water quality objectives (as designated in the Basin Plan) are met or hauled off-site for treatment and disposal at an appropriate waste treatment facility that is permitted to receive such water.

Other construction activities could result in short-term groundwater quality impacts associated with the input of sediment loads or chemical spills into storm drains or groundwater aquifers that exceed water quality objectives if proper minimization measures are not implemented. However, the

Project would be required to comply with the MS4 Permit, including filing a Notice of Intent for permit coverage under the Construction General Permit as well as local stormwater and construction site runoff ordinances. These requirements involve development and implementation of a Construction General Permit SWPPP and implementation of sediment control and stormwater management BMPs specific to the environmental footprint of the Project to minimize water quality impacts related to spills or other activities that could contaminate groundwater. BMPs would be required and incorporated into the SWPPP and other permits prior to approval of building and grading permits, providing an acceptable level of water quality protection.

Impact Details and Conclusions

Compliance with the Construction General Permit including preparation of a SWPPP, waste discharge requirements, and dewatering regulations would ensure that construction activities do not result in violations of any water quality standards or waste discharge requirements, or otherwise result in water quality degradation. Therefore, surface and groundwater quality impacts during construction would be less than significant.

Variant H1

Impact Characterization

Temporary water quality impacts during construction of Variant H1 could occur. Construction of Variant H1 would disturb an additional 15 acres compared to the Project and could result in short-term water quality impacts associated with soil erosion and subsequent sediment transport to watercourses via storm drains. Other potential water quality impacts include chemical spills into storm drains or groundwater aquifers within the Variant H1 footprint if proper minimization measures are not implemented.

Impact Details and Conclusions

Construction activities must comply with the NPDES Construction General Permit, the MS4 Permit, and the governing city's municipal code, which contain standards to ensure that water quality is not degraded. As part of the Construction General Permit, standard erosion control measures and BMPs such as silt fences, silt/sediment traps, check dams, and sandbag dikes would be identified in a SWPPP and would be implemented during construction. BMPs identified in the SWPPP would reduce potential water quality impacts related to spills or other activities that could contaminate surface or groundwater. Therefore, the potential for water quality impacts in the Variant H1 footprint would be less than significant.

Variant H2

Impact Characterization

Temporary water quality impacts during construction of Variant H2 could occur. Construction of Variant H2 could result in short-term water quality impacts associated with soil erosion and subsequent sediment transport to watercourses via storm drains. Other potential water quality impacts include chemical spills into storm drains or groundwater aquifers within the Variant H2 footprint if proper minimization measures are not implemented.

Impact Details and Conclusions

Construction activities must comply with the NPDES Construction General Permit, the MS4 Permit, and the governing city's municipal code, which contain standards to ensure that water quality is not degraded. As part of the Construction General Permit, standard erosion control measures and BMPs such as fences, silt/sediment traps, check dams, and sandbag dikes would be identified in a SWPPP and would be implemented during construction. BMPs identified in the SWPPP would reduce potential water quality impacts related to spills or other activities that could contaminate surface or groundwater. Therefore, the potential for water quality impacts in the Variant H2 footprint would be less than significant.

Variant H3

Impact Characterization

Temporary water quality impacts during construction of Variant H3 could occur. Construction of Variant H3 could result in short-term water quality impacts associated with soil erosion and subsequent sediment transport to watercourses via storm drains. Other potential water quality impacts include chemical spills into storm drains or groundwater aquifers within the Variant H3 footprint if proper minimization measures are not implemented.

Impact Details and Conclusions

Construction activities must comply with the NPDES Construction General Permit, the MS4 Permit, and the governing city's municipal code, which contain standards to ensure that water quality is not degraded. As part of the Construction General Permit, standard erosion control measures and BMPs such as fences, silt/sediment traps, check dams, and sandbag dikes would be identified in a SWPPP and would be implemented during construction. BMPs identified in the SWPPP would reduce potential water quality impacts related to spills or other activities that could contaminate surface or groundwater. Therefore, the potential for water quality impacts in the Variant H3 footprint would be less than significant.

Impact HYD-2	Construction of the Project would not substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the Project may impede sustainable groundwater management of the basin.
Level of Impact	**Less-than-significant impact**

Project

Impact Characterization

The estimated depth to groundwater in the environmental footprint of the Project is approximately 90 feet below ground surface (bgs). The maximum depth of excavation is anticipated to be at least 20 feet bgs, specifically for aerial guideway foundations and bridge piers. Groundwater dewatering is not being anticipated, however the need for dewatering would be determined during the final design phase. In the event that groundwater is encountered during construction dewatering would be conducted on a one-time or temporary basis. Dewatering during construction would not result in a significant impact on groundwater recharge or result in depletion of groundwater supplies. Further, groundwater supplies would not be used during construction activities such as dust control. Construction-related dewatering activities, including handling and discharge of water, monitoring, and reporting, would comply with the Construction General Permit, California Department of Transportation (Caltrans) specification, Central Valley Water Board regulations, and other requirements related to dewatering activities and groundwater resources. As described in Section 3.13, *Public Services and Utilities and Service Systems,* of this EIR, groundwater is the primary water source in the City of Merced. Water used during construction, including for fugitive dust control would be temporary and would not result in a substantial reduction of groundwater supplies or resources. Therefore, construction of the Project would not substantially decrease groundwater supplies or impede sustainable groundwater management of the basin.

Impact Details and Conclusions

Dewatering during construction would be temporary and would not substantially decrease groundwater supplies or impede sustainable groundwater management. Therefore, impacts on groundwater resources during construction of the Project would be less than significant.

Variant H1

Impact Characterization

Groundwater dewatering during construction of Variant H1 is not anticipated. In the event that groundwater is encountered during construction, dewatering would be conducted on a one-time or temporary basis.

Impact Details and Conclusions

Construction of Variant H1 would not result in a significant impact on groundwater recharge or result in depletion of groundwater supplies. Therefore, impacts on groundwater resources during construction of Variant H1 would be less than significant.

Variant H2

Impact Characterization

Groundwater dewatering during construction of Variant H2 is not anticipated. In the event that groundwater is encountered during construction of Variant H2, dewatering would be conducted on a one-time or temporary basis.

Impact Details and Conclusions

Construction of Variant H2 would not result in a significant impact on groundwater recharge or result in depletion of groundwater supplies. Therefore, impacts on groundwater resources during construction would be less than significant.

Variant H3

Impact Characterization

Groundwater dewatering during construction of Variant H3 is not anticipated. In the event that groundwater is encountered during construction of Variant H3, dewatering would be conducted on a one-time or temporary basis.

Impact Details and Conclusions

Construction of Variant H3 would not result in a significant impact on groundwater recharge or result in depletion of groundwater supplies. Therefore, impacts on groundwater resources during construction would be less than significant.

Impact HYD-3	Construction of the Project 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. Construction of the Project would not 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 on-site or off-site, create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems, or provide substantial additional sources of polluted runoff.
Level of Impact	**Less-than-significant impact**

Project

Impact Characterization

During construction, stormwater drainage patterns could be temporarily altered due to site grading, preparation, and excavation activity. However, Project construction would implement BMPs required in the Project SWPPP to minimize the potential for erosion or siltation in nearby storm drains, temporary changes in drainage patterns, or flooding during construction. During construction, an erosion control plan is also required. Construction BMPs would capture and infiltrate small amounts of sheet flow[2] into the ground such that off-site 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. However, the environmental footprint of the Project is predominantly in the FEMA 100-year floodplain. Construction equipment and materials located in the floodplain could obstruct flood flows. BMPs as required by the Construction General Permit such as silt fences, staked straw bales/wattles, geofabric, and sandbag dikes would control construction site runoff, such that flood flows are not impeded or redirected. Prior to a storm event, construction materials and equipment would be moved out of potential flood-prone areas to minimize impeded or redirected flood flows. BMPs would also reduce the discharge of pollution to the storm drain system.

[2] Sheet flow is an overland flow or downslope movement of water taking the form of a thin, continuous film over relatively smooth soil or rock surfaces and is not concentrated into channels.

Impact Details and Conclusions

Compliance with the Construction General Permit including preparation of a SWPPP would ensure drainage patterns are not substantially altered in a manner which would result in substantial erosion or siltation or result in impeded or redirected flood flows. Stormwater BMPs would ensure that Project construction would not increase the rate or amount of surface runoff in a manner that would result in flooding on- or off-site or result in an exceedance of drainage system capacities. The impact would be less than significant.

Variant H1

Impact Characterization

Construction of Variant H1 could result in temporary alterations in stormwater drainage patterns due to site grading, preparation, and excavation activity. Alterations in drainage patterns or soil disturbance associated with construction of Variant H1 could also result in erosion, redirected flood flows, or alterations in the rate or amount of surface runoff. Potential impacts include exceeding the capacity of existing or planned stormwater drainage systems or increased polluted runoff. Construction equipment and materials located in the floodplain could obstruct flood flows.

Impact Details and Conclusions

Construction of Variant H1 would implement BMPs required in the Project SWPPP to minimize the potential for erosion, temporary changes in drainage patterns, or increased surface runoff and associated pollutants. Construction BMPs and measures required by the Construction General Permit would control construction site runoff such that flood flows are not impeded or redirected and stormwater drainage systems are not exceeded. Prior to a storm event, construction materials and equipment would be moved out of potential flood-prone areas to minimize impeded or redirected flood flows. Therefore, impacts would be less than significant.

Variant H2

Impact Characterization

Construction of Variant H2 could result in temporary alterations in stormwater drainage patterns due to site grading, preparation, and excavation activity. Alterations in drainage patterns or soil disturbance associated with construction of Variant H2 could also result in erosion, redirected flood flows, or alterations in the rate or amount of surface runoff. Potential impacts include exceeding the capacity of existing or planned stormwater drainage systems or increased polluted runoff. Construction equipment and materials located in the floodplain could obstruct flood flows.

Impact Details and Conclusions

Construction of Variant H2 would implement BMPs required in the Project SWPPP to minimize the potential for erosion, temporary changes in drainage patterns, or increased surface runoff and associated pollutants. Construction BMPs and measures required by the Construction General Permit would control construction site runoff such that flood flows are not impeded or redirected and stormwater drainage systems are not exceeded. Prior to a storm event, construction materials and equipment would be moved out of potential flood-prone areas to minimize impeded or redirected flood flows. Therefore, impacts would be less than significant.

Variant H3

Impact Characterization

Construction of Variant H3 could result in temporary alterations in stormwater drainage patterns due to site grading, preparation, and excavation activity. Alterations in drainage patterns or soil disturbance associated with construction of Variant H3 could also result in erosion, redirected flood flows, or alterations in the rate or amount of surface runoff. Potential impacts include exceeding the capacity of existing or planned stormwater drainage systems or increased polluted runoff. Construction equipment and materials located in the floodplain could obstruct flood flows.

Impact Details and Conclusions

Construction of Variant H3 would implement BMPs required in the Project SWPPP to minimize the potential for erosion, temporary changes in drainage patterns, or increased surface runoff and associated pollutants. Construction BMPs and measures required by the Construction General Permit would control construction site runoff such that flood flows are not impeded or redirected and stormwater drainage systems are not exceeded. Prior to a storm event, construction materials and equipment would be moved out of potential flood-prone areas to minimize impeded or redirected flood flows. Therefore, impacts would be less than significant.

Impact HYD-4	In a flood hazard area, construction of the Project would not risk release of pollutants due to Project inundation.
Level of Impact	**Less-than-significant impact**

Project

Impact Characterization

Due to the distance from the Pacific Ocean (approximately 79 miles), the environmental footprint of the Project is not within a tsunami inundation area. Therefore, the Project is not subject to inundation by a tsunami. There are no reservoirs adjacent to the environmental footprint of the Project; therefore, the Project would not be prone to inundation by a seiche. However, the environmental footprint of the Project is predominantly in the FEMA 100-year floodplain. Therefore, construction of the Project could be subject to inundation by a flood.

Project construction would involve use of motorized heavy equipment that require the use and storage of fuel, lubricating grease, and other fluids and chemicals. Prior to a flood event, construction equipment and materials would be relocated as necessary such that pollutant release due to Project inundation are reduced. Measures required by the Construction General Permit, including preparation of a SWPPP and associated stormwater BMPs, would limit site runoff during construction. BMPs would control construction site runoff, ensure proper stormwater control and treatment, and reduce the discharge of pollution to the storm drain system.

Construction activities must comply with the NPDES Construction General Permit as well as county and local policies including stormwater BMPs to minimize degradation of water quality associated with stormwater runoff or construction-related pollutants. In addition, measures such as sandbags and other temporary barriers would reduce the release of pollutants and manage flood flows. In addition, construction and maintenance activities would comply with local stormwater and floodplain management ordinances, stormwater requirements of the MS4 permits, and regional waste discharge requirements. Other measures in the SWPPP would include a range of stormwater control BMPs (e.g., installing silt fences, staked straw wattles, or geofabric to prevent silt runoff to storm drains or waterways). Stormwater BMPs would minimize the potential for a release of pollutants as a result of inundation of the environmental footprint of the Project.

Impact Details and Conclusions

With BMPs, as required by the SWPPP, construction site runoff would be controlled. Further, measures such as sandbags and other temporary barriers would reduce the release of pollutants and manage flood flows. Therefore, construction impacts related to release of pollutants due to Project inundation would be less than significant.

Variant H1

Impact Characterization

Construction of Variant H1 would occur in the FEMA 100-year floodplain. Construction equipment and material located in the floodplain has the potential to risk release of pollutants due to Variant H1 inundation.

Impact Details and Conclusions

Prior to a flood event, construction equipment and materials located in the floodplain would be relocated as necessary such that release of pollutants due to Variant H1 inundation are reduced. Measures required by the Construction General Permit, including preparation of a SWPPP and associated stormwater BMPs, would limit site runoff and associated pollutants during construction. Therefore, potential impacts related to risk release of pollutants due to Variant H1 inundation would be less than significant.

Variant H2

Impact Characterization

Construction of Variant H2 would occur in the FEMA 100-year floodplain. Construction equipment and material located in the floodplain has the potential to risk release of pollutants due to Variant H2 inundation.

Impact Details and Conclusions

Prior to a flood event, construction equipment and materials located in the floodplain would be relocated as necessary such that release of pollutants due to Variant H2 inundation are reduced. Measures required by the Construction General Permit, including preparation of a SWPPP and associated stormwater BMPs, would limit site runoff and associated pollutants during construction. Therefore, potential impacts related to risk release of pollutants due to Variant H2 inundation would be less than significant.

Variant H3

Impact Characterization

Construction of Variant H3 would occur in the FEMA 100-year floodplain. Construction equipment and material located in the floodplain has the potential to risk release of pollutants due to Variant H3 inundation.

Impact Details and Conclusions

Prior to a flood event, construction equipment and materials located in the floodplain would be relocated as necessary such that release of pollutants due to Variant H3 inundation are reduced. Measures required by the Construction General Permit, including preparation of a SWPPP and associated stormwater BMPs, would limit site runoff and associated pollutants during construction. Therefore, potential impacts related to risk release of pollutants due to Variant H3 inundation would be less than significant.

Impact HYD-5	Construction of the 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**

Project

Impact Characterization

Commonly practiced BMPs during construction of the Project would control construction site runoff and 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, 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 water and groundwater, as defined in the Basin Plan. Construction runoff would also have to comply with the appropriate water quality objectives for the region. The NPDES 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. Water used during construction, including fugitive dust control, would be temporary and would not result in a substantial reduction of groundwater supplies or resources. Dewatering would be conducted temporarily during the construction phase and would not affect sustainable management of the groundwater basin.

Impact Details and Conclusions

Water quality control measures and BMPs during construction of the Project would ensure impacts would not conflict with or obstruct implementation of a water quality control plan or groundwater sustainability plan. Impacts would be less than significant.

Variant H1

Impact Characterization

BMPs during construction of Variant H1 would control construction site runoff and reduce the discharge of pollutants to storm drain systems from stormwater and other nonpoint-source runoff. In the event of groundwater dewatering, dewatering would be conducted temporarily and would not affect sustainable management of the groundwater basin.

Impact Details and Conclusions

Water quality control measures and BMPs during construction of Variant H1 would ensure that water quality standards would be achieved, including the water quality objectives as defined in the Basin Plan. The NPDES 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 standards. Construction of Variant H1 would not conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management. Therefore, impacts would be less than significant.

Variant H2

Impact Characterization

BMPs during construction of Variant H2 would control construction site runoff and reduce the discharge of pollutants to storm drain systems from stormwater and other nonpoint-source runoff. In the event of groundwater dewatering, dewatering would be conducted temporarily and would not affect sustainable management of the groundwater basin.

Impact Details and Conclusions

Water quality control measures and BMPs during construction of Variant H2 would ensure that water quality standards would be achieved, including the water quality objectives as defined in the Basin Plan. The NPDES 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 standards. Construction of Variant H2 would not conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management. Therefore, impacts would be less than significant.

Variant H3

Impact Characterization

BMPs during construction of Variant H3 would control construction site runoff and reduce the discharge of pollutants to storm drain systems from stormwater and other nonpoint-source runoff. In the event of groundwater dewatering, dewatering would be conducted temporarily and would not affect sustainable management of the groundwater basin.

Impact Details and Conclusions

Water quality control measures and BMPs during construction of Variant H3 would ensure that water quality standards would be achieved, including the water quality objectives as defined in the

Basin Plan. The NPDES 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 standards. Construction of Variant H3 would not conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management. Therefore, impacts would be less than significant.

Impact HYD-6	Operation of the Project would not violate water quality standards or WDRs or otherwise substantially degrade surface water or groundwater quality.
Level of Impact	**Less-than-significant impact**

Project

Impact Characterization

The Project would result in a 3.5 percent increase of impervious surface within the environmental footprint of the Project. Increased impervious areas result in increased runoff rates and volumes and associated pollutants. Impervious areas also reduce infiltration of stormwater and prevent pollutant filtration of stormwater that would otherwise occur in pervious areas. Increased storm runoff would also increase the potential for erosion and sedimentation. Pollutants emitted by trains, as well as increased maintenance activities and pesticide use, can also result in increased pollutant loading to surface waters and degraded groundwater quality. Chemicals used for maintenance activities may include heavy and light oils, fuels, and hydraulic fluids, landscaping supplies, and other potentially toxic materials.

Trains can be sources of pollutants such as petroleum products (e.g., oil, grease, diesel) and metals. Operations would result in the potential for pollutants to be discharged into receiving waters when trains cross over a water body on a bridge or culvert or are located close to a water body. Pollutants emitted by trains would also be deposited on nearby impervious surfaces where runoff would mobilize pollutants to a storm drain inlet and into a receiving water body which could affect water quality. These pollutants may include both inorganic compounds, such as metals, and organic compounds, including polycyclic aromatic hydrocarbons (PAHs). The dust generated by physical braking processes may contain metals like iron, copper, silicon, calcium, manganese, chromium, and barium (Berkhardt et al. 2008; Moreno et al. 2015) as well as PAHs (Markiewicz et al. 2017). Brake dust would consist primarily of particulate metals, which could become dissolved in rainwater. Brake dust would primarily be generated in areas where the trains must reduce their travel speed, such as approaches to stations, layover and maintenance facilities, turns, and elevation changes, primarily descents. The use of lubricating oils in trains may also contribute to the release of particulate PAHs into receiving water bodies. However, only a small fraction of PAHs released along transportation corridors are found in stormwater runoff (about 2 to 6 percent), and the primary sources of these PAHs are physical wear of tires, lubricant oil leakage, exhaust from internal combustion engines, road surface wear, and brakes (Markiewicz et al. 2017). The amount of pollutants released by modern trains under typical operating conditions 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. The track ballast material would minimize stormwater runoff from the area of localized impacts and minimize impacts on water quality.

Improvements 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 area. Incorporation of appropriate stormwater measures, including LID source control, site design, stormwater treatment, and hydromodification management would be required in the design plan. During operations, permanent stormwater control and treatment BMPs specified in the stormwater management and treatment plan would reduce the quantity and improve the quality of stormwater runoff before runoff is discharged into a surface water body. The plan would include design criteria and locations of stormwater control and treatment BMPs. Potential stormwater BMPs include biofiltration swales, biofiltration strips, infiltration devices, detention devices, media filters, wet basins, and dry weather diversion. Treatment BMPs would reduce concentrations of particulate materials in runoff, such as metals and PAHs, while infiltration areas, infiltration devices, biofiltration swales and strips, and media filters can also reduce dissolved metal concentrations in runoff. Stormwater control and treatment BMPs would also maintain predevelopment runoff rates, volumes, and water quality. Stormwater control and treatment BMPs would be designed and constructed for improvements within the UPRR right-of-way (i.e., the Ceres to Merced Extension Alignment) in accordance with the Project Planning and Design Guide (PPDG) developed by Caltrans. Improvements would also be required to comply with the postconstruction stormwater performance standards of the Construction General Permit.

During operations, maintenance activities will be required on tracks, bridge crossings, and other Project facilities. Maintenance activities would require the use and storage of materials and chemicals. Additionally, bridges and culverts would require intermittent maintenance and vegetation would need to be managed to maintain adequate track clearance. Pesticides would be used to maintain and clear vegetation from tracks. Use of pesticides for vegetation removal would be required to comply with DPR regulations. A SWPPP would be prepared under the Industrial General Permit for applicable facilities. The SWPPP would describe how materials and chemicals used and stored would be managed and controlled to prevent discharges of pollutants into storm drain systems and receiving water bodies. In addition, an operations and maintenance plan identifying stormwater BMPs to manage pollutant-generating activities in accordance with the MS4 Permit would also be required. The operations and maintenance plan would identify measures to reduce pollutants in stormwater and non-stormwater runoff: parking lot maintenance; bridge and culvert maintenance; and right-of-way maintenance including vegetation management. Additional pollutants that may be generated and emitted during continuous operations, such as trash, would be minimal and would be managed with good housekeeping practices, such as trash pick-up and sweeping along the tracks.

Operation of the Project would comply with the Industrial General Permit, which requires the use of BMPs, best available technology economically achievable, and best conventional pollutant control technology 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. The Small MS4 Permit requires that the source control measures for pollutant generating activities be designed in accordance with the recommendations of the California Stormwater Quality Association's current Stormwater Best Management Practices Handbook for New Development and Redevelopment manual (California Stormwater Quality Association 2023).

Impact Details and Conclusions

Compliance with the Industrial General Permit including preparation of a SWPPP, MS4 permit, and Caltrans requirements would ensure that operation and maintenance activities do not result in degraded surface water or groundwater quality. Stormwater control and treatment BMPs would minimize potential impacts on surface water quality during operations and would not violate water quality standards or otherwise substantially degrade water quality. Therefore, surface and groundwater quality impacts during operation would be less than significant.

Variant H1

Impact Characterization

Variant H1 would result in an increase in impervious area and associated polluted runoff. Pollutants emitted by increased maintenance activities could also result in increased pollutant loading to surface waters and degraded groundwater quality. Chemicals used for maintenance activities may include heavy and light oils, fuels, and hydraulic fluids, landscaping supplies, and other potentially toxic materials.

Impact Details and Conclusions

Operation of Variant H1 would include permanent stormwater control and treatment BMPs which would improve the quality of stormwater runoff prior to discharging into a water body. An operations and maintenance plan identifying stormwater BMPs to manage pollutant-generating activities in accordance with the MS4 Permit would also be required. Chemicals used for maintenance activities would be managed and controlled to prevent discharges of pollutants into storm drain systems and receiving water bodies. Therefore, water quality impacts would be less than significant.

Variant H2

Impact Characterization

Variant H2 would result in an increase in impervious area and associated polluted runoff. Pollutants emitted by increased maintenance activities could also result in increased pollutant loading to surface waters and degraded groundwater quality. Chemicals used for maintenance activities may include heavy and light oils, fuels, and hydraulic fluids, landscaping supplies, and other potentially toxic materials.

Impact Details and Conclusions

Operation of Variant H2 would include permanent stormwater control and treatment BMPs which would improve the quality of stormwater runoff prior to discharging into a water body. An operations and maintenance plan identifying stormwater BMPs to manage pollutant-generating activities in accordance with the MS4 Permit would also be required. Chemicals used for maintenance activities would be managed and controlled to prevent discharges of pollutants into storm drain systems and receiving water bodies. Therefore, water quality impacts would be less than significant.

Variant H3

Impact Characterization

Variant H3 would result in an increase in impervious area and associated polluted runoff. Pollutants emitted by increased maintenance activities could also result in increased pollutant loading to surface waters and degraded groundwater quality. Chemicals used for maintenance activities may include heavy and light oils, fuels, and hydraulic fluids, landscaping supplies, and other potentially toxic materials.

Impact Details and Conclusions

Operation of Variant H3 would include permanent stormwater control and treatment BMPs which would improve the quality of stormwater runoff prior to discharging into a water body. An operations and maintenance plan identifying stormwater BMPs to manage pollutant-generating activities in accordance with the MS4 Permit would also be required. Chemicals used for maintenance activities would be managed and controlled to prevent discharges of pollutants into storm drain systems and receiving water bodies. Therefore, water quality impacts would be less than significant.

Impact HYD-7	Operation of the Project would not substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the Project may impede sustainable groundwater management of the basin.
Level of Impact	**Less-than-significant impact**

Project

Impact Characterization

The amount of impervious area within the environmental footprint of the Project would increase upon Project completion, with approximately 60 percent of the environmental footprint of the Project covered with impervious surfaces and 40 percent of the environmental footprint of the Project covered with pervious surfaces. Although material used for track areas may allow permeability, any soil compaction would reduce infiltration capacity, reducing groundwater recharge potential. However, stormwater control and treatment BMPs would be designed and constructed for improvements within the UPRR right-of-way in accordance with the PPDG developed by Caltrans. Stormwater controls may include biofiltration swales, biofiltration strips, infiltration devices, and media filters. Landscaping would also be included throughout the environmental footprint of the Project. These features would treat runoff and capture and naturally filter contaminants from the site's stormwater runoff. The addition of stormwater controls and pervious areas would allow for groundwater infiltration and groundwater recharge. New landscaped areas would slow surface water runoff, allowing it to percolate into the ground, providing increased benefits for groundwater recharge. New impervious surfaces would be required to comply with requirements of the applicable MS4 and NPDES permits for stormwater control and treatment, which include requirements for source control and stormwater treatment. As described in Section 3.13, *Public Services and Utilities and Service Systems,* of this EIR, groundwater is the primary water source in the City of Merced. Operation of the Project would occasionally require water supply as part of routine track maintenance. However, operation would not regularly increase water use and would not result in a substantial reduction of groundwater supplies or resources.

Impact Details and Conclusions

The Project would result in a 3.5 percent increase in impervious areas. However, stormwater control and treatment BMPs such as biofiltration swales, biofiltration strips, infiltration devices, and media filters as well as landscaping would allow for groundwater infiltration and groundwater recharge. As a result, the Project would not substantially decrease groundwater supplies, interfere with groundwater recharge, or impede sustainable groundwater management of the basin. Therefore, this impact would be less than significant.

Variant H1

Impact Characterization

Variant H1 would result in an increase in the amount of impervious area, potentially reducing the potential for groundwater recharge. No groundwater supplies would be used for operation of Variant H1.

Impact Details and Conclusions

Stormwater control and treatment BMPs would be designed and constructed for improvements within the UPRR right-of-way, while providing groundwater recharge benefits for Variant H1. Stormwater controls would allow for groundwater infiltration and groundwater recharge. New landscaped areas would also slow surface water runoff, allowing runoff to percolate into the ground. Therefore, groundwater impacts related to groundwater supply and recharge would be less than significant.

Variant H2

Impact Characterization

Variant H2 would result in an increase in the amount of impervious area, potentially reducing the potential for groundwater recharge. No groundwater supplies would be used for operation of Variant H2.

Impact Details and Conclusions

Stormwater control and treatment BMPs would be designed and constructed for improvements within the UPRR right-of-way, while providing groundwater recharge benefits for Variant H2. Stormwater controls would allow for groundwater infiltration and groundwater recharge. New landscaped areas would also slow surface water runoff, allowing runoff to percolate into the ground. Therefore, groundwater impacts related to groundwater supply and recharge would be less than significant.

Variant H3

Impact Characterization

Variant H3 would result in an increase in the amount of impervious area, potentially reducing the potential for groundwater recharge. No groundwater supplies would be used for operation of Variant H3.

Impact Details and Conclusions

Stormwater control and treatment BMPs would be designed and constructed for improvements within the UPRR right-of-way, while providing groundwater recharge benefits for Variant H3. Stormwater controls would allow for groundwater infiltration and groundwater recharge. New landscaped areas would also slow surface water runoff, allowing runoff to percolate into the ground. Therefore, groundwater impacts related to groundwater supply and recharge would be less than significant.

Impact HYD-8	Operation of the 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. Operation of the Project 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 on-site or off-site, create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems, or provide substantial additional sources of polluted runoff.
Level of Impact	**Potentially significant impact**
Mitigation Measures	HYD-8.1: Perform Detailed Hydraulic Evaluations and Modify Designs for Facilities within Flood Zones if Required to Reduce Potential Flooding Impacts HYD-8.2: Model Hydraulics of New Bridges before Construction and Design Bridges to Avoid Increased Flooding and Accommodate Fish Migration
Level of Impact After Mitigation	**Less-than-significant impact**

Project

Impact Characterization

The Project would result in a 3.5 percent increase in impervious areas. The increase in impervious surfaces could potentially increase the rate or amount of surface runoff, resulting in increased flooding, runoff exceeding the capacity of stormwater drainage systems, or additional sources of polluted runoff. Fill would be required for the new main line track, siding tracks, and other proposed improvements. As a result, over-excavation would be required. It is unlikely any existing detention basins would be removed, however five existing detention basins may be modified or enlarged in the industrial area around Cooper Avenue and along State Highway 59 and one new drainage basin created on State Highway 59. Therefore, the increase in impervious areas would be offset by the modification, enlargement, or creation of detention basins. The Project would be required to adhere to the requirements in the Construction General Permit and the applicable MS4 and NPDES permits. Compliance with the applicable MS4 and NPDES permit requirements, including postconstruction requirements of the Construction General Permit, would ensure that operation of the Project would minimize increases in stormwater runoff compared to the existing condition.

On-site storm runoff would be captured and treated using permanent stormwater control and treatment BMPs specified in the stormwater management and treatment plan. Potential stormwater BMPs include biofiltration swales, biofiltration strips, infiltration devices, detention devices, media filters, wet basins, and dry weather diversion. Stormwater BMPs would improve the quality of stormwater runoff, including reducing erosion and siltation, and reduce the quantity of stormwater runoff, and impeded or redirected flood flows. Stormwater treatment methods would comply with MS4 and local stormwater requirements. All Project-related development would comply with applicable federal, state, and local requirements discussed in Section 3.10.2, *Regulatory Setting,* including requirements for water quality, flood control, and stormwater management.

The amount of pollutants released by train operation is minimal. Trains undergo regular inspections and maintenance to prevent and fix leaks of potential pollutants. Track ballast material would be sufficient to infiltrate stormwater and minimize runoff from the area of localized impacts and reduce water quality impacts. Project operations would not provide substantial additional sources of polluted runoff unless an accidental release of hazardous materials occurs along the tracks. However, Project operations would comply with stringent federal and state protocols and regulations intended to reduce the likelihood of accident conditions such as spills. Accident conditions, including the accidental release of hazardous materials, are not expected to increase with Project operations.

The environmental footprint of the Project is predominantly in the FEMA 100-year floodplain, including the maintenance facility. The Project would serve Merced, which has existing flooding vulnerabilities. The embankment along State Highway 59 prior to reaching grade could impede flow and is a potential concern. New structures within the 100-year floodplain also have the potential to impede or redirect flood flows. During operation, railroad tracks could also be inundated. However, the project would be designed to avoid adverse effects on flooding including appropriately designed features and drainage infrastructure. Improvements would be designed with appropriate drainage considerations to ensure storm and flood flows are not impeded. Further, the new aerial guideway structure is not anticipated to impede flood flows. The proposed elevated tracks would be raised above the flood elevation, which is beneficial compared to existing conditions. Due to the low profile of railroad tracks, flood flows would not be impeded or redirected. If tracks were inundated by flooding, the tracks would be inspected and repaired, and debris removed, as needed. Flood flows would be redirected around existing rail facilities located within the floodplain, similar to existing conditions. For Proposed Project facilities located within drainage courses and/or mapped flood zones, the appropriate design storm interval would be used to design the appropriate storm drainage system for structures and facilities, as required by the CVFPB. As noted previously, existing detention basins may be modified, enlarged, or created. As a result, proposed improvements to the approved ACE Merced Layover and Maintenance Facility are not anticipated to affect flood storage and the Project would not exacerbate existing flood hazards. Further, the riverbanks of Black Rascal Creek and portions of Bear Creek are protected by levee systems. Outside the riverbank and levee protected area, cross drainage structures would be installed. 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.

The Project alignment also crosses the 100-year floodplain at Bear Creek. The base flood elevation for Bear Creek at the crossing is 167 feet (FEMA 2008). The Project would also include operation of a new bridge over Bear Creek, drainage ditches, and new culverts to support the new mainline track. The new bridge over Bear Creek would be designed to avoid increasing creek or flood flows. Because the new bridge would have less columns that could impede or redirect flows than the current wood trestle bridge, flow conditions under the structure could potentially improve compared to existing conditions. Installation of new piles or structures in Bear Creek could also result in shading and changes to channel morphology and hydraulics. Channel morphology describes the linear, aerial, and volumetric features of a channel, including depth, length, width, and the shape or configuration of the channel. Channel morphology, along with flow, affects stream hydraulics, which refers to a stream's depth, surface elevation, velocity, and turbulence. Channel morphology and hydraulics and the bridge crossing could also alter water temperature. The new bridge crossing Bear Creek would be designed such that obstructions to the flows in the river are negligible, and encroachment to the floodplains can be avoided. The bridge foundation and support structures would be designed such that no increase in the flood elevation occurs in the river. However, Project facilities within mapped flood zones could impede or redirect flood flows if not appropriately designed, which could result in flooding of off-site areas.

Impact Details and Conclusions

Encroachment permits would be required from CVFPB to construct bridges, and CVFPB requires new bridges to be designed for 200-year flood events. 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. Shading would occur from the new bridge. However, since the bridge is only 17 feet wide, shading and associated changes in water temperatures would be minimal. Shading would not occur all day in any particular location and, therefore, is not expected to strongly affect water quality including water temperatures. Additionally, because of the height of the bridges over the water, ambient light levels generally would be expected to penetrate into the water, minimizing the effects of altered water temperature. Thus, shading is considered a less-than-significant impact on water quality.

At this bridge crossing, the pilings in the water could affect stream velocities, which could alter hydrology or impede or redirect flood flows. Operation of the Project including the increased number of in-water structures due to the new bridge over Bear Creek could result in potentially significant hydrology impacts including channel velocities as well as increased erosion, siltation, or redirected flood flows. Given the bridge designs, this is unlikely to result in substantial change in erosion or exceeding the hydraulic capacity of the creek; however, further evaluation is required. Further, Project facilities within mapped flood zones could impede or redirect flood flows if not appropriately designed, which could result in flooding of off-site areas. This is a potentially significant impact.

Mitigation Measures

Mitigation Measure HYD-8.1: Perform Detailed Hydraulic Evaluations and Modify Designs for Facilities within Flood Zones if Required to Reduce Potential Flooding Impacts

Facilities 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 Project will be designed to avoid adverse effects on flooding including appropriately designed drainage infrastructure based on the detailed hydraulic evaluation to reduce potential flood related impacts. 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 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 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 Project facilities or structures could result in an increase in offsite flooding conditions by more than 1 foot in floodplains and 0.1 foot 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.

- Increasing culvert sizes.
- Increase size of existing detention basins or add more detention basins to provide increased stormwater storage and flood control.
- 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 example, the embankment along State Highway 59 should include equalization culverts to maintain water levels on both sides of the embankment and ensure sufficient sizing to convey runoff flows and reduce the potential for back water flows to the residences east of State Route 59. In addition, because the UPRR spur would be realigned as part of the Project, culverts could be incorporated into the spur berm to facilitate drainage. 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.

Mitigation Measure HYD-8.2: Model Hydraulics of New Bridges Before Construction and Design Bridge to Avoid Increased Flooding and Accommodate Fish Migration

SJJPA or its contractor(s) will perform a hydraulic analysis for all new bridge crossings that expand in-water footprints to determine if changes in velocities will occur and identify the most feasible option with the least impact on the geomorphic integrity of the creek. Any change in velocities will be compared to existing flow rates that may alter downstream water surface elevations or the hydraulic capacity of the creek as a result of pile installation. If velocities would result in increased water surface elevations beyond FEMA free board (additional height above the base flood elevation), the bridge design(s) will be changed to reduce velocities. Additionally, SJJPA or its contractor(s) will involve Regional Water Boards, CVFPB, and the U.S. Army Corps of Engineers in development of scope of work and methodology, analysis of the options, and development of a draft report.

Significance with Application of Mitigation

With implementation of Mitigation Measures HYD-8.1 and HYD-8.2, impacts related to increased erosion, siltation, redirected flood flows, or exceeding the capacity of the creek during operation of the Project would be less than significant.

Variant H1

Impact Characterization

Variant H1 would be located in the FEMA 100-year floodplain.

Impact Details and Conclusions

Variant H1 would comply with the requirements in the Construction General Permit and the applicable MS4/NPDES permits. Variant H1 facilities could potentially impede or redirect flood flows or result in flooding of off-site areas if facilities are not appropriately designed. Changes in the impervious areas associated with Variant H1 could also result in increased runoff rate or volumes, which could exceed the capacity of stormwater drainage systems or provide additional sources of polluted runoff. This is a potentially significant impact.

Mitigation Measures

Mitigation Measure HYD-8.1: Perform Detailed Hydraulic Evaluations and Modify Designs for Facilities within Flood Zones if Required to Reduce Potential Flooding Impacts

Mitigation Measure HYD-8.2: Model Hydraulics of New Bridges Before Construction and Design Bridge to Avoid Increased Flooding and Accommodate Fish Migration

Significance with Application of Mitigation

With implementation of Mitigation Measures HYD-8.1 and HYD-8.2, Variant H1 would not result in flooding or provide additional sources of polluted runoff and this impact would be less than significant.

Variant H2

Impact Characterization

Variant H2 would be located in the FEMA 100-year floodplain.

Impact Details and Conclusions

Variant H2 would comply with the requirements in the Construction General Permit and the applicable MS4/NPDES permits. Variant H2 facilities could potentially impede or redirect flood flows or result in flooding of off-site areas if facilities are not appropriately designed. Changes in the impervious areas associated with Variant H2 could also result in increased runoff rate or volumes, which could exceed the capacity of stormwater drainage systems or provide additional sources of polluted runoff. This is a potentially significant impact.

Mitigation Measures

Mitigation Measure HYD-8.1: Perform Detailed Hydraulic Evaluations and Modify Designs for Facilities within Flood Zones if Required to Reduce Potential Flooding Impacts

Mitigation Measure HYD-8.2: Model Hydraulics of New Bridges Before Construction and Design Bridge to Avoid Increased Flooding and Accommodate Fish Migration

Significance with Application of Mitigation

With implementation of Mitigation Measures HYD-8.1 and HYD-8.2, Variant H2 would not result in flooding or provide additional sources of polluted runoff and this impact would be less than significant.

Variant H3

Impact Characterization

Variant H3 would be located in the FEMA 100-year floodplain.

Impact Details and Conclusions

Variant H3 would comply with the requirements in the Construction General Permit and the applicable MS4/NPDES permits. Variant H3 facilities could potentially impede or redirect flood flows or result in flooding of off-site areas if facilities are not appropriately designed. Changes in the impervious areas associated with Variant H3 could also result in increased runoff rate or volumes, which could exceed the capacity of stormwater drainage systems or provide additional sources of polluted runoff. This is a potentially significant impact.

Mitigation Measures

Mitigation Measure HYD-8.1: Perform Detailed Hydraulic Evaluations and Modify Designs for Facilities within Flood Zones if Required to Reduce Potential Flooding Impacts

Mitigation Measure HYD-8.2: Model Hydraulics of New Bridges Before Construction and Design Bridge to Avoid Increased Flooding and Accommodate Fish Migration

Significance with Application of Mitigation

With implementation of Mitigation Measures HYD-8.1 and HYD-8.2, Variant H3 would not result in flooding or provide additional sources of polluted runoff and this impact would be less than significant.

Impact HYD-9	In a flood hazard, operation of the Project would not risk release of pollutants due to Project inundation.
Level of Impact	**Less-than-significant impact**

Project

Impact Characterization

Due to the distance from the Pacific Ocean (approximately 79 miles), the environmental footprint of the Project is not within a tsunami inundation area. Therefore, the Project is not subject to inundation by a tsunami. There are no reservoirs adjacent to the environmental footprint of the Project; therefore, the Project would not be prone to inundation by a seiche. However, the environmental footprint of the Project is predominantly in the FEMA 100-year floodplain. Therefore, operation of the Project could be subject to inundation by a flood and the potential to mobilize and transport pollutants.

Railroad tracks could be inundated and result in the release of pollutants. However, if a flood event is anticipated with the potential to inundate tracks, operation would be paused, as required by existing standard procedures. If tracks were inundated by flood waters, tracks would be inspected, repaired, and debris removed, as needed. Flood flows and associated pollutants would be redirected around existing rail facilities located within the floodplain, similar to existing conditions. The project would be designed to avoid adverse effects on flooding including appropriately designed drainage infrastructure. Improvements would be designed with appropriate drainage considerations to ensure adequate stormwater capacity and management of flood flow. Existing detention basins may be modified, enlarged, or created; therefore project improvements are not anticipated to affect flood storage. Operation would continue once flood waters have receded and the tracks are determined to be safe and free of debris. The potential for release of pollutants due to inundation would be similar to existing conditions.

Chemicals used for maintenance activities may include heavy and light oils, fuels, hydraulic fluids, landscaping supplies, and other potentially toxic materials. Permanent stormwater control and treatment BMPs would reduce potential impacts due to the release of pollutants, including chemicals used for maintenance activities. Design criteria and locations of permanent stormwater control and treatment BMPs would be specified in the stormwater management and treatment plan. Potential stormwater control and treatment BMPs include biofiltration swales, biofiltration strips, infiltration devices, detention devices, media filters, wet basins, and dry weather diversion. Treatment BMPs would reduce pollutants in runoff. Stormwater control and treatment BMPs would be designed and constructed for improvements within the UPRR right-of-way in accordance with the PPDG developed by Caltrans. In addition, a SWPPP would be prepared under the Industrial General Permit for applicable facilities. The SWPPP would describe how materials and chemicals used and stored would be managed and controlled to prevent discharges of pollutants into storm drain systems and receiving water bodies in the event of Project inundation. Operations would comply with Merced County stormwater management, discharge control, and floodplain requirements and ordinances; stormwater requirements established by the Central Valley and statewide general MS4 permits, and regional waste discharge requirements. Such requirements would entail the use of naturalized and constructed drainage channels to enhance stormwater runoff management and associated stormwater treatment and manage flood flows. Existing and proposed vegetation within and adjacent to the environmental footprint of the Project would slow runoff and allow infiltration, providing increased benefits from the reduced volume of pollutants released. Impervious surfaces and landscape areas would slope toward suitable discharge facilities.

Impact Details and Conclusions

Permanent stormwater control and treatment BMPs and vegetated areas would manage polluted runoff and reduce the potential of pollutant release. Prior to a flood event, chemicals used for maintenance activities that are located in the floodplain would be relocated as necessary such that release of pollutants due to Project inundation are reduced. Compliance with regional and local stormwater and flood requirements would ensure operation impacts of pollutant release due to Project inundation would be less than significant.

Variant H1

Impact Characterization

Variant H1 would be located in the FEMA 100-year floodplain. Chemicals used for maintenance activities risk release of pollutants due to Variant H1 inundation.

Impact Details and Conclusions

Prior to a flood event, chemicals used for maintenance activities of Variant H1 in the floodplain would be relocated as necessary such that release of pollutants due to inundation are reduced. Permanent stormwater control and treatment BMPs would limit site runoff and associated pollutants during operation. Therefore, potential impacts related to risk release of pollutants due to Variant H1 inundation would be less than significant.

Variant H2

Impact Characterization

Variant H2 would be located in the FEMA 100-year floodplain. Chemicals used for maintenance activities risk release of pollutants due to Variant H2 inundation.

Impact Details and Conclusions

Prior to a flood event, chemicals used for maintenance activities of Variant H2 in the floodplain would be relocated as necessary such that release of pollutants due to inundation are reduced. Permanent stormwater control and treatment BMPs would limit site runoff and associated pollutants during operation. Therefore, potential impacts related to risk release of pollutants due to Variant H2 inundation would be less than significant.

Variant H3

Impact Characterization

Variant H3 would be located in the FEMA 100-year floodplain. Chemicals used for maintenance activities risk release of pollutants due to Variant H3 inundation.

Impact Details and Conclusions

Prior to a flood event, chemicals used for maintenance activities of Variant H1 in the floodplain would be relocated as necessary such that release of pollutants due to inundation are reduced. Permanent stormwater control and treatment BMPs would limit site runoff and associated pollutants during operation. Therefore, potential impacts related to risk release of pollutants due to Variant H3 inundation would be less than significant.

Impact HYD-10	Operation of the 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**

Project

Impact Characterization

Stormwater control and treatment features such as surface landscaping design, landscape buffers, and stormwater treatment areas would reduce stormwater runoff flows and associated pollutants. Stormwater BMPs would allow water to percolate into the ground, 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 on groundwater quality as well. The Project overlies the Merced Subbasin, which is managed under the Merced Irrigation-Urban GSA. Groundwater supplies would not be used during operation. Stormwater management strategies would treat runoff and allow groundwater infiltration and groundwater recharge. In addition, the appropriate General Plan policies would require the protection of groundwater recharge areas and groundwater resources, as required by a sustainable groundwater management plan.

Impact Details and Conclusions

Stormwater control and treatment features during operation of the Project would ensure impacts would not conflict with or obstruct implementation of a water quality control plan or groundwater sustainability plan. Impacts would be less than significant.

Variant H1

Impact Characterization

Stormwater BMPs and treatment features would allow water to percolate into the ground, providing stormwater treatment prior to discharge. Any potential contaminants would be filtered, minimizing adverse effects on surface water and groundwater quality and resources.

Impact Details and Conclusions

Stormwater BMPs and treatment features during operation of Variant H1 would minimize impacts on surface water and groundwater resources, as defined by the relevant water quality control plan and sustainable groundwater management plan. Therefore, impacts would not conflict with or obstruct implementation of a water quality control plan or groundwater sustainability plan. Impacts would be less than significant.

Variant H2

Impact Characterization

Stormwater BMPs and treatment features would allow water to percolate into the ground, providing stormwater treatment prior to discharge. Any potential contaminants would be filtered, minimizing adverse effects on surface water and groundwater quality and resources.

Impact Details and Conclusions

Stormwater BMPs and treatment features during operation of Variant H2 would minimize impacts on surface water and groundwater resources, as defined by the relevant water quality control plan and sustainable groundwater management plan. Therefore, impacts would not conflict with or obstruct implementation of a water quality control plan or groundwater sustainability plan. Impacts would be less than significant.

Variant H3

Impact Characterization

Stormwater BMPs and treatment features would allow water to percolate into the ground, providing stormwater treatment prior to discharge. Any potential contaminants would be filtered, minimizing adverse effects on surface water and groundwater quality and resources.

Impact Details and Conclusions

Stormwater BMPs and treatment features during operation of Variant H3 would minimize impacts on surface water and groundwater resources, as defined by the relevant water quality control plan and sustainable groundwater management plan. Therefore, impacts would not conflict with or obstruct implementation of a water quality control plan or groundwater sustainability plan. Impacts would be less than significant.

3.11 Land Use and Planning

3.11.1 Introduction

This section describes the regulatory and environmental setting for land use and planning in the vicinity of the Project. It also describes the impacts on land use and planning that would result from implementation of the Project and mitigation measures that would reduce significant impacts, where feasible and appropriate.

Cumulative impacts on land use and planning, in combination with planned, approved, and reasonably foreseeable projects, are discussed in Chapter 4, *Cumulative Impacts*.

3.11.2 Regulatory Setting

This section summarizes federal, state, regional, and local regulations related to land use and planning applicable to the Project.

3.11.2.1 Federal

No federal regulations related to land use and planning are relevant to this analysis.

3.11.2.2 State

California Government Code Sections 65300 to 65303.4

California Government Code Section “Authority for and Scope of General Plans” (Sections 65300 to 65303.4) requires that each county and city adopt a general plan to guide the city's long-term growth. General plans lay out the pattern of future residential, commercial, industrial, agricultural, open space, public, and recreational land uses within a community. Local jurisdictions implement their general plans by adopting zoning, subdivision, grading, and other ordinances. Zoning identifies the specific types of land uses or forms of development that may be allowed on a given site and establishes regulations that are imposed on new development. Zoning regulations vary between jurisdictions. Typical zoning regulations address permissible types of uses, the density and size of structures, the siting of structures relative to parcel boundaries, architectural design, and the percentage of building coverage allowed relative to the overall square footage of a parcel.

California Sustainable Communities and Climate Protection Act of 2008 (SB 375, Chapter 728)

The California Sustainable Communities and Climate Protection Act (Senate Bill [SB] 375, Chapter 728) requires regional planning agencies in California to develop regional land use plans (called Sustainable Community Strategies [SCS]) as an integral part of their regional transportation plan (RTP) aimed at lowering greenhouse gas (GHG) emissions by reducing sprawl, co-locating uses to shorten necessary trips (home to work, home to store, etc.), and coordinating land use and transportation/transit planning. Coordination is enforced by requiring transportation planning projects to comply with the SCS to receive state funding. SB 375 also allows projects that meet regional sustainable community strategies to qualify for CEQA exemptions or streamlining.

3.11.2.3 Regional and Local

The SJJPA, as a state joint powers agency, proposes improvements within and outside the Union Pacific Railroad (UPRR) and BNSF Railway (BNSF) rights-of-way. The Interstate Commerce Commission Termination Act (ICCTA) affords railroads that engage in interstate commerce considerable flexibility in making necessary improvements and modifications to rail infrastructure, subject to the requirements of the Surface Transportation Board. ICCTA broadly preempts state and local regulation of railroads; this preemption extends to the construction and operation of rail lines. As such, activities within the UPRR and BNSF rights-of-way are clearly exempt from local building and zoning codes as well as other land use ordinances. Project activities outside of the UPRR and BNSF rights-of-way, however, would be subject to regional and local plans and regulations. Though ICCTA broadly preempts state and local regulation of railroads, SJJPA intends to obtain local agency permits for construction of facilities that fall outside the UPRR and BNSF rights-of-way, even though SJJPA has not determined whether such permits are legally necessary or required.

Appendix 3.0-1 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 Project improvements would be located. Section 15125(d) of the State 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 Project would be consistent with the plans of relevant jurisdictions.[1] The Project would be generally consistent with the applicable goals, policies, and objectives related to land use and planning identified in Appendix 3.0-1.

3.11.3 Environmental Setting

This section describes the environmental setting for the Project related to land use and planning. For the purposes of this analysis, the Resource Study Area (RSA) is defined as the area within 0.5-mile of the Project as shown on Figure 3.11-1.

Per the City of Merced General Plan Land Use Diagram (2015), the Project would be located on land designated as manufacturing/industrial, general commercial, thoroughfare commercial, regional community commercial, business park, and open space as shown on Figure 3.11-2. Other existing land uses adjacent to the Project include high to medium density residential, public/general use, low density residential, government owned, and mobile home park residential. The Riviera Holiday Mobile Estates/Senior Community is located east of the Project site and Snelling Highway (State Route [SR] 59), just north of Bear Creek. Two multi-family residential units (Willowbrook Apartments and Granville Luxury Apartments) are located east of SR 59 just north of the mobile home park. Industrial and educational uses in the Project site are concentrated at the southwest corner of the Cooper Avenue and SR 59 intersection. The ShadowBrook area, located east of SR 59 and north of West 16th Street, is designated as high to medium density residential (City of Merced 2015). This area is designated as high to medium density residential and Stephan Gray Park is also located within the ShadowBrook area. Downtown Merced is also in the RSA and serves as a main corridor for retail and businesses in the City of Merced. Located off SR 59 with several interchanges, downtown Merced has attracted tenants such as Merced County Office of Education, the Merced Auto Center, Costco, various restaurants, coffee shops, pharmacies, and electrical and roofing supply

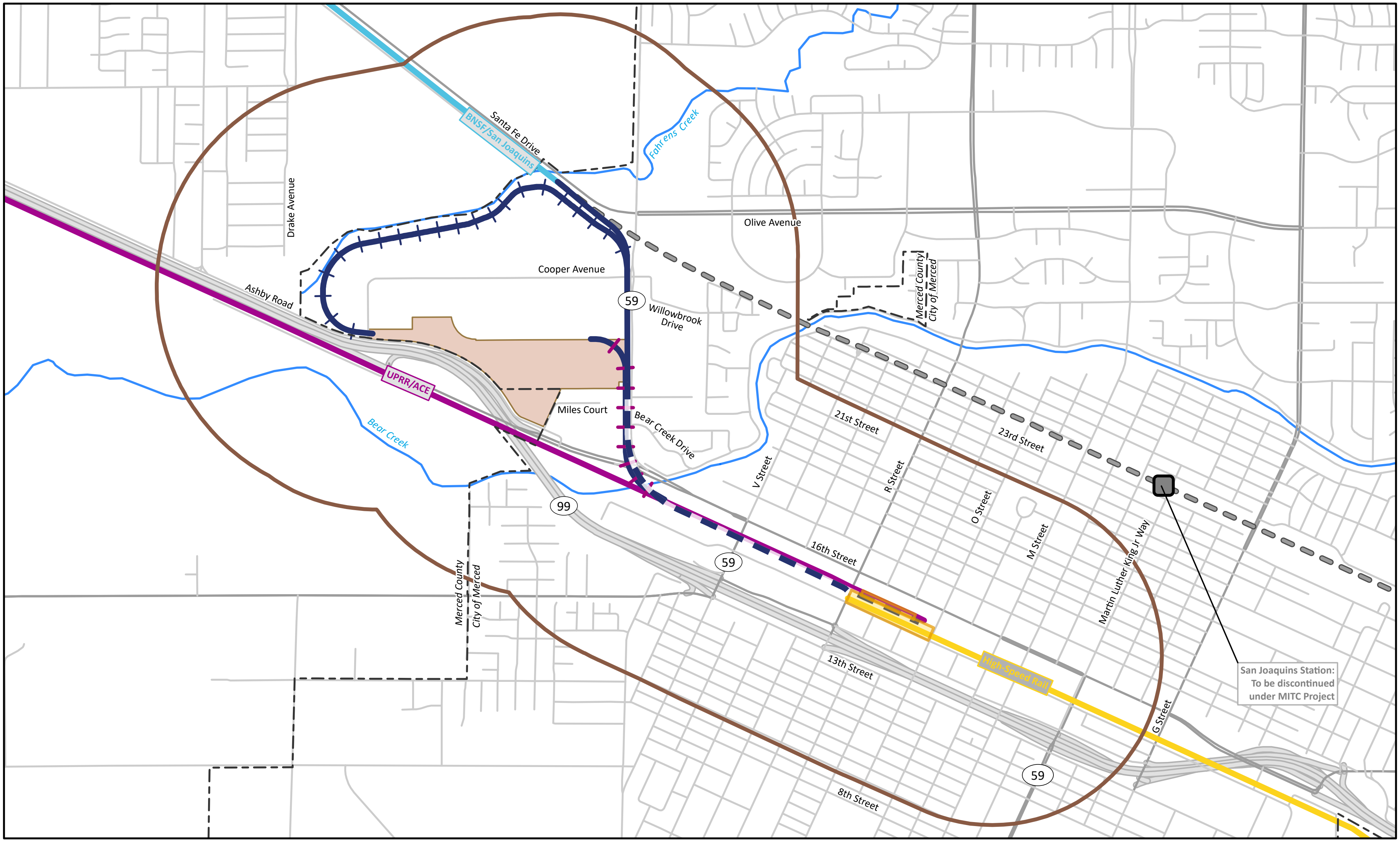
[1] An inconsistency with regional or local plans is not necessarily considered a significant impact under CEQA, unless it is related to a physical impact on the environment that is significant in its own right.

stores. Safety Merced Manufacturing and Jain Farm Fresh Foods, Inc. Frozen Ingredients Division are located along Cooper Avenue. On Main Street are several auto dealerships, grocery stores, antique shops, restaurants, bars, and hotels.

Home to county courts, administrative buildings, and City Hall, Downtown Merced also plays an integral role as the seat of government in the area (City of Merced 2023). Downtown Merced is also the finance and banking center for Merced County, as well as the hub of culture and performing arts, with several galleries and two live performing arts theaters, Playhouse Merced and the Art Kamangar Center at The Merced Theatre.

Activity centers are generally located northeast, east, and south within the RSA. Merced Marketplace, a large shopping center, which includes a Walmart, is located approximately 960 feet northeast of the Project east of SR 59 along Olive Avenue. The Merced Applegate Park Zoo and skate park is located one mile east of the Project, and John C. Fremont Elementary School is located approximately 1,800 feet north of 16th Street. A series of automobile dealerships are located along Auto Center Drive. Another shopping center with a grocery store, a home improvement store, and other commercial uses are located between Highway 99 and SR 140 (Central Yosemite Highway). Leontine Gracey Elementary School is located outside of the RSA approximately 280 feet south of SR 140.

The Project RSA includes land uses zoned as Light and Heavy Industrial, Commercial, Planned Development, and Low Density Residential (City of Merced 2012) as shown on Figure 3.11-3. There is land zoned for agricultural use north of the Project RSA and Freeway 99 (Merced County 2013).



Existing UPRR/Approved ACE
Proposed High-Speed Rail
Existing BNSF/San Joaquins
Proposed Integrated Merced High-Speed Rail Station
Approved ACE Merced Layover and Maintenance Facility
0.5-mile Buffer
City of Merced Boundary

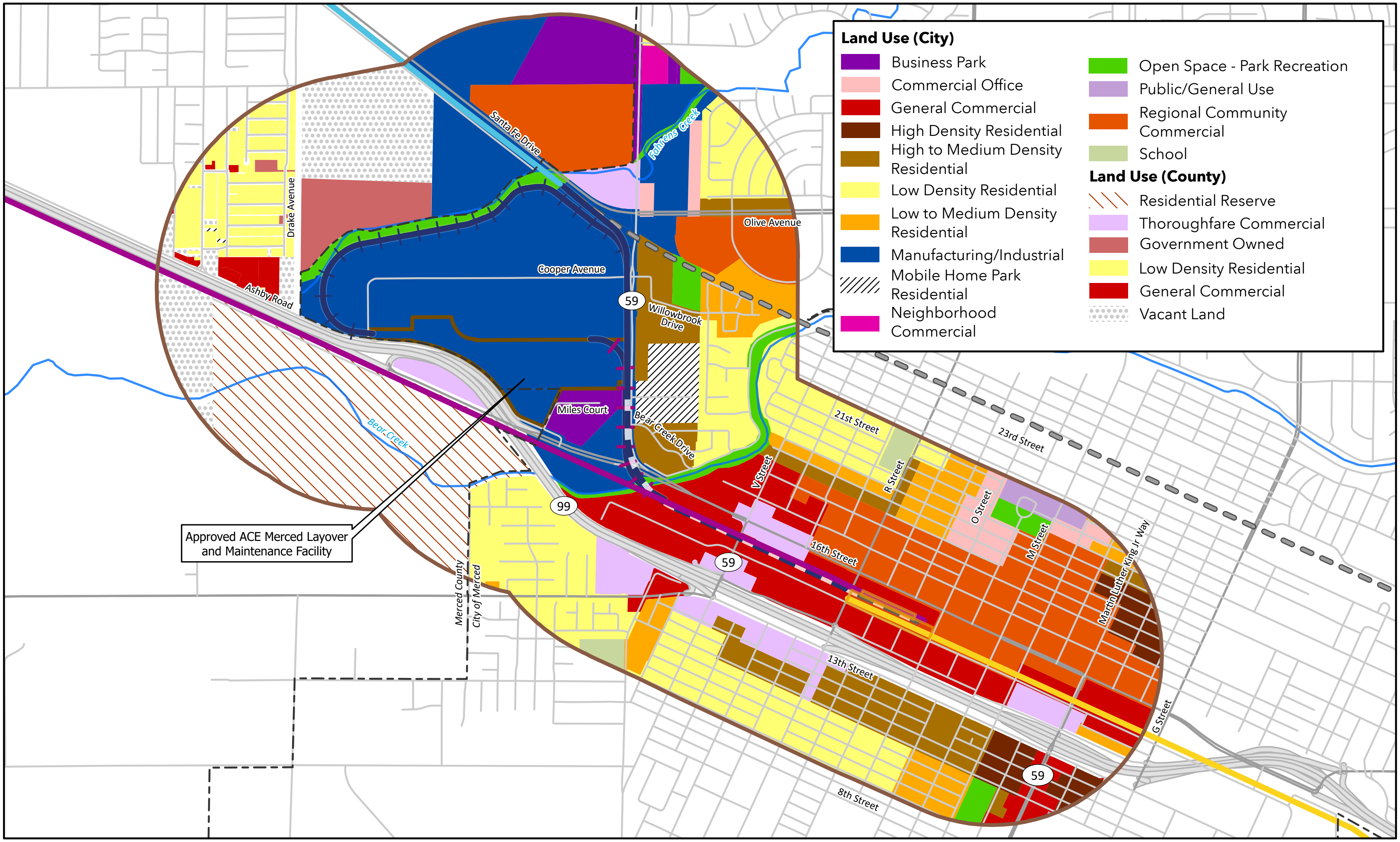
MITC Project
San Joaquins: Elevated Track
San Joaquins: At-grade Track
San Joaquins: Layover and Maintenance Access Line
ACE/UPRR Spur Track
San Joaquins: To be discontinued under MITC Project

Data Source: City of Merced

0 1,000 2,000 Feet

MITC

Figure 3.11-1
Land Use Resource Study Area
Merced Intermodal Track Connection Project



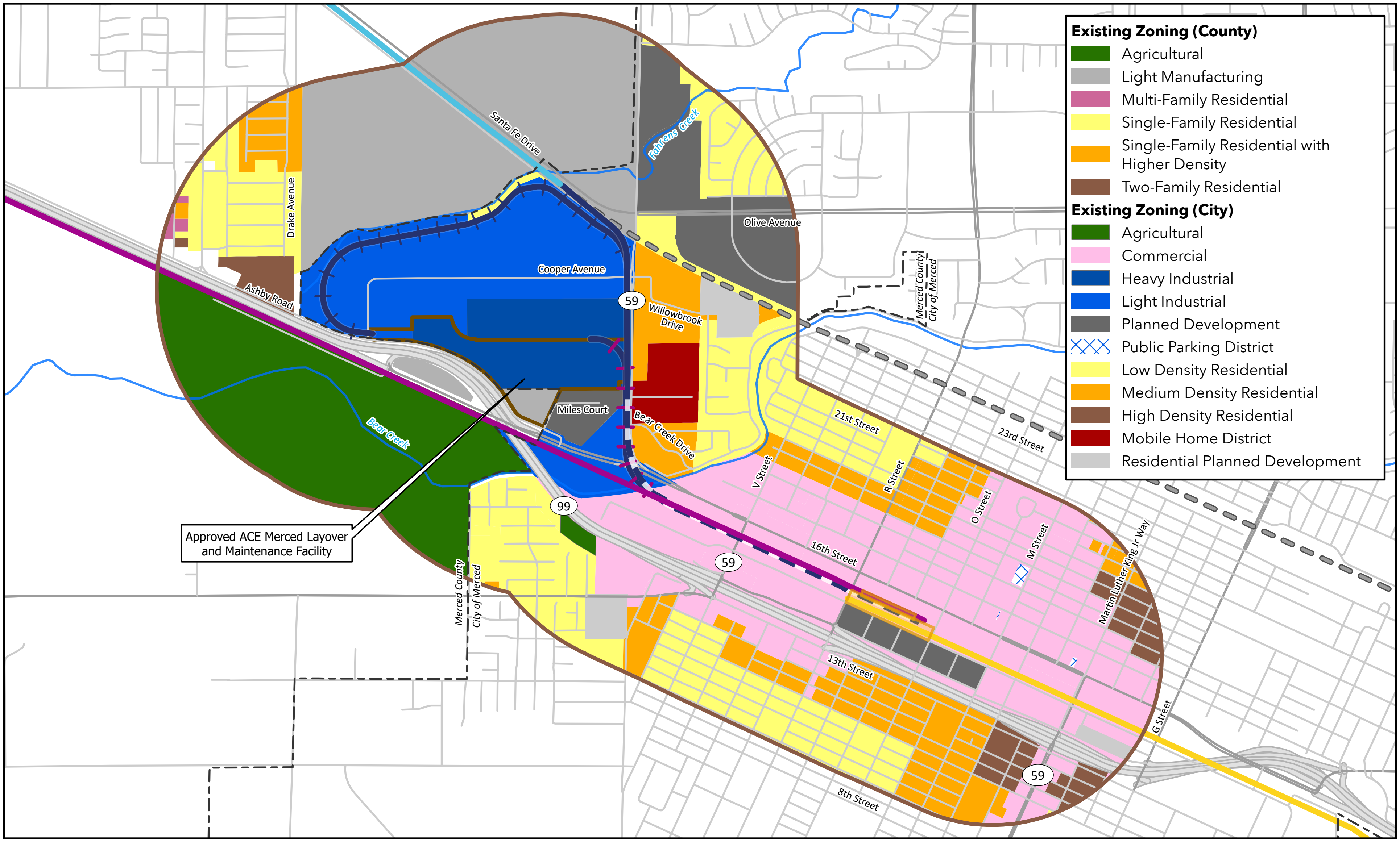
Existing UPRR/Approved ACE
Proposed High-Speed Rail
Existing BNSF/San Joaquins
Proposed Integrated Merced High-Speed Rail Station
Approved ACE Merced Layover and Maintenance Facility
Half-mile Buffer
City of Merced Boundary

MITC Project
San Joaquins: Elevated Track
San Joaquins: At-grade Track
San Joaquins: Layover andMaintenance Access Line
ACE Relocated Spur
San Joaquins: To Be Discontinued

Data Source: City of Merced, Merced County

0 1,000 2,000 Feet

Figure 3.11-2
Existing Land Use
Merced Intermodal Track Connection Project



Existing UPRR/Approved ACE
Proposed High-Speed Rail
Existing BNSF/San Joaquins
Proposed Integrated Merced High-Speed Rail Station
Approved ACE Merced Layover and Maintenance Facility
Half-mile Buffer
City of Merced Boundary

MITC Project
San Joaquins: Elevated Track
San Joaquins: At-grade Track
San Joaquins: Layover andMaintenance Access Line
ACE Relocated Spur
San Joaquins: To Be Discontinued

Data Source: City of Merced, Merced County

0 1,000 2,000 Feet

N

Figure 3.11-3
Existing Zoning
Merced Intermodal Track Connection Project

MITC

3.11.4 Impact Analysis

This section describes the environmental impacts of the Project on land use and planning. This section also describes the methods used to evaluate the impacts and the thresholds used to determine whether an impact would be significant.

3.11.4.1 Methods for Analysis

Methods

This analysis considers existing land uses, regional plans, and general plans of the City of Merced and Merced County that pertain to the Project. Potential impacts on land use and planning in the RSA were evaluated based on a review of existing land use policies from the applicable plans described in Section 3.11.2, *Regulatory Setting*. Figures documenting existing land uses and zoning designations from the city and county general plans within the RSA are shown on Figure 3.11-2 and Figure 3.11-3.

The approach to evaluate land use and planning considers whether the improvements would have any of the following effects:

- Enhance the connectivity and livability of the communities it serves or, instead, displace major community facilities, introduce a new or reinforce an existing physical barrier that divides an established community, or sever travel corridors that connect residents with important neighborhood and community facilities and institutions.
- Support and advance an adopted policy or, instead, contravene, impede, or thwart attainment of the policy.
- Be compatible, supportive, and promote the general plan land use designation, its intent, and the allowable uses or, instead, introduce a change to the setting that would conflict with the general plan or introduce land incompatibilities with the general plan land use designation, its intent, and the allowable uses.

Principal Sources

Principal sources consulted for the impact analysis are listed below.

- California Government Code Section 65300 – 65303.4
- California Sustainable Communities and Climate Protection Act of 2008 (SB 375, Chapter 728)
- Regional Transportation Plan (RTP) / Sustainable Community Strategy (SCS) for Merced County
- 2030 Merced County General Plan
- City of Merced Vision 2030 General Plan

3.11.4.2 Thresholds of Significance

The CEQA Guidelines Appendix G (14 Cal. Code Regs. 15000 et seq.) identifies significance criteria to be considered for determining whether a project could have significant impacts on land use and planning.

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

- Physically divide an established community.
- Cause a significant environmental impact due to conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect.

3.11.4.3 Impacts and Mitigation Measures

Impact LU-1	Construction of the Project would not physically divide an established community.
Level of Impact	**Potentially significant impact**
Mitigation Measures	TR-1.1: Transportation Management Plan (TMP) for Project construction
Level of Impact	**Less-than-significant impact**

Project

Impact Characterization

Construction of the Project would have the potential to temporarily disrupt access or necessitate detours on streets near construction areas. This disturbance could impede access to local businesses and community services and facilities in construction areas and could interfere with the routine activities and interactions that contribute to established communities.

Impact Details and Conclusions

The Project could require lane closures, roadway closures and detours throughout the construction process. Detours or impeded access due to construction of the Project would be temporary, lasting several days at a particular location, and would not result in a permanent impediment to circulation or access to common uses that define an established community. Nonetheless, construction activities could temporarily disrupt and interfere with uses that contribute to community cohesion and identity, which would be a potentially significant impact.

Mitigation Measures

Mitigation Measure TR-1.1: Transportation Management Plan (TMP) for Project construction

Refer to mitigation measure description in Section 3.16, *Transportation*.

Significance with Application of Mitigation Measure

Mitigation Measure TR-1.1, described in Section 3.16, *Transportation*, requires the preparation and adoption of a construction Transportation Management Plan (TMP) road traffic control plan for the Project and would include strategies to reduce impacts from street or lane closures and detours, maintain local circulation and traffic flow, and limit pedestrian and bicycle transit access closures. With implementation of Mitigation Measure TR-1.1, construction activities for the Project would not physically divide an established community and impacts would be less than significant.

Variant H1

Impact Characterization

In addition to construction within the approved ACE Merced Layover and Maintenance Facility, approximately 15 acres would be utilized for photovoltaic (solar panels). The additional acreage would be located on parcels that would be acquired to accommodate the proposed San Joaquins facility access line. This disturbance could impede access to local businesses and community services and facilities in construction areas and could interfere with the routine activities and interactions that contribute to established communities.

Impact Details and Conclusions

Variant H1 could require lane closures, roadway closures and detours throughout the construction process. Detours or impeded access due to construction of Variant H1 would be temporary, lasting several days at a particular location, and would not result in a permanent impediment to circulation or access to common uses that define an established community. Nonetheless, construction activities could temporarily disrupt and interfere with uses that contribute to community cohesion and identity, which would be a potentially significant impact.

Mitigation Measures

Mitigation Measure TR-1.1: Transportation Management Plan (TMP) for Project construction

Significance with Application of Mitigation Measure

With implementation of Mitigation Measure TR-1.1, construction activities for Variant H1 would not physically divide an established community and impacts would be less than significant.

Variant H2

Impact Details and Conclusions

Variant H2 could require lane closures, roadway closures and detours throughout the construction process. Detours or impeded access due to construction of Variant H1 would be temporary, lasting several days at a particular location, and would not result in a permanent impediment to circulation or access to common uses that define an established community. Nonetheless, construction activities could temporarily disrupt and interfere with uses that contribute to community cohesion and identity, which would be a potentially significant impact.

Mitigation Measures

Mitigation Measure TR-1.1: Transportation Management Plan (TMP) for Project construction

Significance with Application of Mitigation Measure

With implementation of Mitigation Measure TR-1.1, construction activities for Variant H2 would not physically divide an established community and impacts would be less than significant.

Variant H3

Impact Details and Conclusions

Variant H3 could require lane closures, roadway closures and detours throughout the construction process. Detours or impeded access due to construction of Variant H1 would be temporary, lasting several days at a particular location, and would not result in a permanent impediment to circulation or access to common uses that define an established community. Nonetheless, construction activities could temporarily disrupt and interfere with uses that contribute to community cohesion and identity, which would be a potentially significant impact.

Mitigation Measures

Mitigation Measure TR-1.1: Transportation Management Plan (TMP) for Project construction

Significance with Application of Mitigation Measure

With implementation of Mitigation Measure TR-1.1, construction activities for Variant H3 would not physically divide an established community and impacts would be less than significant.

Impact LU-2	Construction of the Project would not conflict with an applicable land use plan, policy, or regulation of an agency with jurisdiction over the improvements for the purpose of avoiding or mitigating an environmental effect.
Level of Impact	**Less-than-significant impact**

Project

Impact Characterization

Portions of the Project located outside the UPRR and BNSF ROWs are subject to local, county, and regional land use plans, policies, and regulations. An impact could occur if Project operations conflict with applicable land use plans, policies, and regulations. Project elements located within the existing UPRR and BNSF ROWs are exempt from local building and zoning codes and other land use ordinances. Portions of the Project will be constructed on existing UPRR and BNSF ROWs with at-grade and elevated track segments. As such, no impacts on land use and planning are expected from the operation within the UPRR and BNSF ROWs.

Impact Details and Conclusions

The Project would be located primarily in the City of Merced with a small portion of the approved ACE Merced Layover and Maintenance Facility located in Merced County. The majority of the Project would be located in locations currently zoned for industrial and commercial uses; however, small portions within the approved ACE Merced Layover and Maintenance Facility are zoned as low density residential (Figure 3.11-3). As shown in Figure 3.11-2, the existing land uses in these locations include business park, manufacturing/industrial and open space.

The Project would operate in accordance with the Merced Vision 2030 General Plan by furthering its goals of creating mixed-used, transit, and pedestrian-friendly residential environments, promoting communities with living environments that encourage people to use a variety of transportation alternatives, and building effective and efficient transportation infrastructure. The Project would be consistent with surrounding land uses and designations as included in both the City of Merced and Merced County General Plans and zoning policies.

Furthermore, the State of California's SB 375 seeks to reduce greenhouse gas emissions through coordinated transportation and land use planning.

Variant H1

Impact Characterization

Variant H1 is located primarily within the city limits of Merced with a small portion within the County of Merced. Construction of Variant H1 would be subject to local, county, and regional land use plans, policies, and regulations listed in Appendix 3.0-1. An impact could occur if construction of Variant H1 conflicts with applicable land use plans, policies, and regulations.

Impact Details and Conclusions

Variant H1 is consistent with applicable land use plans, policies, and regulations (e.g., general plans, specific plans, zoning codes, zoning maps) adopted by the regional and local jurisdictions within the RSA.

Furthermore, the State of California's SB 375 seeks to reduce greenhouse gas emissions through coordinated transportation and land use planning. Variant H1 supports these goals by providing clean energy (green hydrogen) to fuel future hydrogen powered trains.

Variant H2

Impact Characterization

Variant H2 is located entirely within the city limits of Merced, and the required equipment and infrastructure for Variant H2 would be located within the same environmental footprint as the Project. Construction of Variant H2 would be subject to local, county, and regional land use plans, policies, and regulations listed in Table 3.11-1. An impact could occur if construction of Variant H2 conflicts with applicable land use plans, policies, and regulations.

Impact Details and Conclusions

Variant H2 is consistent with applicable land use plans, policies, and regulations (e.g., general plans, specific plans, zoning codes, zoning maps) adopted by the regional and local jurisdictions. Construction of Variant H2 would not conflict with applicable land use plans, policies, or regulations.

Furthermore, the State of California's SB 375 seeks to reduce greenhouse gas emissions through coordinated transportation and land use planning. Variant H2 supports these goals by providing clean energy (green hydrogen) to fuel future hydrogen powered trains.

1 **Table 3.11-1. Consistency with Plans and Policies**

Planning Jurisdiction	Adopted Plans	Description of Plan	Consistency with Plans and Policies	Applicability
State of California	California Sustainable Communities and Climate Protection Act of 2008 (SB 375)	• SB 375 requires regional planning agencies in California to develop regional land use plans (called Sustainable Community Strategies [SCS]) as an integral part of their regional transportation plan (RTP) aimed at lowering greenhouse gas (GHG) emissions by reducing sprawl, co-locating uses to shorten necessary trips (home to work, home to store, etc.), and coordinating land use and transportation/transit planning.	**Consistent.** The Project and Variant H1 would support the State of California's SB 375 goals of lowering greenhouse gas emissions by providing the infrastructure and hydrogen fuel to power future hydrogen powered trains.	**Project, and Variant H1**

Planning Jurisdiction	Adopted Plans	Description of Plan	Consistency with Plans and Policies	Applicability
Merced County Association of Governments	*RTP/ SCS*	Adopted in 2022, the RTP/SCS (the "RTP plan") is a long-range planning document that guides investments in roads, freeways, public transit, bikeways, and other ways people move around Merced County until 2046. The RTP plan seeks to ensure that the Merced County Transportation system continues to operate efficiently with sufficient capacity to meet demand through a suite of mobility options. Relevant goals and objectives include: • Goal 9. Passenger Rail: Provide a rail system that offers safe and reliable service for passengers. • Objective 9.1. Expand intercity passenger service on the Amtrak San Joaquin route. • Objective 9.2. Establish new commuter rail service provided by the Altamont Corridor Express to Sacramento and San Jose. • Objective 9.3. Establish a high-speed rail system connecting Merced to the Bay Area and Southern California.	**Consistent.** The Project and Variant 1 would further the goals of the RTP/SCS by expanding intercity passenger service on the Amtrak San Joaquin route. The RTP plan identifies the Project as a critical project for future operations of the Amtrak San Joaquins Rail, enabling direct cross-platform connections to other rail services and transit. The Project is consistent with goals to (1) provide an efficient, effective, coordinated regional transit system that increases mobility for urban and rural populations, including transportation for disadvantaged persons, and (2) provide a rail system that offers safe and reliable service for passengers. Variant H1 provides the necessary fuel necessary for a reliable regional transit system.	**Project and Variant H1**

Planning Jurisdiction	Adopted Plans	Description of Plan	Consistency with Plans and Policies	Applicability
Merced County	*2030 Merced County General Plan*	The 2030 Merced County General Plan (2013) serves as the County's blueprint for future land use, development, preservation, and resource conservation decisions until 2030.	**Consistent.** The Project and Variant H1 are consistent with the 2030 Merced County General Plan by focusing growth within existing or suitably located new communities (Goal LU-1), primarily limiting growth within established city boundaries (Policy LU-1.1), and promoting transit ridership (Policy LU-1.7).	**Project and Variant H1**
Merced County	Merced County Zoning Ordinance, Title 18, Article 2: Zones, Allowable Uses, and Development Standards	The Merced County Unified Development Ordinance provides a set of detailed requirements that implement General Plan policies at the individual parcel level. Title 18, Article 2 of the Merced County Unified Development Ordinance establishes locational and developmental standards that regulate what may or may not be done on a particular parcel of unincorporated land. Such standards include lot size, building setback, and a list of allowable uses.	**Consistent.** The Project and Variant H1 are consistent with Title 18, Article 2 of the Merced County Zoning Ordinance since the Project would be located on land that conforms or complements the zoning of the respective locations (industrial or commercial) (Merced County 2019).	**Project and Variant H1**

Planning Jurisdiction	Adopted Plans	Description of Plan	Consistency with Plans and Policies	Applicability
City of Merced	*Merced Vision 2030 General Plan*	The Merced Vision 2030 General Plan, adopted in 2012, serves as the blueprint for growth and development in the City of Merced until 2030. The Merced Vision 2030 General Plan includes 10 topics: urban expansion (amended 2015), land use (amended 2015), transportation and circulation (amended 2015), public services (amended 2017), urban design, open space (amended 2016), sustainable development, housing (amended 2016), noise, and safety (amended 2016).	**Consistent.** The Project, Variant H1, Variant H2, and Variant H3 are consistent with the Merced Vision 2030 General Plan by furthering its goals of creating mixed-used, transit, and pedestrian-friendly residential environments, promoting communities with living environments that encourage people to use a variety of transportation alternatives, and building effective and efficient transportation infrastructure. Furthermore, the Project, Variant H1, Variant H2, and Variant H3 are consistent with the City of Merced General Plan Land Use Diagram since the Project or the Variants would be located on land that conforms or complements the zoning and land uses of the respective locations (manufacturing/industrial or general commercial). Although small portions are zoned as low density residential or designated to open space land uses, currently those locations actually have manufacturing and industrial uses and therefore would be consistent with surrounding land uses and designations (City of Merced General Plan Land Use Diagram 2015).	**Project, Variant H1, Variant H2, and Variant H3**

Variant H3

Impact Characterization

Variant H3 is located entirely within the city limits of Merced, and the required equipment and infrastructure for Variant H3 would be located within the same environmental footprint as the Project. Construction of Variant H3 would be subject to local, county, and regional land use plans, policies, and regulations listed in Table 3.11-1. An impact could occur if construction of Variant H3 conflicts with applicable land use plans, policies, and regulations.

Impact Details and Conclusions

Construction activities for Variant H3 are similar to Variant H2 with no additional impacts.

Impact LU-3	Operation of the Project would not physically divide an established community.
Level of Impact	**Less-than-significant impact**

Project

Impact Characterization

As shown in Figure 3.11-3, the approved ACE Merced Layover and Maintenance Facility is zoned for industrial and commercial uses and the rail extensions generally follow the SR 59 and UPRR and BNSF ROWs. The study area provides a mix of employment and residential opportunities accessed via SR 59, Ashby Road, 16th Street and various cross streets in the urbanized core. Although much of the Project is elevated, a proposed at-grade rail crossing at the intersection at SR 59 / Cooper Avenue and a modification of the existing UPRR spur at -grade crossing at the SR 59 /16th Street intersection would be required potentially impacting community accessibility.

Impact Details and Conclusions

The majority of the proposed rail segment is elevated, negating the need for at-grade rail crossings at busy downtown cross streets including V, R and O Streets, and allowing for continual access and flow of active transportation and vehicular movement during operations. The proposed at-grade rail crossing at the intersection of SR 59 and 16th Street would replace the existing UPRR spur crossing. UPRR provides intermittent service to the industrial area. While the limited number of crossings that would occur would cause temporary inconveniences, the crossings would not result in a division of the community. The proposed at-grade rail crossing located at the signalized intersection of SR 59 / Cooper Avenue may cause time delays for those entering or leaving the industrial area; however, access will be maintained to this area. No residential land uses or zoned parcels would be acquired for operation activities.

Although portions of the Project would be located in areas with existing commercial, public/general use, and a small portion zoned as Low Density Residential, the Project would not result in the division of an established community or contribute to the loss of community cohesion because the Project would be located within or adjacent to the existing UPRR ROW, which already serves as an existing barrier in the community. In addition, the Project would occupy spaces compatible with industrial, commercial uses, and public use land uses in the surrounding area. Therefore, operation of the Project would not affect property access and would not physically divide an established community and impacts would be less than significant.

Variant H1

Impact Characterization

Variant H1 is located mostly within the city limits of Merced with a small portion of Variant H1 within the County of Merced. An impact could occur if Variant H1 operations would impede routine activities and interactions frequented by established communities, thereby contributing to the physical division of an established community.

Impact Details and Conclusions

Solar panels, hydrogen processing, and green hydrogen storage are components of Variant H1. approximately 15 acres would be utilized for photovoltaic (solar panels), in addition to the approved ACE Merced Layover and Maintenance Facility. The remaining acres would be located on parcels proposed for full acquistion to accommodate the San Joaquins access track connection to approved ACE Merced Layover and Maintenance Facility. These sites are along Fahrens Creek, south of the BNSF Railway/San Joaquins Amtrak ROW and north of Ashby Road and SR 59. Fahrens Creek, BNSF ROW, and SR 59, all of which currently function as a physical barrier between residential communities.

Variant H1's solar panels and hydrogen generation and storage would operate on land designated as manufacturing/industrial, business park, and general commercial and within the UPRR and BNSF ROWs as shown on Figure 3.11-2 and Figure 3.11-3 (City of Merced 2015). Variant H1 would not operate on land uses containing residential communities or schools, public facilities such as post offices or community centers, and government offices. Portions of Variant H1 would operate adjacent to the UPRR ROW on land uses designated as general commercial, open space, and manufacturing/industrial. Additionally, these land uses are zoned as heavy manufacturing and light manufacturing (City of Merced 2015).

Overall, Variant H1 would not result in the division of an established community or contribute to the loss of community cohesion because the Project would be located within or adjacent to the existing UPRR ROW, which already serves as an existing barrier in the community. Operation of Variant H1 would not affect property access and would not physically divide an established community. Therefore, no impacts would occur during operation of Variant H1.

Variant H2

Impact Characterization

Variant H2 is located within the city limits of Merced. An impact could occur if Variant H2 operations would impede routine activities and interactions frequented by established communities, thereby contributing to the physical division of an established community.

Impact Details and Conclusions

On-site hydrogen storage are components of Variant H2. Variant H2 would operate on 0.89 acres of the approved ACE Merced Layover and Maintenance Facility. Variant H2 is consistent with applicable land use plans, policies, and regulations (e.g., general plans, specific plans, zoning codes, zoning maps) adopted by the state, regional and local jurisdictions. Implementation of Variant H2 would not affect property access and would not physically divide an established community. Therefore, no impacts would occur during operation of Variant H2.

Variant H3

Impact Characterization

Variant H3 is located within the city limits of Merced. An impact could occur if Variant H2 operations would impede routine activities and interactions frequented by established communities, thereby contributing to the physical division of an established community.

Impact Details and Conclusions

Variant H3's operation activities are similar to Variant H2 with no additional impacts. As such, no impacts would occur during operation of Variant H3.

Impact LU-4	Operation of the Project would not conflict with an applicable land use plan, policy, or regulation of an agency with jurisdiction over the improvements for the purpose of avoiding or mitigating an environmental effect.
Level of Impact	**No impact**

Project

Impact Characterization

Project elements located within the existing UPRR and BNSF ROWs are exempt from local building and zoning codes and other land use ordinances. As shown in Figure 3.11-1, portions of the Project will be constructed on existing UPRR and BNSF ROWs with at-grade and elevated track segments.

Portions of the Project would be located outside UPRR and BNSF ROWs occurring on properties subject to local, county, and regional land use plans, policies, and regulations. An impact could occur if Project operations conflict with applicable land use plans, policies, and regulations.

Impact Details and Conclusions

The Project is located primarily in the City of Merced with a small portion of the approved ACE Merced Layover and Maintenance Facility located in Merced County. Shown on Figure 3.11-3, the majority of the Project would be in locations currently zoned for industrial and commercial uses; however, small portions within the Approved ACE Merced Layover and Maintenance Facility are zoned as residential planned development (Merced County) planned development and low density residential. Shown in Figure 3.11-2, the existing land uses in these locations include business park, manufacturing/industrial and open space.

The Project would operate in accordance with the Merced Vision 2030 General Plan by furthering its goals of creating mixed-used, transit, and pedestrian-friendly residential environments, promoting communities with living environments that encourage people to use a variety of transportation alternatives, and building effective and efficient transportation infrastructure. The Project would be consistent with surrounding land uses and designations as included in both the City of Merced and Merced County General Plans and zoning policies.

Furthermore, the State of California's SB 375 seeks to reduce greenhouse gas emissions through coordinated transportation and land use planning. Therefore, no impacts would occur during operation of the Project.

Variant H1

Impact Characterization

As shown on Figure 3.11-2, Variant H1 is located primarily within the city limits of Merced with a small portion within the County of Merced. Construction of Variant H1 would be subject to local, county, and regional land use plans, policies, and regulations listed in Table 3.11-1. An impact could occur if construction of Variant H1 conflicts with applicable land use plans, policies, and regulations.

Impact Details and Conclusions

Variant H1 is consistent with applicable land use plans, policies, and regulations (e.g., general plans, specific plans, zoning codes, zoning maps) adopted by the regional and local jurisdictions within the RSA. Furthermore, the State of California's SB 375 seeks to reduce greenhouse gas emissions through coordinated transportation and land use planning. Variant H1 supports these goals by providing clean energy (green hydrogen) to fuel future hydrogen powered trains. Therefore, no impacts would occur during operation of Variant H1.

Variant H2

Impact Characterization

Variant H2 is located entirely within the city limits of Merced, and the required equipment and infrastructure for Variant H2 would be located within the same environmental footprint as the Project. Construction of Variant H2 would be subject to local, county, and regional land use plans, policies, and regulations listed in Table 3.11-1. An impact could occur if construction of Variant H2 conflicts with applicable land use plans, policies, and regulations.

Impact Details and Conclusions

Variant H2 is consistent with applicable land use plans, policies, and regulations (e.g., general plans, specific plans, zoning codes, zoning maps) adopted by the regional and local jurisdictions. Construction of Variant H2 would not conflict with applicable land use plans, policies, or regulations. Furthermore, the State of California's SB 375 seeks to reduce greenhouse gas emissions through coordinated transportation and land use planning. Therefore, no impacts would occur during operation of Variant H2.

Variant H3

Impact Characterization

Variant H3 is located entirely within the city limits of Merced, and the required equipment and infrastructure for Variant H3 would be located within the same environmental footprint as the Project. Construction of Variant H3 would be subject to local, county, and regional land use plans, policies, and regulations listed in Table 3.11-1. An impact could occur if construction of Variant H3 conflicts with applicable land use plans, policies, and regulations.

Impact Details and Conclusions

Variant H3 operation activities are similar to Variant H2 with no additional impacts. As such, no impacts would occur during operation of Variant H3.

3.12 Noise and Vibration

3.12.1 Introduction

This section describes the regulatory and environmental setting for noise and vibration in the vicinity of the Project. It also describes the impacts from noise and vibration on sensitive land uses that would result from the Project and mitigation measures that would reduce significant impacts, where feasible and appropriate.

Cumulative impacts from noise and vibration, in combination with planned, approved, and reasonably foreseeable projects, are discussed in Chapter 4, *Cumulative Impacts*.

3.12.1.1 Fundamentals of Environmental Noise and Vibration

Overview of Noise and Sound

Noise is unwanted sound. Sound is measured in terms of sound pressure level and is usually expressed in decibels (dB). The human ear is less sensitive to higher and lower frequencies than it is to mid-range frequencies. Almost all noise ordinances, and this noise analysis, use the A-weighted decibel (dBA) system, which measures what humans hear in a more meaningful way because it reduces the sound levels of higher and lower frequency sounds—similar to what humans hear. Figure 3.12-1 shows typical cumulative A-weighted sound pressure levels (L_{DN}) for transit and non-transit sources.

Noise from transit systems is expressed in terms of a source-path-receiver framework. The source generates noise levels that depend on the type of source (e.g., a commuter train) and its operating characteristics (e.g., speed). The receiver is the noise-sensitive land use (e.g., residence, hospital, school) exposed to noise from the source. Between the source and the receiver is the path, where the noise is reduced by distance, intervening buildings, and topography. Environmental noise impacts are assessed at the receiver. Noise criteria are established for the various types of receivers because not all receivers have the same noise sensitivity.

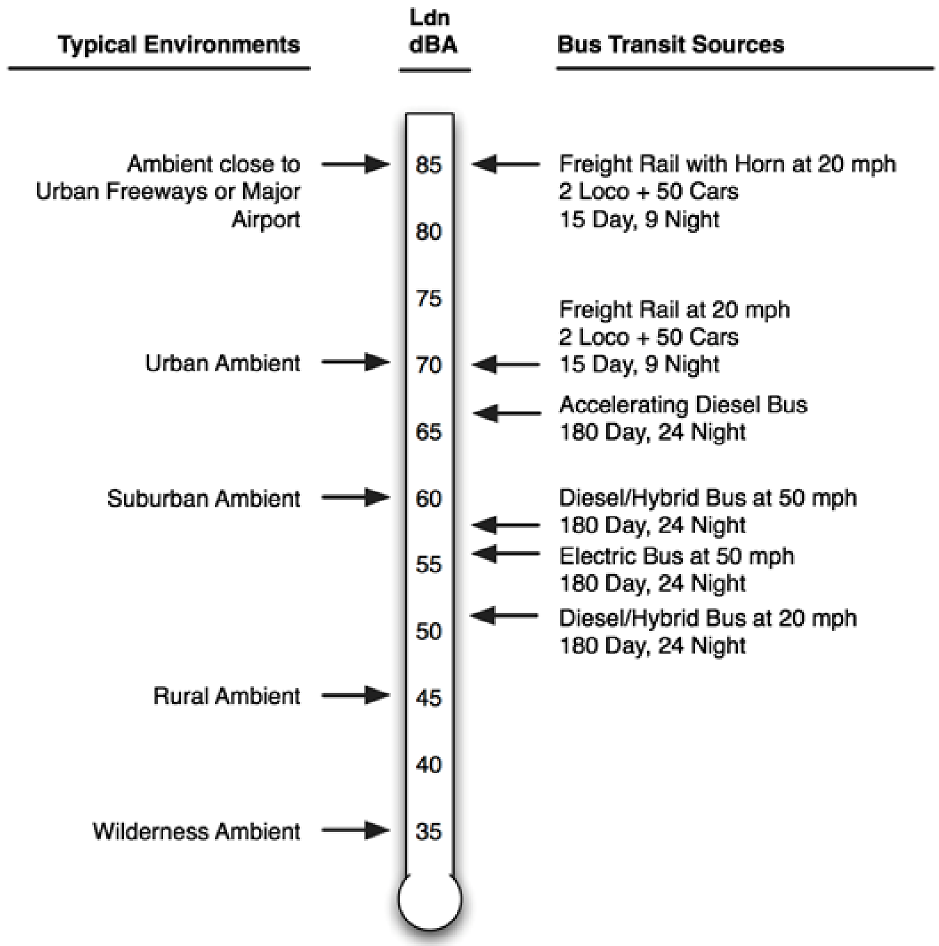


Figure 3.12-1. Cumulative Noise Levels from Transportation Sources

Analysts use four common noise measurement descriptors to assess noise impacts from traffic and transit projects. They are the equivalent sound level (L_{eq}), the day-night sound level (L_{dn}), the maximum sound level (L_{max}), and the sound exposure level (SEL).

- L_{eq}: The level of a constant sound for a specified period of time that has the same sound energy as an actual fluctuating noise over the same period of time. The peak-hour L_{eq} is used for all traffic and commuter rail noise analyses at locations with daytime use, such as schools and libraries.
- L_{dn}: The L_{eq} over a 24-hour period, with 10 decibels added to nighttime sound levels (between 10 p.m. and 7 a.m.) to account for the greater sensitivity and lower background sound levels during this time. The L_{dn} is the primary noise-level descriptor for rail noise at residential land uses.
- L_{max}: The loudest 1 second of noise over a measurement period, or L_{max}, is used in many local and state ordinances for noise emitted from private land uses and for construction noise impact evaluations.
- SEL: The SEL is the primary descriptor of a single noise event (e.g., noise from a train passing a specific location along the track). The SEL represents a receiver's cumulative noise exposure

from an event and the total A-weighted sound during the event normalized to a 1-second interval.

Overview of Groundborne Vibration

Vibration from a transit system is also expressed in terms of a source-path-receiver framework but instead of the air, is transmitted through solids. The source is the train rolling on the tracks, which generates vibration energy transmitted through the supporting structure under the tracks and into the ground. Once the vibration gets into the ground, it propagates through the various soil and rock strata—the path—to the foundations of nearby buildings—the receivers. Groundborne vibrations are generally reduced with distance depending on the local geological conditions. A receiver is a vibration-sensitive building (e.g., residence, hospital, school) where the vibrations may cause perceptible shaking of the floors, walls, and ceilings and a rumbling sound inside rooms. Not all receivers have the same vibration sensitivity. Consequently, vibration criteria are established for the various types of receivers. Groundborne noise often occurs as a perceptible rumble and is caused by the noise radiated from the vibration of room surfaces.

Vibration above certain levels can damage buildings, disrupt sensitive operations, and cause annoyance to humans in buildings. The response of humans, buildings, and equipment to vibration is most accurately described using velocity or acceleration. In this analysis, vibration decibel (VdB) is the primary measure to evaluate the effects of vibration. Figure 3.12-2 illustrates typical groundborne vibration velocity levels for common sources and thresholds for human and structural response to groundborne vibration. As shown, the range of interest is from approximately 50 to 100 VdB in terms of vibration velocity level (i.e., from imperceptible background vibration to the threshold of damage). Although the threshold of human perception to vibration is approximately 65 VdB, annoyance does not usually occur unless the vibration exceeds 70 VdB.

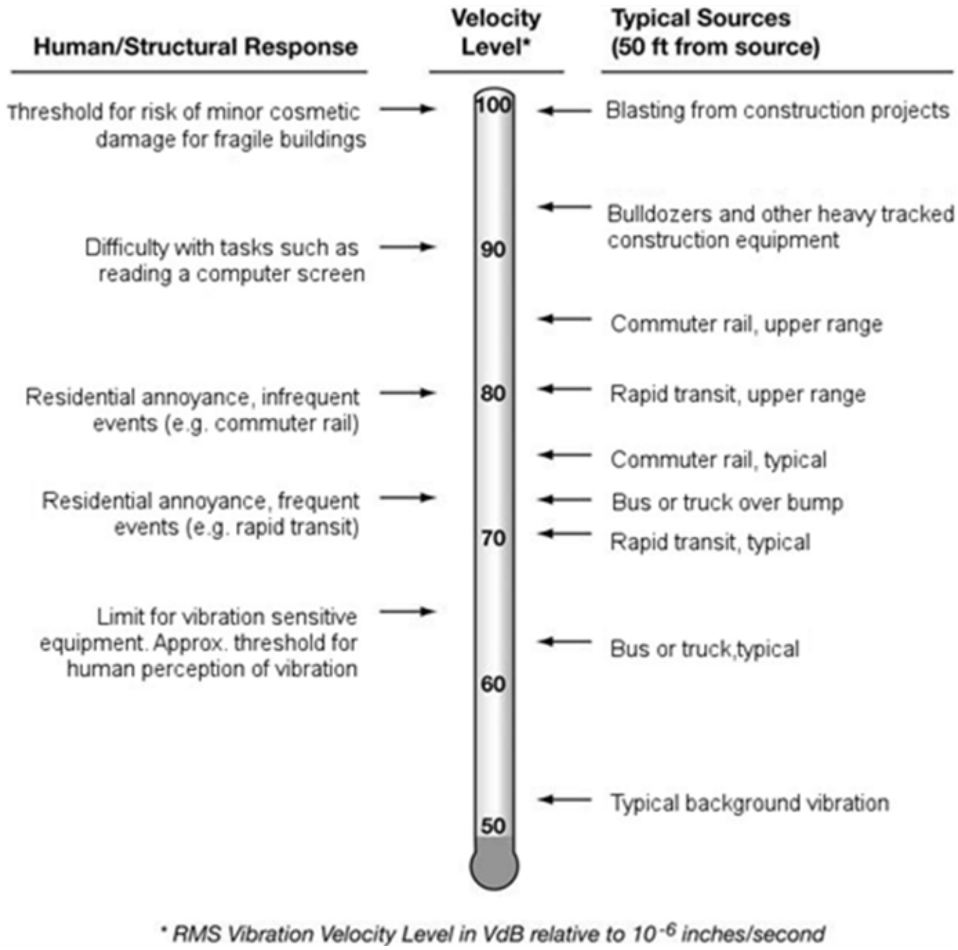


Figure 3.12-2. Typical Groundborne Vibration Levels

3.12.2 Regulatory Setting

This section summarizes the federal, state, regional, and local regulations related to noise and vibration applicable to the Project.

3.12.2.1 Federal

Noise Control Act of 1972

The Noise Control Act of 1972 (42 United States Code [USC] § 4901) was the first comprehensive statement of national noise policy. The Noise Control Act declared "it is the policy of the U.S. to promote an environment for all Americans free from noise that jeopardizes their health or welfare." Although the Noise Control Act, as a funded program, was ultimately abandoned at the federal level, it served as the catalyst for comprehensive noise studies and the generation of noise assessment and mitigation policies, regulations, ordinances, standards, and guidance for many states, counties, and municipal governments. For example, the noise elements of community general plan documents and local noise ordinances considered in this analysis were largely created in response to the passage of the Noise Control Act.

U.S. Environmental Protection Agency Railroad Noise Emission Standards

Interstate rail carriers must comply with U.S. Environmental Protection Agency (40 Code of Federal Regulation [CFR] § 201) noise emission standards, which are expressed as maximum measured noise levels and applicable to locomotives manufactured after 1979.

- 100 feet from geometric center of stationary locomotive, connected to a load cell and operating at any throttle setting except idle—87 A-weighted decibels (at idle setting, 70 A-weighted decibels).
- 100 feet from geometric center of mobile locomotive—90 A-weighted decibels.
- 100 feet from geometric center of mobile railcars, at speeds of up to 45 miles per hour—88 A-weighted decibels—or speeds greater than 45 miles per hour—93 A-weighted decibels.

Federal Railroad Administration Guidelines and Noise Emission Compliance Regulation

The Federal Railroad Administration (FRA) has developed a guidance manual for assessing noise and vibration impacts from major rail projects. Although not at the level of a rule or a standard, FRA guidance is intended to satisfy environmental review requirements and assist project sponsors in addressing predicted construction and operation noise and vibration during the design process. FRA also has a regulation governing compliance of noise emissions from interstate railroads. FRA's Railroad Noise Emission Compliance Regulation (49 CFR § 210) prescribes compliance requirements for enforcing railroad noise emission standards adopted by the U.S. Environmental Protection Agency (40 CFR § 201).

Federal Transit Administration Guidelines

Similar to FRA, the Federal Transit Administration (FTA) has developed a guidance manual for assessing noise and vibration impacts from major rail projects intended to satisfy environmental review requirements and assist project sponsors in addressing predicted construction and operation noise and vibration during the design process. The FTA guidance manual noise and vibration impact criteria for rail projects and their associated fixed facilities, such as storage and maintenance yards, passenger stations and terminals, parking facilities, and substations are described in Section 3.12.4.2, *Thresholds of Significance*, and are the primary noise criteria used for the Project. FTA guidance is accepted by FRA.

3.12.2.2 State

California Noise Control Act

At the state level, the California Noise Control Act of 1973 (Health and Safety Code § 46010 et seq.), requires the Office of Noise Control in the Department of Health Services to provide assistance to local communities developing local noise control programs. The Office of Noise Control also works with the Office of Planning and Research to provide guidance for preparing required noise elements in city and county general plans, pursuant to Government Code Section 65302(f). In preparing the noise element, a city or county must identify local noise sources and analyze and quantify, to the extent practicable, current and projected noise levels for various sources, including highways and freeways; passenger and freight railroad operations; ground rapid transit systems; commercial, general, and military aviation and airport operations; and other ground stationary noise sources. These noise sources also would include commuter rail alignments. The California Noise Control Act stipulates the mapping of noise-level contours for these sources, using community noise metrics appropriate for environmental impact assessment as defined in Section 3.12.4.2, *Thresholds of Significance*. Cities and counties use these as guides to making land use decisions to minimize the community residents' exposure to excessive noise.

3.12.2.3 Regional and Local

The San Joaquin Joint Powers Authority (SJJPA), as a state joint powers agency, proposes improvements within and outside the Union Pacific Railroad (UPRR) and BNSF Railway (BNSF) rights-of-way. The Interstate Commerce Commission Termination Act (ICCTA) affords railroads that engage in interstate commerce considerable flexibility in making necessary improvements and modifications to rail infrastructure, subject to the requirements of the Surface Transportation Board. ICCTA broadly preempts state and local regulation of railroads; this preemption extends to the construction and operation of rail lines. As such, activities within the UPRR and BNSF rights-of-way are clearly exempt from local building and zoning codes as well as other land use ordinances. Project activities outside of the UPRR and BNSF rights-of-way, however, could be subject to regional and local plans and regulations. Though ICCTA broadly preempts state and local regulation of railroads, SJJPA intends to obtain local agency permits for construction of facilities that fall outside the UPRR and BNSF rights-of-way, even though SJJPA has not determined whether such permits are legally necessary or required.

Appendix 3.0-1 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 Project improvements would be 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 Project would be consistent with the plans of relevant jurisdictions.1 The Project would be generally consistent with the applicable goals, policies, and objectives related to noise and vibration identified in Appendix 3.0-1. There are instances, however, in which the Project could be inconsistent with the local goals, policies, and objectives related to noise and vibration. The noise and vibration impact and mitigation requirements prescribed for the Project are based on FRA and FTA standards.

The Project would be located in the jurisdiction of one county and one incorporated city. Table 3.12-1 lists county and city general plans and summarizes applicable noise and vibration policies that have been reviewed and considered for the preparation of this analysis.

[1] 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.

Table 3.12-1. List of Local Plans Regarding Noise and Vibration

Document Title	Summary
2030 Merced County General Plan (County of Merced 2013)	Policy HS-7.2 requires noise mitigation measures to reduce traffic and/or rail noise levels to comply with standards if pre-project noise levels already exceed the standards for new uses affected by transportation (65 decibels L_{dn} for residential, office buildings, and other noise-sensitive land uses; and 70 decibels L_{dn} for playgrounds and parks) and the increase is significant. Policy HS-7.11 supports improvements to at-grade crossings in urban areas to eliminate the need for train horn sounding near communities. Policy HS-7.12 requires new projects to include appropriate noise mitigation measures to comply with standards.
Merced Vision 2030 General Plan (City of Merced 2012)	Policy N-1.6 requires mitigation for all significant noise impacts as a condition of project approval for sensitive land uses. The maximum allowable noise exposure from transportation (railroad) noise sources is set at 65 decibels L_{dn} for residential and other noise-sensitive land uses and 70 decibels L_{dn} for playgrounds and parks.

Note: All general plans follow the noise standards set by the State of California
dB =decibel
L_{dn} =day-night sound level

3.12.3 Environmental Setting

This section describes the environmental setting related to noise and vibration for the Project.

3.12.3.1 Study Area

For the purposes of this analysis, the study area for noise and vibration is defined as follows:

- The study area for noise is the area within approximately 500 feet of the track centerline or maintenance facility.
- The study area for vibration is the area within approximately 200 feet of the track centerline or maintenance facility.

Figure 3.12-3 depicts the noise and vibration study areas for the Project.

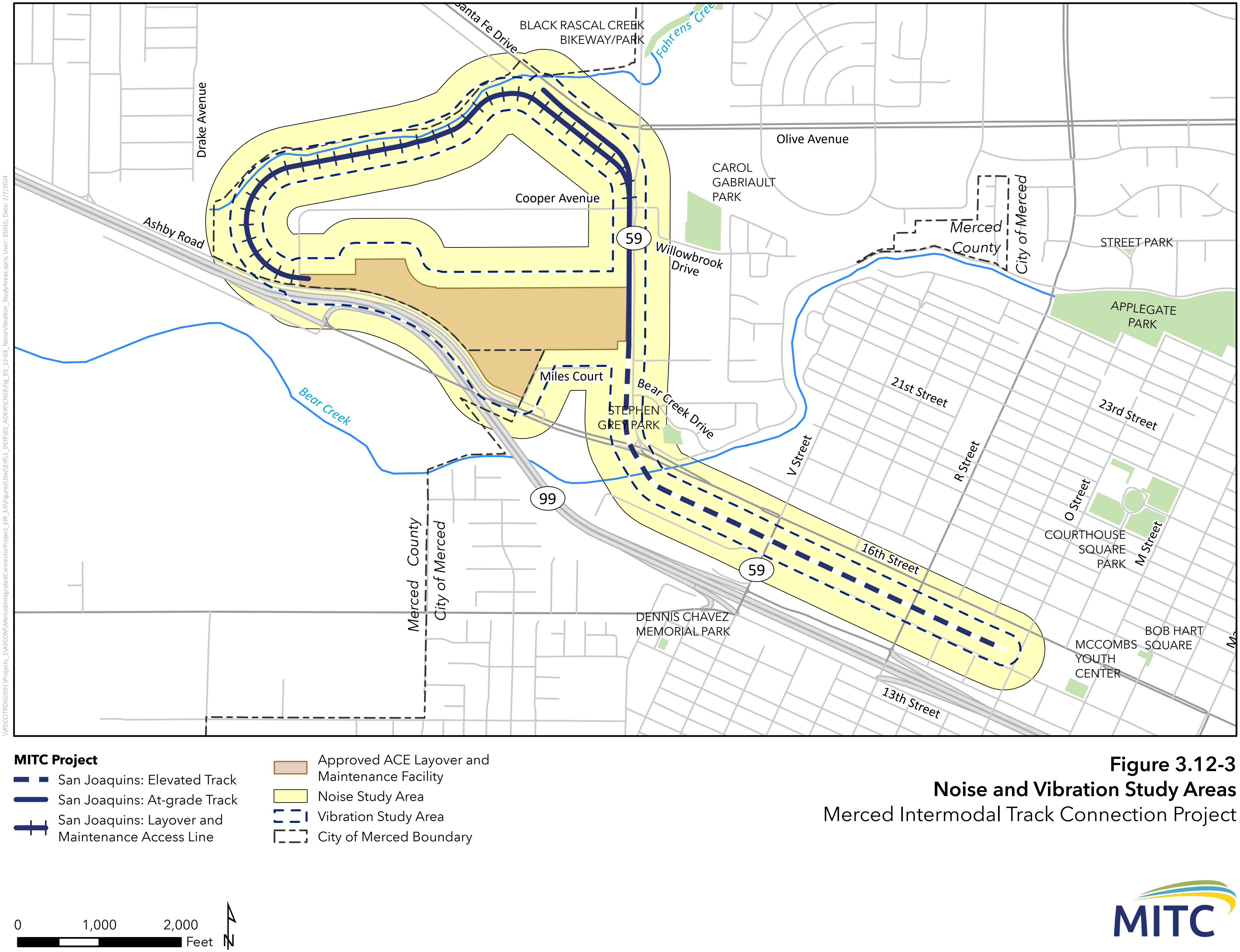


Figure 3.12-3
Noise and Vibration Study Areas
Merced Intermodal Track Connection Project

3.12.3.2 Noise and Vibration Levels

Information presented in this section regarding noise and vibration was obtained from the following sources:

- Available reports and data (federal and state statutes, regional agency policies, and ordinances)
- Field reconnaissance throughout the study area to assess potential locations for noise measurements
- Noise measurements at locations throughout the study area to document existing conditions at sensitive receptors
- Amtrak San Joaquins data on existing locomotive fleet and operations
- General plan noise elements for jurisdictions included in the Project vicinity

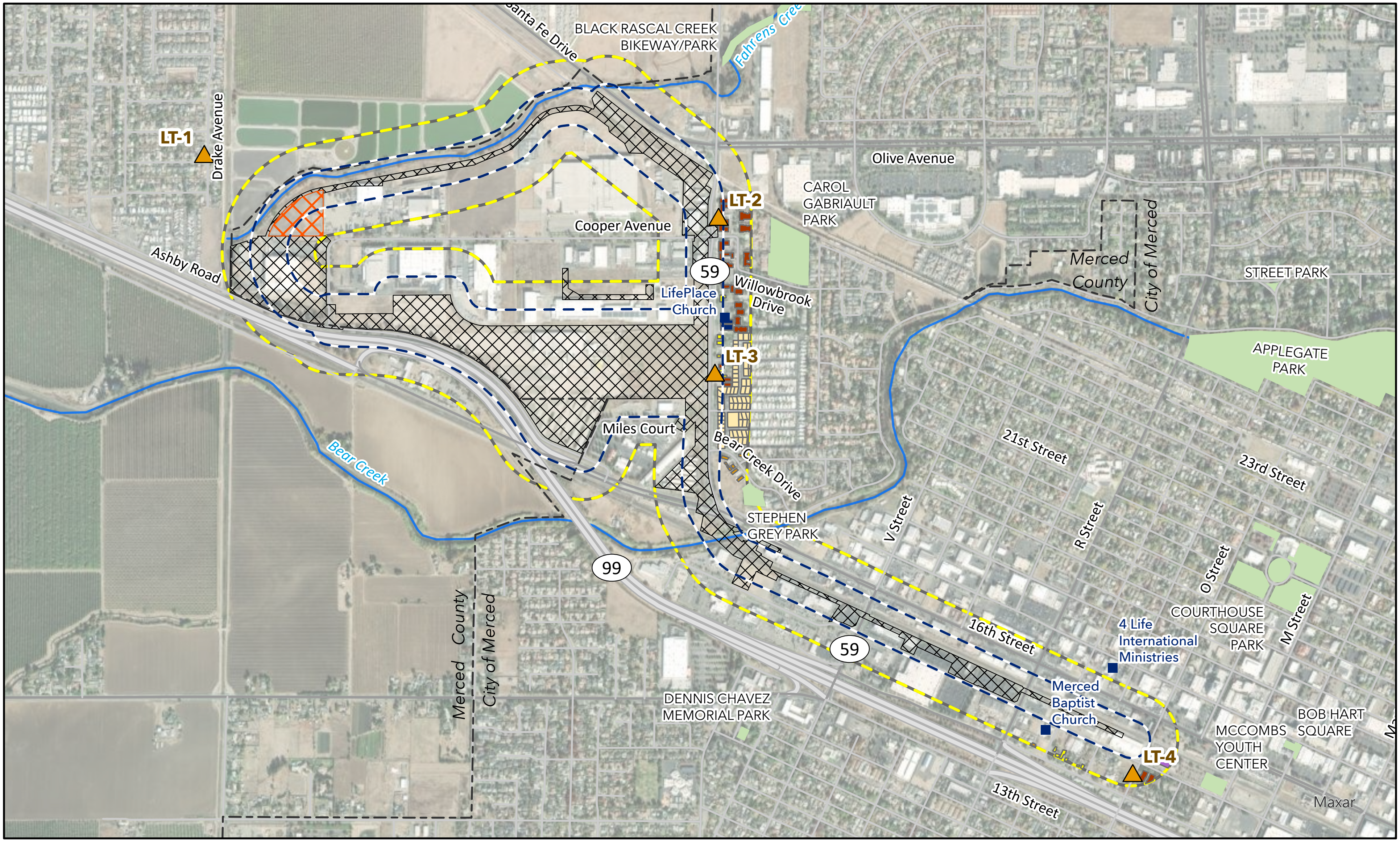
Based on this information, existing noise sources in the study area include Amtrak San Joaquins intercity rail operations (in some areas), freight rail operations, roadway traffic, and general community activity. Significant sources of vibration in the study area are Amtrak San Joaquins intercity rail service (in some areas) and freight rail operations.

Because the thresholds for noise impacts in FTA noise criteria are based on the existing noise levels, measuring and characterizing the existing noise levels at noise-sensitive receptor locations in the study area is an important step in the impact assessment. The noise measurements included long-term (24-hour) monitoring of the A-weighted sound level at noise-sensitive receptor locations in the study area.

The noise measurements were performed with NTi Audio model XL2 noise monitors that conform to American National Standard Institute standards for Type 1 (precision) sound level meters. Calibrations, based on the U.S. National Institute of Standards and Technology standards, were conducted before and after each measurement. The noise monitors were set to continuously monitor and record multiple noise level metrics, as well as to obtain audio recordings during the measurement periods.

Table 3.12-2 summarizes results of the existing noise measurements for the Project study area. Figure 3.12-4 shows the locations of the 4 long-term noise sites (LT) and noise senstive land uses within the study area for noise and vibration. The long-term noise measurements were used to characterize the existing noise levels at residential locations, and hourly data from the long-term sites were used to characterize the existing noise levels at sensitive nonresidential locations.

The sensitive land use for vibration is essentially the same as for noise, except that parkland is not considered a vibration-sensitive receptor. Because a general vibration assessment, as described in Section 6.4 of the FTA guidance manual, (rather than a detailed vibration analysis) was performed, existing vibration levels were not measured for this analysis.



MITC Environmental Footprint
Variant H1 Additional Environmental Footprint
Noise Study Area
Vibration Study Area
City of Merced Boundary

Sensitive Receptors
Residential - High Density
Residential - Medium Density
Residential - Single Family
Residential - Mobile Home
Senior Center
Church

0 1,000 2,000 Feet
N

Figure 3.12-4
Noise Measurement Locations and Noise-Sensitive Land Uses
Merced Intermodal Track Connection Project

MITC

Table 3.12-2. Existing Noise Level Measurements in the Study Area

Site #	Measurement Location	Measurement Start	Measurement Duration (Hours)	Noise Level (dBA)[a]	
				Peak Hour L_{eq}	L_{dn}
LT-1	2115 Drake Ave, Merced County	2023-7-25	24	53	60
LT-2	3028 Willowbrook Drive, Merced	2023-7-25	24	67	74
LT-3	2646 N State Highway 59, Merced	2023-7-25	24	72	75
LT-4[b]	1427 O St., Merced	2022-6-14	3[c]	65	63

Notes:
[a] L_{dn} is used for Category 2 (residential) land use and L_{eq} is used for Category 3 (institutional) land use.
[b] LT-4 was measured as a part of the California High-Speed Rail Authority Merced to Fresno Project Section, Merced Station Relocation Variation Noise and Vibration Impact Assessment, August 2022
[c] Three 1-hour measurements were made to estimate the L_{dn} using calculations in the FTA Guidance Manual.
LT-#=long-term noise sites
dBA=A-weighted decibels
L_{eq} = equivalent sound level
L_{dn} = day-night sound level

3.12.3.3 Sensitive Land Uses

The Project is located in the City of Merced and the Project study area includes the City of Merced and a portion of unincorporated Merced County.

Noise-sensitive land uses and receptors in the Project study area include single-family residences and mobile home parks to the west of the proposed maintenance facility site; single- and multi-family housing, a mobile home park, the Life Place Church and the Stephen Gray Park along North State Highway 59; and single- and multi-family residences, hotels, the Merced Baptist Church, and 4 Life International Ministries in downtown Merced north of O Street.

The following noise measurement sites were used to characterize the existing noise levels in the Project study area:

- **Site LT-1, 2115 Drake Ave, Merced County:** The L_{dn} measured at this location was 60 A-weighted decibels. The dominant noise sources were traffic on Drake Avenue and distant train noise. Noise levels were measured for 24 hours in front of the building. This noise measurement site is representative of all noise-sensitive land uses to the west of the proposed maintenance facility.
- **Site LT-2, 3028 Willowbrook Drive, Merced:** The L_{dn} measured at this location was 74 A-weighted decibels. The dominant noise sources were local road traffic on North State Highway 59 and local activities. Noise levels were measured for 24 hours between two of the apartment buildings. This noise measurement site is representative of all noise-sensitive land uses on the northern portion of North State Highway 59.
- **Site LT-3, 2646 N State Highway 59, Merced:** The L_{dn} measured at this location was 75 A-weighted decibels. The dominant noise source was traffic on North State Highway 59. Noise levels were measured for 24 hours in the front yard of the residence. This noise measurement site is representative of all noise-sensitive land uses on the southern portion of North State Highway 59.

- **Site LT-4, 1427 O St., Merced:** The L_{dn} estimated at this location was 63 A-weighted decibels. The dominant noise sources were State Route 99 and freight trains. Noise levels were measured for 3 hours adjacent to the Sierra Meadows Senior Apartments. This noise measurement site is representative of all noise-sensitive land uses north of O Street in downtown Merced.

3.12.4 Impact Analysis

This section describes the environmental impacts of the Project for noise and vibration. This section also 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.

3.12.4.1 Methods for Analysis

Methods

The approach to evaluating noise and vibration impacts from this Project followed the FTA's guidance manual, Transit Noise and Vibration Impact Assessment (FTA 2018) and can be summarized as follows.

- Analyze direct noise and vibration impacts through quantitative analysis.
- To assess railroad noise and vibration, consider train type, train schedule, number of cars in each train, speed profiles, plans and profiles of the track structure (elevated vs at-grade), use of horns and bells at at-grade crossings, landform topography, and noise level changes associated with the proposed route change.
- To assess railroad vibration, the assessment used the General Assessment methodology in Section 6.4 of the FTA guidance manual. This included the locomotive powered passenger or freight curve, and the appropriate adjustments for speed and track type.

To assess construction noise emissions, consider equipment expected to be used by contractors during construction, usage scenarios for how equipment would be operated, estimated site layouts of equipment along the right-of-way, and the location of construction operations with respect to nearby noise-sensitive receivers.

- To assess construction vibration, account for vibration from construction equipment, estimated site layout of equipment along the right-of-way, and the location of construction operations with respect to nearby sensitive receivers.

Construction Noise and Vibration Impact Assessment Methodology

The construction noise impact assessment used the methodology described in the FTA guidance manual (FTA 2018). SJJPA and its contractors will make decisions regarding procedures and equipment. For this analysis, construction scenarios for typical railroad construction projects are used to predict noise impacts. The construction noise methodology includes the following information.

- Noise emissions from typical equipment used by contractors
- Construction methods

- Scenarios for equipment usage
- Estimated site layouts of equipment along the right-of-way
- Proximity of construction activities to nearby noise-sensitive receivers
- FTA construction noise assessment criteria

The FTA guidance manual (2018) also provides the methodology for the assessment of construction vibration impacts. Estimated construction scenarios have been developed for typical railroad construction projects, allowing a quantitative construction vibration assessment to be conducted. Construction vibration is assessed quantitatively where a potential for blasting, pile driving, vibratory compaction, demolition, or excavation close to vibration-sensitive structures exists. The methodology included the following information.

- Vibration source levels from equipment used by contractors
- Estimated site layouts of equipment along the right-of-way
- Relationship of construction activities to nearby vibration-sensitive receivers
- FTA vibration impact criteria for annoyance and building damage

Train Operation Noise and Vibration Impact Assessment Methodology

Train operation noise and vibration levels were projected using current San Joaquins Amtrak operation plans and the prediction models provided in the FTA guidance manual (FTA 2018). Potential impacts were evaluated in accordance with the Detailed Noise Analysis and General Vibration Assessment procedures outlined in the FTA guidance manual. The methodology and assumptions for train operation are listed below.

- Currently, Amtrak operates six roundtrip weekday trains between Bakersfield, Sacramento, and Oakland. These trains travel through Merced between the hours of 7 a.m. and 10 p.m.
- The trains consist of one engine and five cars.
- The hydrogen engine would be equivalent in noise level to diesel engines.

Projected and existing ambient noise exposures were tabulated at the identified receivers or clusters of receivers and the levels of noise impact (no impact, moderate impact, or severe impact) were identified by comparing the existing and train noise exposure based on the applicable FTA noise impact criteria. Similarly, projected and existing maximum train vibration levels were tabulated at vibration-sensitive locations and potential impacts were identified based on the applicable FTA vibration impact criteria along with FTA guidance on how to account for existing vibration.

3.12.4.2 Thresholds of Significance

CEQA Guidelines Appendix G (14 California Code of Regulations § 15000 et seq.) has identified significance criteria for determining whether a project could have significant impacts on noise- and vibration-sensitive land use from noise and vibration.

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

- Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the Project in excess of severe impact standards for a severe impact established by FTA for transit projects and other changes related to the Project. These standards cover both substantial permanent and substantial temporary/periodic increases in ambient noise levels in the vicinity of the Project above levels existing without the Project.
- Generation of excessive groundborne vibration or groundborne noise levels.

The noise and vibration impact criteria for the Project are based on FTA and FRA guidelines (which have identical thresholds for assessing impact), which are described in the following subsections.

Federal Transit Administration Noise Criteria

Construction Noise and Vibration Impact Assessment Criteria

Construction activities for a large transportation project often generate noise and vibration complaints even though they take place only for a limited time. Construction noise and vibration impacts are assessed where the exposure of noise- and vibration-sensitive receptors in relation to construction-related noise or vibration is expected to occur at levels exceeding standards established by FTA and established thresholds for architectural and structural building damage (FTA 2018).

Construction Noise Impact Criteria

Table 3.12-3 presents the FTA noise assessment criteria for construction activity. The last column applies to construction activities that extend over 30 days near any given receptor. L_{dn} is used to assess impacts in residential areas and 24-hour L_{eq} is used in commercial and industrial areas. The 8-hour L_{eq} and the 30-day average L_{dn} noise exposure from construction noise calculations use the noise emission levels of the construction equipment, its location relative to receivers, and operating hours. The construction noise limits are normally assessed at the noise-sensitive receptor property line.

Table 3.12-3. Federal Transit Administration Construction Noise Assessment Criteria

Land Use	8-hour L_{eq}, dBA		Noise Exposure, L_{dn}, dBA
	Day	Night	30-day Average
Residential	80	70	75[a]
Commercial	85	85	80[b]
Industrial	90	90	85[b]

Source: FTA 2018.
[a] In urban areas with very high ambient noise levels (L_{dn} greater than 65 dB), L_{dn} from construction operations should not exceed existing ambient noise levels + 10 dB.
[b] 24-hour L_{eq}, not L_{dn}.
L_{eq} = equivalent sound level.
dBA = A-weighted decibel.
L_{dn} = day-night sound level.
dB = decibels.

Construction Vibration Impact Criteria

Guidelines in the FTA guidance manual (FTA 2018) provide the basis for the construction vibration assessment. FTA provides construction vibration criteria designed primarily to prevent building damage, and to assess whether vibration might interfere with vibration-sensitive building activities or temporarily annoy building occupants during the construction period. The FTA criteria include two ways to express vibration levels.

- Root-mean-square vibration velocity level (L_v, in VdB), which is associated with human response to vibration, for annoyance and activity interference.
- Peak particle velocity (PPV), which is the maximum instantaneous peak of a vibration signal used for assessments of damage potential.

To avoid temporary annoyance to building occupants during construction or construction interference with vibration-sensitive equipment inside special-use buildings, such as a magnetic resonance imaging (MRI) machine, FTA recommends using the long-term operational vibration criteria (discussed in the *Operational Noise and Vibration Impact Assessment Criteria* subsection).

Table 3.12-4 presents the FTA building damage criteria for construction activity and lists PPV and approximate L_v limits for four building categories. These limits are used to estimate potential problems that should be addressed during final design.

Table 3.12-4. Federal Transit Administration Construction Vibration Damage Criteria

Building Category	PPV (inch/sec)	Approximate L_v[a]
I. Reinforced concrete, steel, or timber (no plaster)	0.5	102
II. Engineered concrete and masonry (no plaster)	0.3	98
III. Non-engineered timber and masonry buildings	0.2	94
IV. Buildings extremely susceptible to vibration damage	0.12	90

Source: FTA 2018.
[a] RMS vibration velocity level in VdB relative to 1 micro-inch/second.
PPV = peak particle velocity.
RMS = root-mean-square
VdB = vibration decibel.

Operational Noise and Vibration Impact Assessment Criteria

Train Noise Impact Criteria

The descriptors and criteria for assessing noise impacts vary according to land use categories adjacent to the track. For land uses where people live and sleep (e.g., residential neighborhoods, hospitals, hotels), L_{dn} is the assessment parameter. For other land use types where there are noise-sensitive uses (e.g., outdoor concert areas, schools, libraries), $L_{eq}(h)$ for an hour of noise sensitivity that coincides with train activity is the assessment parameter. Table 3.12-5 summarizes the three land use categories and noise metrics applied to each category.

Table 3.12-5. Federal Transit Administration Noise-Sensitive Land Use Categories

Land Use Category	Noise Metric (dBA)	Descriptions of Land Use Category
1	Outdoor $L_{eq}(h)$*	Tracts of land where quiet is an essential element in their intended purpose. This category includes lands set aside for serenity and quiet, such as outdoor amphitheaters, concert pavilions, and National Historic Landmarks with significant outdoor use.

Land Use Category	Noise Metric (dBA)	Descriptions of Land Use Category
2	Outdoor L_{dn}	Residences and buildings where people normally sleep. This category includes homes and hospitals, where nighttime sensitivity to noise is of utmost importance.
3	Outdoor L_{eq}(h)*	Institutional land uses with primarily daytime and evening use. This category includes schools, libraries, and churches, where it is important to avoid interference with such activities as speech, meditation, and concentration. Buildings with interior spaces where quiet is important, such as medical offices, conference rooms, recording studios, and concert halls fall into this category, as well as places for meditation or study associated with cemeteries, monuments, and museums. Certain historical sites, parks, and recreational facilities are also included.

Source: FTA 2018.
* L_{eq} for the noisiest hour of transit-related activity during hours of noise sensitivity.
dBA = A-weighted decibel.
L_{eq} = equivalent sound level.
L_{dn} = day-night sound level.

The noise impact criteria used by FTA and FRA are ambient based; the increase in future noise (future noise levels with the Project compared to existing noise levels) is assessed rather than the noise caused by each passing train. The criteria do not specify a comparison of future Project noise with projections of future no Project noise because comparison of a noise projection with an existing noise condition is more accurate than comparison of a projection with another noise projection. Because background noise is expected to increase by the time the Project generates noise, this approach of using existing noise conditions is conservative, since lower existing noise levels will result in a greater probability of project noise impacts.

Figure 3.12-5 depicts the FTA noise impact criteria for human annoyance. Depending on the magnitude of the cumulative noise increases, FTA and FRA categorize impacts as follows.

- No impact.
- Moderate impact—The change in cumulative noise level would be noticeable to most people, but may not be sufficient to generate strong, negative reactions.
- Severe impact—A significant percentage of people would be highly annoyed by the Project's noise.

As the existing level of ambient noise increases, the allowable level of transit noise increases, but the total amount that community noise exposure is allowed to increase is reduced. This approach accounts for the potential for a project noise exposure that is lower than the existing noise exposure to still cause an effect.

Train Vibration Impact Criteria

Table 3.12-6 summarizes FTA criteria for acceptable groundborne vibrations and presents vibration sensitivity in terms of the land use categories. These levels represent the maximum vibration level of an individual train passing. A vibration event occurs each time a train passes the building or property and causes discernible vibration. *Frequent events* are more than 70 vibration events per day, *occasional events* are 30 to 70 vibration events per day, and *infrequent events* are fewer than 30 vibration events per day. Groundborne vibration impacts from train operations inside vibration-sensitive buildings are defined by the vibration velocity level, expressed in terms of VdB, and the number of vibration events per day from the same kind of source.

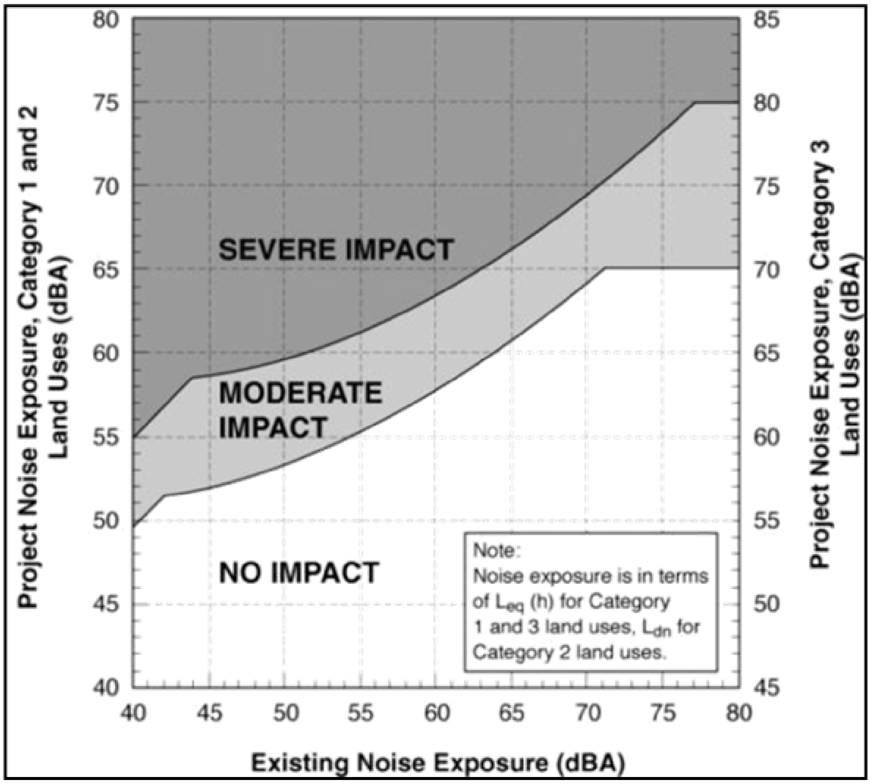


Figure 3.12-5. Federal Transit Administration Noise Impact Criteria

Table 3.12-5 and Table 3.12-6 include separate FTA criteria for groundborne noise. Although the criteria are expressed in dBA, which emphasizes the more audible middle and high frequencies, the criteria are significantly lower than airborne noise criteria to account for the annoying low-frequency character of groundborne noise. Groundborne noise is a low-frequency rumbling sound inside buildings, caused by vibrations of floors, walls, and ceilings. Groundborne noise is generally not a problem for buildings near railroad tracks at or above grade, because the airborne noise from trains typically overshadows effects of groundborne noise. Groundborne noise becomes an issue in cases where airborne noise cannot be heard, such as for buildings near tunnels.

Table 3.12-6. Federal Transit Administration Groundborne Vibration and Groundborne Noise Impact Criteria

	Groundborne Vibration Impact Levels (VdB re 1 micro-inch/second)			Groundborne Noise Impact Levels (dBA re 20 micro Pascals)		
Land Use Category	**Frequent Events**	**Occasional Events**	**Infrequent Events**	**Frequent Events**	**Occasional Events**	**Infrequent Events**
Category 1: Buildings where vibration would interfere with	65 VdB[a]	65 VdB[a]	65 VdB[a]	N/A[b]	N/A[b]	N/A[b]

Land Use Category	Groundborne Vibration Impact Levels (VdB re 1 micro-inch/second)			Groundborne Noise Impact Levels (dBA re 20 micro Pascals)		
	Frequent Events	Occasional Events	Infrequent Events	Frequent Events	Occasional Events	Infrequent Events
interior operations.						
Category 2: Residences and buildings where people normally sleep.	72 VdB	75 VdB	80 VdB	35 dBA	38 dBA	43 dBA
Category 3: Institutional land uses with primarily daytime use.	75 VdB	78 VdB	83 VdB	40 dBA	43 dBA	48 dBA

Source: FTA 2018.
[a] This criterion limit is based on levels that are acceptable for most moderately sensitive equipment such as optical microscopes. For equipment that is more sensitive, a detailed vibration analysis must be performed.
[b] Vibration-sensitive equipment is generally not sensitive to groundborne noise.
VdB = vibration decibel.
dBA = A-weighted decibel.
N/A = not applicable.

Impact NOI-1	Construction of the Project could generate a substantial temporary increase in ambient noise levels in the vicinity of the Project in excess of FTA thresholds.
Level of Impact	**Potentially significant impact**
Mitigation Measures	NOI-1.1: Implement a Construction Noise Control Plan
Level of Impact After Mitigation	**Significant and unavoidable impact**

Project

Impact Characterization

Construction of the Project would include three elements: (1) new San Joaquins alignment from BNSF to the proposed integrated station, (2) realignment of the UPRR industrial spur, and (3) San Joaquins access and improvements to the approved Altamont Corridor Express (ACE) Merced Layover and Maintenance Facility. The new alignment construction is expected to occur over a period of 30 months, the realignment is expected to occur over a period of 12 months, and the improvements to the approved ACE Merced Layover and Maintenance Facility is expected to occur over 24 months (refer to Table 2-10 in Chapter 2, *Project Description*). Because some track improvements are located on an active rail line, construction work could occur during the nighttime. The local noise ordinances for the cities and counties along the extension alignment generally limit construction noise to particular time periods during weekday, weekend, and holiday daytime hours. Nighttime construction work is generally prohibited, but some jurisdictions allow a variance.

Table 3.12-7 summarizes the estimated construction noise levels and residential noise impact screening distances for each of the planned construction activities. The noise estimates are based on scenarios for the construction activities, using FTA methodology described in Section 3.12.4.1, *Methods for Analysis*, and FTA criteria described in Section 3.12.4.2, *Thresholds for Significance*. However, to be conservative, the screening distance estimates did not assume any topography or ground effects. The results of the analysis indicate that noise impacts would be limited to residences within 135 to 270 feet from a construction site for daytime and 430 to 860 feet for nighttime, depending on the activity. The potential for noise impacts would be greatest during structures work at locations where pile driving is required for the aerial guideway construction. Construction activities would be considered to have a potentially significant impact if they would generate noise exposure in excess of the FTA thresholds, and this would be a potentially significant impact.

Table 3.12-7. Residential Noise Impact Assessment for Construction Activities

Construction Activity and Equipment	Noise Level at 50 feet (dBA)	Equipment Usage Factor (%)	8-Hour L_{eq} at 50 feet (dBA)		Approx. Noise Impact Distance Day/Night (feet)
			Predicted Exposure	Daytime/Nighttime Criterion	
Site Work			**89**	**80/70**	**135/430**
Grader	85	53	82	--	--
Water Truck	84	44	80	--	--
D6 Dozer	85	61	83	--	--
D8 Dozer	85	45	82	--	--
Compactor	82	45	79	--	--
Dump Truck	84	23	78	--	--
Rail Work			**90**	**80/70**	**150/475**
Locomotive	88	25	82	--	--
D6 Dozer	85	38	81	--	--
Grader	85	38	81	--	--
Water Truck	84	38	80	--	--
Tamper	83	20	76	--	--
Aligner	85	20	78	--	--
Swinger	85	19	78	--	--
Welder	74	38	70	--	--
Flat Bed Truck	84	31	79	--	--
Pickup Truck	75	25	69	--	--
Sports Utility Vehicle	75	31	70	--	--
35 Ton Rough Terrain Crane	83	38	79	--	--
Flat Bed Tractor	84	13	75	--	--
Wheel Loader	80	28	74	--	--
Structures Work			**95**	**80/70**	**270/860**
Impact Pile Driver	101	20	94	--	--
Generator	82	90	82	--	--
75 Ton Mobile Crane	83	38	79	--	--
Water Truck	84	20	77	--	--

Construction Activity and Equipment	Noise Level at 50 feet (dBA)	Equipment Usage Factor (%)	8-Hour L_{eq} at 50 feet (dBA)		Approx. Noise Impact Distance Day/Night (feet)
			Predicted Exposure	Daytime/Nighttime Criterion	
Flat Bed Truck	84	25	78	--	--
Pickup Truck	75	53	72	--	--
Concrete Mixer	85	13	76	--	--
Concrete Pump	82	18	75	--	--
Wheel Loader	80	20	73	--	--
Welder	74	31	69	--	--

dBA = A-weighted decibel.
L_{eq} = equivalent sound level.

Impact Details and Conclusions

Construction activities would be considered to have a significant impact if they would generate noise exposure in excess of the FTA thresholds. As shown in Table 3.12-7, the operation of certain construction equipment and construction activities could generate noise exposure in excess of FTA thresholds. The most significant construction activity would be impact pile driving, if included. Residences along the east side of Snelling Highway (SR 59) would be within the daytime impact screening distance if impact pile driving were to occur. Residences in this area would also be within the nighttime impact screening distances if nighttime construction occurs. Without impact pile driving, the residences would not be within the screening distance and the impact would be less than significant. Nighttime construction near residential uses would have larger impacts than daytime construction and would result in a potentially significant impact. If nighttime construction is not anticipated, there would not be potentially significant impacts.

In addition, construction activities and temporary construction easements may result in temporary construction impacts to businesses adjacent to the corridor. As discussed in Section 2.6, *Right-of-Way and Easement Need*s, and shown in Figures 2-9 through 2-11 in Chapter 2, *Project Description*, the Project would require 23 temporary construction easements, which would be restored upon completion of Project construction and delivered back to the property owner. Construction activities and temporary construction easements may result in temporary construction noise impacts to businesses adjacent to the corridor. Construction activities would be considered to have a potentially significant impact if they would generate noise exposure in excess of the FTA thresholds, and this would be a potentially significant impact. The potential for noise impacts would be greatest during structures work at locations where pile driving is required for the aerial guideway construction. Businesses adjacent to pile driving locations, including Razzari Auto Centers, Black Bear Diner, and Costco, may be temporarily impacted by construction noise. However, the disturbance would not require business closure or temporary relocation.

It is anticipated that that five full property acquisitions would be required and three permanent businesses would be displaced by the Project easements and ROW requirements, including Safeway Manufacturing, SJR LLC, and Smith Ronald W & Ann E Trustees. Acquired businesses are expected to be relocated to existing buildings, which would not require substantial construction. As such, the permanent business relocations and related construction are not anticipated to generate a substantial temporary increase in ambient noise levels in excess of FTA thresholds from the use of heavy construction equipment, demolition, excavation, hauling, and construction activities. In addition, new construction would be subject to local land use review and permitting and will be subject to the same or similar regulatory requirements as the Project, as applicable.

The Project would require demolition of the buildings and structures occupied by the displaced businesses as well as a small number of other buildings and structures (e.g., those that are not occupied by businesses). Demolition may result in a temporary increase in noise related to the use of heavy construction equipment, excavation, hauling, and construction activities. However, these impacts are expected to be minor and temporary. In addition, these activities would be subject to the same or similar regulatory requirements as the Project, as applicable.

Mitigation Measures

Mitigation Measure NOI-1.1: Implement a Construction Noise Control Plan

A noise control plan that incorporates, at a minimum, the following best practices into the construction scope of work and specifications to reduce the impact of temporary construction-related noise on nearby noise-sensitive receptors will be prepared and implemented.

- Install temporary construction site sound barriers near noise sources.
- Use moveable sound barriers at the source of the construction activity.
- Avoid the use of impact pile drivers where possible near noise-sensitive areas or use quieter alternatives (e.g., drilled piles) where geological conditions permit.
- Locate stationary construction equipment as far as possible from noise-sensitive sites.
- Reroute construction-related truck traffic along roadways that will cause the least disturbance to residents.
- Use low-noise-emission equipment.
- Implement noise-deadening measures for truck loading and operations.
- Line or cover storage bins, conveyors, and chutes with sound-deadening material.
- Use acoustic enclosures, shields, or shrouds for equipment and facilities.
- Use high-grade engine exhaust silencers and engine-casing sound insulation.
- Minimize the use of generators to power equipment.
- Limit use of public address systems.
- Grade surface irregularities on construction sites.
- Monitor and maintain equipment to meet noise limits.
- Establish an active community liaison program to keep residents informed about construction and to provide a procedure for addressing complaints.

Significance with Application of Mitigation

Although the measures specified in Mitigation Measure NOI-1.1 would generally reduce the construction noise levels, the measures would not necessarily guarantee that sensitive residential receptors would not be exposed to noise levels exceeding the 80-dBA limit during the day or the 70-dBA limit at night. In specific, given the active railroads, it is possible that construction near some residential areas will have to be conducted at night to avoid disruption of freight and passenger rail operations and to complete construction on schedule. Furthermore, a temporary sound wall may be effective in certain locations, but in many cases the nature of the construction work makes use of such sound walls infeasible.

Construction-related noise would be short-term and would cease after the construction is completed. Still, even with mitigation, the impact of temporary construction-related noise on nearby noise sensitive receptors could be a significant and unavoidable impact during construction of the Project, in particular where heavy construction would occur at night near residences.

Variant H1

Impact Characterization

The construction of the hydrogen fueling storage areas and the solar panels would fall under the Site Work portion of Table 3.12-7. The daytime distance to impact would be 135 feet and the nighttime distance to impact would be 435 feet.

Impact Details and Conclusions

The westernmost portion of the closest solar panel site to the Modern Mobile Home Park would be just within the nighttime screening distance for construction. Nighttime construction near residential uses would have larger impacts than daytime construction and would result in a potentially significant impact. If nighttime construction is not anticipated, there would not be potentially significant impacts.

Mitigation Measures

Mitigation Measure NOI-1.1: Implement a Construction Noise Control Plan

Significance with Application of Mitigation

Although the measures specified in Mitigation Measure NOI-1.1 would generally reduce the construction noise levels, the measures would not necessarily guarantee that sensitive residential receptors would not be exposed to noise levels exceeding the 80-dBA limit during the day or the 70-dBA limit at night. In specific, given the active railroads, it is possible that construction near some residential areas will have to be conducted at night to avoid disruption of freight and passenger rail operations and to complete construction on schedule. Furthermore, a temporary sound wall may be effective in certain locations, but in many cases the nature of the construction work makes use of such sound walls infeasible.

Construction-related noise would be short-term and would cease after the construction is completed. Still, even with mitigation, the impact of temporary construction-related noise on nearby noise sensitive receptors could be a significant and unavoidable impact during construction of Variant H1, in particular where heavy construction would occur at night near residences.

Variant H2

Impact Characterization

The construction of the hydrogen fueling and storage areas would fall under the Site Work portion of Table 3.12-7. The daytime distance to impact would be 135 feet and the nighttime distance to impact would be 435 feet.

Impact Details and Conclusions

There are no sensitive receptors within the screening distances for the fueling and storage areas; thus, there would be no additional impact related to construction noise for Variant H2. However, there would still be construction noise impacts related to the overall project, as detailed above.

Mitigation Measures

Mitigation Measure NOI-1.1: Implement a Construction Noise Control Plan

Significance with Application of Mitigation

Although the measures specified in Mitigation Measure NOI-1.1 would generally reduce the construction noise levels, the measures would not necessarily guarantee that sensitive residential receptors would not be exposed to noise levels exceeding the 80-dBA limit during the day or the 70-dBA limit at night. In specific, given the active railroads, it is possible that construction near some residential areas will have to be conducted at night to avoid disruption of freight and passenger rail operations and to complete construction on schedule. Furthermore, a temporary sound wall may be effective in certain locations, but in many cases the nature of the construction work makes use of such sound walls infeasible.

Construction-related noise would be short-term and would cease after the construction is completed. Still, even with mitigation, the impact of temporary construction-related noise on nearby noise sensitive receptors could be a significant and unavoidable impact during construction of Variant H2, in particular where heavy construction would occur at night near residences.

Variant H3

Impact Characterization

The construction of the hydrogen fueling and storage areas would fall under the Site Work portion of Table 3.12-7. The daytime distance to impact would be 135 feet and the nighttime distance to impact would be 435 feet.

Impact Details and Conclusions

There are no sensitive receptors within the screening distances for the fueling and storage areas; thus, there would be no additional impact related to construction noise for Variant H3. However, there would still be construction noise impacts related to the overall project, as detailed above.

Mitigation Measures

Mitigation Measure NOI-1.1: Implement a Construction Noise Control Plan

Significance with Application of Mitigation

Although the measures specified in Mitigation Measure NOI-1.1 would generally reduce the construction noise levels, the measures would not necessarily guarantee that sensitive residential receptors would not be exposed to noise levels exceeding the 80-dBA limit during the day or the 70-dBA limit at night. In specific, given the active railroads, it is possible that construction near some residential areas will have to be conducted at night to avoid disruption of freight and passenger rail operations and to complete construction on schedule. Furthermore, a temporary sound wall may be effective in certain locations, but in many cases the nature of the construction work makes use of such sound walls infeasible.

Construction-related noise would be short-term and would cease after the construction is completed. Still, even with mitigation, the impact of temporary construction-related noise on nearby noise sensitive receptors could be a significant and unavoidable impact during construction of Variant H3, in particular where heavy construction would occur at night near residences.

Impact NOI-2	Construction of the Project would not generate excessive groundborne vibration or groundborne noise levels.
Level of Impact	**Potentially significant impact**
Mitigation Measures	NOI-2.1: Implement a Construction Vibration Control Plan
Level of Impact After Mitigation	**Less-than-significant impact**

Project

Impact Characterization

Construction of the Project would include three elements: (1) new San Joaquins alignment from BNSF to the proposed integrated station, (2) realignment of the UPRR industrial spur, and (3) San Joaquins access and improvements to the approved ACE Merced Layover and Maintenance Facility. The new alignment construction is expected to occur over a period of 30 months, the realignment is expected to occur over a period of 12 months, and the improvements to the approved ACE Merced Layover and Maintenance Facility is expected to occur over 24 months (refer to Table 2-10 in Chapter 2, *Project Description*). Because some track improvements are located on an active rail line, construction work could occur during the nighttime. The local noise ordinances for the cities and counties along the extension alignment generally limit construction to particular time periods during weekday, weekend, and holiday daytime hours. Nighttime construction work is generally prohibited, but some jurisdictions allow a variance. There are no local jurisdictional limits on vibration.

During construction, some activities, such as pile driving and vibro-compaction for ground improvements, may cause groundborne vibration. Construction equipment associated with these activities can produce vibration levels ranging from 87 VdB to 104 VdB at a distance of 25 feet from construction activities. Table 3.12-8 lists the approximate distances within which receivers could experience construction related vibration annoyance effects. The actual distance would vary depending on the type of soil or rock encountered at a specific site. Damage from construction vibration activities would be limited to within 50 feet for impact pile driving and less than 25 feet for all other construction activities. There are no buildings located within those distances.

Table 3.12-8. Screening Distances for Construction Vibration Impacts

Land Use Category	Vibration Criterion Level (VdB)	Approximate Vibration Impact Distance (feet)
Category 2: Residences and buildings where people normally sleep	72	290
Category 3: Institutional land uses with primarily daytime use	75	230

VdB = vibration decibel

Impact Details and Conclusions

With the inclusion of impact pile driving, residences along the eastside of SR 59 would be within the vibration impact screening distance and would have potentially significant impacts. Without impact pile driving, the residences would not be within the screening distance and the impact would be less than significant.

Mitigation Measures

Mitigation Measure NOI-2.1: Implement a Construction Vibration Control Plan

A vibration control plan that incorporates, at a minimum, the following best practices into the construction scope of work and specifications to reduce the impact of temporary construction-related vibration on nearby noise-sensitive receptors will be prepared and implemented in conjunction with the noise control plan.

- Avoid the use of impact pile drivers where possible near noise-sensitive areas or use quieter alternatives (e.g., drilled piles) where geological conditions permit.
- Reroute construction-related truck traffic along roadways that will cause the least disturbance to residents.
- Use low-vibration equipment.
- Grade surface irregularities on construction sites.
- Monitor and maintain equipment to meet vibration limits.
- Establish an active community liaison program to keep residents informed about construction and to provide a procedure for addressing complaints.

Significance with Application of Mitigation

With implementation of Mitigation Measure NOI-2.1, vibration impacts during construction of the Project would be less than significant.

Variant H1

Impact Characterization

The construction of the hydrogen fueling, storage areas and the solar panels would not include pile driving, so the distances to impact would be less than the screening distances in Table 3.12-8.

Impact Details and Conclusions

There are no sensitive receptors within the vibration screening distances for the fueling and storage areas or the solar panels; thus, there would be no impact related to vibration during construction of Variant H1.

Variant H2

Impact Characterization

The construction of the hydrogen fueling and storage areas would not include pile driving, so the distances to impact would be less than the screening distances in Table 3.12-8.

Impact Details and Conclusions

There are no sensitive receptors within the vibration screening distances for the fueling and storage areas; thus, there would be no impact related to vibration during construction of Variant H2.

Variant H3

Impact Characterization

The construction of the hydrogen fueling and storage areas would not include pile driving, so the distances to impact would be less than the screening distances in Table 3.12-8.

Impact Details and Conclusions

There are no sensitive receptors within the vibration screening distances for the fueling and storage areas; thus, there would be no impact related to vibration during construction of Variant H3.

Impact NOI-3	Operation of the Project would not generate a substantial temporary increase in ambient noise levels in the vicinity of the Project in excess of FTA thresholds.
Level of Impact	**Less than significant impact**

Project

Impact Characterization

Table 3.12-9 summarizes the results of the residential (category 2) and institutional (category 3) noise impact assessment for the Project. Table 3.12-9 contains the projected noise levels for the Project, the measured existing noise levels, the distance to the nearest track, the train speed, the FTA criteria, and a tabulation of the impacts. Noise levels during the operations of the Project would be well below both the existing noise and the impact thresholds due to the high existing noise levels and the small number of trains being added as part of the Project. Additional noise from traffic due to deliveries or employee vehicles on SR 59 was not assessed as a part of the Project due to the very high volume of cars and trucks on SR 59. The average annual daily vehicle traffic on SR 59 is 12,000 with over 700 heavy trucks per day. The increased traffic due to the Project would not change the noise levels at any location.

Impact Details and Conclusions

Operational noise impacts would be less than significant.

Table 3.12-9. Summary of Federal Transit Administration Category 2 (Residential) and Category 3 (Institutional) Noise Impacts

Location	Side of Track	Distance to Near Track (feet)	Max. Train Speed (mph)	Existing Noise Level (dBA)	Noise Levels (dBA)				
					Project Levels	FTA Criteria		Type and # of Impacts	
						Mod.	Sev.	Mod.	Sev.
Residential									
O St to G St	NB	No noise sensitive receivers.							
O St to G St	SB	476	30	63[a]	39	59	65	0	0
V St to O St	NB	349	30	63[a]	45	59	65	0	0
V St to O St	SB	256	30	63[a]	43	59	65	0	0
W 16th Street to N Riviera Holiday	NB	154	30	75[b]	62	65	73	0	0
W 16th Street to N Riviera Holiday	SB	No noise sensitive receivers.							
N Riviera Holiday to Existing Rail	NB	159	30	75[b]	62	65	73	0	0
N Riviera Holiday to Existing Rail	SB	No noise sensitive receivers.							
Drake Ave	NB	609	10	60[c]	42	58	63	0	0
Drake Ave	SB	No noise sensitive receivers.							
Institutional									
Merced Baptist Church	SB	291	30	65[a]	52	66	71	0	0
LifePlace Church	NB	188	30	72[d]	67	70	76	0	0

dBA = A-weighted decibels, FTA = Federal Transit Administration, Mod. = moderate, mph = miles per hour, NB = northbound, SB = southbound, Sev. = severe

[a] LT-4

[b] LT-3

[c] LT-1

[d] LT-2

Variant H1

Impact Characterization

Variant H1 would combine on-site production of hydrogen with hydrogen train delivery to the approved ACE Merced Layover and Maintenance Facility. The frequency and makeup of the trains would be similar to the operations described for Variant H3 below because some hydrogen would be produced on-site. The on-site production would not generate any additional operational noise impacts.

Variant H1 would add one hydrogen train delivery with one locomotive and one car per week to the approved ACE Merced Layover and Maintenance Facility. To be conservative, the impact assessment for Variant H1 added one train per day to the analysis, similar to the assessment for Variant H3. Table 3.12-9 summarizes the results of the residential (category 2) and institutional (category 3) noise impact assessment for Variant H3. Table 3.12-9 contains the projected noise levels for Variant

H3, the measured existing noise levels, the distance to the nearest track, the train speed, the FTA criteria, and a tabulation of the impacts.

Impact Details and Conclusions

Operational noise impacts would be less than significant for Variant H1.

Variant H2

Impact Characterization

Variant H2 would add one hydrogen truck delivery per day to the approved ACE Merced Layover and Maintenance Facility via SR 59. Because of the high volume of existing traffic on SR 59, there would be no additional noise due to the one truck per day.

Impact Details and Conclusions

Operational noise impacts would be less than significant for Variant H2.

Variant H3

Impact Characterization

Variant H3 would add one hydrogen train delivery with one locomotive and one car per week to the approved ACE Merced Layover and Maintenance Facility. To be conservative, the impact assessment added one train per day to the analysis. Table 3.12-10 summarizes the results of the residential (category 2) and institutional (category 3) noise impact assessment for Variant H3. Table 3.12-10 contains the projected noise levels for Variant H3, the measured existing noise levels, the distance to the nearest track, the train speed, the FTA criteria, and a tabulation of the impacts.

Impact Details and Conclusions

Operational noise impacts would be less than significant under Variant H3.

Table 3.12-10. Summary of Federal Transit Administration Category 2 (Residential) and Category 3 (Institutional) Noise Impacts – Variant H3

					Noise Levels (dBA)				
				Existing Noise Level (dBA)	Variant H3 Levels	FTA Criteria		Type and # of Impacts	
Location	**Side of Track**	**Distance to Near Track (feet)**	**Max. Train Speed (mph)**			**Mod.**	**Sev.**	**Mod.**	**Sev.**
Residential									
O St to G St	NB	No noise sensitive receivers.							
O St to G St	SB	476	30	63 [a]	39	59	65	0	0
[redacted]				a					
V St to O St	NB	349	30	63 [a]	46	59	65	0	0
V St to O St	SB	256	30	63 [a]	43	59	65	0	0
W 16th Street to N Riviera Holiday	NB	154	30	75 [b]	63	65	73	0	0
W 16th Street to N Riviera Holiday	SB	No noise sensitive receivers.							
N Riviera Holiday to Existing Rail	NB	159	30	75 [b]	62	65	73	0	0
[redacted]				b					
N Riviera Holiday to Existing Rail	SB	No noise sensitive receivers.							
Drake Ave	NB	609	10	60 [c]	42	58	63	0	0
[redacted]				c					
Drake Ave	SB	No noise sensitive receivers.							
Institutional									
Merced Baptist Church	SB	291	30	65 [a]	52	66	71	0	0
LifePlace Church	NB	188	30	72 [d]	67	70	76	0	0

dBA = A-weighted decibels, FTA = Federal Transit Administration, Mod. = moderate, mph = miles per hour, NB = northbound, SB = southbound, Sev. = severe

[a] LT-4

[b] LT-3

[c] LT-1

[d] LT-2

Impact NOI-4	Operation of the Project would not generate excessive groundborne vibration or groundborne noise levels.
Level of Impact	**Less than significant impact**

Project

Impact Characterization

Table 3.12-11 summarizes the results of the residential (category 2) and institutional (category 3) vibration impact assessment for the Project. Table 3.12-11 contains the projected vibration levels for the Project, the distance to the nearest track, the train speed, the FTA criteria, and a tabulation of the impacts. The vibration levels were calculated using the FTA general assessment methodology.

Table 3.12-11. Summary of Federal Transit Administration Category 2 (Residential) and Category 3 (Institutional) Vibration Impacts – Project

Location	Side of Track	Dist. to Near Track (feet)	Max. Train Speed (mph)	Project Levels (VdB)	FTA Criteria (VdB)	# of Impacts
Residential						
O St to G St	NB	No vibration sensitive receivers.				
O St to G St	SB	476	30	48	80	0
V St to O St	NB	349	30	51	80	0
V St to O St	SB	256	30	54	80	0
W 16th Street to N Riviera Holiday	NB	158	30	69	80	0
W 16th Street to N Riviera Holiday	SB	No vibration sensitive receivers.				
N Riviera Holiday to Existing Rail	NB	176	25	72	80	0
N Riviera Holiday to Existing Rail	SB	No vibration sensitive receivers.				
Drake Ave	NB	609	10	45	80	0
Drake Ave	SB	No vibration sensitive receivers.				
Institutional						
Merced Baptist Church	SB	291	30	53	83	0
LifePlace Church	NB	188	30	68	83	0

Notes: The Project’s anticipated vibration levels were calculated following the FTA’s guidance manual, as discussed in Section 3.12.4.1, *Methods for Analysis*.
FTA = Federal Transit Administration.
mph = miles per hour.
NB = northbound.
SB = southbound.
VdB = vibration decibel levels.

Impact Details and Conclusions

Operational vibration impacts would be less than significant under the Project.

Variant H1

Impact Characterization

There would be no additional operational vibration due to Variant H1 compared to the impact discussed above for the Project.

Impact Details and Conclusions

Operational vibration impacts would be less than significant under Variant H1.

Variant H2

Impact Characterization

Compared to the impact discussed above for the Project, Variant H2 would add one hydrogen truck delivery per day to the approved ACE Merced Layover and Maintenance Facility via SR 59. However, rubber tired vehicles do not generate noticeable vibration.

Impact Details and Conclusions

Operational vibration impacts would be less than significant under Variant H2.

Variant H3

Impact Characterization

Compared to the impact discussed above for the Project, Variant H3 would add one hydrogen train delivery with one locomotive and one car per week to the site. To be conservative, the impact assessment added one train per day to the analysis. The addition of one train per day would not change the impact discussed above for the Project.

Impact Details and Conclusions

Operational vibration impacts would be less than significant under Variant H3.

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3.13 Public Services and Utilities and Service Systems

3.13.1 Introduction

This section describes the regulatory and environmental setting for public services and utilities and service systems in the vicinity of the Project. It also describes the impacts on public services and utilities and service systems that would result from the Project and mitigation measures that would reduce significant impacts, where feasible and appropriate.

Cumulative impacts on public services and utilities and service systems, in combination with planned, approved, and reasonably foreseeable projects, are discussed in Chapter 4, *Cumulative Impacts.*

3.13.2 Regulatory Setting

This section summarizes the federal, state, regional, and local regulations related to public services and utilities and service systems applicable to the Project.

3.13.2.1 Public Services

Federal Regulations

National Fire Protection Association

The National Fire Protection Association (NFPA) has set forth national hydrogen-specific codes. Provisions include items related to annual inspections, general storage requirements, gaseous hydrogen storage, dispensing systems, piping, and tubing for all systems, valving, and fittings, venting and other equipment, and fire safety (National Renewable Energy Laboratory 2015). Applicable standards include the following:

- NFPA 1, Fire Code
- NFPA 2, Hydrogen Technologies Code
- NFPA 30A, Motor Fuel-Dispensing Facilities and Repair Garages
- NFPA 55, Compressed Gases and Cryogenic Fluids Code

State Regulations

California Division of Occupational Safety and Health

The California Division of Occupational Safety and Health (Cal/OSHA) protects the health and safety of workers throughout California. California Code of Regulations (Cal. Code Regs.), Title 8, establishes industrial safety standards for construction (Cal/OSHA 2021). Employers are required to have an effective Injury and Illness Prevention Program (IIPP), which includes training and instruction on safe work practices (Cal/OSHA 2020). Cal/OSHA conducts on-site inspections of construction sites and has the authority to fine or cite unsafe practices or incomplete IIPPs to ensure the practice of safe work environments.

Regional and Local Regulations

The SJJPA, as a state joint powers agency, proposes improvements within and outside the Union Pacific Railroad (UPRR) and BNSF Railway (BNSF) rights-of-way. The Interstate Commerce Commission Termination Act (ICCTA) affords railroads that engage in interstate commerce considerable flexibility in making necessary improvements and modifications to rail infrastructure, subject to the requirements of the Surface Transportation Board. ICCTA broadly preempts state and local regulation of railroads; this preemption extends to the construction and operation of rail lines. As such, activities within the UPRR and BNSF rights-of-way are clearly exempt from local building and zoning codes as well as other land use ordinances. Project activities outside of the UPRR and BNSF rights-of-way, however, would be subject to regional and local plans and regulations. Though ICCTA broadly preempts state and local regulation of railroads, SJJPA intends to obtain local agency permits for construction of facilities that fall outside the UPRR and BNSF rights-of-way, even though SJJPA has not determined whether such permits are legally necessary or required.

Appendix 3.0-1, *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 Project improvements would be located. Section 15125(d) of the State 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 Project would be consistent with the plans of relevant jurisdictions.[1] The Project would be consistent with the applicable goals, policies, and objectives related to public services identified in Appendix 3.0-1.

3.13.2.2 Utilities

Federal Regulations

Electric Power

Federal Power Act of 1935

The Federal Power Act of 1935 created the Federal Power Commission, now the Federal Energy Regulatory Commission (FERC). FERC is an independent agency that under Parts II and III of the Act regulates the transmission and sale of natural gas for resale in interstate commerce, the transmission of oil by pipeline in interstate commerce, and the transmission and wholesale of electricity in interstate commerce. FERC also licenses and inspects private, municipal, and state hydroelectric projects; approves the siting and abandonment of interstate natural gas facilities, including pipelines, storage, and liquified natural gas; oversees environmental matters related to natural gas and hydroelectricity projects and major electricity policy initiatives; and administers accounting and the financial reporting regulations and conduct of regulated companies. The Energy Policy Act of 2005 amended the Federal Power Act of 1935 to extend FERC's jurisdiction to certain power plant sales as well as the reliability of electric service. Other significant amendments to the Act include the Public Utility Regulatory Policies Act of 1978, the Energy Security Act of 1980, the Electric Consumers Protection Act of 1986, the Energy Policy of 1992, and America's Water Infrastructure Act of 2018.

[1] 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.

Solid Waste

The Resource Conservation and Recovery Act (RCRA) (42 United States Code [U.S.C.] Section 6901 et seq.) was enacted in 1976 to oversee proper management of solid and hazardous wastes, from their generation to ultimate disposal or destruction. Implementation of RCRA has largely been delegated to federally approved state waste management programs and, under Subtitle D, further promulgated to local governments for management of planning, regulation, and implementation of nonhazardous solid waste disposal. The U.S. Environmental Protection Agency (USEPA) retains oversight of state actions. Where facilities are found to be inadequate, 40 Code of Federal Regulations (CFR) Section 256.42 requires that necessary facilities and practices be developed by the responsible state and local agencies or by the private sector. In California, that responsibility was created under the California Integrated Waste Management Act of 1989 and Assembly Bill (AB) 939.

Stormwater Facilities

The Clean Water Act (CWA) of 1977 establishes the basic structure for regulating discharges of pollutants into the waters of the United States (U.S.) and regulating quality standards for surface waters, by outlawing the discharge of any pollutant from a point source into navigable waters unless a permit is obtained. Under the CWA's National Pollutant Discharge Elimination System (NPDES) program, USEPA regulates discharges of pollutants from municipal and industrial wastewater treatment plants, sewer collection systems, and stormwater discharges from industrial facilities and municipalities. USEPA enforces requirements to ensure that industries pre-treat pollutants in their wastes to protect local sanitary sewers and wastewater treatment plants. NPDES permits establish limits and conditions for discharges from municipal wastewater treatment facilities to waters of the U.S.

Safe Drinking Water Act of 1996

The Safe Drinking Water Act (SDWA) of 1996 is the principal federal law in the United States intended to ensure safe drinking water for the public. Pursuant to the act, USEPA is required to set standards for drinking water quality and oversee states, localities, and water suppliers that implement the standards.

CWA Section 301

Under CWA Section 301, it is unlawful to discharge any pollutant into waters of the U.S. without authorization under specific provisions of the CWA, including Sections 402 and 404, which are discussed below.

CWA Section 303

USEPA has authority under the CWA to implement water pollution control programs. In California, this authority is delegated to the State Water Resources Control Board (SWRCB). Section 303(d) requires states to develop a list of water-quality-impaired water bodies and to implement total maximum daily loads (TMDLs) for certain pollutants to meet water quality standards. A TMDL establishes the maximum amount of a pollutant allowed in a water body and serves as the starting point or planning tool for restoring water quality. In general, once a water body has been added to a state's list of impaired waters it stays there until the state develops a TMDL and SWRCB approves it. SWRCB reporting guidance provides a way to keep track of a state's water bodies, from listing as impaired to meeting water quality standards. This tracking system contains a running account of the state's water bodies and categorizes each based on the attainment status. For example, once a TMDL is developed, a water body is no longer on the Section 303(d) list, but it is still tracked until the water is fully restored.

CWA Section 401

Under CWA Section 401, projects permitted under CWA Section 404 (described below) for any activity that may discharge into waters of the U.S. must obtain State Water Quality Certification that the proposed activity will comply with state water quality standards. The most common federal permits triggering Section 401 Certification are CWA Section 404 permits issued by the U.S. Army Corps of Engineers (USACE). The Section 401 permit certifications are obtained from the Regional Water Quality Control Board (RWQCB), dependent on the project location, and are required before USACE issues a Section 404 permit.

CWA Section 402 NPDES

Through delegated jurisdiction under the CWA, the SWRCB regulates point-source discharges to waters of the U.S. under NPDES. Regulated discharges also include diffuse sources of discharge caused by general construction activities covering an area greater than one acre and stormwater discharges in municipal separate storm sewer systems in which runoff is carried through a developed conveyance system to specific discharge locations. The SWRCB issues both a construction general permit for protection of water quality from stormwater discharges during construction activities and an industrial general permit for protection of water quality from stormwater discharges during industrial activities. Under construction and operation of the Project, SJJPA would be responsible for compliance with both NPDES permits.

CWA Section 404

USACE has jurisdiction over all waters of the U.S., which include navigable waters and traditionally navigable waters as defined in 33 CFR Part 328.3(a). Under CWA Section 404, USACE regulates the discharge of dredged or fill materials (including from construction activities) into waters of the U.S.

Telecommunications

Communications Act of 1934

The Communications Act of 1934 replaced the Federal Radio Commission with the Federal Communications Commission (FCC). It also transferred regulation of interstate telephone services from the Interstate Commerce Commission to the FCC. The FCC regulates interstate and international communications by radio, television, wire, satellite, and cable in all 50 states, the District of Columbia, and U.S. territories. An independent U.S. government agency overseen by Congress, the FCC is the United States' primary authority for communications law, regulation, and technological innovation. The FCC's rules and regulations are in Title 47 of the CFR.

State Regulations

Sustainable Communities and Climate Protection Act of 2008 (Senate Bill 375)

The Sustainable Communities and Climate Protection Act (Senate Bill [SB] 375), passed in 2008, directs the California Air Resources Board to set regional targets for reducing greenhouse gas emissions from passenger vehicles. The law was established to ensure that cities and counties participate in the development of regional plans in achieving such targets.

Solid Waste

Assembly Bill 341

Under commercial recycling law (Chapter 476, Statutes of 2011), AB 341 directed the California Department of Resources Recycling and Recovery (CalRecycle) to develop and adopt regulations for mandatory commercial recycling and declared a state policy goal that not less than 75 percent of solid waste generated be source reduced, recycled, or composted by the year 2020 and annually thereafter.

Assembly Bill 939

The Integrated Waste Management Act (AB 939), passed in 1989, requires the implementation of solid waste management programs, including requiring each city or county to divert solid waste from landfill disposal through source reduction, recycling, and composting, and achieve a 50 percent diversion. The law also requires every county and city in the state to prepare a Source Reduction and Recycling Element that identifies programs that the county or city will implement to achieve the required solid waste disposal reduction goal and submit an annual report to CalRecycle to provide an update on progress in achieving this goal. The Integrated Waste Management Act further requires that businesses and public entities that generate four cubic yards or more of solid waste per week have a recycling program, and it sets a statewide goal of 75 percent reduction of solid waste disposal by 2020.

Assembly Bill 1327

The California Solid Waste Reuse and Recycling Access Act of 1991 (AB 1327) requires jurisdictions to mandate any "development project" for which an application for a building permit is submitted to provide an adequate storage area for collection and removal of recyclable materials. The areas to be utilized must be adequate in capacity, number, and distribution to serve the project.

Senate Bill 1332

SB 1332, also known as the California Integrated Waste Management Act of 1989, requires cities and counties to prepare an Integrated Waste Management Plan, including a Countywide Siting Element, for each jurisdiction. The Countywide Siting Element provides an estimate of total permitted disposal capacity needed for a 15-year period, or whenever additional capacity is necessary. Per Public Resources Code Sections 41700 through 41721.5, the Countywide Siting Element must be updated by each operator and permitted by CalRecycle, which is within the Natural Resources Agency, every 5 years.

Senate Bill 1374

Construction and Demolition Waste Materials Diversion Requirements (SB 1374) was signed into law in 2002 to assist jurisdictions with diverting construction and demolition waste material. The bill requires that jurisdictions provide a summary of progress made in diverting construction and debris waste in the annual AB 939 report to CalRecycle.

California Green Building Standards Code (CALGreen)

Under Section 5.408.1.1 through 5.408.1.3 of the 2022 California Green Building Standards Code (CALGreen), the minimum recycling rate for construction and demolition waste is 65 percent. Additionally, the 2022 CALGreen Building Code requires 100 percent accountability of excavated soil; proper accountability and disposal of universal waste; and 100 percent recycling of soil, vegetation, and rocks generated from land clearing activities. CALGreen allows for either a 65 percent diversion requirement or the local requirement, whichever is more stringent. CALGreen does not require jurisdictions to adopt a local construction and demolition ordinance.

Stormwater Facilities

The state regulates wastewater discharges to surface waters through the NPDES Program. The NPDES Permit Program controls water pollution by regulating point sources that discharge pollutants, including storm drain and sewer effluent, into waters of the U.S. The NPDES Program is a federal program delegated to the State of California for implementation through the SWRCB and the nine RWQCBs, which are collectively known as the Water Boards. The Project is in the Central Valley RWQCB region.

The Construction General Permit, Order No. 2009-0009-DWQ, as amended by 2010-0014-DWQ and 2012-0006-DWQ, requires dischargers whose project disturbs one or more acres but are part of a larger common plan of development that in total disturbs one or more acres, to obtain coverage under the General Permit for Discharges of Stormwater Associated with Construction Activity.

Porter-Cologne Water Quality Act

This act provides the legal basis for water quality regulation in California. This act requires a "Report of Waste Discharge" for any discharge of waste (liquid, solid, or gaseous) to land or surface waters that may impair beneficial uses of surface and/or groundwater of the state. It predates the CWA and regulates discharges to waters of the state. Additionally, it prohibits discharges of "waste" as defined, and this definition is broader than the CWA definition of "pollutant." Discharges under the Porter-Cologne Water Quality Act are permitted by waste discharge requirements and may be required even when the discharge is already permitted or exempt under the CWA. The SWRCB and RWQCBs are responsible for establishing the water quality standards (objectives and beneficial uses) required by the CWA and regulating discharges to ensure compliance with the water quality standards. Details about water quality standards in a project area are included in the Central Valley RWQCB Basin Plan (Central Valley RWQCB 2019).

Construction General NPDES Permit

The Construction General NPDES Permit (CGP) Order No. 2009-0009-DWQ, as amended by Order No. 2010-0014-DWQ (effective February 14, 2011) and Order No. 2012-0006-DWQ (effective July 17, 2012), regulates stormwater discharges from construction sites that disturb a soil area of 1 acre or greater and/or are small sites that are part of a large common plan of development. By law, stormwater discharges associated with construction activity where clearing, grading, and excavation result in soil disturbance of at least one acre must comply with the provisions of the CGP. Construction activity that results in soil disturbances of less than 1 acre is subject to the CGP if there is potential for significant water quality impairment resulting from the activity as determined by the RWQCB. Operators of regulated construction sites are required to develop Stormwater Pollution Prevention Plans (SWPPPs); to implement sediment, erosion, and pollution prevention control measures; and to obtain coverage under the CGP.

The main objectives of the CGP are to:

- Reduce erosion from construction projects or activities

- Minimize or eliminate sediment in stormwater discharges from construction projects
- Prevent materials used at a construction site from contacting stormwater
- Implement a sampling and analysis program to monitor construction site runoff
- Eliminate unauthorized non-stormwater discharges from the construction sites
- Implement appropriate measures to reduce potential impacts on waterways both during and after construction projects
- Establish maintenance commitments on post-construction pollution control measures

The CGP separates projects into Risk Levels 1, 2, or 3. Risk levels are determined during the planning and design phases and based on potential erosion and transport to receiving waters. For all projects subject to the permit, applicants are required to develop and implement an effective SWPPP that includes best management practices (BMPs) in the following categories:

- Good site management "housekeeping"
- Non-stormwater management
- Erosion control
- Sediment controls
- Run-on and runoff controls

Industrial General NPDES Permit

The Industrial General NPDES Permit (IGP) Order 2014-0057-DWQ as amended in 2015 and 2018 (effective July 1, 2020) is implemented by the SWRCB to minimize impacts to stormwater from industrial activities. The Project would be subject to the regulations of the IGP because it is a transportation facility with vehicle maintenance shops and equipment cleaning operations. The IGP requires preparation of an industrial SWPPP and a monitoring plan for industrial facilities, including vehicle maintenance facilities associated with transportation operations.

Water Facilities

California Water Code

When a city or county is the CEQA lead agency for a project meeting certain criterion, California Water Code Sections 10910 through 10915 require that the relevant water service provider determine whether the water demands of the proposed project were accounted for in the most recent urban water management plan (UWMP). If the project's water demand was not accounted for in the UWMP, the water service provider must prepare a Water Supply Assessment (WSA) demonstrating supplies are sufficient to meet the anticipated needs of the project. If the provider determines that potable water supplies are, or will be, insufficient, the project applicant must submit plans for acquiring additional potable water supplies. With respect to this Project, the CEQA lead agency is SJJPA and not a county or city and, therefore, Water Code Sections 10190 through 10915 do not apply. Further, the Project does not meet the criteria identified for requiring preparation of a WSA.

California Water Code (CWC) Sections 10610 through 10656 require every urban water supplier that either provides more than 3,000 acre-feet of water annually, or serves more than 3,000 urban connections, to submit a UWMP every 5 years to the California Department of Water Resources. UWMPs support long-term planning to ensure that adequate supplies are available to meet existing and future water needs. The UWMPs assess water sources over a 20-year planning period, describe management measures and water shortage contingency plans, and report progress toward meeting water demand reduction goals.

SB 610, Water Supply Assessments, was adopted in 2001 and reflects the growing awareness of the need to incorporate water supply and demand analysis at the earliest possible stage in the land use planning process. SB 610 amended the statutes of the UWMP Act, as well as CWC Section 10910 et seq.

The 2020 City of Merced UWMP describes the City of Merced's water system; characterizes water use; describes the water supply sources for the City of Merced; and analyzes the reliability of the City of Merced's water service for normal, dry, and 5-year drought conditions for the next 20 years (City of Merced 2021).

Title 22

The CWC requires the California Department of Public Health to establish water reclamation criteria. In 1975, the California Department of Public Health prepared Title 22 regulations to satisfy this requirement. Title 22 regulates production and use of reclaimed water in California by establishing three categories of reclaimed water: primary effluent, secondary effluent, and tertiary effluent. Primary effluent typically includes grit removal and initial sedimentation or settling tanks. Secondary effluent is adequately disinfected, oxidized effluent, which typically involves aeration and additional settling basins. Tertiary effluent is adequately disinfected, oxidized, coagulated, clarified, filtered effluent, which typically involves filtration and chlorination. In addition to defining reclaimed water uses, Title 22 defines requirements for sampling and analysis of effluent and specifies design requirements for treatment facilities.

State Water Resources Control Board, Division of Drinking Water, Source Water Assessment Program

The 1996 SDWA Amendments require each state to develop and implement a Source Water Assessment Program. Section 11672.60 of the California Health and Safety Code requires the Department of Health Services (DHS) (the precursor to California Department of Public Health) to develop and implement a program to protect sources of drinking water, specifying that the program must include both a source water assessment program and a wellhead protection program. In response, DHS developed the Drinking Water Source Assessment and Protection Program, which addresses both groundwater and surface water sources.

Sustainable Groundwater Management Act of 2014

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, 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 Project overlies the Merced Subbasin of the larger San Joaquin Valley Groundwater Basin. The Merced Subbasin is designated as a high-priority basin. Groundwater in the Merced Subbasin is 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 Turner Island Water District GSA) and is moving into the GSP implementation phase.

Electric Power

Senate Bill 100

On September 10, 2018, Governor Jerry Brown signed SB 100—also known as "The 100 Percent Clean Energy Act of 2018"—into law. The legislation is comprised of two major components: (1) it strengthens and accelerates California's existing renewable portfolio standard, setting a new target of 60 percent by 2030, and (2) it commits California to a 100 percent clean energy mix by 2045 through the supply and generation of zero-carbon resources.

Other Utilities

California Public Utilities Commission

The California Public Utilities Commission (CPUC) regulates privately owned electric, natural gas, telecommunications, water, railroad, rail transit, and passenger transportation companies. The CPUC is tasked with ensuring that consumers have safe, reliable utility service at reasonable rates and protecting against fraud. Specifically related to utilities, the CPUC has authority over, and is responsible under, numerous General Orders.

California Code of Regulations

The California Code of Regulations includes authoritative sections regarding public utilities in Title 20 (Public Utilities and Energy), Division 1 (Public Utilities Commission). Additionally, the California Health and Safety Code and the CWC contain information regarding sanitary and water utilities. The Public Utilities Code, Division 1 (Regulation of Public Utilities) gives specific regulation on public utilities, including the CPUC.

California Integrated Waste Management Board

At the state level, the management of solid waste is governed by regulations established by CalRecycle, which delegates local permitting, enforcement, and inspection responsibilities to local enforcement agencies. In 1997, regulations adopted by the SRWQCB pertaining to landfills (Title 23, Chapter 15) were incorporated with CalRecycle regulations (Title 14) to form Title 27 of the California Code of Regulations.

California Government Code Section 4216

Section 4216 of the California Government Code (Protection of Underground Infrastructure) requires that an excavator must contact a regional notification center (e.g., Underground Service Alert) at least 2 days before excavation of any subsurface installations. An Underground Service Alert will notify the utilities that may have buried lines within 1,000 feet of the excavation.

Representatives of the utilities are required to mark the specific locations of their facilities within the work area before the start of excavation. The construction contractor is required to probe and expose the underground facilities by hand before using power equipment.

Regional and Local Regulations

The SJJPA, as a state joint powers agency, proposes improvements within and outside the UPRR and BNSF rights-of-way. The ICCTA affords railroads that engage in interstate commerce considerable flexibility in making necessary improvements and modifications to rail infrastructure, subject to the requirements of the Surface Transportation Board. ICCTA broadly preempts state and local regulation of railroads; this preemption extends to the construction and operation of rail lines. As such, activities within the UPRR and BNSF rights-of-way are clearly exempt from local building and zoning codes as well as other land use ordinances. Project activities outside of the UPRR and BNSF rights-of-way, however, would be subject to regional and local plans and regulations. Though ICCTA broadly preempts state and local regulation of railroads, SJJPA intends to obtain local agency permits for construction of facilities that fall outside the UPRR and BNSF rights-of-way, even though SJJPA has not determined whether such permits are legally necessary or required.

Appendix 3.0-1, *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 Project improvements would be located. Section 15125(d) of the State 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 Project would be consistent with the plans of relevant jurisdictions.[2] The Project would be consistent with the applicable goals, policies, and objectives related to utilities identified in Appendix 3.0-1.

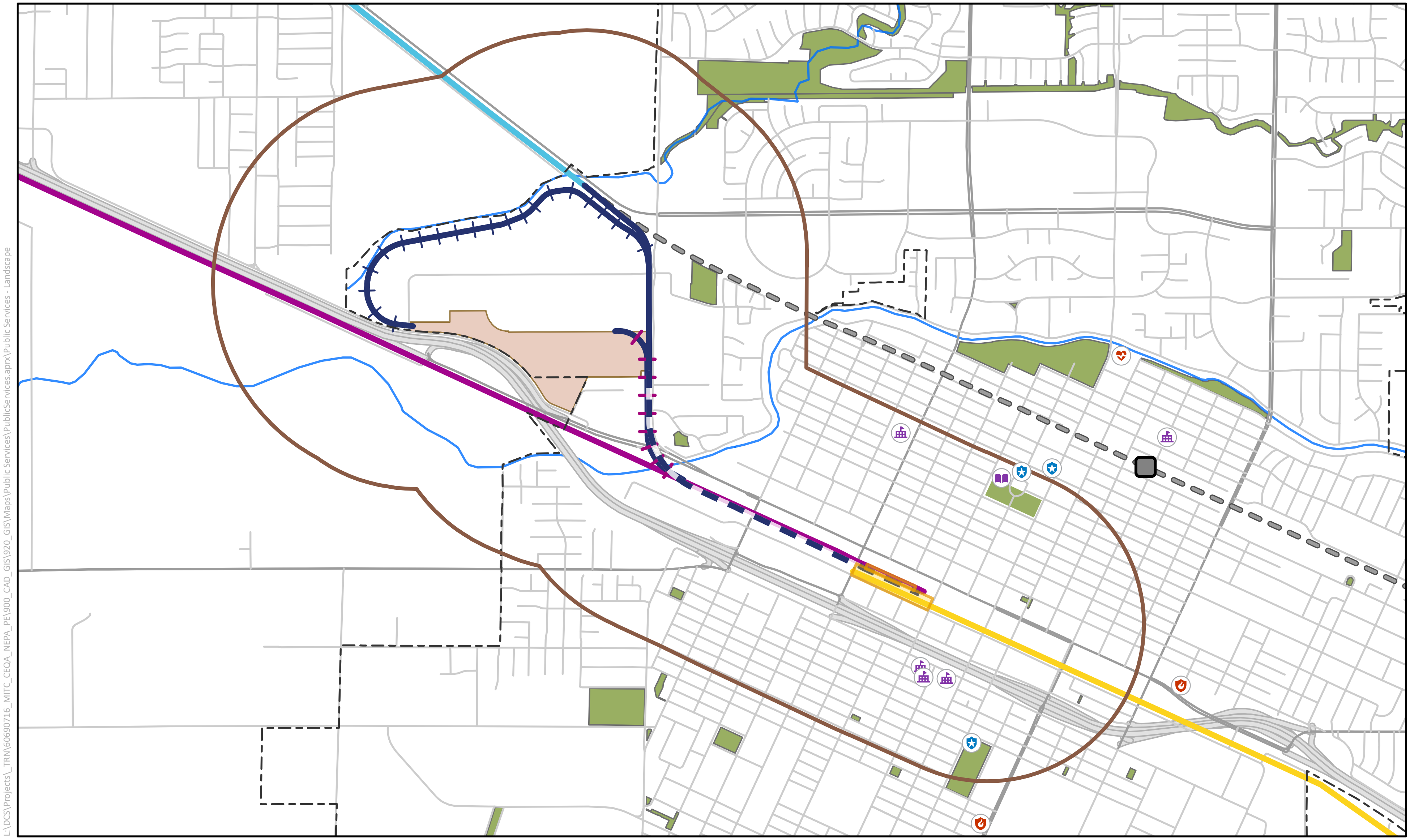
3.13.3 Environmental Setting

This section describes the environmental setting related to public services and utilities and service systems for the Project.

3.13.3.1 Public Services

Public services considerations include fire protection, law enforcement, schools, and other public facilities that operate in the jurisdictions where the Project would operate. Recreational resources are overseen by the parks and recreation departments of the cities and counties where public facilities would be located. These municipalities use planning documents, such as master plans, to guide the acquisition, preservation, improvement, maintenance, and expansion of local parklands and trail networks. Additionally, the general plans of each jurisdiction typically include goals and policies that address recreational resources. Other agencies, such as the U.S. National Park Service or U.S. Forest Service, oversee parks, recreation, open space, and refuge lands on a state and regional level and provide guidance on issues that transcend the authority of local jurisdictions. For the purposes of this analysis, the resource study area (RSA) for public services is a 0.5-mile radius and includes law enforcement, fire protection, and hospitals, schools, and recreation resources (Figure 3.13-1).

[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.



Existing UPRR/Approved ACE
Proposed High-Speed Rail
Existing BNSF/San Joaquins
Proposed Integrated Merced High-Speed Rail Station
Approved ACE Merced Layover and Maintenance Facility
City of Merced Boundary

MITC Project
San Joaquins: Elevated Track
San Joaquins: At-grade Track
San Joaquins: Layover and Maintenance Access Line
ACE/UPRR Spur Track
San Joaquins: To be discontinued under MITC Project

0.5-mile buffer
Hospital
School
Library
Police Station
Fire Station
Park

Figure 3.13-1
Public Services
Merced Intermodal Track Connection Project

0 1,000 2,000
Feet
N

MITC

Data Source: City of Merced

Information for existing public services in the RSA was obtained from the following sources:

- Direct coordination with jurisdictions for background information
- Resources and access information for fire, police, and emergency medical teams, including general plans
- School district maps identifying locations of schools
- Parks and recreational resources obtained from local and regional parks master plans, general plans, aerial maps, and Geographical Information System data

Fire Protection

Fire departments provide a range of services and programs aimed to protect lives and property from fire hazards, medical emergencies, exposure to hazardous materials, and other dangerous conditions. Table 3.13-1 provides a list of fire departments and stations in the RSA, including the types of services and equipment on hand, existing staffing levels, and response times, if available. The identified fire stations are those that would serve the Project. The State of California mandates mutual aid agreements with resources and facilities of the state to prevent and combat the effect of disasters that may result from such calamities as flood, fire, and earthquake (California Governor's Office of Emergency Services 2003).

Merced County Fire Department

The Merced County Fire Department provides first responder level emergency medical services (EMS), including rescue and extrication, as well as control and mitigation of hazardous materials emergency incidents. The Merced County Office of Emergency Services provides aid and support for fire and non-fire emergencies such as floods, earthquakes, extreme weather events, and other disasters (Merced County 2023a)

City of Merced Fire Department

The City of Merced Fire Department (MFD) provides fire protection, rescue, and EMS from two fire stations. The Department's Headquarters (Station 51) is near the intersection of East 16th and G Streets. Station 81 is on Martin Luther King Jr. Way adjacent to the Merced County Public Works.

MFD has a goal of maintaining a response time of 4 to 6 minutes for the first crew to arrive at a fire or medical emergency in an assigned district. This goal was chosen based on proven factors affecting property damage and, more importantly, life.

MFD personnel are typically assigned to a three-shift work schedule, which provides the City of Merced coverage 24 hours a day, 7 days a week. Each station is equipped with engine companies (water, hose, and pump), ladder companies (ladder, rescue tools, and rescue equipment), aircraft rescue firefighting vehicle, personnel rehabilitation unit, and other support vehicles (City of Merced 2023a).

Table 3.13-1. Fire Departments Servicing the Resource Study Area

Jurisdictions	Fire Department Information
Merced County	**Services:** Merced County Fire Department provides basic life support units, first responder medical, disaster planning, emergency medical services, hazardous materials response, rescue, fire law/code enforcement, and fire prevention. **Stations in proximity to the RSA:** • Station 81: 735 Martin Luther King Jr. Way, Merced (0.75 mile from the Project footprint) • Station 91: 16056 Acacia Street, Delhi (16.20 miles from the Project footprint) • Station 96: 1430 C Street, Livingston (12 miles from the Project footprint) **Existing staffing level:** Each station is staffed by a full-time Fire Captain or Fire Apparatus Engineer, with 79 professional firefighters. **Response time goal:** Maintain fire department staffing levels and response times consistent with National Fire Protection Association standards.
City of Merced	**Services:** The Merced Fire Department provides hazardous materials response, technical rescue, medical services, aircraft rescue firefighting, and swift water rescue. **Stations in proximity to the RSA:** Station 51: 99 East 16th Street, Merced (0.78 mile from the Project footprint) **Existing Staffing Level:** Minimum daily staffing: 1 battalion chief, 6 captains, 6 engineers, and 7 firefighters; 1 chief, 2 captains, 4 lieutenants, 12 sergeants, 79 officers (including detectives) (42 unsworn officers). **Calls for service in 2022:** The department responded to 11,672 calls. **Response time goal:** Response time of approximately 5 minutes citywide for Priority 1 calls.

Sources: Merced County 2023a, City of Merced 2023a

Law Enforcement

Law enforcement departments have the primary responsibility to protect the life and property of citizens from criminal activities. Table 3.13-2 provides a list of law enforcement departments in the RSA, staffing, services, and response times, if available.

Merced County Sheriff's Office

The Merced County Sheriff's Department responds and provides enforcement services, search and rescue, aviation, K-9-unit, Special Weapons and Tactics (SWAT), and medical response services. The sheriff's department is also responsible for maintaining correctional facilities, operating correctional programs, and maintaining crime prevention programs. The Aviation Unit may provide, when resources are available, air support to other law enforcement agencies in the scope of mutual aid during life threatening emergencies. The Merced County Sheriff's Department serves the law enforcement agencies in Merced County and is on West 22nd Street north of Bear Creek and Snelling Highway (SR 59) (Merced County 2023b).

City of Merced Police Department

Police protection for the entire City of Merced is provided by the City of Merced Police Department. The Police Department employs a mixture of sworn officers, nonsworn officer positions (clerical, etc.), and unpaid volunteers. The service standard used for planning future police facilities is approximately 1.32 sworn officers per 1,000 population (City of Merced 2023b).

Criminal activity and calls for police service will increase due to population growth alone. By 2030, officer responses to incidents could increase from 65,000 in 2009 to more than 130,000 annually if existing population trends hold true (City of Merced 2017). The city is divided into three Districts (North, Central and South). All three of these districts are included within the RSA. At any time, police districts can be added or revised to address staffing and resource needs.

Table 3.13-2. Law Enforcement Operating in the Resource Study Area

Department	Law Enforcement Office Information
Merced County Sheriff's Office	**Staffing:** The Merced County Sherriff's Office consists of 124 sworn deputy sheriffs. **Services:** Aviation, dive team, K-9-unit, Special Emergency Response Team, search and rescue, SWAT, Sheriff Tactics and Reconnaissance Team, and Sheriff Enforcement Team. **Headquarters in proximity to the RSA:** • 700 West 22nd Street, Merced (0.50 miles from the Project footprint) **Service ratio goal:** Encourage optimal staffing levels for both sworn sheriff deputies and civilian support staff.
City of Merced Police Department	**Staffing Level:** The Merced Police Department consists of 84 sworn officers. **Services:** Patrol division, crime prevention, code enforcement, Disruptive Area Response Team, traffic, bomb unit, SWAT, K-9 unit, and Crime Scene Response Team. **Stations in the RSA:** • Main Station: 611 West 22nd Street, Merced (0.25 mile from the Project footprint) • South Station: 470 West 11th Street, Merced (0.75 mile from the Project footprint) **Service ratio goal:** 1.32 officers for every 1,000 citizens.

Source: Merced County 2023b, City of Merced 2023b
SWAT = Special Weapons and Tactics

Schools

Table 3.13-3 identifies the public schools and daycares in the RSA. The RSA for schools is within a 0.50-mile radius of the Project footprint.

Table 3.13-3. Educational Facilities in the Resource Study Area

School	Distance from the Project Footprint
Valley High School	0.25 miles
John C. Fremont Elementary School	0.36 miles
Galen Clark Preschool	0.99 miles
Stowell Elementary School	1.00 miles

Source: City of Merced 2017

Parks and Recreational Facilities

As shown on Figure 3.13-1, the closest park or recreation center to the Project footprint is the Stephan Gray Park. The park is accessed via North Bear Creek Drive located northeast of the Sate Route SR 59 and 16th Street intersection. Additional parks identified in the RSA include:

- Carol Gabriault Park
- Fahrens Park

- Michael O. Sullivan Bike Path
- McNamara Park
- Southwest Merced Park
- Dennis Chavez Park
- Diego Rivera Park
- Courthouse Park

Libraries

The Merced County Library system was established in 1910, and at its peak provided library services at the Main Library in Merced and 18 branch locations throughout the county. Currently, the library has 15 branches, in addition to the main library. Show in Table 3.13-4, only one library is located within the RSA.

Table 3.13-4. Libraries in the Resource Study Area

Library	Distance from the Project Footprint
Merced County Library	0.25 mile

Source: City of Merced 2017

Hospitals

As shown on Figure 3.13-1, there are no hospitals in the RSA.

3.13.3.2 Utilities and Service Systems

This section describes the environmental setting related to utilities and service systems for the Project. For the purposes of this analysis, the RSA for utilities and service systems is defined as follows:

- **Direct Impacts**. Utilities and service systems in the environmental footprint of the Project that would be directly affected by physical changes from structural development and/or infrastructure installation represents the direct impact RSA.
- **Indirect Impacts.** The service systems of identified utilities that currently or would provide service to the RSA represent the indirect impact.

Information presented in this section regarding existing utilities and service systems was obtained from the following sources:

- Utility providers in the RSA
- Operating permits for utilities in the RSA

This section begins with an overview of utilities and service system providers in the RSA, followed by a detailed description of existing water, wastewater, stormwater, and telecommunications utilities in the RSA. Descriptions of solid waste facilities are presented for the entire RSA because they are large operations that typically serve multiple municipalities.

Utilities within the RSA include providers that maintain utilities infrastructure, including telecommunication lines, electric power, natural gas, water, wastewater treatment, stormwater drainage, and solid waste, in the environmental footprint of the Project. Existing utilities can be found in *Appendix 2.0-2, MITC 15% Engineering Plans, pages 35-45*. It should be noted that shown utilities are a result of preliminary investigations. Future Project phases would include field survey and verification of underground utilities.

Solid Waste

Solid waste in the City of Merced and Merced County is disposed of at two landfill sites owned and operated by the Merced County Regional Waste Management Authority. The west side of the county is served by the Billy Wright Disposal Site, and the east side (including the City of Merced) by the Highway 59 Disposal Site. Merced County is the contracting agency for landfill operation and maintenance. It is estimated that the remaining capacity of the Highway 59 site will last until the year 2030. The City of Merced provides services for all refuse pick-up in the City of Merced limits, including green waste and recycling (City of Merced 2024). Table 3.13-5 presents the solid waste facilities that serve the RSA, including landfills, recycling facilities, composting facilities, and transfer stations.

Table 3.13-5. Solid Waste Facilities in the Resource the Resource Study Area

Facility Name	Facility Location	Permitted Capacity (per day)	Remaining Capacity (cubic yards)	Remaining Capacity Date	Estimated Closure Date	Types of Waste Accepted
Billy Wright Disposal Site	Merced	1,500 tons	11,370,000	9/30/2010	12/31/2054	Mixed municipal, agricultural, and construction and demolition.
Highway 59 Disposal Site	Merced	1,500 tons	28,025,334	9/1/2005	1/1/2030	Mixed municipal, green materials, wood, tires, hazardous materials, and other designated.

Source: CalRecycle 2023

Water Supply

City of Merced

Since 1917, the City of Merced has relied on groundwater as its primary water source, but groundwater is recharged entirely through agricultural application of surface water from the Merced River. The City of Merced's water system has 20 groundwater wells with a total well capacity of 54,400 gallons per minute (gpm). In 2020, the City of Merced supplied 20,076 acre-feet of potable water and 4,050 acre-feet of recycled water (City of Merced 2021). Potable water demands are projected to increase to 31,825 acre-feet by 2040 due to increases in the City of Merced and University of California Merced population (City of Merced 2021). The City of Merced's water supply is projected to sufficiently meet demands through 2040 through the installation of additional groundwater wells and construction of a 10 million gallon per day (mgd) surface water treatment plant (SWTP) (City of Merced 2021). The SWTP is projected to use surface water supplied by the Merced Irrigation District (MID) and begin operation by 2030. Table 3.13-6 accounts for future demand and capacity of water in normal and multiple dry years.

Table 3.13-6. City of Merced Future Water Supply and Demand (2025–2040)

	2025		2030		2035		2040	
	Supply	Demand	Supply	Demand	Supply	Demand	Supply	Demand
Total Water Use (Normal Water Year) (acre-feet)	24,418	24,418	26,751	26,751	28,995	28,995	31,825	31,825
Total Water Use (Single Dry-Year) (acre-feet)	26,860	26,860	29,426	29,426	31,895	31,895	35,008	35,008
Total Water Use (Drought Lasting Two Consecutive Water Years) (acre-feet)	29,301	29,301	32,101	32,101	34,794	34,794	38,190	38,190
Total Water Use (Drought Lasting Three Consecutive Water Years) (acre-feet)	26,860	26,860	29,426	29,426	31,895	31,895	35,008	35,008
Total Water Use (Drought Lasting Four Consecutive Water Years) (acre-feet)	19,534	19,534	21,401	21,401	23,196	23,196	25,460	25,460
Total Water Use (Drought Lasting Five Consecutive Water Years) (acre-feet)	19,534	19,534	21,401	21,401	23,196	23,196	25,460	25,460

Source: City of Merced 2021.

The Merced groundwater basin, which is currently the City of Merced's only water source, is a high-priority basin. The addition of surface water to the City of Merced's water portfolio, continued implementation of water conservation measures, and participation in regional activities to address the sustainable management of the groundwater basin are critical components for the long-term reliability of the City's water system.

The City of Merced is in the geomorphic province known as the Central Valley, which is divided into the Sacramento Valley and the San Joaquin Valley. The groundwater underlying the City of Merced is part of the larger San Joaquin Valley Groundwater Basin in the San Joaquin River Hydrologic Region. The San Joaquin Valley Groundwater Basin is further subdivided into nine subbasins, including the Merced Subbasin. The Project lies entirely within the Merced Subbasin. The Merced Subbasin covers a surface area of approximately 491,000 acres (767 square miles) (City of Merced 2021).

Merced County

Portions of the Project would be located in the Franklin-Beachwood community within unincorporated Merced County. California America Water supplies the Franklin-Beachwood Community with water, which owns and operates four groundwater wells. The Merced groundwater basin is a high-priority basin and serves as Merced County's water source. Since California America Water does not meet the California Water Code Section 10610–10656 thresholds and provides less than 3,000 acre-feet of water annually and serves less than 3,000 urban connections, a UWMP has not been prepared for the Franklin-Beachwood Community. Projected demand for the community is 1,974 acre-feet per year (Merced County 2009).

Wastewater Collection and Disposal

Wastewater (sanitary sewer) collection and treatment in the Merced urban area is provided by the City of Merced. The City of Merced wastewater treatment facility has a permitted capacity of 10 mgd, with an average 2008 flow of 8.5 mgd (City of Merced 2017). The City of Merced has initiated an expansion project to increase capacity to 12 mgd and upgrade to tertiary treatment with the addition of filtration and ultra-violet disinfection. Future improvements would add another 8 mgd in capacity (in increments of 4 mgd), for a total of 20 mgd. This design capacity can support a population of approximately 150,000.

Stormwater Drainage and Flood Control

City of Merced

The City of Merced requires the construction of stormwater percolation/detention basins with new development (City of Merced 2017). Percolation basins are designed to collect stormwater and filter it before it is absorbed into the soil and reaches groundwater tables. Detention basins are designed to temporarily collect runoff so that it can be metered at acceptable rates into canals and streams, which have limited capacity. The disposal system is composed of MID facilities, including water distribution canals and laterals, drains, and natural channels that go through the area. Regulation of water quality through the NPDES Program is discussed in more detail in Section 3.10, *Hydrology and Water Quality*.

The City of Merced has been involved with developing a Stormwater Management Plan (SWMP) to fulfill requirements of stormwater discharges in accordance with the CWA. The Merced Stormwater Group (MSWG) is a coalition of municipalities, including the Cities of Atwater, Merced, and

Livingston; Merced County; and MID (Merced 2024). The MSWG will implement the SWMP to limit the discharge of pollutants from stormwater systems, using specific control measures and BMPs. Mitigation of potential flood impacts is addressed by the City's Flood Damage Prevention Ordinance. The ordinance restricts development of flood-prone areas, and mandates special construction requirements for those developments allowed within the floodplain. Currently, floodplain requirements are based on a 100-year event. The State of California has enacted legislation requiring communities to prepare flood damage control ordinances based on a 200-year event, which may require the City of Merced to update this ordinance for certain areas of the City of Merced.

Merced County

Stormwater runoff is not treated and goes directly into Merced County's waterways. The CWA was enacted in 1972 to make the discharge of pollutants to any water body in the United States unlawful. Under the SWRCB Water Quality Order No. 2003-0005-DWQ (Merced County 2023), Merced County was tasked with creating an SWMP that outlines the BMPs to achieve the removal of pollutants from stormwater to the maximum extent possible. BMPs are practiced to prevent pollutants from entering Merced County's waterways. Merced County Ordinance No. 1923: Stormwater Ordinance (Merced County 2023) was enacted by Merced County to conduct the enforcement measures found in the SWRCB Order No. 2013-0001-DWQ (Merced County 2023).

Telecommunications

Telecommunication services include fiber optics, phone, and television cable. Transmission of internet service is available through various broadband technologies such as fiber-optic, cable, or fixed wireless. Telecommunication utility owners located within the RSA include Comcast, AT&T, and Sprint.

Electric Power and Natural Gas

PG&E is the primary electricity and natural gas provider in the area surrounding the Project. Like other private utility suppliers, PG&E is regulated by CPUC. PG&E transports power through underground duct banks and overhead lines. PG&E's high-pressure gas transmission pipelines deliver natural gas to residential and commercial connections through small, low-pressure neighborhood distribution pipelines. A combination of underground gas pipes, underground power, and overhead power lines are located throughout the RSA.

3.13.4 Impact Analysis

This section describes the environmental impacts of the Project on public services and utilities and service systems. This section also 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.

3.13.4.1 Methods for Analysis

Methods

The methods used to evaluate impacts on public services and utilities and service systems are described below. Direct impacts on utilities and service systems would occur if the Project disrupted or damaged existing utilities infrastructure. To determine the potential for direct impacts on utilities and service systems to occur, the environmental footprint of the Project compared to the locations of utilities infrastructure. For this analysis, utilities that would be potentially affected during construction and require protection in place or to be relocated are identified.

Public Services

This analysis evaluates potential impacts on public services that would result from the Project. Impacts from the construction and operation of the Project on public services in the RSA were evaluated based on review of available literature and information from each city and county in the RSA.

Construction impacts are those resulting from building and installing infrastructure required for the Project. Operations impacts would result from operation of the service and ongoing, routine, and occasional maintenance activities associated with the service.

For construction- and operations-related impacts, significant impacts related to fire protection, law enforcement, emergency services, and schools may occur if acceptable service ratios and performance objectives are not met and the resultant increase in staffing or equipment requires the construction of new or altered facilities that could cause a significant physical impact on the environment. Not meeting service ratios is considered a social or economic impact; CEQA is concerned with the resultant physical impacts on the environment. Thus, a project may result in an increased demand for public services, but a significant impact under CEQA occurs only if that demand results in the need for new facilities, which creates an indirect physical impact on the environment that is significant. To determine impacts associated with construction and operations, this section is a qualitative assessment of whether the Project would result in a demand for public services that would be similar to or different from existing conditions.

Utilities and Service Systems

Direct impacts on utilities and service systems would occur if the Project disrupted or damaged existing utilities infrastructure. To determine the potential for direct impacts on utilities and service systems to occur, the environmental footprint of the Project is compared to the locations of utilities infrastructure. For this analysis, utilities that would be potentially affected during construction and require protection in place or to be relocated are identified.

Indirect impacts on utilities and service systems would occur if the Project would result in demand for utilities that exceed the planned supply of the appropriate service provider, thereby resulting in the need for new entitlements or the construction of new utilities infrastructure. The demand for water, wastewater, stormwater, and solid waste resulting from the Project is determined for both construction and operation. Construction demand is assumed to conform to industry standards.

3.13.4.2 Thresholds of Significance

The CEQA Guidelines Appendix G (14 Cal. Code Regs. 15000 et seq.) identifies significance criteria to be considered for determining whether a project would have significant impacts on public services and utilities and service systems.

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

Public Services

Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physical altered governmental facilities, the construction of which would cause significant environmental impacts, to maintain acceptable service ratios, response times, or other performance objectives for any of the public services:

- Fire protection
- Police protection
- Schools
- Parks
- Other public facilities

Utilities and Service Systems

- Require or result in the relocation or construction of new or expanded water, wastewater treatment or stormwater drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects.
- Would not have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry, and multiple dry years.
- Result in a determination by the wastewater treatment provider, which serves or may serve the project, that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments.
- Generate solid waste in excess of state or local standards, or more than the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals.
- Violate federal, state, and local management and reduction statutes and regulations related to solid waste.

3.13.4.3 Impacts and Mitigation Measures

Impact PS-1	Construction of the Project could increase fire protection, emergency responders, and law enforcement service ratios, response times, or other performance objectives but, with mitigation, would not result in the need for new or physically altered fire protection or law enforcement facilities.
Level of Impact	**Potentially significant impact**
Mitigation Measures	TR-1.1: Transportation Management Plan (TMP) for Project construction
Level of Impact After Mitigation	**Less-than-significant impact**

Project

Impact Characterization

Construction of the Project would impact fire protection, law enforcement, and emergency response services in two primary ways:

- Construction activities occurring in roadways and streets would disrupt traffic and interfere with response times for fire, police, and other emergency responders.
- Additional fire, police, and other emergency response services would be needed for construction workers and the locations where construction would take place.

Impact Details and Conclusions

The Project would require temporary road detours during the construction phase and potentially impact emergency response times related to fire and police protection. Street detours to build the aerial guideway would occur on the streets perpendicular to the alignment between O Street and V Street. At-grade crossings would require the installation of crossing panels, crossing signals, guards/gates, and signal houses where the new track would cross the roadway. The existing roadway adjacent to the at-grade segments of the guideway along State Route 59 (SR 59) would require roadway modifications that would require lane reduction during construction hours. Street detours, although temporary in nature, may interfere with typical routes and thoroughfares used by emergency responders and therefore require the use of alternative routes. Such instances would increase emergency response times and result in a potentially significant impact.

During construction, accidents involving construction personnel and equipment may impose a demand for local emergency responders. Construction staging areas and construction areas that store construction equipment or materials could be subject to crime and vandalism. As a result, demand for law enforcement services could increase. Temporary construction workers could increase the local population and require such public services, resulting in a potentially significant impact.

Accidents involving construction workers or equipment, and the increased potential crime and vandalism at construction staging areas, could increase the need for public services. In reference to construction safety and preventing construction accidents, Cal/OSHA's Title 8 regulations require an emergency action plan that establishes protocol for any emergency scenarios and establishes safety measures to prevent and respond to medical emergencies (Cal/OSHA 2005). In addition, construction areas would include fencing and visual screening to deter trespassers from accessing the construction sites, which would decrease the likelihood of construction personnel involvement.

Construction of the Project would not generate any housing and therefore would not generate a demand for new schools or parks or government facilities. The guideway would not require any property acquisition or temporary construction easements that would interfere with or result in the physical alteration of government facilities. However, for the reasons previously described construction activities in streets and roadways would require street detours that would potentially interfere with emergency response times to fire protection and police protection, resulting in a potentially significant impact.

Mitigation Measures

Mitigation Measure TR-1.1: Transportation Management Plan (TMP) for Project construction

Refer to mitigation measure description in Section 3.16, *Transportation*.

Significance with Application of Mitigation

Mitigation Measure TR-1.1 requires the preparation of a construction road traffic control plan that describes protocols for coordinating with local jurisdictions on emergency vehicle access and maintaining access for fire protection, law enforcement, and emergency service providers. The construction road traffic control plan would address temporary road closures, detour provisions, allowable routes, and alternatives access. This mitigation measure would reduce such delays to a less than significant level. Local municipalities would adjust their staff and deployment according to these temporary disruptions, preventing substantial increases in staffing. As a result, there would be no need for new or altered public service facilities. With implementation of Mitigation Measure TR-1.1, construction activities associated with the Project would have a less-than-significant impact on public services.

Variant H1

Impact Characterization

The impact characterization for Variant H1 is the same as described above for the Project.

Impact Details and Conclusions

The impact details for Variant H1 are similar as described above for the Project, except there would be additional construction of solar panels, hydrogen storage, and hydrogen fueling facilities. Construction activities in streets and roadways would require street detours that would potentially interfere with emergency response times to fire protection and police protection, resulting in a potentially significant impact.

Mitigation Measures

Mitigation Measure TR-1.1: Transportation Management Plan (TMP) for Project construction

Significance with Application of Mitigation

With implementation of Mitigation Measure TR-1.1, construction activities associated with Variant H1 would have a less-than-significant impact on public services.

Variant H2

Impact Characterization

The impact characterization for Variant H2 is the same as described above for the Project.

Impact Details and Conclusions

The impact details for Variant H1 are similar as described above for the Project, except there would be additional construction of hydrogen storage and fueling facilities. Construction activities in streets and roadways would require street detours that would potentially interfere with emergency response times to fire protection and police protection, resulting in a potentially significant impact.

Mitigation Measures

Mitigation Measure TR-1.1: Transportation Management Plan (TMP) for Project construction

Significance with Application of Mitigation

With implementation of Mitigation Measure TR-1.1, construction activities associated with Variant H2 would have a less-than-significant impact on public services.

Variant H3

Impact Characterization

The impact characterization for Variant H3 is the same as described above for the Project.

Impact Details and Conclusions

The impact details for Variant H3 are the same as described above for the Project, except there be additional construction of hydrogen storage and fueling facilities. Construction activities in streets and roadways would require street detours that would potentially interfere with emergency response times to fire protection and police protection, resulting in a potentially significant impact.

Mitigation Measures

Mitigation Measure TR-1.1: Transportation Management Plan (TMP) for Project construction

Significance with Application of Mitigation

With implementation of Mitigation Measure TR-1.1, construction activities associated with Variant H3 would have a less-than-significant impact on public services.

Impact PS-2	Operation of the Project would not increase fire protection, emergency responders, and law enforcement service ratios, response times, or other performance objectives and would not result in the need for new or physically altered fire protection or law enforcement facilities.
Level of Impact	**Less-than-significant impact**

Project

Impact Characterization

Operation of the Project would impact fire protection, law enforcement, and emergency response services in the following ways:

- Daily San Joaquins trains could interfere with the response times for fire, police, and other emergency responders resulting from the addition of crossing gates at two at-grade crossings. The two crossings include, Cooper Avenue/Snelling Highway (SR 59), and on Cooper Avenue immediately north of Ashby Road.
- Daily ACE trains could interfere with the response times for fire, police, and other emergency responders due to at-grade improvements and crossing gates at the intersection of Snelling Highway (SR 59)/16th Street.
- Accident conditions involving trains would require response from fire, police, and other emergency responders.
- Additional residents due to the new employees at the approved ACE Merced Layover and Maintenance Facility may increase demand for fire, police, and other emergency responders.

Impact Details and Conclusions

During operations, the Project would implement San Joaquins train service originating and terminating in Merced. With eight weekday round trips originating and terminating in the City of Merced, this would result in crossing gate downtime and at-grade crossings during the morning and evening peak hours. Gate downtimes usually have a duration of 45 seconds to 1 minute. However, municipalities would deploy their staff to maintain coverage on other side of the tracks and identify alternate routes for responders to minimize response times. As such, these gate downtimes would not substantially affect emergency response times. The Project would increase the number of visitors or travelers passing through the area surrounding the Project. This would increase the number of calls for service for law enforcement and therefore lead to longer response times to non-priority calls. However, the additional demand from visitors would be intermittent and would not result in the need for construction of new or altered facilities.

Crime rates would not substantially deviate from existing crime levels of the surrounding communities because of Project operations. Without a change in crime incidence, no substantial increase in law enforcement staffing is anticipated, and there would be no need for new or altered facilities.

If an incident involving trains occurred, substantial coordinated emergency response attention would be required. The probability of such an event is remote, and local public service providers would not increase staffing or expand nor alter their facilities to manage such an extreme event; rather, local agencies would coordinate with other service providers to assist with response. Thus, there would not be an increase in emergency services, and there would not be a need for additional fire, law enforcement, and emergency service facilities.

With the implementation of the Project, new employment opportunities would arise, creating the potential for new residents to relocate to the Project area. Although the total number of employees is not yet known, it is anticipated that the number would be small and would not result in a significant increase in demand for services.

In summary, operation of the Project would not increase fire protection, emergency responders, and law enforcement service ratios, response times, or other performance objectives and would not result in the need for new or physically altered fire protection or law enforcement facilities. As a result, impacts related to fire protection, law enforcement, and emergency services would be less than significant.

Variant H1

Impact Characterization

The impact characterization for Variant H1 is the same as described above for the Project. Additional analysis for Variant H1 considers accident conditions related to the production or storage of hydrogen that would require response from fire, police, and other emergency responders.

Impact Details and Conclusions

The impact details for Variant H1 are similar to those described for the Project. In comparison to the Project, Variant H1 would necessitate the production and storage of hydrogen to fuel the train fleet. Hydrogen has a range of flammable concentrations in air, which means it can ignite. The presence of hydrogen and compressed gas increases the likelihood of emergencies related to fire. As such, hydrogen's properties require additional engineering controls to enable its safe use. NFPA has set forth national hydrogen-specific codes that the Project shall comply with. Provisions include items related to annual inspections, general storage requirements, gaseous hydrogen storage, dispensing systems, piping, and tubing for all systems, valving, and fittings, venting and other equipment, and fire safety. Hydrogen-specific codes (NFPA 2023) are listed under:

- NFPA 1: Fire Code
- NFPA 2: Hydrogen Technologies Code
- NFPA 30A: Motor Fuel-Dispensing Facilities and Repair Garages
- NFPA 55: Compressed Gases and Cryogenic Fluids Code

The purpose of NFPA 2 is to provide fundamental safeguards for the generation, installation, storage, piping, use, and handling of hydrogen in compressed gas form or cryogenic liquid form (NFPA 2023). One of the requirements of NFPA 2 is that radiant impacts greater than 1,500 British thermal units per hour per square foot are not allowed off-site. This requirement would necessitate the installation of solid barrier walls designed to prevent flame or explosion hazards around the hydrogen equipment enclosure area, if they were to occur, from extending off-site. NFPA 2 also provides setback standards to prevent hydrogen hazards from affecting adjacent uses or groups. Variant H1 shall achieve these standards, and fire hazard exposure would not extend beyond on-site setback areas. The design, installation, and testing of the hydrogen site shall be in accordance with NFPA 2, applicable safety regulations, and professional engineering standards to reduce the risk of fire or explosion from hydrogen. Abiding by the standards set forth by NFPA would reduce the likelihood of additional emergency fire protection, law enforcement, and emergency services.

If fire were to occur, substantial coordinated emergency response attention would be required. Local public service providers would not increase staffing or expand or alter their facilities to manage such an event; rather, local agencies would coordinate with other service providers to assist with mutual-aid response. Thus, there would not be an increase in emergency services, and there would not be a need for additional fire, law enforcement, and emergency service facilities. Therefore, impacts would be less than significant.

Variant H2

Impact Characterization

The impact characterization for Variant H2 is the same as described for Variant H1.

Impact Details and Conclusions

The impact details for Variant H2 are the same as described for Variant H1. In comparison with Variant H1, Variant H2 shall also abide by the provisions set forth by NFPA during the storage of hydrogen fuel to reduce emergencies related to fires. Operation of Variant H2 would not increase fire protection, emergency responders, and law enforcement service ratios, response times, or other performance objectives and would not result in the need for new or physically altered fire protection or law enforcement facilities. As a result, impacts related to fire protection, law enforcement, and emergency services would be less than significant.

Variant H3

Impact Characterization

The impact characterization for Variant H3 is the same as described for Variant H1.

Impact Details and Conclusions

The impact details for Variant H3 are similar as described above for the Project and the same as described for Variant H1. In comparison with Variant H1, Variant H3 shall also abide by the provisions set forth by NFPA during the storage of hydrogen fuel to reduce emergencies related to fires.

Compared with the Project, Variant H3 would require an incremental increase in rail services. Operations would supply hydrogen by rail instead of processing hydrogen on-site. As a result, Variant H3 would require up to one daily roundtrips of trains from the approved ACE Merced Layover and Maintenance Facility to Natomas. This would require an addition of two gate downtimes that would have a duration of 45 seconds to 1 minute. However, municipalities would deploy their staff to maintain coverage on other side of the tracks and identify alternate routes for responders to minimize response times. As such, these gate downtimes would not substantially affect emergency response times.

Operation of Variant H3 would not increase fire protection, emergency responders, and law enforcement service ratios, response times, or other performance objectives and would not result in the need for new or physically altered fire protection or law enforcement facilities. As a result, impacts related to fire protection, law enforcement, and emergency services would be less than significant.

Impact USS-1	Construction of the Project would require or result in the relocation or construction of new or expanded water, wastewater treatment or stormwater drainage, electric power, natural gas, or telecommunications facilities; the construction or relocation of such utilities would not cause significant environmental effects.
Level of Impact	**Potentially significant impact**
Mitigation Measure	USS-1.1: Implement Utility Relocation Plan
Level of Impact after Mitigation	**Less-than-significant impact**

Project

Impact Characterization

A significant impact on utilities and service systems would occur if the project results in the construction of new or expanded water, wastewater treatment or stormwater drainage, electric power, natural gas, or telecommunications facilities or expansion of existing facilities, in which the construction of which could cause significant environmental effects.

Impact Details and Conclusions

Storm Water Drainage

The Project would require the creation of impervious surfaces, including for parking to serve San Joaquins maintenance and operations staff at the approved ACE Merced Layover and Maintenance Facility, and the proposed grade-separated guideway, Discussed in Section 3.10, *Hydrology and Water Quality*, stormwater drainage patterns could be temporarily altered due to site grading, preparation, and excavation activity. However, Project construction would implement BMPs required in the Project SWPPP to minimize the potential for erosion or siltation in nearby storm drains, temporary changes in drainage patterns, or flooding during construction.

Storm water facility design would be required to comply with state and local requirements for storm drain design, including integration of post-construction stormwater controls into site design. The design of storm drains would be consistent with municipal requirements. The implementation of these storm water facilities would help avoid any water quality impacts, and the environmental effects from installing these facilities would be less than significant.

Utility Relocations

Shown in *Appendix 2.0-2, MITC 15% Engineering Plans, pages 35-45,* existing utilities are present within the Project footprint. In addition, there may be utilities that would be within the Project footprint that are yet to be identified by service providers. Construction of the Project would conflict with existing utilities infrastructure, requiring the relocation of existing utilities. It is possible that relocation or accidental disruption during construction of the Project could disrupt utility service or damage utilities, resulting in a potentially significant impact on utilities infrastructure.

Mitigation Measures

Mitigation Measure USS-1.1: Implement Utility Relocation Plan

San Joaquin Joint Powers Authority (SJPPA) or its contractor will coordinate with all utility providers during final design and construction stages to identify utilities potentially impacted by the Project, including existing and planned utilities. A utility relocation plan will be developed and implemented to minimize service interruption and safely relocate, repair, or replace affected utilities. SJPPA or its contractor will assist utility owners in developing a communications plan to inform end users of potential planned service interruptions.

Significance with Application of Mitigation

With implementation of Mitigation Measure USS-1.1, impacts on utilities infrastructure during construction of the Project would be less than significant.

Variant H1

Impact Characterization

The impact characterization for Variant H1 is the same as described for the Project.

Impact Details and Conclusions

It is possible that relocation or accidental disruption during construction of Variant H1 could disrupt utility service or damage utilities, resulting in a potentially significant impact on utilities infrastructure.

Mitigation Measures

Mitigation Measure USS-1.1: Implement Utility Relocation Plan

Significance with Application of Mitigation

With implementation of Mitigation Measure USS-1.1, impacts on utilities infrastructure duuring construction of Variant H1 would be less than significant.

Variant H2

Impact Characterization

The impact characterization for Variant H2 is the same as described for the Project.

Impact Details and Conclusions

It is possible that relocation or accidental disruption during construction of Variant H2 could disrupt utility service or damage utilities, resulting in a potentially significant impact on utilities infrastructure.

Mitigation Measures

Mitigation Measure USS-1.1: Implement Utility Relocation Plan

Significance with Application of Mitigation

With implementation of Mitigation Measure USS-1.1, impacts on utilities infrastructure duuring construction of Variant H2 would be less than significant.

Variant H3

Impact Characterization

The impact characterization for Variant H3 is the same as described for the Project.

Impact Details and Conclusions

It is possible that relocation or accidental disruption during construction of Variant H3 could disrupt utility service or damage utilities, resulting in a potentially significant impact on utilities infrastructure.

Mitigation Measures

Mitigation Measure USS-1.1: Implement Utility Relocation Plan

Significance with Application of Mitigation

With implementation of Mitigation Measure USS-1.1, impacts on utilities infrastructure duuring construction of Variant H3 would be less than significant.

Impact USS-2	There would be sufficient water supplies available to serve the Project during construction and reasonably foreseeable future development during normal, dry, and multiple dry years.
Level of Impact	**Less-than-significant impact**

Project

Impact Characterization

A significant impact on utilities and service systems would occur if the construction of the Project results in new or expanded entitlements to supply water to the Project.

Impact Details and Conclusions

Construction of the Project would include the installation of a new track and the aerial guideway. Grading for the Project would occur before the track alignment is laid. As described under Impact USS-1, the construction staging area and grading would require water use for fugitive dust control that would generate water demand. Additionally, the contractor would use temporary water services at temporary offices located at construction staging sites. During the construction phase, the Project would tap into water services supplied by the City of Merced.

The groundwater underlying the City of Merced and the Project is the Merced Subbasin. The groundwater basin, which is currently the City of Merced's only water source, is a high-priority basin. The SGMA requires governments and water agencies of high-priority basins to halt overdraft and bring groundwater basins into balanced levels of pumping and recharge. Groundwater in the Merced Subbasin is managed under the Merced Irrigation-Urban GSA. The Merced Subbasin GSP has been adopted by the City of Merced. As a result of the City's adoption of the GSP and required by law, the City of Merced would abide to the regulatory framework set forth by the SGMA to prevent the overdraft of the Merced Subbasin. Water use during construction would be temporary and would not place a long-term demand on the City of Merced's water supply.

Table 3.13-6 accounts for the City of Merced's future demand and capacity of water in normal and multiple dry years. During water shortages, including droughts, the City of Merced would meet shortfalls through implementation of water shortage contingency plans that are incorporated by the City of Merced UWMP (City of Merced 2021). The City of Merced would have sufficient water supply to serve the temporary, incremental demands associated with construction of Project. The City of Merced would have sufficient water supplies available to serve the construction of the Project and reasonably foreseeable future development during normal, dry, and multiple dry years. Therefore, impacts would be less than significant.

Variant H1

Impact Characterization

The impact characterization for Variant H1 is the same as described for the Project.

Impact Details and Conclusions

The impact details for Variant H1 are similar as described for the Project. Variant H1 would grade existing undeveloped land previously used for farming to prepare the solar panel, hydrogen processing, and hydrogen storage site. Grading would require water use for fugitive dust control that would generate water demand. During the construction phase, the Project would tap into water services supplied by the City of Merced.

Table 3.13-6 accounts for the City of Merced's future demand and capacity of water in normal and multiple dry years. During water shortages, including droughts, the City of Merced would meet shortfalls through implementation of water shortage contingency plans that are incorporated by the City of Merced UWMP (City of Merced 2021). The City of Merced would have sufficient water supply to serve the temporary, incremental demands associated with construction of Variant H1. The City of Merced would have sufficient water supplies available to serve the construction of Variant H1 and reasonably foreseeable future development during normal, dry, and multiple dry years. Therefore, impacts would be less than significant.

Variant H2

Impact Characterization

The impact characterization for Variant H2 is the same as described for the Project.

Impact Details and Conclusions

The impact details for Variant H2 are similar as described for the Project, except that it would include a hydrogen storage/fueling facility that would not demand any additional water. Therefore, impacts on water supplies would be less than significant.

Variant H3

Impact Characterization

The impact characterization for Variant H3 is the same as described for the Project.

Impact Details and Conclusions

The impact details for Variant H3 are similar as described for the Project, except that it would include a hydrogen storage/fueling facility that would not demand any additional water. Therefore, impacts on water supplies would be less than significant.

Impact USS-3	Construction of the Project would not result in a determination by the wastewater treatment provider, which serves or may serve the Project, that it does not have adequate capacity to serve the Project’s projected demand in addition to the provider’s existing commitments.
Level of Impact	**Less-than-significant impact**

Project

Impact Characterization

A significant impact on utilities and service systems would occur if construction of the Project results in a determination by the wastewater treatment provider that serves or may serve the Project that it does not have adequate capacity to serve the projected project demand in addition to its existing commitments.

Impact Details and Conclusions

Construction contractors would provide portable toilets at construction sites. The wastewater would be hauled off-site and dumped at a wastewater treatment facility. This source of wastewater would be temporary during construction. The small amount of wastewater created during construction (from portable restroom facilities) could be accommodated by wastewater treatment facilities in the RSA. As shown in Section 3.13.3.2, *Utilities and Service Systems*, local wastewater treatment plants would have available and adequate capacity to serve the temporary, incremental demands associated with construction of Project. The Project would not result in an impact determination by the wastewater treatment providers. Therefore, wastewater impacts from construction of the Project would be less than significant.

Variant H1

Impact Characterization

The impact characterization for Variant H1 is the same as described for the Project.

Impact Details and Conclusions

The impact details for Variant H1 are the same as described for the Project. Additional portable toilets would be required if the contractor identifies an additional construction staging area on the on-site green hydrogen parcel. The small amount of wastewater created during construction (from portable restroom facilities) could be accommodated by wastewater treatment facilities in the Project area. Therefore, impacts would be less than significant.

Variant H2

Impact Characterization

The impact characterization for Variant H2 is the same as described for the Project.

Impact Details and Conclusions

The impact details for Variant H2 are similar as described for the Project, except that it would include a hydrogen storage/fueling facility. Therefore, impacts would be less than significant.

Variant H3

Impact Characterization

The impact characterization for Variant H3 is the same as described for the Project.

Impact Details and Conclusions

The impact details for Variant H2 are similar as described for the Project, except that it would include a hydrogen storage/fueling facility. Therefore, impacts would be less than significant.

Impact USS-4	Construction of the Project would not generate solid waste in excess of state or local standards or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals; and/or violate federal, state, and local management and reduction statutes and regulations related to solid waste
Level of Impact	**Less-than-significant impact**

Project

Impact Characterization

A significant impact on utilities and service systems would occur if construction of the Project results in insufficient permitted capacity at the landfill serving the project to accommodate solid waste disposal needs.

Impact Details and Conclusions

Construction of the Project would generate construction and demolition waste during ground clearing, track installation, and the stripping of aerial guideway falsework. The contractor would abide by CALGreen provisions that require 65 percent of the construction and demolition waste generated during construction to be recycled or diverted from the waste stream (2022 CALGreen 5.408.1.1 through 5.408.1.3). Those materials that cannot be reused on-site would be conveyed to a solid waste facility that is permitted to accept construction and demolition waste. As shown in Table 3.13-5, the Billy Wright Disposal Site accepts construction and demolition material and has sufficient remaining capacity (or a throughput) that would accommodate the temporary demand for waste disposal generated by construction of the Project. It is estimated that the remaining capacity of the facility will last until the year 2054. The permitted capacity for the Billy Wright Disposal Site is 1,500 tons per day, a threshold this Project is not anticipated to exceed.

The contractor may encounter contaminated soils during ground-disturbing activities and grading for the track. Project grading would occur on land that was formerly designated as farmland and on an active railroad ROW that may have contaminated soils from hazardous materials such as pesticides and hydrocarbons (oil). As shown in Table 3.13-5, the SR 59 Disposal Site accepts hazardous waste and has sufficient remaining capacity that would accommodate the temporary demand. Therefore, solid waste generated by construction of the Project would not be in excess of state or local standards, or the capacity of local infrastructure, and would not violate statutes and regulations related to solid waste. Thus, construction of the Project would have a less-than-significant impact related to solid waste.

Variant H1

Impact Characterization

The impact characterization for Variant H1 is the same as described for the Project.

Impact Details and Conclusions

The impact details for Variant H1 are the same as described for the Project. Construction of Variant H1 would include installation of solar panels, hydrogen processing, and fuel storage. Impacts would be less than significant.

Variant H2

Impact Characterization

The impact characterization for Variant H2 is the same as described for the Project.

Impact Details and Conclusions

The impact details for Variant H2 are similar as described for the Project, except that it would include a hydrogen storage/fueling facility. Therefore, impacts would be less than significant.

Variant H3

Impact Characterization

The impact characterization for Variant H3 is the same as described for the Project.

Impact Details and Conclusions

The impact details for Variant H3 are similar as described for the Project, except that it would include a hydrogen storage/fueling facility. Therefore, impacts would be less than significant.

Impact USS-5	Operation of the Project would require or result in the relocation or construction of new or expanded water, wastewater treatment or stormwater drainage, electric power, natural gas, or telecommunications facilities; the construction or relocation of such utilities during operations would not cause significant environmental effects.
Level of Impact	**Less-than-significant impact**

Project

Impact Characterization

A significant impact on utilities and service systems would occur if the project results in the construction of new or expanded water, wastewater treatment or stormwater drainage, electric power, natural gas, or telecommunications facilities or expansion of existing facilities, in which the construction or relocation could cause significant environmental effects.

Impact Details and Conclusions

Water and Wastewater Facilities

Water usage associated with the Project would occur at the approved ACE Merced Layover and Maintenance Facility and would be required to comply with the Industrial General Permit, which requires the use of best management practices, best available technology economically achievable, and best conventional pollutant control technology to reduce and prevent discharges of pollutants to meet applicable water quality standards.

Increase in wastewater generation would not be of a magnitude to require the expansion of existing or construction of new wastewater treatment infrastructure or result in violations of wastewater treatment requirements. The wastewater and water providers within the RSA have capacity for existing and future demand. Therefore, water and wastewater generation from operation of the Project is expected to result in a determination by the wastewater treatment provider that serves the Project that it has adequate capacity to serve the Project's projected demand in addition to the providers existing commitments. As stated above, local water providers would have sufficient water supplies available to serve the Project and reasonably foreseeable future development during normal, dry, and multiple dry years. During water shortages, including droughts, local water providers would meet shortfalls through implementation of water shortage contingency plans. Therefore, impacts from operation of the Project would be less than significant.

Stormwater Facilities

The Project would increase areas of impervious surface and increases in stormwater runoff. The elevated track would be located in an urbanized area where roadways are paved, and existing stormwater infrastructure serves surrounding land uses and roadways. The aerial guideway would introduce minimal impervious surfaces and would therefore stormwater flow at locations where water is drained from the structure. Areas where new track would be laid would not require stormwater facilities, and water would percolate through to the ground. The Project improvements to the approved ACE Merced Layover and Maintenance Facility, including additional parking and expansion of the proposed service buildings, would increase impervious surfaces as well.

Discussed in Section 3.10, *Hydrology and Water Quality*, on-site storm runoff would be captured and treated using permanent stormwater control and treatment BMPs specified in the stormwater management and treatment plan. Potential stormwater BMPs include biofiltration swales, biofiltration strips, infiltration devices, detention devices, media filters, wet basins, and dry weather diversion. Stormwater BMPs would improve the quality of stormwater runoff, including reducing erosion and siltation, and reduce the quantity of stormwater runoff, and impeded or redirected flood flows. Stormwater treatment methods would comply with MS4 and local stormwater requirements. Therefore, operation of the Project would not require the expansion of any existing facilities or construction of any new facilities and would result in less than significant impact on stormwater facilities.

Electric Power

Operation of the Project would require an increase in electrical power to support increased maintenance activities at the approved ACE Merced Layover and Maintenance Facility, and to power signal and switch houses required for the Project. Though local connections to electric transmission facilities may be necessary, the amount of electricity needed for the Project, is not anticipated to result in the need for new or expanded electric power facilities. Therefore, operation of the Project would not require the expansion of any existing facilities or construction of any new facilities and would result in a less than significant impact on electric power facilities.

Telecommunication

Telecommunication connections would be required to serve the Project. and maintenance facility. However, operation of the Project would not require the expansion of any existing facilities or construction of any new facilities and would result in a less than significant impact on telecommunication services.

Natural Gas

It is anticipated that the operation of the Project would require natural gas at the approved ACE Merced Layover and Maintenance Facility. However, the Project would not require the expansion of existing facilities to serve the Project. Therefore, operation of the Project would not require the expansion of any existing facilities or construction of any new facilities and would result in no impact on natural gas facilities.

Variant H1

Impact Characterization

The impact characterization for Variant H1 is the same as described for the Project.

Impact Details and Conclusions

Water Facilities

Variant H1 would demand additional water to generate the green-hydrogen fuel. Variant H1 would install water service feeds to support operations. Variant H1 would be located in an urbanized area with water mainlines available in the vicinty. While connection to existing infrastructure would require the construction of new service feed, it would not require the expansion of water treatment facilities or new or expanded water rights. Variant H1 would not have a significant effect existing water facilities. Therefore, operation of Variant H1 would in less than significant impact on water facilities.

Wastewater Facilities

Operations of Variant H1 include the washdown of solar panels, operation of hydrogen production, supply, and storage as well as additional staff to operate and manage these tasks. As a wastewater management would be a fundamental component. However, it is not anticipated that the increased need for wastewater management would have a significant impact on existing facilities. Therefore, operation of Variant H1 would in less than significant impact on water wastewater management facilities.

Stormwater Facilities

Variant H1 would convert approximately 15 acres of pervious surfaces to impervious surfaces to accommodate the operations related to the photovoltaic (solar) panels, hydrogen processing, and fuel storage. Such conversion would result in a potential increase in stormwater runoff during operations. Variant H1 would convert undeveloped land previously devoted to farming. Existing storm drain systems at this site are comprised of detention ponds or a man-made reservoir that stores stormwater runoff. During operations, Variant H1 would utilize similar systems and would be designed for adequate capacity for projected stormwater. Stormwater would convey into these detention ponds where stormwater would percolate and runoff would be retained to reduce the potential for water quality impacts.

Additionally, Variant H1 shall comply with applicable provisions, ordinances, and regulatory framework set forth by local, state, and federal laws related to runoff and water quality as described in Section 3.10, *Hydrology and Water Quality*. Therefore, Variant H1 operations would result in a less than significant impact related to stormwater drainage facilities.

Electric Power

During operations, Variant H1 would generate approximately 34 megawatts per hour (MWh) of electrical power through the use of solar panels. The Project would install new service feeds to connect with the existing power lines. However, Variant H1 would generate sufficient power to operate the hydrogen processing site. Therefore, operation of Variant H1 would not require the expansion of any existing facilities and would result in a less than significant impact on electric power.

Telecommunication

Operation of Variant H1 would require additional demand for telecommunication services beyond that of the Project. However, Variant H1 would not require the expansion of any existing facilities or construction of any new facilities and would result in a less than significant on telecommunication services.

Natural Gas

Operation of Variant H1 would not result in additional demand for natural gas beyond that of the Project. Therefore, operation of Variant H1 would not require the expansion of any existing facilities or construction of any new facilities and would result in a less than significant impact on natural gas facilities.

Variant H2

Impact Characterization

The impact characterization for Variant H2 is the same as described for the Project.

Impact Details and Conclusions

Variant H2 will include additional operation of the hydrogen storage/fueling facility, which would require additional electricity, but not likely additional natural gas, water, wastewater, or telecommunications. The additional electricity will not substantially change the electricity demand of the project and thus impacts related to utilities would be less than significant.

Variant H3

Impact Characterization

The impact characterization for Variant H3 is the same as described for the Project.

Impact Details and Conclusions

Variant H3 will include additional operation of the hydrogen storage/fueling facility, which would require additional electricity, but not likely additional natural gas, water, wastewater, or telecommunications. The additional electricity will not substantially change the electricity demand of the project and thus impacts related to utilities would be less than significant.

Impact USS-6	There would be sufficient water supplies available to serve the Project during operations and reasonably foreseeable future development during normal, dry, and multiple dry years.
Level of Impact	**Less-than-significant impact**

Project

Impact Characterization

According to Appendix G of the CEQA Guidelines, a significant impact on utilities and service systems would occur if the operation of the Project results in new or expanded entitlements to supply water to the Project.

Impact Details and Conclusions

Operation of the Project would require in an increase in water supply to support staff and project. The groundwater underlying the City of Merced and the Project is the Merced Subbasin. The groundwater basin, which is currently the City of Merced's only water source, is a high-priority basin. The SGMA requires governments and water agencies of high-priority basins to halt overdraft and bring groundwater basins into balanced levels of pumping and recharge. Groundwater in the Merced Subbasin is managed under the Merced Irrigation-Urban GSA. The Merced Subbasin GSP has been adopted by the City of Merced. As a result of the City's adoption of the GSP, which is required by law, the City of Merced would abide by the regulatory framework set forth by the SGMA to prevent the overdraft of the Merced Subbasin.

Table 3.13-6 accounts for the City of Merced's future demand and capacity of water in normal and multiple dry years. During water shortages, including droughts, the City of Merced would meet shortfalls through implementation of water shortage contingency plans that are incorporated by the City of Merced UWMP (City of Merced 2021). The City of Merced would have sufficient water supply to serve the incremental demands associated with operation of the Project. The City of Merced would have sufficient water supplies available to serve the operation of the Project and reasonably foreseeable future development during normal, dry, and multiple dry years. Therefore, impacts would be less than significant.

Variant H1

Impact Characterization

Variant H1 would require water to support hydrogen production, staff, and cleaning of solar panels. Operations of Variant H1 could result in a significant impact if water usage exceeds planned demand for the facility, thereby affecting city water usage and demand projections.

Impact Details and Conclusions

Variant H1 would demand approximately 1,648 gallons of water per day, which is equivalent to 1.84 acre-feet per year. Table 3.13-6 accounts for the City of Merced's future water demand and supply in normal and multiple dry years. During the Project's horizon year of 2030, the City of Merced would supply a total of 26,751 acre-feet per year for a normal water year and 21,401 acre-feet per year for a drought lasting five consecutive years (Table 3.13-6). Variant H1's demand of 1.84 acre-feet per year would represent 0.0069 percent and 0.0086 percent, respectively, of the City of Merced's supply during the normal water year and a drought lasting five consecutive years. This measurable increase is less than 0.01 percent and is small relative to City of Merced's available supply in 2030 for normal and drought years. There would be sufficient water supplies available to serve Variant H1. Additionally, during water shortages, including droughts, the City of Merced would meet shortfalls through implementation of water shortage contingency plans that are incorporated by the City of Merced UWMP (City of Merced 2021). There would be sufficient water supplies available to serve Variant H1 during operations and reasonably foreseeable future development during normal, dry, and multiple dry years. Therefore, impacts would be less than significant.

Variant H2

Impact Characterization

The impact characterization for Variant H2 is the same as described for the Project.

Impact Details and Conclusions

Variant H2 would not demand any additional water. Therefore, impacts would be less than significant.

Variant H3

Impact Characterization

The impact characterization for Variant H3 is the same as described for the Project.

Impact Details and Conclusions

Variant H3 would not demand any additional water. Therefore, impacts would be less than significant.

Impact USS-7	Operation of the Project would not result in a determination by the wastewater treatment provider, which serves or may serve the project, that it does not have adequate capacity to serve the project's projected demand in addition to the provider's existing commitments.
Level of Impact	**Less-than-significant impact**

Project

Impact Characterization

A significant impact on utilities and service systems would occur if operation of the Project results in a determination by the wastewater treatment provider that serves or may serve the Project that it does not have adequate capacity to serve the projected project demand in addition to its existing commitments.

Impact Details and Conclusions

The Project would require wastewater management; however, the amount of water would not exceed other facilities with similar operations and staff numbers. Therefore, operation of the Project would result in a less than significant impact.

Variant H1

Impact Characterization

The impact characterization for Variant H1 is the same as described for the Project.

Impact Details and Conclusions

The impact detail for Variant H1 is the same as described for the Project. There would be no impact.

Variant H2

Impact Characterization

The impact characterization for Variant H2 is the same as described for the Project.

Impact Details and Conclusions

The impact details for Variant H2 are the same as described for the Project. There would be no impact.

Variant H3

Impact Characterization

The impact characterization for Variant H3 is the same as described for the Project.

Impact Details and Conclusions

The impact details for Variant H3 are the same as described for the Project. There would be no impact.

Impact USS-8	Operation of the Project would not generate solid waste in excess of state or local standards or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals; and/or violate federal, state, and local management and reduction statutes and regulations related to solid waste.
Level of Impact	**Less-than-significant impact**

Project

Impact Characterization

According to Appendix G of the CEQA Guidelines, a significant impact on utilities and service systems would occur if operation of the Project results in insufficient permitted solid waste serving the project to accommodate solid waste disposal needs.

Impact Details and Conclusions

The Proposed Project would generate solid waste from routine maintenance of the equipment and facility, and minimal waste is anticipated. Thus, operation of the Project would not generate solid waste in excess of state or local standards, in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals. The Project would be required to comply with applicable federal, state, and local statutes and regulations, outlined Section 3.13.2, *Regulatory Setting*, pertaining to solid waste disposal. As described under Impact USS-5, the Project would not generate solid waste. Therefore, operation of the Project would have a less-than-significant impact related to solid waste.

Variant H1

Impact Characterization

The impact characterization for Variant H1 is the same as described for the Project.

Impact Details and Conclusions

Variant H1 would generate solid waste activities associated with the operations of hydrogen fuel production, fueling and storage. Activities include solar panel cleaning, hydrogen processing, and staff use. Thus, the impacts for Variant H1 are similar as described for the Project but with somewhat increased solid waste generation, but impacts would still be less than significant.

Variant H2

Impact Characterization

The impact characterization for Variant H2 is the same as described for the Project.

Impact Details and Conclusions

Variant H2 would generate solid waste activities associated with hydrogen fueling and storage. Thus, the impacts for Variant H2 are similar as described for Variant H1.

Variant H3

Impact Characterization

The impact characterization for Variant H3 is the same as described for the Project.

Impact Details and Conclusions

Variant H3 would generate solid waste activities associated with hydrogen fueling and storage. Thus, the impacts for Variant H3 are similar as described for Variant H1.

3.14 Recreation

3.14.1 Introduction

This section describes the regulatory and environmental setting for parks and recreation in the vicinity of the Project. It also describes the impacts on parks and recreation that would result from the Project and mitigation measures that would reduce significant impacts, where feasible and appropriate.

Cumulative impacts on parks and recreation, in combination with planned, approved, and reasonably foreseeable projects, are discussed in Chapter 4, *Cumulative Impacts*.

3.14.2 Regulatory Setting

This section summarizes the federal, state, regional, and local regulations related to parks and recreation applicable to the Project.

3.14.2.1 Federal

National Trails System Act of 1968, as amended

The National Trails System was created in 1968 by the National Trails System Act (Public Law 90-543). The National Trails System Act of 1968, as amended, authorized a national system of interstate riding and hiking trails to provide additional outdoor recreation opportunities and to promote the preservation of access to outdoor areas and historic resources. The National Trails System includes four classes of trails: National Historic Scenic Trails, National Historic Trails, National Recreation Trails, and Connecting or Side Trails. To support this legislation, to protect existing trails, and to provide new trails, the California Department of Parks and Recreation prepared the *California Recreational Trails Plan* as a guide for all state agencies that provide and manage recreational trails, last updated on June 29, 2002 (National Trails System Act, amended March 12, 2019).

National Wild and Scenic Rivers Act of 1968

The National Wild and Scenic Rivers Act of 1968 (Public Law 90-542; 16 United States Code [U.S.C.] 1271 et seq.) preserves certain designated rivers with outstanding natural, cultural, and recreational values in a free-flowing condition for the enjoyment of present and future generations and is administered by either a federal or state agency. These rivers must possess extraordinary scenic, recreational, fishery, or wildlife values.

3.14.2.2 State

California Public Park Preservation Act of 1971

The primary instrument for protecting and preserving parkland in the state is California's Public Park Preservation Act of 1971. Under the California Public Resources Code (Public Res. Code) Sections 5400–5409, a public agency that acquires public parkland for non-park use, must either pay compensation that is sufficient to acquire substantially equivalent substitute parkland or provide substitute parkland of comparable characteristics. If less than 10 percent of the parkland, but not more than 1 acre is acquired, the operating entity may improve the portion of the parkland and facilities not acquired.

California Recreational Trails Act of 1974

The *California Recreational Trails Plan* is a guide for all state agencies and recreation providers that manage recreational trails (California Department of Parks and Recreation 2002). Preparation of a recreational trails plan was authorized by the California Legislature in 1978 as an element of the California Recreational Trails Act of 1974 (Public Res. Code 2070–5077.8). The plan identifies trail corridors that form a statewide trail system that links mountain, valley, and coastal communities to recreational, cultural, and natural resources throughout the state.

California Wild and Scenic Rivers Act

Following the passage of the National Wild and Scenic Rivers Act, California's Legislature passed the Wild and Scenic Rivers Act of 1972 (Public Res. Code 5093.50–5093.70). Under California law, "certain rivers which possess extraordinary scenic, recreational, fishery, or wildlife values will be preserved in their free-flowing state, together with their immediate environments, for the benefit and enjoyment of the people of the state." The Natural Resources Agency is responsible for coordinating activities of state agencies that may affect the designated rivers.

3.14.2.3 Regional and Local

The SJJPA, as a state joint powers agency, proposes improvements within and outside the Union Pacific Railroad (UPRR) and BNSF Railway (BNSF) rights-of-way. The Interstate Commerce Commission Termination Act (ICCTA) affords railroads that engage in interstate commerce considerable flexibility in making necessary improvements and modifications to rail infrastructure, subject to the requirements of the Surface Transportation Board. ICCTA broadly preempts state and local regulation of railroads; this preemption extends to the construction and operation of rail lines. As such, activities within the UPRR and BNSF rights-of-way are clearly exempt from local building and zoning codes as well as other land use ordinances. Project activities outside of the UPRR and BNSF rights-of-way, however, would be subject to regional and local plans and regulations. Though ICCTA broadly preempts state and local regulation of railroads, SJJPA intends to obtain local agency permits for construction of facilities that fall outside the UPRR and BNSF rights-of-way, even though SJJPA has not determined whether such permits are legally necessary or required.

Appendix 3.0-1 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 Project improvements would be located. Section 15125(d) of the State 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 Project would be consistent with the plans of relevant jurisdictions. The Project would be generally consistent with the applicable goals, policies, and objectives related to recreation identified in Appendix 3.0-1.

Merced County

2030 Merced County General Plan

The *2030 Merced County General Plan* (Merced County 2013) serves as the County's blueprint for future land use, development, preservation, and resource conservation decisions until 2030. The *2030 Merced County General Plan* provides a framework for Merced County to achieve its vision for both rural and urban land use.

The Recreation and Cultural Resources Element of the *2030 Merced County General Plan* provides a policy context for Merced County to achieve its recreation goals and cultural resource protection vision. The following are relevant goals and policies that address park and recreation opportunities in Merced County.

Goal RCR-1: Preserve, enhance, expand, and manage Merced County's diverse system of regional parks, trails, recreation areas, and natural resources for the enjoyment of present and future residents and park visitors.

Policy RCR-1.1: Public Recreation Land Use. Encourage the continuation and expansion of existing public recreation land uses, including, but not limited to, public beaches, parks, recreation areas, wild areas, and trails.

Policy RCR-1.4: Regional Recreation Facilities Master Plan. Prepare and regularly update a Regional Park and Recreation Facilities Master Plan.

Policy RCR-1.6: Non-Recreational Land Use Buffers. Require buffering between non-recreational land uses and sensitive public recreation lands through site design and other techniques when the non-recreational land use may significantly impact recreational lands.

Policy RCR-1.7: Agricultural Land Use Compatibility. Consider agriculture as a compatible land use and appropriate buffer for public and private recreation areas.

Policy RCR-1.12: Recreation Services. Support recreation services to promote the full use of recreation facilities within their design capacity and improve connections and access to a wide range of recreation opportunities in order to improve the quality of life for residents and visitors.

City of Merced

Merced Vision 2030 General Plan

The *Merced Vision 2030 General Plan* includes an Open Space, Conservation, and Recreation element. This topic's purpose is to ensure the continued availability of open land for the public's enjoyment as well as for the preservation of natural resources through policies that guide development within the City's natural, environmental, and cultural resources. The Open Space, Conservation, and Recreation element also seeks to balance the preservation of agricultural pursuits and the pastoral lifestyle, protection and conservation of natural resource lands, and increasing development pressures throughout the Merced urban areas (City of Merced 2017).

Parks and Recreation Master Plan

The *Park and Open Space Master Plan* is a long-range guide for park and recreation services in the City of Merced. The *Park and Open Space Master Plan* provides direction and guidelines for acquiring and developing parks, open space, trails, and other recreational facilities. In addition, the plan addresses community needs and charts a new direction for the City of Merced to take in the future. The plan inventories existing recreation resources, provides a summary of community input on needs, wants, and vision for parks and recreation in the City of Merced, and provides recommendations for the management, maintenance, and programs (City of Merced 2004).

3.14.3 Environmental Setting

This section describes the environmental setting related to parks and recreational facilities associated with the Project. For purposes of this analysis, the resource study area (RSA) is defined as a 0.5-mile buffer around the alignment.

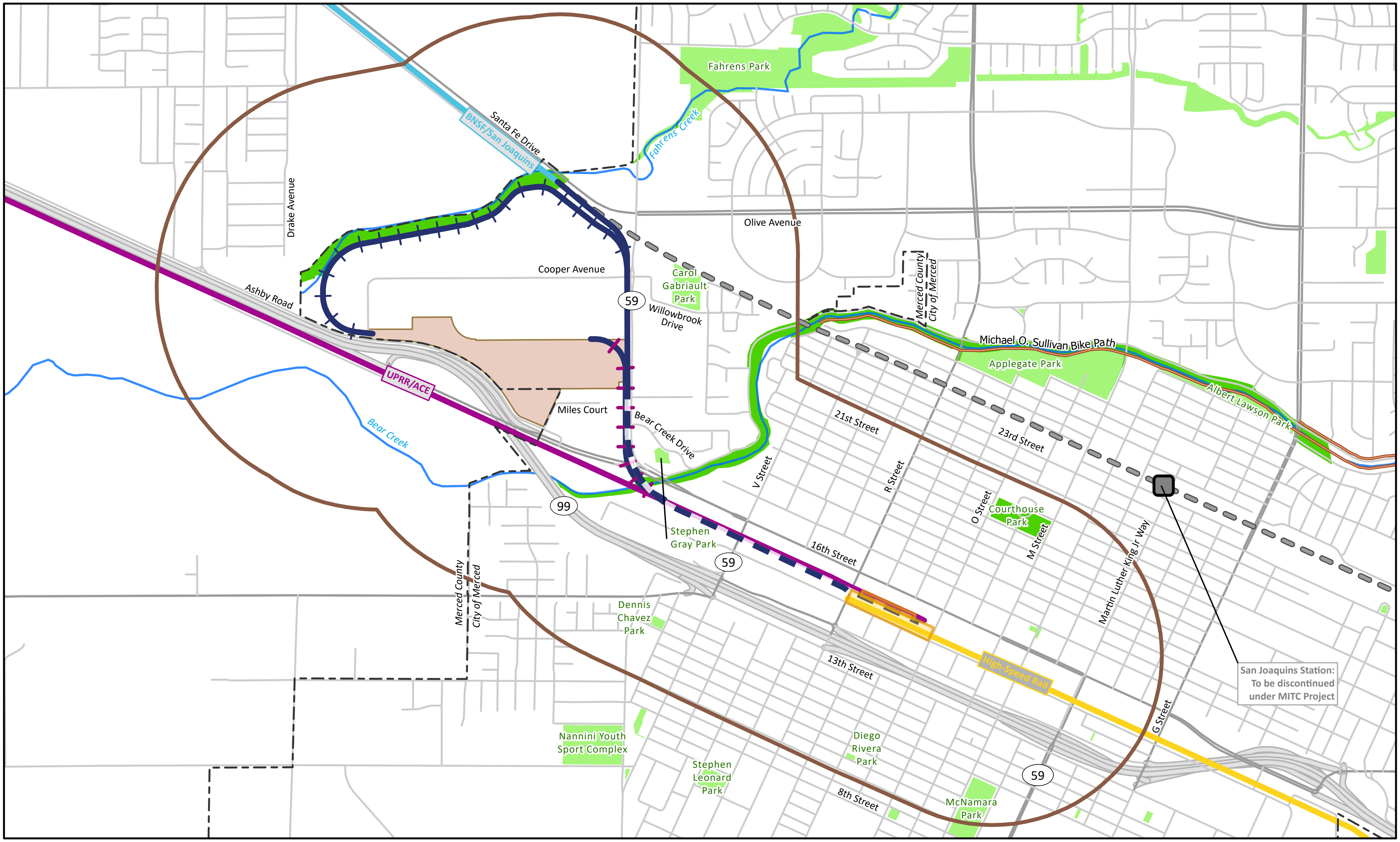
Recreational resources are generally overseen by the parks and recreation departments of the City of Merced and Merced County where facilities would be located. These municipalities generally use planning documents, such as master plans, to guide the acquisition, preservation, improvement, maintenance, and expansion of local parklands and trail networks. Additionally, the general plans of each jurisdiction typically include goals and policies that address recreational resources. Information presented in this section regarding existing recreational resources was obtained from local land use general plans, local and regional parks master plans, and reviews of aerial maps and geographic information system (GIS) data.

As shown on Figure 3.14-1, the closest park or recreation center to the Project footprint is the Stephen Gray Park. The park is accessed via North Bear Creek Drive located northeast of the SR 59 and 16th Street intersection. Additional parks identified in the RSA include:

- Carol Gabriault Park
- Fahrens Park
- Michael O. Sullivan Bike Path
- McNamara Park
- Dennis Chavez Park
- Diego Rivera Park
- Courthouse Park

Areas designated as Open Space are located along Fahrens Creek and the approved ACE Merced Layover and Maintenance Facility access line and along Bear Creek.

The RSA does not contain any trails that are part of the National Trails System. No rivers or portions of rivers in the RSA are designated as “wild, scenic, and recreational” under the National Wild and Scenic Rivers Act. No trails have been identified as part of the California Recreational Trails Plan, and no rivers or portions of rivers in the RSA are designated as “wild, scenic, and recreational” under the California Wild and Scenic Rivers Act.



Existing UPRR/Approved ACE
Proposed High-Speed Rail
Existing BNSF/San Joaquins
Proposed Integrated Merced High-Speed Rail Station
Approved ACE Merced Layover and Maintenance Facility
City of Merced Boundary
0.5-mile Buffer
City Park
Open Space
Michael O. Sullivan Bike Path

MITC Project

San Joaquins: Elevated Track
San Joaquins: At-grade Track
San Joaquins: Layover and Maintenance Access Line
ACE/UPRR Spur Track
San Joaquins: To be discontinued under MITC Project

Figure 3.14-1
Parks and Recreational Resources
Merced Intermodal Track Connection Project

0 1,000 2,000
Feet

MITC

Data Source: City of Merced

3.14.4 Impact Analysis

This section describes the environmental impacts of the Project on parks and recreational resources. This section also describes the methods used to evaluate the impacts, and the thresholds used to determine whether an impact would be significant.

3.14.4.1 Methods for Analysis

Methods

The analysis of impacts on parks and recreational resources was based on a review of local recreation planning documents, specifically the City of Merced and Merced County general plans. The RSA for determining impacts include parks and recreational resources located within a 0.5-mile buffer of the Project alignment.

Methods for evaluating short-term impacts include construction activities that will occur near recreational resources and could result in temporary increases in noise and dust experienced by users of these recreational resources. Temporary construction impacts within 300 feet of recreational resources would have the greatest impact due to the proximity of construction activities. Recreational resources located farther than 300 feet from construction activities would remain unaffected. Construction activities could also require temporary easements in a recreational resource or the temporary closure or disruption to the use of a recreational resource. A construction impact period on recreational resources is considered significant if these activities prevent the function of a recreational resource from continuing or would diminish the ability of user or access the recreational resource, leading to the increased use of other park areas, such that substantial physical deterioration of those facilities could occur or be accelerated or require the construction or expansion of recreation resources that would result in a significant impact on the environment.

Methods for evaluating long-term impacts include operational activities that would occur on or near recreational resources that could be affected by increased noise levels experienced by nearby users, or by a substantial population increase from the Project resulting in a greater demand for recreational facilities or if facilities required the permanent acquisition of recreational areas. An operation period impact on recreational resources is considered significant if operation of the Project affects the character of the existing recreational resource, leading to the increased use of other park areas, such that substantial physical deterioration of those facilities could occur or be accelerated or require the construction or expansion of recreation resources that would result in a significant effect on the environment.

Principal Sources

Principal sources consulted for the impact analysis are listed below.

- Regional Transportation Plan (RTP) / Sustainable Community Strategy (SCS) for Merced County
- 2030 Merced County General Plan
- City of Merced Vision 2030 General Plan
- City of Merced Parks and Recreation Master Plan

3.14.4.2 Thresholds of Significance

The CEQA Guidelines Appendix G (14 Cal. Code Regs. 15000 et seq.) identifies significance criteria to be considered for determining whether a project could have significant impacts on parks and recreation.

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

- Increase the use of existing neighborhood and regional parks or other recreational resources such that substantial physical deterioration of the facility would occur or be accelerated.
- Include recreational facilities or require the construction or expansion of recreational resources that might have an adverse physical effect on the environment.

3.14.4.3 Impacts and Mitigation Measures

Impact REC-1	Construction of the Project would not increase the use of existing neighborhood and regional parks or other recreational resources such that substantial physical deterioration of the facility could occur or be accelerated.
Level of Impact	**Less-than-significant impact**

Project

Impact Characterization

Impacts could occur if Project construction activities would increase the use of the existing parks or other recreational resources within the RSA and lead to the occurrence or acceleration of substantial physical deterioration of the recreational resource.

Impact Details and Conclusions

Construction of the Project would not result in substantial population increases and thus would not increase the use of existing neighborhood and regional parks or other recreational resources, which would not experience physical deterioration or acceleration.

Recreational resources located more than 300 feet from the elevated and at-grade alignment are separated by commercial and industrial uses. Construction of the elevated and at-grade lead tracks to the approved ACE Merced Maintenance Layover and Maintenance Facility would not disrupt use of or result in construction-related impacts on these parks. Therefore, the Project would not accelerate or cause physical deterioration to the existing recreational facility and resources and would result in a less than significant impact.

Variant H1

Impact Characterization

Impacts from the construction of Variant H1 could occur if activities would increase the use of the existing parks or other recreational resources within the RSA and lead to the occurrence or acceleration of substantial physical deterioration of the recreational resource. Therefore, impacts associated with Variant H1 would be less than significant.

Impact Details and Conclusions

Construction of the solar facility to support the on-site hydrogen production would not increase the use of the existing neighborhood and parks or recreational resources such that substantial physical deterioration of the facility could occur.

Variant H2

Impact Characterization

The required equipment and infrastructure for Variant H2 would be located within the same environmental footprint as the Project. Impacts could occur if Variant H2 operations would increase the use of the existing parks or other recreational resources within the RSA and lead to the occurrence or acceleration of substantial physical deterioration of the recreational resource.

Impact Details and Conclusions

Variant H2 would not increase the use of the existing neighborhood and regional parks or recreational resources such that substantial deterioration of the facility would occur or be accelerated Therefore, impacts associated with Variant H2 would be less than significant.

Variant H3

Impact Characterization

Impacts could occur if Variant H3 operations would increase the use of the existing parks or other recreational resources within the RSA and lead to the occurrence or acceleration of substantial physical deterioration of the recreational resource.

Impact Details and Conclusions

Variant H3 would not increase the use of the existing neighborhood and parks or recreational resources such that substantial deterioration of the facility would occur or be accelerated. Therefore, impacts associated with Variant H3 would be less than significant.

Impact REC-2	Construction of the Project would not include recreational facilities or require the construction or expansion of recreational resources that might have an adverse physical effect on the environment.
Level of Impact	**Less-than-significant impact**

Project

Impact Characterization

Impacts could occur if Project construction activities would include recreational facilities or require construction or expansion of recreational resources that might have an adverse physical environmental effect.

Impact Details and Conclusions

Recreational resources over 300 feet from the elevated and at-grade alignment are separated by commercial and industrial uses. Construction of the elevated and at-grade lead tracks to the approved ACE Merced Maintenance Layover and Maintenance Facility would not result in adverse physical degradation on existing recreational facilities or might result in demand for new recreational facilities, such that construction or expansion would be required. Therefore, the impacts would be less than significant.

Variant H1

Impact Characterization

Variant H1 would be located at the approved ACE Merced Layover and Maintenance Facility and parcels adjacent to the facility. Impacts could occur if Variant H1 construction activities would include recreational facilities or require construction or expansion of recreational resources that might have an adverse physical environmental effect.

Impact Details and Conclusions

Construction of Variant H1 would not result in adverse physical degradation on existing recreational facilities. Therefore, the impacts would be less than significant.

Variant H2

Impact Characterization

Variant H2 would be located in the same environmental footprint as the Project. Impacts could occur if operations of Variant H1 result in the degradation or increased demand of recreational facilities.

Impact Details and Conclusions

Construction of Variant H2 would not result in adverse physical degradation on existing recreational facilities. Therefore, the impacts would be less than significant.

Variant H3

Impact Characterization

Variant H2 would be located in the same environmental footprint as the Project. Impacts could occur if operations of Variant H1 result in the degradation or increased demand of recreational facilities.

Impact Details and Conclusions

Construction of Variant H3 would not result in adverse physical degradation on existing recreational facilities. Therefore, the impacts would be less than significant.

Impact REC-3	Operation of the Project would not increase the use of existing neighborhood and regional parks or other recreational resources such that substantial physical deterioration of the facility could occur or be accelerated.
Level of Impact	**Less-than-significant impact**

Project

Impact Characterization

Impacts could occur if Project operations would increase the use of the existing parks or other recreational resources within the RSA and lead to the occurrence or acceleration of substantial physical deterioration of the recreational resource.

Impact Details and Conclusions

Project operations would not substantially change the character of the existing recreational resources, lead to increased use of parks, or increased use of recreational facilities. The project would not generate substantial numbers of new residents that would generate substantial additional use or demand for parks. Additionally, existing recreational resources are located farther than 300 feet from Project and would be unaffected. Train services originating and terminating in the City of Merced would not substantially change the character of the nearby recreational resources and would not increase the use of existing neighborhood and regional parks, or recreational resources such that substantial physical deterioration of the facility could occur or be accelerated. Parks and recreational resources would be unaffected by the operation of the Project. Therefore, the impacts would be less than significant.

Variant H1

Impact Characterization

Impacts could occur if Variant H1 operations would increase the use of the existing parks or other recreational resources within the RSA and lead to the occurrence or acceleration of substantial physical deterioration of the recreational resource.

Impact Details and Conclusions

Variant H1 would not generate substantial numbers of new residents that would generate substantial additional use or demand for parks. Additionally, existing recreational resources are located farther than 300 feet from Project and would not increase the use of existing neighborhood and regional parks, or recreational resources such that substantial physical deterioration of the facility could occur or be accelerated. Therefore, impacts associated with Variant H1 would be less than significant.

Variant H2

Impact Characterization

Impacts could occur if Variant H2 operations would increase the use of the existing parks or other recreational resources within the RSA and lead to the occurrence or acceleration of substantial physical deterioration of the recreational resource.

Impact Details and Conclusions

Variant H2 would not increase the use of the existing neighborhood and regional parks or recreational resources such that substantial deterioration of the facility could occur or be accelerated. Therefore, impacts associated with Variant H2 would be less than significant.

Variant H3

Impact Characterization

Impacts could occur if Variant H3 operations would increase the use of the existing parks or other recreational resources within the RSA and lead to the occurrence or acceleration of substantial physical deterioration of the recreational resource.

Impact Details and Conclusions

Variant H3 would not increase the use of the existing neighborhood and regional parks or recreational resources such that substantial deterioration of the facility could occur or be accelerated. Therefore, impacts associated with Variant H1 would be less than significant.

Impact REC-4	Operation of the Project would not include recreational facilities or require the construction or expansion of recreational resources that might have an adverse physical effect on the environment.
Level of Impact	**No impact**

Project

Impact Characterization

Project impacts could occur if Project operations would include recreational facilities or require construction or expansion of recreational resources that might have an adverse physical environmental effect.

Impact Details and Conclusions

Operations of the Project would not result in adverse physical degradation of parks or recreational facilities that would displace recreational use or result in demand for new recreational facilities, such that construction or expansion of recreational facilities would be required. Therefore, Project operations would have no impact on the physical environment as a result of new or expanded recreational facilities.

Variant H1

Impact Characterization

Variant H1 would be located at the approved ACE Merced Layover and Maintenance Facility and parcels adjacent to the facility. Variant H1 impacts could occur if Project operations require construction or expansion of recreational resources that might have an adverse physical environmental effect.

Impact Details and Conclusions

Variant H1 operations would not result in adverse physical degradation on existing recreational facilities or might result in demand for new recreational facilities, such that construction or expansion would be required. Therefore, there would be no impact.

Variant H2

Impact Characterization

Variant H2 would be located at the approved ACE Merced Layover and Maintenance Facility. Impacts could occur if Variant H2 operations would include recreational facilities or require construction or expansion of recreational resources that might have an adverse physical environmental effect.

Impact Details and Conclusions

Operation of Variant H2 would not result in adverse physical degradation on existing recreational facilities or might result in demand for new recreational facilities, such that construction or expansion would be required since hydrogen would be transported by truck instead of processing hydrogen on-site. Therefore, there would be no impact.

Variant H3

Impact Characterization

Variant H3 would be located at the approved ACE Merced Layover and Maintenance Facility. Impacts could occur if Variant H3 operations would include recreational facilities or require construction or expansion of recreational resources that might have an adverse physical environmental effect.

Impact Details and Conclusions

Operation of Variant H3 would not result in adverse physical degradation on existing recreational facilities or might result in demand for new recreational facilities, such that construction or expansion would be required since hydrogen would be transported via rail instead of processing hydrogen on-site. Therefore, there would be no impact.

3.15 Safety and Security

3.15.1 Introduction

This section describes the regulatory and environmental setting for safety and security in the vicinity of the Project. It also describes the impacts on safety and security that would result from the Project and mitigation measures that would reduce significant impacts, where feasible and appropriate. System safety refers to the prevention of accidents to transit passengers, employees, or others present at or adjacent to transit facilities, which includes stations, tracks, pedestrian walkways, traction power substations, and trains. Security relates to the protection of people from intentional acts that could result in injury or harm and protection of property from deliberate acts. This includes crime prevention, law enforcement, and protection against terrorism.

Cumulative impacts on safety and security, in combination with planned, approved, and reasonably foreseeable projects, are discussed in Chapter 4, *Cumulative Impacts*.

3.15.2 Regulatory Setting

This section summarizes the federal, state, regional, and local regulations related to safety and security applicable to the Project.

3.15.2.1 Federal

Federal Railroad Administration

The Federal Railroad Administration (FRA), under the umbrella of the U.S. Department of Transportation, was created by the Department of Transportation Act of 1966 (49 U.S.C. 103, Section 3(e)(1)). FRA was created primarily to promulgate and enforce rail safety regulations, administer railroad assistance programs, and conduct research and development in support of improved railroad safety and national rail transportation policy. FRA enforces safety regulations for the nation's railroad system and development of intercity passenger rail through legislative rules, non-legislative rules, and management and procedural rules.

Rail Safety Improvement Act of 2008 (Public Law 110-432)

In September 2008, Congress enacted the Rail Safety Improvement Act (Public Law 110-432, 122 Statutes 4854 [October 16, 2008] [codified at 49 U.S.C. 20157]), the first authorization of FRA's safety programs since 1994. As such, FRA enforces safety regulations for intercity passenger rail and freight rail services. This law establishes the work hour limitations for rail operators and required positive train control (PTC) technology to be installed across the U.S. rail network by 2015. In October 2015, Congress extended the deadline for PTC compliance to December 31, 2018, under the Positive Train Control Enforcement and Implementation Act of 2015 (Public Law 114-73, 129 Statutes 568, 576-82 [October 29, 2015] [codified at 49 U.S.C. 20157(a)(1), (a)(2)(B), (k)]).

Transportation Security Administration

The enactment of the Aviation and Transportation Security Act (49 CFR 1580) in November 2001 established the Transportation Security Administration (TSA) as the agency responsible for transportation security screening and enforcement (49 U.S.C. 114). TSA administrative rules for rail transportation security are codified under 49 CFR 1580. TSA has issued a series of security directives that require rail transportation operators to implement certain protective measures, report potential threats and security concerns to TSA, and designate a primary and alternate security coordinator. Specifically, Security Directives RAILPAX-04-01 and RAILPAX-04-02 would be applicable to this Project (TSA 2006).

Public Transportation Agency Safety Plan (49 CFR Part 673)

The Public Transportation Agency Safety Plan regulation, at 49 CFR Part 673, requires covered public transportation providers and state Departments of Transportation to establish safety performance targets to address the safety performance measures identified in the National Public Transportation Safety Plan (49 CFR 673.11(a)(3)).

American with Disabilities Act of 1990 (28 CFR Part 36)

Title III of the American with Disabilities Act (ADA) of 1990 regulations set guidelines for accessibility to places of public accommodation and commercial facilities by individuals with disabilities. The guidelines are to be applied during the design, construction, and alteration of such buildings and facilities to the extent required by regulations issued by federal agencies, including the Department of Justice, under the ADA.

3.15.2.2 State

California Public Utilities Commission

The State of California, through Section 99152 of the Public Utilities Code, requires the California Public Utilities Commission (CPUC) to develop a safety oversight program for the design, construction, and operation of public transit guideways. The CPUC also prescribes safety and security requirements for the design, construction, operation, and maintenance of all rail transit and public transit fixed-guideway systems such as intercity passenger rail, freight rail, heavy rail transit, light rail transit, trolleys, and funicular systems in General Orders, and ensures those are carried out through the Rail Transit Safety Branch activities and Commission Resolutions and Decision pertaining to rail transit matters. The CPUC ensures that rail transit system extension and new construction projects undergo a safety certification review and approval. To implement this mandate, the commission adopted General Orders (GOs) 88-B and 164-E. GO 88-B provided a process for CPUC staff authorization of rail crossing modifications that meet certain criteria. Upon completion of the design package, local agencies must work with railroads to complete a single GO 88-B form, *Modification of an Existing Railroad*, to construct or modify the railroad crossing. GO 164-E, *Rules and Regulations Governing State Safety Oversight of Rail Fixed Guideway Systems*, includes general requirements for fixed guideway systems, such as system safety security plans, system security plans, hazard management process, at-grade rail crossings, and safety certification plans.

California Emergency Services Act (Sections 8550 to 8692)

The California Emergency Services Act authorizes the Office of Emergency Services to prescribe powers and duties supportive of the Act's goals, namely protection of human health and safety and preservation of the lives and property of the people of the state. In addition, the Act authorizes the establishment of local organizations to carry out its provisions through necessary and proper actions.

3.15.2.3 Regional and Local

Regional

The Merced County Department of Public Health (MCDPH) maintains an Emergency Operations Plan (EOP) as required for all counties within the state of California (MCDPH 2017). The purpose of the EOP is to help plan for, respond to, and recover from a natural disaster or human-caused event. The EOP outlines the activities of the various divisions within the MCDPH in responding to bioterrorism, naturally occurring disease outbreaks, earthquakes, floods, and other man-made or natural disasters (MCDPH 2017). The plan also identifies the location of critical emergency response facilities, such as emergency dispatch and operations centers, government structures, and hospitals or other major medical facilities. Figure 3.13-1 in Section 3.13, *Public Services and Utilities and Service Systems,* shows the emergency response facilities approximate to the resource study area.

Merced County is also developing a comprehensive Local Road Safety Plan (LRSP), which will enhance traffic safety for all modes of transportation. This document is a requirement for the county to be eligible to receive federal funding for future local roadway safety improvement projects. The LRSP will outline safety patterns throughout the county and will create a toolbox to address these patterns and proposed projects to improve safety at key locations (Merced County Department of Public Works 2023).

Local

The City of Merced requires a public works encroachment permit whenever work or activity is performed in the City easements or rights-of-way (ROWs), such as

- Street improvements (pavement, curb, gutter, sidewalk, and/or driveway)
- Public utility installation(s) (PG&E, PacBell, Cable TV)
- Storm drain installations and/or connections
- Sanitary sewer installations and/or connections
- Water services and main installations
- Monitoring well installation, monitoring, and abandonment

Where construction activities interfere with ROW crossings or pedestrian spaces, the permitting process requires a traffic control plan, including dimensions and pedestrian control (City of Merced 2023).

Section 3.11, *Land Use and Planning*, of this environmental impact report (EIR), , includes a list of applicable goals, policies, and objectives from regional and local plans of the jurisdictions in which the Project would be located. Section 15125(d) of the California Environmental Quality Act (CEQA)

Guidelines requires an EIR to discuss "any inconsistencies between the 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 Project would be consistent with the plans of relevant jurisdictions.[1] The Project would be generally consistent with the applicable goals, policies, and objectives related to safety and security identified in Appendix 3.0-1.

3.15.3 Environmental Setting

This section describes the environmental setting related to safety and security for the Project. It entails the existing conditions and available resources to help mitigate on-board and station area accidents, crimes, and fires in the threshold of significance.

3.15.3.1 Resource Study Area

For the purposes of this analysis, the resource study area for safety and security is the same as that of Section 3.13, *Public Services and Utilities and Service Systems*. It is defined as follows.

- Law enforcement, fire protection, and hospitals within a 0.5-mile radius of the Project.
- Schools, libraries, and parks within a 0.25-mile radius of the Project.

3.15.3.2 Traffic Safety

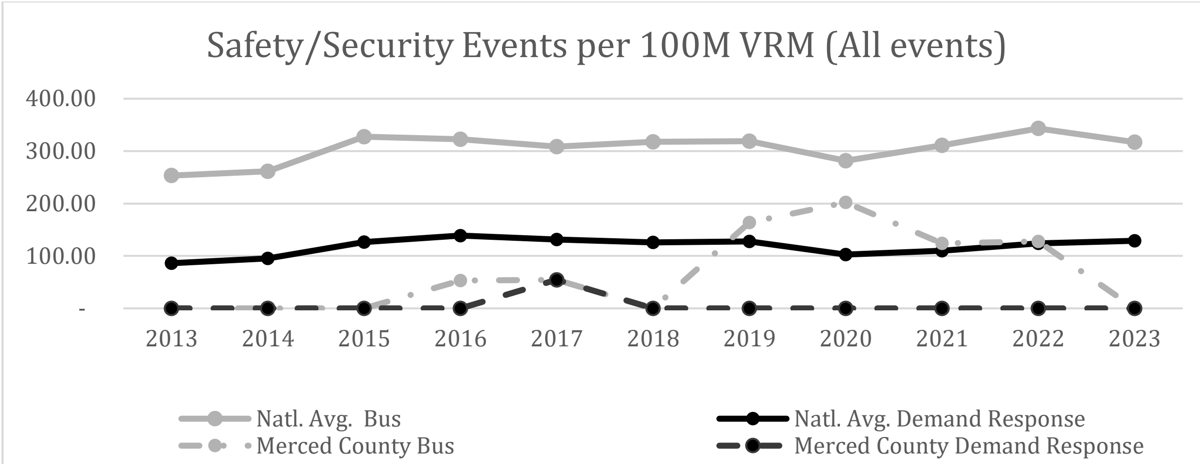
SR 59 and State Route 99 provide the primary connection to cities within the County and locations beyond. SR 99 is recognized as one of the most dangerous highways in the state and the nation. In 2021 290 crashes occurred in Merced County, resulting in 431 persons injured and 12 fatalities (TIMS 2024). When combining with both corridors with City of Merced roadways, 504 accidents occurred in 2021 resulting in 13 fatalities and 694 injuries (TIMS 2024).

3.15.3.3 On-Board Passenger and Operator Safety

The Transit Joint Powers Authority of Merced County is a National Transit Database (NTD) reporter operating local bus and demand response services[2] in the Project vicinity. Figure 3.15-1 compares NTD safety statistics for the Joint Powers Authority to other NTD reporters as a proxy for transit operations safety under the existing condition. As shown on Figure 3.15-1, Merced County has had fewer reportable safety and/or security events per 100 million vehicle revenue miles compared to the national average for similar modes.

[1] 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.

[2] Demand Response Services included any non-fixed route transit services that require advanced scheduling by the customer.



Source: National Transit Database, 2023 SS Time Series

Figure 3.15-1: Safety and Security Events per 100 million VRM

3.15.3.4 Rail Crossing/Pedestrian Safety

Four streets provide access across the Project area. Each of these crossings, including existing pedestrian and safety amenities, is described below:

- **R Street**: The R Street corridor generally features a 6- to 8-foot sidewalk with no buffer or planter separating pedestrian space from general traffic. Crosswalks exist at signalized intersections spaced approximately 500 feet apart. However, where R Street crosses the existing rail tracks, the sidewalk becomes intermittent as the pedestrian space transitions to a bikeway. A rail signal with cross bar regulates general traffic movement across the track. Due to the gap in sidewalk with no clear crosswalk or signage, it is unclear how pedestrian movement is currently protected at this location.
- **V Street**: The V Street corridor generally features a 4- to 6-foot sidewalk with no buffer or planter separating pedestrian space from general traffic. Crosswalks and signalized intersections are spaced 500 feet apart between the SR 99 and 16th Street but become much less frequent outside of this core area. A rail signal with cross bar regulates general traffic and pedestrian movement across the existing track.
- **16th Street**: East of Bear Creek and across the Bear Creek Bridge where it runs parallel to the alignment, 16th Street features 6- to 8-foot sidewalks. However, this space transitions to shoulder west of Bear Creek, and 16th Street does not include any pedestrian facilities where it crosses the Project. A rail signal with cross bar regulates general traffic and pedestrian movement across the existing track.
- **Cooper Avenue/Willowbrook Drive**: East of the Project, Willowbrook Drive features 8-foot sidewalks separated from general traffic by an 8-foot buffer. To the west, Cooper Avenue does not include sidewalks outside the vicinity of the signalized intersection at Cooper Avenue, Willowbrook Drive, and Snelling Highway (SR 59). There are no striped crosswalks on either facility other than the signalized crossing on SR 59.

In addition to the four public ROW crossings, a private drive currently crosses the Project area and existing rail facilities approximately 800 feet north of Bear Creek Drive. As shown on Figure 3.15-2, this crossing does not currently feature any pedestrian or safety amenities.

Source: Google Streetview, June 2023

Figure 3.15-2: Private Road Rail Crossing off SR 59

3.15.3.5 Fire Safety/Fire Risk

According to the California Department of Forestry and Fire Protection (Cal Fire), 2,721 wildfires were recorded in California in the year 2022 (California Department of Forestry and Fire 2023). About 20 wildfires have been recorded for Merced County alone since 2013 and cover approximately 10,203,583 acres.

Cal Fire has a list of California communities at risk for wildfire and created fire hazard severity zones for very high, high, and moderate risk of wildfire. These severity zones are designated as being located in either a state responsibility area or a local responsibility area. In Merced County, the state responsibility area is east of the Main Canal and Le Grand Canal over 5 miles from the Project footprint. Figure 3.15-3 illustrates the local responsibility fire severity hazard zone for Merced County. The majority of the City of Merced is located outside of the agency's fire hazard zones and is free of major wildland fire hazards. The nearest location designated as a moderate fire hazard within the local responsibility area is just outside the city limits, extending northwest from the corner of Santa Fe Drive and Snelling Highway (SR 59).

3.15.3.6 On-Board and Station Area Security

Local safety and security are key to understanding the security risk posed in the station area. Station area crimes are typically categorized as systematic, on employees and on patrons. Systematic crimes include destruction of vehicles, facilities, and properties; crimes on employees include assault on operators and employees in facilities; and crimes on patrons include minor theft to assault. Criminal rates in the City of Merced are similar to the state of California and national rates. However, property crime, burglary, vehicular theft, and aggravated assault are higher for the City of Merced.

Table 3.15-1 summarizes the crimes rates reported for 2019 in the Project area compared to the state and nation.

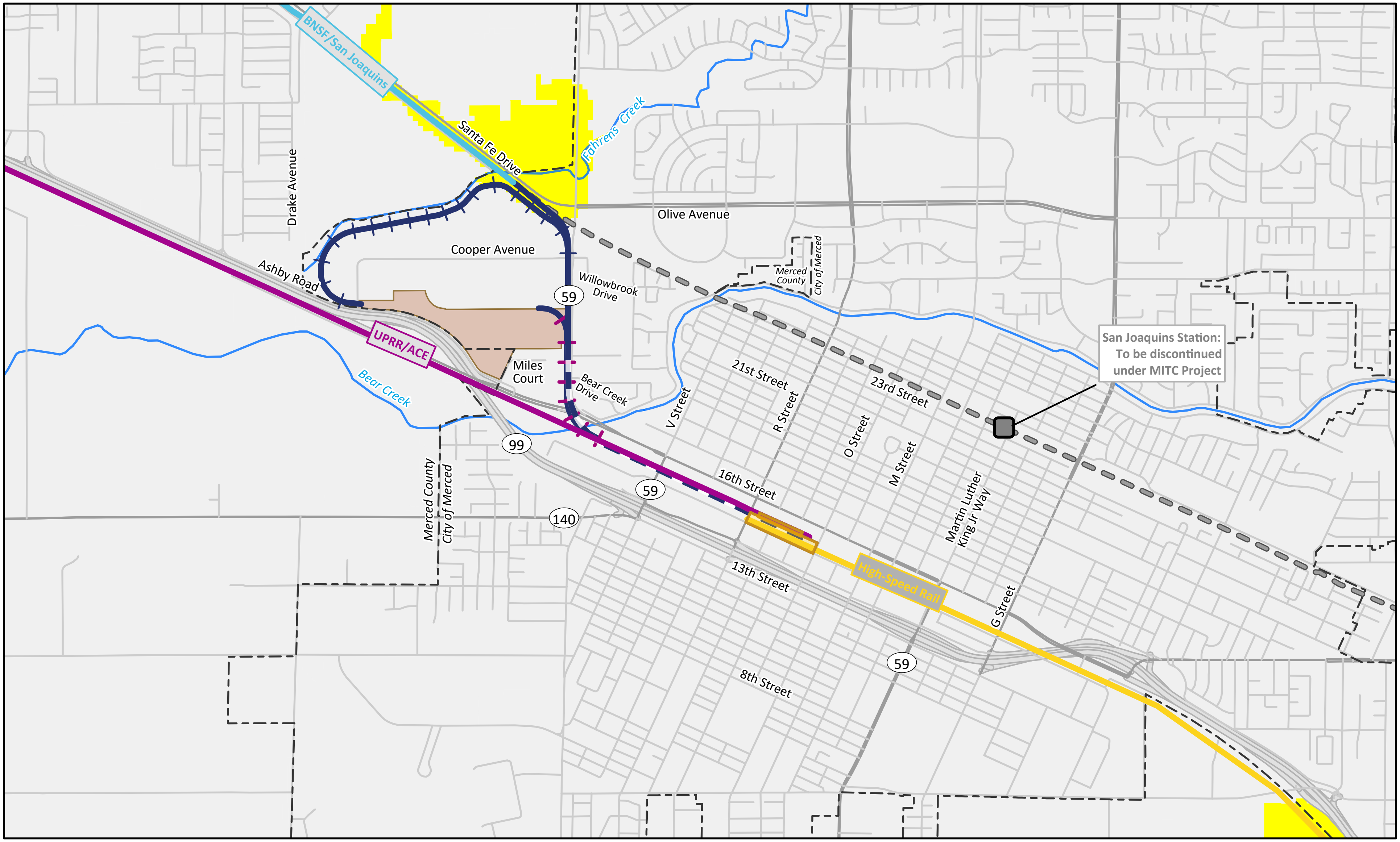
Table 3.15-1: Reported Crime Rates per 10,000 Residents (2019)

Location	Murder	Rape	Robbery	Aggravated Assault	Property Crime	Burglary	Larceny-Theft	Vehicle Theft
City of Merced	0.4	3.0	7.4	44.6	251.0	51.6	148.8	50.6
California	0.4	3.8	13.2	26.7	233.1	38.6	158.6	35.9
National	0.5	4.3	8.2	25.0	211.0	34.1	155.0	22.0

Source: Federal Bureau of Investigation 2019

3.15.3.7 Emergency Response

This section describes the emergency services and facilities that are in or proximate to the threshold of significance. The emergency services include hospital/clinics, law enforcement, Merced Police Department (MPD), and fire department, Merced Fire Department (MFD). MPD and Merced County Sheriff Department are the official law enforcement agencies serving Merced City in a 23.3-square-mile jurisdiction. MPD has three main bureaus, namely Merced Community College, South Station, and Central Station. South Station is in the southwestern part of the Project and is the only MPD station in the threshold of significance. One Sheriff Department north of the Project also falls in the threshold of significance. This Sheriff Department also functions as a correction center. Table 3.15-2 lists the exact location and distance for the law enforcement agencies to the Project.



Existing UPRR/Approved ACE
Proposed High-Speed Rail
Existing BNSF/San Joaquins
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City of Merced Boundary

MITC Project
San Joaquins: Elevated Track
San Joaquins: At-grade Track
San Joaquins: Layover and Maintenance Access Line
ACE/UPRR Spur Track
San Joaquins: To be discontinued under MITC Project

Fire Hazard Severity Zone
LRA Moderate
LRA Unzoned

0 1,000 2,000 Feet

N

Data Source: City of Merced, CAL FIRE

Figure 3.15-3
Fire Hazard Severity Zone
Merced Intermodal Track Connection Project

L:\DCS\Projects_TRN\60690716_MITC_CEQA_NEPA_PE\900_CAD_GIS\920_GIS\Maps\Safety\Safety_Security.aprx\Figure 3.15-3 Fire Hazard Severity Zone

Table 3.15-2: Police Departments Proximate to the Project

Police Station	Address	Approximate Distance from the Project Footprint to the Police Station (mile)	Compass Direction
South Station	470 West 11th Street	0.75	Southeast
Sheriff Department/County Jail	700 West 22nd Street	0.98	North

Source: City of Merced 2023

The City of Merced is served by MFD. MFD responds to and mitigates non-law enforcement emergencies in the city and provides resources to outside communities. There are 32 fire departments in Merced County with a ratio of one fire department per 8,8355 people and one fire department to 60 square miles. The fire departments in the City of Merced comprise five MFD stations, five fire districts, and two county stations (City of Merced 2022). The departments have advanced equipment, including fire prevention vehicles, roof training props, and an aircraft crash fire rescue engine. The closest fire station to the Project footprint is Station 51, which is the headquarters of MFD. Station 51 is 1 mile to the east of the Project footprint and outside the threshold of significance. The Project is also proximate to Merced County Fire Department Station 81. Table 3.15-3 lists the addresses, districts, and distances of fire stations close to the Project.

Table 3.15-3: Police Stations in or Proximate to Project

Fire Station	Address	Approximate Distance from the Project Footprint to the Police Station (miles)	District
Station 51	99 East 16th Street, Merced	1.07	District 1
Station 54	1425 East 21st Street, Merced	2.33	District 4
County Fire Department Station 81	735 Martin Luther King Jr Way, Merced	1.13	District 1

Source: City of Merced 2023; Merced County Open Data, 2023

Emergency Medical Services (EMS) include hospitals and in-patient emergency facilities proximate to the Project. There are no EMS centers in the threshold of significance of the Project. The only EMS center in the City of Merced is Mercy Medical Center, which serves as a Paramedic Base Hospital and Disaster Control Facility. Riggs Ambulance Service provides 9-1-1 emergency medical response to the residents of Merced City. Table 3.15-4 lists the locations and distances of EMS stations and hospitals from the Project footprint.

Table 3.15-4: EMS Station and Hospital Proximate to Project

EMS Station/Hospital	Address	Approximate Distance from the Project to the Police Station (miles)	Direction
Mercy Medical Center	333 Mercy Avenue, Merced	3.93	North
Riggs Ambulance Service	100 Riggs Avenue, Merced	2.54	Southwest

Source: Merced County Emergency Medical Services Agency, 2023

3.15.4 Impact Analysis

This section describes the environmental impacts of the Project on safety and security. This section also 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.

3.15.4.1 Methods for Analysis

The methods used to evaluate impacts on safety and security are described below.

Methods include the review of public safety and security within five core areas: on-board passenger and operator safety, rail crossing/pedestrian safety, fire safety/fire risk, on-board and station area security, and emergency response.

To determine potential risks to passenger or operator safety, this analysis reviews Project design features for high-risk areas such as extreme curvature or slope, high-speed operation, and/or dangerous intersections. In addition, the Project is assumed to maintain compliance with state and federally mandated safety, operations, and staff training requirements outlined in Section 3.15.3, *Environmental Setting*. Potential risks include:

- Pedestrian connectivity was evaluated in and around the Project area. Existing pedestrian conditions were reported from north to south along the Project corridor. For the potential impacts and mitigation measures, active transportation facilities were reviewed. For purposes of CEQA compliance, crossing hazards are considered significant if they could increase hazards to workers, passengers, or adjacent human and environmental receptors along the rail route.
- Fire safety was evaluated using CalFire's classification of fire severity hazards (OSFM 2024) within 0.5 mile of the Project area along with an assessment of whether the Project could impair the ability to implement any emergency response or evacuation plan. A review of Sections 3.3, *Air Quality*, and 3.9, *Hazards and Hazardous Materials*, supplements this analysis to determine whether any potential Project impacts to dust or other pollutant concentrations or hazardous materials could increase the risk of wildfire in the Project area. In addition, potential impacts associated with flooding or landslide risk (see Section 3.8, *Geology, Seismicity, Soils, and Paleontological Resources*) were reviewed to determine potential for the Project to exacerbate potential post-fire slope instability or drainage changes.
- Potential security hazards were evaluated using 2019 Federal Bureau of Investigation (FBI) crime rates for the jurisdiction where the Project station is proposed (FBI 2019). Crime rates were categorized according to the standards used by the FBI's Uniform Crime Reporting Program, a program that is used to standardize and track reporting of crime on a national level. Because the Project system is a closed system, crime was evaluated around the station area where passengers would be able to get on and off. For purposes of CEQA compliance, security hazards are considered significant if they could increase hazards to workers, passengers, or adjacent human and environmental receptors along the rail route.
- Rail crossing/pedestrian safety was evaluated through the lens of proposed changes to facility dimensions, barriers, and crossing protection compared to the existing landscape. This considers intersections of general traffic with the rail operation, pedestrian rail crossings, and

pedestrian roadway crossings, in locations where the roadway or pedestrian space would be modified by the Project.

- The emergency response analysis includes a review of fire, police, and in-patient medical emergency services within the resource study area (RSA). The locations of fire stations, police stations, emergency response centers, and in-patient medical centers in the RSA were determined. Geographic analysis of the emergency services and the corresponding jurisdictional boundaries were used in conjunction with a review of local roadway impacts to determine the short-term (i.e., construction) and long-term impacts to emergency response times and service areas. For purposes of CEQA compliance, impacts were considered significant if they impair implementation of or physically interfere with an adopted emergency response or evacuation plan.

3.15.4.2 Thresholds of Significance

The CEQA Guidelines Appendix G (14 Cal. Code Regs. 15000 et seq.) identifies significance criteria to be considered for determining whether a project could have significant impacts on safety and security.

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

- Be located in an airport land use plan area or, where such a plan has not been adopted, be within 2 miles of a public airport or public use airport, and result in a safety hazard or excessive noise for people residing or working in the resource study area.
- Be located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport and expose people residing or working in the project area to excessive noise levels.
- Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.
- Expose people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires.
- For projects located in or near state responsibility areas or lands classified as very high fire hazard severity zones, an impact would be considered significant if construction or operation of the project would have any of the following consequences:
    - Substantially impair an adopted emergency response plan or emergency evacuation plan.
    - Because of slope, prevailing winds, and other factors, exacerbate wildfire risks and thereby expose residents to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire.
    - Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines, or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts on the environment.
    - Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes.

- Substantially increase hazards to workers, passengers, or adjacent human and environmental receptors along rail routes due to a design feature (e.g., sharp curves or dangerous intersections) or increase in passenger train movements.

3.15.4.3 Impacts and Mitigation Measures

Impact SAF-1	Construction of the Project would be located within an airport land use plan area, within 2 miles of a public airport or public-use airport, and within the vicinity of a private airstrip, but would not result in a safety hazard or excessive noise for people residing or working in the study area.
Level of Impact	**Less-than-significant impact**

Project

Impact Characterization

Project construction would be located in proximity the Merced Municipal Airport and the Merced-Castle regional airport runways, and could result in workers exposed to excessive noise impacts excessive noise impacts from inbound and out-bound flights, Merced Municipal Airport is a commercial passenger service facility. Merced Castle Regional Airport, a general aviation airport is utilized by the United States Forest Service (USFS) as reloading for aerial firefighting and is headquarters for the Sierra Academy of Aeronautics – a flight training school. The school comprises the majority of the air traffic.

Impact Details and Conclusions

The Project footprint is located approximately two miles from the Merced Regional Airport and approximately 4.5 miles from the Castle Airport. According to the *Merced County Airport Land Use Compatibility Plan (Merced County 2012)*, the Project area would be located in Zone D for the overflight areas associated with the Merced Municipal Airport. Zone D is defined as "other overflight area) where noise impacts would be low. The Project is located in Zones C and D of Merced-Castle's flight patterns. Zone C is defined as "extended approach/Departure area & primary traffic patterns," where the noise impact is considered moderate. In 2019, Merced-Castle averaged approximately 283 aircraft operations per day (AirNav 2024). Although the risk of exposure to hazardous noise levels is moderate, the exposure to constructure workers would be less than noise generated from construction machinery commonly utilized. In addition, noise generated from airport operations would be intermittent as flights approach or takeoff from the airport. As a result, the impact would be less than significant.

Variant H1

Impact Characterization

Noise exposure during construction of Variant H1 would be the same as the Project and is not expected to create additional exposure to hazardous noise levels.

Impact Details and Conclusions

Similar to the project, the impact from noise levels for Variant H1 would be less than significant.

Variant H2

Impact Characterization

Noise exposure during construction of Variant H2 would be the same as the Project and is not expected to create additional exposure to hazardous noise levels.

Impact Details and Conclusions

Similar to the project, the impact from noise levels for Variant H2 would be less than significant.

Variant H3

Impact Characterization

Noise exposure during construction of Variant H3 would be the same as the Project and is not expected to create additional exposure to hazardous noise levels.

Impact Details and Conclusions

Similar to the project, the impact from noise levels for Variant H3 would be less than significant.

Impact SAF-2	Construction of the Project could impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plans
Level of Impact	**Potentially significant impact**
Mitigation Measures	SAF-1.1: Emergency Service Coordination TR-1.1: Transportation Management Plan (TMP) for Project construction
Level of Impact After Mitigation	**Less-than-significant impact**

Project

Impact Characterization

Construction activities occurring in roadways and streets could disrupt traffic and interfere with response times for fire, police, and other emergency responders. Construction of any linear infrastructure project could impair implementation of emergency response and evacuation plans.

Impact Details and Conclusions

Construction of the Project would involve work at four public right-of-way crossings, which are described in more detail in Section 3.15.3.2, *Traffic Safety*. The proposed rail crossings at R Street, V Street, and 16th Street would be elevated ROW crossings, while the rail alignment would cross Cooper Avenue at grade. R Street, V Street and 16th Street are major through routes providing freeway access. However, none of these crossings provide direct or sole access points for any of the fire, medical or law enforcement facilities described in Section 3.15.3.5, *Fire Safety/Fire Risk*. Potential impacts at these locations during construction would be temporary, geographically limited, and dependent on detailed construction plans and timing. Cooper Avenue provides access to several industrial uses in the vicinity of the Project area. Construction through this intersection could temporarily disrupt emergency access to these properties. The Project is a linear infrastructure project with the potential disrupt traffic and interfere with response times for fire, police, and other emergency responders; in addition, the Project would require temporary road detours during construction and could potentially impact emergency response times related to fire and police protection. This would be a potentially significant impact. See Section 3.15.4.3, Impacts and Mitigation Measures, for additional information on potential construction detours.

Mitigation Measures

Mitigation Measure SAF-1.1: Emergency Service Coordination

In compliance with City of Merced construction permitting requirements (see Section 3.15.2.3, *Regional and Local*) the project sponsor shall communicate specific construction plans including any closure to public ROW, duration, and temporary traffic and safety plans of the City of Merced. Prior to permitting, the project sponsor shall coordinate with key emergency personnel identified in the Merced County EOP to minimize impacts, develop alternate routes and facilitate additional communication as appropriate to mitigate potential impacts.

Mitigation Measure TR-1.1: Transportation Management Plan (TMP) for Project construction

Refer to mitigation measure description in Section 3.16, *Transportation*.

Significance with Application of Mitigation

With implementation of Mitigation Measures SAF-1.1 and TR-1.1, impacts related to the implementation of or physical interference with an adopted emergency response plan or emergency evacuation plans during construction of the Project would be less than significant.

Variant H1

Impact Characterization

The impact characterization is the same as described above for the Project.

Impact Details and Conclusions

The impact details are similar as described above for the Project. Variant H1 is a linear infrastructure project with the potential disrupt traffic and interfere with response times for fire, police, and other emergency responders; in addition, Variant H1 would require temporary road detours during construction and could potentially impact emergency response times related to fire and police protection. This would be a potentially significant impact.

Mitigation Measures

Mitigation Measure SAF-1.1: Emergency Service Coordination

Mitigation Measure TR-1.1: Transportation Management Plan (TMP) for Project construction

Significance with Application of Mitigation

With implementation of Mitigation Measures SAF-1.1 and TR-1.1, impacts related to the implementation of or physical interference with an adopted emergency response plan or emergency evacuation plans during construction of Variant H1 would be less than significant.

Variant H2

Impact Characterization

The impact characterization is the same as described above for the Project.

Impact Details and Conclusions

The impact details are similar as described above for the Project. Variant H2 is a linear infrastructure project with the potential disrupt traffic and interfere with response times for fire, police, and other emergency responders; in addition, Variant H2 would require temporary road detours during construction and could potentially impact emergency response times related to fire and police protection. This would be a potentially significant impact.

Mitigation Measures

Mitigation Measure SAF-1.1: Emergency Service Coordination

Mitigation Measure TR-1.1: Transportation Management Plan (TMP) for Project construction

Significance with Application of Mitigation

With implementation of Mitigation Measures SAF-1.1 and TR-1.1, impacts related to the implementation of or physical interference with an adopted emergency response plan or emergency evacuation plans during construction of Variant H2 would be less than significant.

Variant H3

Impact Characterization

The impact characterization is the same as described above for the Project.

Impact Details and Conclusions

The impact details are similar as described above for the Project. Variant H3 is a linear infrastructure project with the potential disrupt traffic and interfere with response times for fire, police, and other emergency responders; in addition, Variant H3 would require temporary road detours during construction and could potentially impact emergency response times related to fire and police protection. This would be a potentially significant impact.

Mitigation Measures

Mitigation Measure SAF-1.1: Emergency Service Coordination

Mitigation Measure TR-1.1: Transportation Management Plan (TMP) for Project construction

Significance with Application of Mitigation

With implementation of Mitigation Measures SAF-1.1 and TR-1.1, impacts related to the implementation of or physical interference with an adopted emergency response plan or emergency evacuation plans during construction of Variant H3 would be less than significant.

Impact SAF-3	Construction of the Project would not increase exposure of people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires and the Project is not located in or near state responsibility areas or lands classified as high or very high fire hazard severity zones so would not result in any of the associated consequences of being in such a zone.
Level of Impact	**Less-than-significant impact**

Project

Impact Characterization

The Project footprint is located over five miles outside of any state responsibility area fire hazard severity zones. The local responsibility area nearest the Project footprint is a moderate severity area and is separated from the project by Santa Fe Drive and a creek, minimizing the risk of construction related activity leading to fire in the hazard area.

Impact Details and Conclusions

As stated above, the Project footprint is located over five miles outside of any state responsibility area fire hazard severity zones. The Project proposes to construct a combination of new track, track shifts, track upgrades, and an aerial guideway structure. The Project is not anticipated to exacerbate risk of wildfire during construction. Therefore, the impact would be less than significant.

Variant H1

Impact Characterization

The character of potential impacts under Variant H1 would be similar to the description of the Project above. Under Variant H1, photovoltaic panels, fuel processing, and fuel storage areas would also be constructed.

Impact Details and Conclusions

The construction of the additional features proposed under Variant H1 would not exacerbate wildfire risk. Therefore, the impact would be less than significant.

Variant H2

Impact Characterization

The impact characterization is the same as described above for the Project.

Impact Details and Conclusions

There would be no additional risk of wildfire under Variant H2. Therefore, the impact would be less than significant.

Variant H3

Impact Characterization

The impact characterization is the same as described above for the Project.

Impact Details and Conclusions

There would be no additional risk of wildfire under Variant H2. Therefore, the impact would be less than significant.

Impact SAF-4	Construction of the Project would not increase hazards to workers, passengers, or adjacent human and environmental receptors along rail routes due to a design feature (e.g., sharp curves or dangerous intersections) or increase in passenger train movements.
Level of Impact	**No impact**

Project

Impact Characterization

Hazards stemming from Project design features are considered to be an operational impact, not one that would occur during construction. See Impact SAF-8 below for the operational safety discussion.

Impact Details and Conclusions

As hazards stemming from design features are considered an operational impact, no impact would occur.

Variant H1

Impact Characterization

Construction of Variant H1 would not alter the characterization of the Project above.

Impact Details and Conclusions

As hazards stemming from design features are considered an operational impact, no impact would occur.

Variant H2

Impact Characterization

Construction of Variant H2 would not alter the characterization of the Project above.

Impact Details and Conclusions

As hazards stemming from design features are considered an operational impact, no impact would occur.

Variant H3

Impact Characterization

Construction of Variant H3 would not alter the characterization of the Project above.

Impact Details and Conclusions

As hazards stemming from design features are considered an operational impact, no impact would occur.

Impact SAF-5	Operation of the Project would be located within an airport land use plan area, within 2 miles of a public airport or public-use airport, and within the vicinity of a private airstrip, but would not result in a safety hazard or excessive noise for people residing or working in the study area.
Level of Impact	**Less-than-significant impact**

Project

Impact Characterization

As stated above under Impact SAF-1, the Project footprint is located approximately 2 miles from the Merced Municipal Airport and 4.5 miles from the Merced-Castle Airport. The Project area is located within Zones C and D in the southeast extended approach. In addition, the Project footprint is located within Zone D for the overflight areas associated with the Merced Municipal Airport. The project will not create any new residences, but will include employees supporting operations and maintenance of trains at the ACE layover and maintenance facility.

Impact Details and Conclusions

The Project does not propose any features that would exceed the height limits of either of the applicable airport land use plans (306 to 350 feet for the Merced Municipal Airport, and 600 to 700 feet for the Merced-Castle Airport). Therefore, impacts related to safety within an airport zone are not anticipated.

Variant H1

Impact Characterization

Variant H1 would involve the generation, processing and storage of green hydrogen at the approved ACE Merced Layover and Maintenance Facility. Construction of the infrastructure needed for Variant

H1would occur in the same area as described for the Project and would be subject to the same requirements.

Impact Details and Conclusions

Operation of Variant H1 would be required to comply with the FAA and ALUCP building height regulations and would otherwise be compatible with the land uses contemplated for the project site under the ALUCP; as such, Variant H1 would not pose a safety hazard or generate excessive noise for people working in the project area. Impacts would be less than significant.

Variant H2

Impact Characterization

Variant H2 would involve the off-site processing and transportation (via truck) of either green hydrogen or grey hydrogen to the approved ACE Merced Layover and Maintenance Facility, where it would be stored. Construction of the infrastructure needed for Variant H2 would occur in the same area as described for the Project and would be subject to the same requirements.

Impact Details and Conclusions

Development of the Variant H2 would be required to comply with the FAA and ALUCP building height regulations and would otherwise be compatible with the land uses contemplated for the project site under the ALUCP; as such, Variant H2 would not pose a safety hazard or generate excessive noise for people working in the project area. Impacts would be less than significant.

Variant H3

Impact Characterization

Variant H3 would involve the off-site processing and transportation (via train) of either green hydrogen or grey hydrogen to the approved ACE Merced Layover and Maintenance Facility, where it would be stored. Construction of the infrastructure needed for Variant H3 would occur in the same area as described for the Project and would be subject to the same requirements.

Impact Details and Conclusions

Development of the Variant H3 would be required to comply with the FAA and ALUCP building height regulations and would otherwise be compatible with the land uses contemplated for the project site under the ALUCP; as such, Variant H3 would not pose a safety hazard or generate excessive noise for people working in the project area. Impacts would be less than significant.

Impact SAF-6	Operation of the Project would not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.
Level of Impact	**Less-than-significant impact**

Project

Impact Characterization

The Project would install guard gates at at-grade crossings between 16th Street/SR 59, Cooper Avenue/SR 59, and the Cooper Avenue/Safeway crossing. This could result in localized traffic disruptions and could affect emergency response times.

Impact Details and Conclusions

Despite these localized traffic delay impacts, emergency vehicle response times are a function of travel along the entire path from their base to the incident location. Project operations would substantially reduce overall vehicle miles travelled (VMT), which would generally reduce congestion. Most of the VMT reductions would be during peak hours, thereby reducing congestion. Thus, operation impacts related to emergency plans emergency response plan or emergency evacuation plans would be less than significant.

Variant H1

Impact Characterization

The impact of Variant H1 would be the same as the Project as described above.

Impact Details and Conclusions

Operational impacts under Variant H1 would be less than significant.

Variant H2

Impact Characterization

The impact of Variant H2 would be the same as the Project as described above.

Impact Details and Conclusions

Operational impacts under Variant H2 would be less than significant.

Variant H3

Impact Characterization

The impact of Variant H2 would be the same as the Project as described above.

Impact Details and Conclusions

Operational impacts under Variant H2 would be less than significant.

Impact SAF-7	Operation of the Project would not increase exposure of people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires and the Project is not located in or near state responsibility areas or lands classified as high or very high fire hazard severity zones so would not result in any of the associated consequences of being in such a zone.

Level of Impact	**Less-than-significant impact**

Project

Impact Characterization

As stated above under Impact SAF-3, the Project footprint is located over five miles outside of any state responsibility area fire hazard severity zones. The local responsibility area nearest the Project footprint is a moderate severity area and is separated from the Project footprint by Santa Fe Drive and a creek, minimizing the risk of construction related activity leading to fire in the hazard area.

Impact Details and Conclusions

As stated above, the Project footprint is located over five miles outside of any state responsibility area fire hazard severity zones. The Project proposes to construct a combination of new track, track shifts, track upgrades, and an aerial guideway structure. The Project is not anticipated to exacerbate risk of wildfire during operations. Therefore, the impact would be less than significant.

Variant H1

Impact Characterization

The impact of Variant H1 would be the same as the Project as described above.

Impact Details and Conclusions

Operational impacts under Variant H1 would be less than significant.

Variant H2

Impact Characterization

The impact of Variant H2 would be the same as the Project as described above.

Impact Details and Conclusions

Operational impacts under Variant H2 would be less than significant.

Variant H3

Impact Characterization

The impact of Variant H3 would be the same as the Project as described above.

Impact Details and Conclusions

Operational impacts under Variant H3 would be less than significant.

Impact SAF-8	Operation of the Project would not increase hazards to workers, passengers, or adjacent human and environmental receptors along rail routes due to a design feature (e.g., sharp curves or dangerous intersections) or increase in passenger train movements.
Level of Impact	**Less-than-significant impact**

Project

Impact Characterization

The Project would consist of a new passenger rail connection for the San Joaquins, a new aerial guideway and modifications to the approved ACE Merced Layover and Maintenance Facility. It would also include two new at-grade crossings at Cooper Avenue.

Impact Details and Conclusions

As stated in Section 3.16, *Transportation*, the Project would adhere to the documented local, regional, and Caltrans planning guidance. This would facilitate safety improvements for the future at-grade crossings through roadway planning and enhanced visual, physical, and auditory signaling paired with MUTCD signage on approach. As such, the crossings and other design features would result in less than significant impacts related to hazards.

Variant H1

Impact Characterization

Variant H1 would not change rail design or operations relative to the Proposed Project.

Impact Details and Conclusions

Like the proposed project, the impact related to design features and passenger train movements. would be less than significant.

Variant H2

Impact Characterization

Variant H2 would not change rail design or operations relative to the Proposed Project.

Impact Details and Conclusions

Like the proposed project, the impact related to design features and passenger train movements. would be less than significant.

Variant H3

Impact Characterization

Like the proposed project, the impact related to design features and passenger train movements. would be less than significant.

Impact Details and Conclusions

As explained in Section 3.9, *Hazards and Hazardous Materials*, Variant H3 would be required to comply with applicable federal, state, and local laws related to the safe handling of hazardous materials, as well as hydrogen-specific considerations. Under this variant, the ACE Merced Layover and Maintenance Facility would also be enrolled in the HMBP program. Based on these considerations, the addition of up to one additional freight train on any given day would result in a less than significant impact on safety.

3.16 Transportation

3.16.1 Introduction

This section describes the regulatory and environmental setting for transportation in the vicinity of the Project. It also describes the impacts on transportation that would result from the Project and mitigation measures that would reduce significant impacts, where feasible and appropriate.

Additional considerations of transportation are presented in Section 3.15, *Safety and Security*, which addresses impacts on emergency response. Cumulative impacts on transportation, in combination with planned, approved, and reasonably foreseeable projects, are discussed in Chapter 4, *Cumulative Impacts*.

3.16.2 Regulatory Setting

This section summarizes the federal, state, regional, and local regulations related to transportation applicable to the Project.

3.16.2.1 Federal

The Federal Railroad Administration (FRA) is responsible for developing and enforcing regulations that govern the safety of freight and passenger rail systems, including the design, operation, and maintenance of railroads. These regulations are primarily concerned with components such as grade crossings, tracks, and train control, rather than rail stations. FRA does issue guidance on station design compliance with the Americans with Disabilities Act of 1990 (ADA). Additionally, FRA is responsible for project development and investment in rail infrastructure and intercity passenger rail service, and the Office of Railroad Policy and Development has issued guidance on station area planning for high-speed and intercity passenger rail (FRA 2011).

The Federal Transit Administration (FTA) is responsible for administering federal grant programs, providing technical assistance, and developing and enforcing regulations related to public transit systems. Similar to FRA, FTA issues regulations and guidance on ADA compliance for transportation facilities. Most of the oversight activities undertaken by FTA relate to their grant funding.

3.16.2.2 State

The California Department of Transportation, or Caltrans, is generally responsible for planning and oversight of the statewide transportation system and is directly responsible for specific components of the system, including the design, construction, operation, and maintenance of the highway and freeway networks and the operation of intercity rail services. Senate Bill (SB) 391 requires Caltrans to update the California Transportation Plan every 5 years, which establishes a vision for the statewide transportation system and outlines policies and strategies that complement the regional transportation plans (RTPs) prepared by California's 18 metropolitan planning organizations (MPOs). California Transportation Plan 2050, which was completed in 2021, is comprised of eight goals: provide a safe and secure transportation system; achieve statewide greenhouse gas (GHG) emissions reduction targets and increase resilience to climate change; eliminate transportation burdens for low-income communities of color, people with disabilities, and other disadvantaged groups; improve multimodal mobility and access to destinations for all users; enable vibrant, healthy communities; support a vibrant, resilient economy; enhance environmental health and reduce negative transportation impacts; and maintain a high-quality, resilient transportation system (Caltrans 2021).

The California Transportation Plan references several mode-specific plans, including the 2018 California State Rail Plan and the Draft 2023 State Rail Plan, both of which establish the vision for the statewide passenger and freight rail system and identifies necessary investments. The 2018 mid-term (2027) plan includes expanded service to Merced and a high-speed rail connection at the proposed integrated Merced HSR Station (proposed integrated station), and both the mid- and long-term (2040) plans identify Merced as a key transfer station for local and high-speed service (Caltrans 2018). Caltrans published the Draft 2023 California State Rail Plan on March 10, 2023, which includes completion of the integrated station in its near-term goals (Caltrans 2023). Other statewide mode-specific plans address freight mobility, public transit, and bicycling and walking.

Sustainable Communities and Climate Protection Act of 2008 (SB 375)

The Sustainable Communities and Climate Protection Act of 2008 seeks to reduce GHG emissions through coordinated transportation and land use planning. SB 375 requires MPOs to incorporate a Sustainable Communities Strategy (SCS) into their RTP. The SCS must demonstrate how the region would meet emission reduction targets for cars and light trucks set by the California Air Resources Board.

SB 743

SB 743, which amends several sections of the Government and Public Resources Codes in the California Constitution, changes how the environmental impacts of transportation projects are evaluated under the California Environmental Quality Act (CEQA). Previously, transportation impact analyses focused on automobile delay as measured by level of service (LOS) and similar metrics. SB 743 shifts the focus of transportation impact analyses to reducing vehicle miles traveled (VMT) and GHG emissions. The Governor's Office of Planning and Research is responsible for proposing specific criteria for these metrics.

The new criteria, contained in CEQA Guidelines Section 15064.3, were certified and adopted in December 2018. Section 15064.3 states that VMT is the most appropriate measure of transportation impacts; with limited exceptions, a project's effect on automobile delay does not constitute a significant environmental impact. Other relevant considerations may include a project's effects on transit and nonmotorized travel. Transportation projects that reduce, or have no impact on, VMT should be presumed to cause a less than significant transportation impact. The Office of Planning and Research published a technical advisory on evaluating transportation impacts in CEQA, which provides general principles and recommendations for VMT and significance thresholds (Governor's Office of Planning and Research 2018).

3.16.2.3 Regional and Local

The Federal-Aid Highway Act of 1962 requires every urbanized area with a population of over 50,000 to form an MPO. Under 23 United States Code (U.S.C.) 134, MPOs are required to create RTPs to ensure that transportation planning happens in a comprehensive and coordinated manner. MPOs prepare and update their RTP every 4 years and typically forecast 20 to 30 years. In conjunction with the RTP, MPOs prepare a transportation improvement program (TIP) that lists all major transportation projects that would receive federal funding. Projects must be listed in the TIP to receive federal funding.

The SJJPA, as a state joint powers agency, proposes improvements within and outside the Union Pacific Railroad (UPRR) and BNSF Railway (BNSF) rights-of-way. The Interstate Commerce Commission Termination Act (ICCTA) affords railroads that engage in interstate commerce considerable flexibility in making necessary improvements and modifications to rail infrastructure, subject to the requirements of the Surface Transportation Board. ICCTA broadly preempts state and local regulation of railroads; this preemption extends to the construction and operation of rail lines. As such, activities within the UPRR and BNSF rights-of-way are clearly exempt from local building and zoning codes as well as other land use ordinances. Project activities outside of the UPRR and BNSF rights-of-way, however, would be subject to regional and local plans and regulations. Though ICCTA broadly preempts state and local regulation of railroads, SJJPA intends to obtain local agency permits for construction of facilities that fall outside the UPRR and BNSF rights-of-way, even though SJJPA has not determined whether such permits are legally necessary or required.

Table 3.16-1 provides a list of applicable goals, policies, and objectives from regional and local plans of the jurisdictions in which the Project improvements would be located. Section 15125(d) of the CEQA Guidelines requires an environmental impact report (EIR) to discuss "any inconsistencies between the 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 Project would be consistent with the plans of relevant jurisdictions.[1] The Project would be generally consistent with the applicable goals, policies, and objectives related to transportation identified in Table 3.16-1.

Table 3.16-1. Regional Plans and Local General Plans

Plan	Applicable Goals, Policies, and Objectives
Regional Transportation Plans	
Regional Transportation Plan and Sustainable Communities Strategy for Merced County (MCAG 2022b)	MCAG is a joint powers authority that serves as the Regional Transportation Planning Agency and the MPO for Merced County. Goals include providing a rail system that offers safe and reliable service for passengers; providing an efficient, effective, coordinated regional transit system; and creating a safe, connected, integrated regional transportation system for bicyclists and pedestrians. Specific passenger rail objectives include expanding intercity passenger service on the Amtrak San Joaquin route, establishing new commuter rail service provided by ACE, and establishing a high-speed rail system connecting Merced to the Bay Area and southern California. Specific projects include the proposed integrated station.
Merced County 2022 Short-Range Transit Plan (MCAG 2022a)	Specific recommendations include planning for a bus transfer facility to replace the existing Merced Transpo facility, possibly in conjunction with the proposed integrated station.

[1] 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.

Plan	Applicable Goals, Policies, and Objectives
County Plans	
2030 Merced County General Plan (Merced County 2013)	Policies include working with the California High-Speed Rail Authority, cities, and local agencies to locate a high-speed rail corridor and station in Merced County and encouraging the San Joaquin Regional Rail Commission to expand ACE service to the City of Merced.
City Plans	
Merced Vision 2030 General Plan (City of Merced 2012)	Goals include an efficient and comprehensive public transit system and rail systems that provide safe and convenient service to the community. Specific policies include supporting and enhancing the use of public transit and supporting a safe and effective public transit system. Specific implementing actions include planning for multimodal transfer sites (with reference to a future downtown high-speed rail station).
Active Transportation Plans	
City of Merced Active Transportation and Safe-Routes-to-School Plan (City of Merced 2019)	Emphasizes the opportunity to plan for bicycle and pedestrian infrastructure and connections when building the proposed integrated station. Specific projects include proposed bike lanes and bike boulevards near both the existing station and the proposed integrated station.
Merced County Regional Bicycle Transportation Plan (MCAG 2008)	Emphasizes the importance of providing connections between bicycles and transit and building bicycle facilities at transit centers.

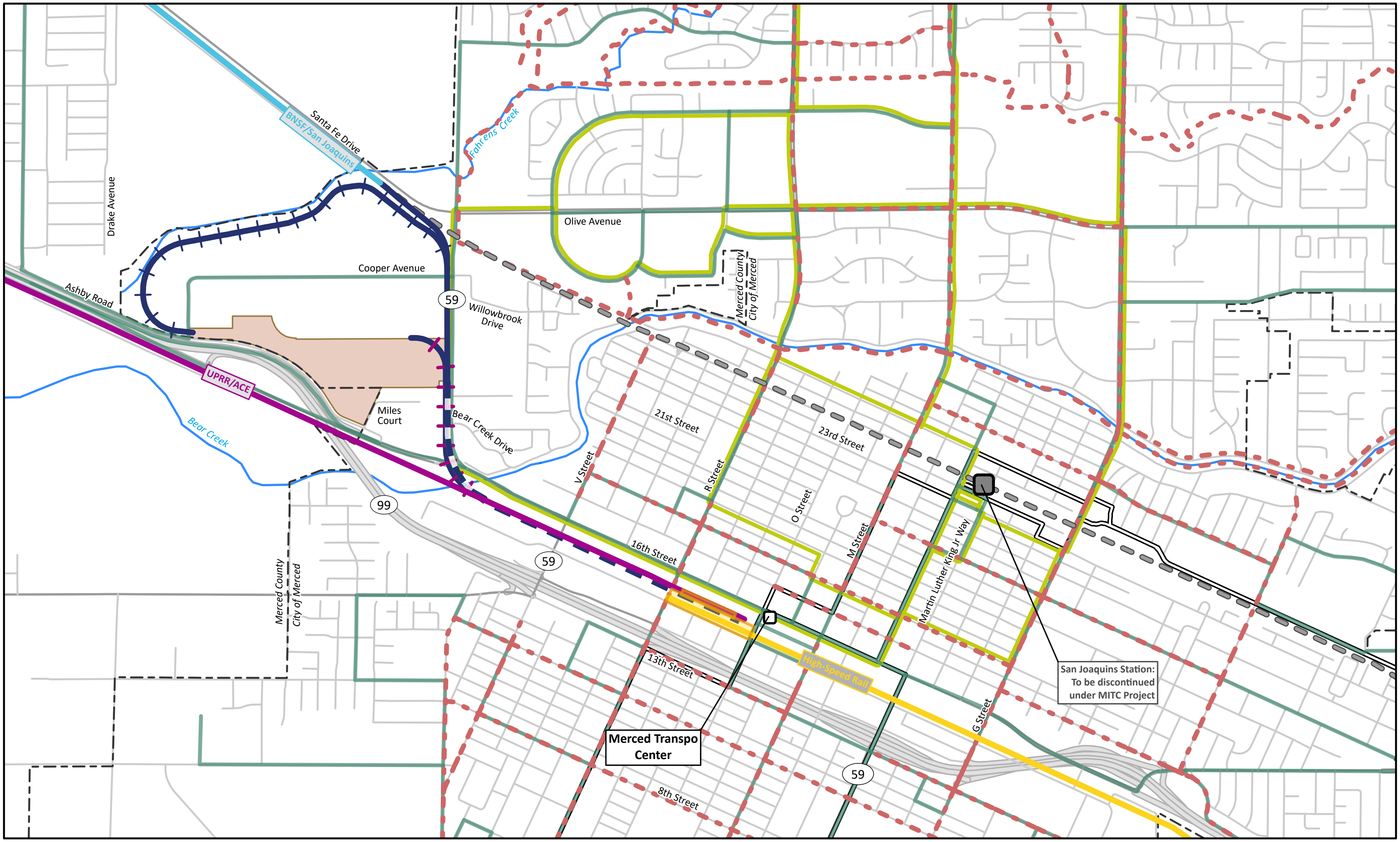
Notes:
ACE = Altamont Corridor Express
MCAG = Merced County Association of Governments
MPO = Metropolitan Planning Organization

3.16.3 Environmental Setting

This section describes the environmental setting related to transportation for the Project. For the purposes of this analysis, the resource study area (RSA) for transportation extends beyond the environmental footprint of the Project. The RSA includes areas of indirect impacts, including areas of potential disturbance associated with construction, intersections, and transportation facilities within 0.5 mile of the proposed integrated station. In reference to ridership and VMT, the RSA is defined as the MCAG region (i.e., Merced County) with the Project opening year of 2030.

3.16.3.1 Public Transit

The RSA is served by three forms of public transit: regional rail, regional bus, and local bus. The Merced Amtrak station has direct connections with all three forms and is located at West 24th Street and Martin Luther King Jr. Way. Under the integrated service concept, this station would be replaced by the proposed integrated station, which would be approximately 0.9 mile southwest of the existing station at 15th Street between O and R Streets. The City of Merced downtown transportation center (Merced Transpo) is located at 16th and O Streets, next to the proposed integrated station, and serves as a bus transfer facility. Figure 3.16-1 shows existing transit routes in the RSA. The San Joaquins provides connections from Merced to Stockton, Stockton to Sacramento and Stockton to Oakland. As a result, the RSA includes the existing service area due to changes to ridership at each location.



- Existing UPRR/Approved ACE
- Proposed High-Speed Rail
- Existing BNSF/San Joaquins
- Proposed Integrated Merced High-Speed Rail Station
- Approved ACE Merced Layover and Maintenance Facility
- City of Merced Boundary

MITC Project

- San Joaquins: Elevated Track
- San Joaquins: At-grade Track
- San Joaquins: Layover and Maintenance Access Line
- ACE/UPRR Spur Track
- San Joaquins: To be discontinued under MITC Project

- Merced Transpo Center
- Existing Bikeway
- Merced TheBus Route
- CatTracks Route
- YARTS Route

Figure 3.16-1
Transit and Bikeways
Merced Intermodal Track Connection Project

Data Source: City of Merced

0 1,000 2,000 Feet

N

MITC

Regional Rail

San Joaquins passenger rail service is operated by Amtrak. Six trains pass through the Merced Amtrak station daily in each direction; departures are shown in Table 3.16-2 (Amtrak 2022)[2]. San Joaquins Thruway Bus services provides connecting bus service to numerous cities, including Los Angeles (via Bakersfield) and Sacramento (via Stockton). Passengers are allowed to book bus-only tickets from Amtrak to places without requiring an Amtrak train trip for many of the Thruway Bus routes.

Table 3.16-2. Existing San Joaquins Passenger Rail Service Timetable in Merced

Departure	Direction	Terminus
7:23 a.m.	Northbound	Oakland
8:45 a.m.	Southbound	Bakersfield
10:45 a.m.	Southbound	Bakersfield
11:23 a.m.	Northbound	Oakland
12:45 p.m.	Southbound	Bakersfield
2:45 p.m.	Southbound	Bakersfield
3:23 p.m.	Northbound	Oakland
4:45 p.m.	Southbound	Bakersfield
5:23 p.m.	Northbound	Oakland
7:23 p.m.	Northbound	Oakland
8:45 p.m.	Southbound	Bakersfield
9:19 p.m.	Northbound	Sacramento

Source: Amtrak San Joaquins Timetable (effective May 15, 2022).

Regional Bus

The Yosemite Area Regional Transportation Service (YARTS) provides year-round service from Merced to Yosemite National Park via the Highway 140 route (YARTS 2023). The route begins at Merced Airport and stops at both Merced Transpo, which is a local transit center next to the proposed integrated station, and the existing Merced Amtrak station. YARTS service is listed in Table 3.16-3.

[2] Prior to the pandemic, SJJPA provided seven daily roundtrips. Pending state funding approval, SJJPA is planning to re-incorporate the seventh roundtrip in late 2024.

Table 3.16-3. YARTS Highway 140 Service Timetable

Merced Transpo	Merced Amtrak	Yosemite (arrive)	Yosemite (depart)	Merced Amtrak	Merced Transpo
5:05 a.m.	5:15 a.m.	7:56 a.m.	9:14 a.m.	11:57 a.m.	12:07 p.m.
6:15 a.m.	6:25 a.m.	9:06 a.m.	12:14 p.m.	2:57 p.m.	3:07 p.m.
7:20 a.m.	7:30 a.m.	10:11 a.m.	2:29 p.m.	5:12 p.m.	5:22 p.m.
8:00 a.m.	8:10 a.m.	10:51 a.m.	3:59 p.m.	6:42 p.m.	6:52 p.m.
9:00 a.m.	9:10 a.m.	11:51 a.m.	5:29 p.m.	8:12 p.m.	8:22 p.m.
10:45 a.m.	10:55 a.m.	1:36 p.m.	6:14 p.m.	8:57 p.m.	9:07 p.m.
---	4:35 p.m.	7:16 p.m.	8:49 p.m.	Request only	Request only

Source: YARTS Highway 140 2023 Service (effective May 15, 2023).

Local Bus

The Transit Joint Powers Authority of Merced County operates local bus service in Merced County called Merced County Transit (The Bus). The Bus services 15 total routes with 13 of the routes within or to Merced (The Bus 2022). Among the 13 routes operating within or to Merced, 8 are local routes and 5 are intercity routes with other communities in Merced County. Most routes start, finish, or stop at Merced Transpo. The local and intercity routes generally operate with 30- and 60- to 90-minute headways on weekdays, respectively. All routes have reduced service on weekends and generally operate between 6:00 a.m. and 9:00 p.m. Additionally, The Bus operates curb-to-curb paratransit service.

Currently, 29 stops and 5 routes are within a 0.5-mile radius of the existing station: M3, M4, M5, M6, and UC. Of these routes, M5 and UC provide direct service to the existing station. There are 28 stops and 12 routes within a 0.5-mile radius of the proposed integrated station: M1, M2, M3, M4, M5, M6, M7, UC, LB, P, T, and W1. All routes except for M1 start and finish at Merced Transpo.

Additionally, the University of California (UC) Merced operates nine bus routes; students, faculty, and staff can ride for free with a university ID, while community members can ride for $2 (UC Merced 2023). Three routes stop at the existing Merced Amtrak station; no other routes have stops within 0.5 mile of the existing station. The Bobcat Express operates on weekdays and stops at the Merced Amtrak station six times between 12:00 p.m. and 7:30 p.m. The G Line operates on weekdays and stops at the station 13 times between 7:00 a.m. and 10:00 p.m. The E1 Line operates on weekends and stops at the station 10 times between 9:00 a.m. and 10:00 p.m. Each route has a stop within 0.5 mile of the existing station.

3.16.3.2 Bicycle and Pedestrian Facilities

The City of Merced defines four classes of bikeways:

- Class I bikeways, or bike paths, are dedicated, off-road facilities.
- Class II bikeways, or bike lanes, are signed and striped facilities that share the roadway.
- Class III bikeways, or bike routes, are signed facilities that share the roadway.
- Class IV bikeways, or protected bike lanes, are physically separated from the roadway.

One Class I bikeway is within 0.5 mile of the existing station: the Michael O'Sullivan Bike Path, which follows Bear Creek. There are no Class I bikeways within 0.5 mile of the proposed integrated station. Four Class II bikeways are within 0.5 mile of the existing station: M Street, G Street, 21st Street (west of G Street), and 18th Street. Five Class II bikeways are within 0.5 mile of the proposed integrated station: R Street, M Street, 18th Street (east of O Street), 13th Street, and 11th Street.

Two Class III bikeways are within 0.5 mile of the existing station: 26th Street and 21st Street (east of G Street). Two Class III bikeways are within 0.5 mile of the proposed integrated station: 18th Street (west of O Street) and Main Street. No Class IV bikeways are within 0.5 mile of the existing station or the proposed integrated station.

Sidewalks are on both sides of most roadways within 0.5 mile of both the existing station and the proposed integrated station. At the existing station location, sidewalks are only on the northern side of the streets. 13th and 14th Streets, which parallel State Route (SR) 99 (Golden State Highway) near the proposed integrated station, only have sidewalks on the southern and northern sides of the street, respectively. There are several gaps in sidewalk coverage less than a block in length near both station locations, but these are primarily on one side of minor streets. Most crosswalks in Merced are on arterials such as R Street, N Street, M Street, G Street, Main Street, and 16th Street. Within the immediate vicinity of the existing station, there is only one crosswalk on the eastern side of the K Street and 24th Street intersection. There are crosswalks for every crossing at the major intersections nearest to the proposed integrated station: 16th Street and R Street, and 16th Street and O Street.

Amtrak San Joaquins and Altamont Corridor Express (ACE) allow passengers to bring bicycles onboard their trains; both provide racks for standard bicycles or allow folding bicycles in place of a piece of luggage. There is one bike rack at the existing station.

3.16.3.3 Roadways

MCAG uses a functional classification system to group roadways according to the type of service they provide (MCAG 2022c, Merced County 2022). Three classes of roadways are within 0.5 mile of the proposed integrated station and the existing station: freeways, secondary arterials, and local roadways.

Freeways are primarily used for intercity, regional, and interstate travel; access is restricted, and interchanges are typically at least 1 mile apart. One freeway, SR 99, is within 0.5 mile of the proposed integrated station and none are within 0.5 mile of the existing station.

Secondary arterials connect major activity centers with major roadways and facilitate both local and regional travel. Nine secondary arterials are within 0.5 mile of the proposed integrated station: R Street, M Street, N Street, Canal Street, 13th Street, 16th Street, 19th Street, 20th Street, and 21st Street. Thirteen secondary arterials are within 0.5 mile of the existing station: 19th Street, 20th Street, 21st Street, 22nd Street, 23rd Street, Santa Fe Avenue, 25th Street, 27th Street, 28th Street, Bear Creek Drive, G Street, M Street, and N Street.

The remaining roadways within 0.5 mile of the proposed integrated station and the existing station are classified as local roadways, which provide direct access to the abutting land and primarily facilitate local travel.

Six at-grade rail crossings are within 0.5 mile of the proposed integrated station: V Street, R Street, O Street, M Street, Canal Street, and Martin Luther King Jr. Way. Three at-grade rail crossings and one above-grade crossing are within 0.5 mile of the existing Merced Amtrak station.

3.16.3.4 Passenger and Freight Rail Movements

Two rail corridors travel through downtown Merced and are owned by Union Pacific Railroad Company (UPRR) and BNSF Railway (BNSF). Both corridors have one track and are designated as Class I railroads by the Surface Transportation Board since they have revenues greater than $250 million per year. The northern track runs parallel to Santa Fe Avenue and is owned by BNSF, which operates freight service. BNSF shares track with Amtrak's San Joaquins intercity rail service, and the existing Merced Amtrak station is near milepost 1056 (BNSF). The BNSF corridor is designated as a Class 4 track by FRA, which allows for a maximum allowable operating speed of 60 miles per hour (m.p.h.) for freight trains and 80 m.p.h. for passenger trains.

The southern track runs parallel to 16th Street and is owned by UPRR, which operates freight service. Approximately 22 freight trains operate daily on this section of track. The Merced section does not have existing passenger service; however, the San Joaquin Regional Rail Commission (SJRRC) is in the planning process of extending ACE service to Merced and would become part of the proposed integrated station. SJRRC completed the CEQA environmental clearance of the ACE service to Merced in December 2021.

The proposed Integrated station would be near milepost 150 (UP). The UPRR corridor is dedicated as a Class 5 track by FRA, which allows for a maximum operating speed of 80 m.p.h. for freight trains and 90 m.p.h. for passenger trains.[3]

3.16.4 Impact Analysis

This section describes the environmental impacts of the Project on transportation. This section also 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.

3.16.4.1 Methods for Analysis

Methods

Methods of analysis include a review of existing and planned transportation as found in the Regional Transportation Plan, Regional Transit Short-Range Plan, County General Plan, City General Plan, Merced County Regional Active Transportation Plan, and City Active Transportation Plan.

The approach to evaluate transportation considers whether the Project would have any of the following effects:

- Be compatible, supportive, and promote the RTP, SCS, and general plan goals, designation, their intent, and the objectives or, instead, introduce a change to the setting that would conflict with

[3] Although FRA has defined maximum speeds per track classification, UPRR has set a maximum speed of 79 mph for passenger trains on this corridor.

the plans or introduce transportation incompatibilities with the goals and objectives of identified plans.

- Support and advance an adopted policy or, instead, contravene, impede, or thwart attainment of the policy.
- Identification of decrease or increase of induced travel measured by VMT in the RSA. This is done to measure the Project's likeliness to lead to a measurable and substantial increase in VMT at the Project horizon year of 2030.
- Potential risk of the Project to increase hazards due to geometric design (e.g., sharp curves or dangerous intersections) or reduce emergency access.

Principle Sources

Principle sources consulted for the impact analysis are listed below.

- California Environmental Quality Act Guidelines Appendix G
- California Government Code Section 65300 – 65303.4
- California Sustainable Communities and Climate Protection Act of 2008 (SB 375, Chapter 728)
- Regional Transportation Plan (RTP) / Sustainable Community Strategy (SCS) for Merced County
- 2030 Merced County General Plan
- City of Merced Vision 2030 General Plan
- Merced County 2022 Short-Range Transit Plan
- City of Merced Active Transportation and Safe-Routes-to-School Plan (2019)
- Merced County Regional Bicycle Transportation Plan (2008)

3.16.4.2 Thresholds of Significance

The CEQA Guidelines Appendix G (14 Cal. Code Regs. 15000 et seq.) identifies significance criteria to be considered for determining whether a project could have significant impacts on transportation.

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

- Conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities.
- Conflict or be inconsistent with CEQA Guidelines Section 15064.3, subdivision (b).
- Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment).
- Result in inadequate emergency access.

3.16.4.3 Impacts and Mitigation Measures

Impact TR-1	Construction of the Project could conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadways, bicycle, and pedestrian facilities.
Level of Impact	**Potentially significant impact**
Mitigation Measures	TR-1.1: Transportation Management Plan (TMP) for Project construction TR-1.2: Mainline railway disruption control plan for Project construction TR-1.3: Passenger railway disruption control plan for Project construction
Level of Impact After Mitigation	**Less-than-significant impact**

Project

Impact Characterization

Construction of the Project would include new at-grade track for the San Joaquins and the proposed aerial guideway—connecting to the proposed integrated station. Proposed improvements include a new UPRR structure over Bear Creek, a new at-grade UPRR industrial spur crossing at the intersection of SR 59 and 16th Street, new UPRR industrial spur track adjacent to SR 59, and new track providing San Joaquins access to the approved ACE Merced Layover and Maintenance Facility (see Figure 2-1 in Chapter 2, *Project Description*).

Construction of the Project that would impact a program, plan, ordinance, or policy addressing the circulation system—including transit, roadways, bicycle, and pedestrian facilities—would happen in two primary ways:

- Construction activities occurring in roadways and streets would disrupt traffic and potentially interfere with transit headways, pedestrian access, and personal vehicle travel times.
- According to local and regional ordinance and policy, additional traffic and access conflicts would require transportation and railway management planning for both general traffic and mainline railway disruption for residents near the at-grade and elevated guideway track locations where construction would take place.

Construction Characterization

At-grade trackwork and construction of the aerial guideway would temporarily impact travel times and accessibility due to required lane closures and detours around active construction zones. Construction at at-grade intersections, including SR 59/Cooper Avenue and SR 59/16th Street, would impact intersection operations, resulting in travel delays. However, delays would be intermittent and temporary in nature. Similarly, the proposed aerial guideway would cross the SR 59/16th Street Intersection, V Street, R Street and O street, requiring temporary modifications to travel lanes or detours.

Impacts on Circulation System, Transit, and Roadway

At-grade and aerial guideway construction activities, including construction equipment and trucks entering or leaving active construction locations, would require lane closures and/or temporary detours during the construction phase, impacting commuter and bus travel times. Lane closures and detours, although temporary in nature, may interfere with typical routes and thoroughfares used by

Merced residents and therefore require the use of alternative routes. Such instances would increase travel times for personal vehicles and transit routes such as M1 on Snelling Highway (SR 59) and result in a significant impact on transit schedules or require temporary route changes.

Access to the Riviera Holiday Mobile Estates Senior Living Community has a single neighborhood access point on Snelling Highway. Impact to residential travel time due to road closures at 16th Street and SR 59 intersection or north of Cooper Avenue for construction of the San Joaquins industrial spur for facility access would temporarily increase travel times for residents. A detour using North Bear Creek Drive and Olive Avenue would extend trip durations and impact access. Retention of access from north or south, with advanced notice, would be required throughout the duration of the construction phase. Such increase in travel times would result in a significant impact. To lessen impacts related to vehicle travel times, the Project would implement a construction road traffic control plan as identified in Mitigation Measure TR-1.1. This plan would serve to maintain acceptable performance objectives for general vehicles in accordance with the respective agencies that have jurisdiction. Incorporation of Mitigation Measure TR-1.1 would lessen impacts to less than significant.

Impacts on Pedestrians and Bikeways

Active transportation including biking and pedestrians would be temporarily impacted due to closures of roadway segments adjacent to railway construction. This would primarily take place along SR 59 and the proposed integrated HSR station location between O Street and R Street. There are no sidewalks along SR 59 or existing bicycle facilities. While little to no formalized bike or pedestrian facilities are present on SR 59 from Olive Road to 16th Steet, the informal use should be accounted for in mitigation measures.

To lessen impacts related to transit travel times, resident personal vehicle travel times, pedestrian and bikeway facility access, and local residents' access to neighborhoods, the Project shall implement a construction road traffic control plan as identified in Mitigation Measure TR-1.1. This plan would serve to maintain acceptable response times and performance objectives for transit services, active transportation, and general vehicles in accordance with the respective agencies that have jurisdiction. Incorporation of Mitigation Measure TR-1.1 would lessen impacts to less than significant.

Impacts on Freight Rail and Passenger Rail

Disruption to active freight rail operations, including on the UPRR mainline and UPRR industrial spur would result in a significant impact. In the event that construction disrupts active freight rail operations, coordination shall occur well in advance of construction activity. Under Mitigation Measure TR-1.2, the Project shall implement a mainline railway disruption control plan for Project construction. This plan would serve to maintain acceptable freight travel times, schedule retention and performance objectives in accordance with the respective agencies that have jurisdiction. Incorporation of Mitigation Measure TR-1.2 would lessen impacts to less than significant.

To reduce impacts related to transit travel times on passenger rail and minimize disruptions, the Project shall implement an ACE/San Joaquins railway disruption control plan for project construction as identified in Mitigation Measure TR-1.3. This plan shall serve to maintain acceptable passenger rail travel times, and retention of scheduled headways in accordance with respective agencies that have jurisdiction. With incorporation of Mitigation Measure TR-1.3, impacts would be less than significant.

Mitigation Measures

Mitigation Measure TR-1.1: Transportation Management Plan (TMP) for Project construction

Mitigation Measure TR-1.1 would apply to Project construction activities to mitigate potential disruptions or conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadways, bicycle, and pedestrian facilities.

San Joaquin Joint Powers Authority (SJJPA) shall coordinate with Caltrans and with public works and transportation departments of local jurisdictions to develop a TMP that would mitigate construction impacts on transit, roadway, bicycle, and pedestrian facilities, while allowing for expeditious completion of construction. Measures that would be implemented throughout the course of construction of the Project would include, but would not be limited to, the following:

- Limit number of simultaneous street closures and consequent detours of transit and automobile traffic within each immediate vicinity, with closure timeframe limited as much as feasible for each closure, unless alternative routes are available.
- Implement traffic control measures to minimize traffic conflicts for all roadway users (regardless of mode) where lane closures and restricted travel speeds would be required for longer periods.
- Provide advance notice of all construction-related street closures, durations, and detours to Caltrans, local jurisdictions, emergency service providers, and motorists to maintain timely and accessible emergency responsiveness.
- Provide safety measures for motorists, transit vehicles, bicyclists, and pedestrians to ensure safe travel through construction zones.
- Limit sidewalk (and pedestrian walkway/path) and bikeway closures to one location within each vicinity at a time, with closure timeframe limited as much as feasible for each closure, unless alternative routes are available.
- Coordinate in advance with Merced “The Bus” Transit Authority to ensure access to SR 59 stops ID 228, 229, 230, and 5331 for Route M1.

Mitigation Measure TR-1.2: Mainline railway disruption control plan for Project construction.

Mitigation Measure TR-1.2 would apply to Project construction activities to mitigate potential disruptions or conflict with a program, plan, ordinance, or policy addressing the railways in the Project construction area.

The contractor shall coordinate with UPRR and BNSF to ensure advanced notice of impacts to operations would be made well in advance. No impacts are foreseen during construction or operations, sequenced with freight rail activity. If unavoidable, coordination shall occur well in advance of activity.

SJJPA shall make efforts to contain and minimize disruption to freight (UPRR and BNSF) services during Project construction, while allowing for expeditious completion of construction. Measures that shall be implemented throughout the course of construction of the Project would include, but would not be limited to, the following:

- Provide safety measures for freight rail operation through construction zones.
- Require contractors to coordinate with rail dispatch to minimize disruption of rail service in the corridor.
- Where feasible, maintain acceptable service access for freight operation.
- Provide advance notice of construction-related track closures to affected parties.
- Coordinate with UPRR and BNSF in advance and during any potential disruption to freight operation and/or UPRR and BNSF facilities and maintain emergency access for UPRR and BNSF for the duration of construction.

Mitigation Measure TR-1.3: Passenger railway disruption control plan for Project construction.

Mitigation Measure TR-1.3 would apply to Project construction activities to mitigate potential disruptions or conflict with a program, plan, ordinance, or policy addressing the railways in the project construction area.

SJJPA shall make efforts to contain and minimize disruption to ACE and San Joaquins service during construction of the Project, while allowing for expeditious completion of construction. Measures that shall be implemented throughout the course of construction of the Project would include, but would not be limited to, the following:

- Provide safety measures for ACE and San Joaquins operation through construction zone areas.
- Require contractors to coordinate with ACE and San Joaquins dispatch to minimize disruption of ACE and San Joaquins service.
- Where feasible, limit closure of any tracks for construction activities to periods when ACE and San Joaquins service is not scheduled or is less frequent (e.g., weekends or weekday evenings).
- Where feasible, maintain acceptable service access for ACE and San Joaquins operation.
- While not anticipated, where track closures result in temporary suspension or substantial disruption to ACE and San Joaquins service, work with local and regional transit providers to provide alternative transit service around the closure area (e.g., increased bus and shuttle service).
- Provide advance notice to transit riders of any temporary suspension of or substantial disruption to ACE and San Joaquins service.
- Coordinate with ACE and San Joaquins in advance and during any potential disruption to ACE and San Joaquins operation and/or ACE and San Joaquins facilities and maintain emergency access for ACE and San Joaquins for the duration of construction.

Significance with Application of Mitigation Measure

Implementation of Mitigation Measures TR-1.1, TR-1.2, and TR-1.3 would address construction-related effects on the circulation system and on active passenger rail operations and would reduce construction-related impacts to less than significant.

Variant H1

Impact Characterization

The impact characterization for Variant H1 is the same as described above for the Project.

Impact Details and Conclusions

The impact details for Variant H1 are similar as described above for the Project. Compared to the Project, construction of the solar facility to support on-site hydrogen production would result in additional truck traffic related to grading and installation of hydrogen equipment on existing roadways that could result in significant impacts. However, Variant H1 shall incorporate Mitigation Measure TR-1.1 that would necessitate a TMP to reduce impacts related to transit, roadways, bicycle, and pedestrian facilities. Thus, construction of the hydrogen production facility would not conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadways, bicycle, and pedestrian facilities. Therefore, impacts would be less than significant with mitigation.

Variant H2

Impact Characterization

The impact characterization for Variant H2 is the same as described above for the Project.

Impact Details and Conclusions

Variant H2 does not consist of any additional construction since hydrogen would be transported by truck instead of processing hydrogen on-site. Therefore, there would be no impacts during construction and impacts would be less than significant with mitigation.

Variant H3

Impact Characterization

The impact characterization for Variant H3 is the same as described above for the Project.

Impact Details and Conclusions

The impact details for Variant H3 are the same as described above for Variant H2. Variant H3 does not consist of any additional construction since hydrogen would be transported by rail instead of processing hydrogen on-site. There would be no additional impacts during construction and impacts would be less than significant with mitigation.

Impact TR-2	Construction of the Project would not conflict or be inconsistent with CEQA Guidelines Section 15064.3, subdivision (b)(2).
Level of Impact	**Less-than-significant impact**

Project

Impact Characterization

According to the definition found in CEQA Guidelines Section 15064.3, subdivision (b)(2) a transportation project that reduces VMT is presumed to cause a less than significant transportation impact.

Impact Details and Conclusions

Construction of Project would temporarily generate additional VMT related to construction work activities, construction labor trips, and the transport of excavated materials and construction equipment and supplies. This additional VMT would terminate upon completion of construction and would not be in effect during operation of the Project, when there would be an overall reduction in VMT compared with the No-Build Alternative. The temporary nature of construction-related VMT and construction-related traffic circulation changes (e.g., detours) would generally be localized to the work areas and construction staging locations. As a result, they would not result in a substantial or long-term change in regional travel patterns such that construction of the Project would result in a significant impact related to VMT. Therefore, construction of the Project would result in a less than significant impact.

Variant H1

Impact Characterization

The impact characterization for Variant H1 is the same as described above for the Project.

Impact Details and Conclusions

The impact detail for Variant H1 is the same as described above for the Project. There would be less-than-significant impact.

Variant H2

Impact Characterization

The impact characterization for Variant H2 is the same as described above for the Project.

Impact Details and Conclusions

Variant H2 does not consist of any additional construction since hydrogen would be transported by truck instead of processing hydrogen on-site. Therefore, there would be no impacts during construction.

Variant H3

Impact Characterization

The impact characterization for Variant H3 is the same as described above for the Project.

Impact Details and Conclusions

The impact details for Variant H3 are the same as described above for Variant H2. Variant H3 does not consist of any additional construction since hydrogen would be transported by rail instead of processing hydrogen on-site. There would be no impacts during construction.

Impact TR-3	Construction of the Project could substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment).
Mitigation Measures	TR-1.1: Transportation Management Plan (TMP) for Project construction
Level of Impact After Mitigation	**Less-than-significant impact**

Project

Impact Characterization

The Project would result in an impact if it substantially increases hazards due to a geometric design feature or incompatible uses.

Impact Details and Conclusions

Construction of the Project would involve partial or full temporary street closures, temporary closures of at-grade railroad crossings, and increased heavy vehicle and equipment on public streets in proximity of passenger vehicles. Per Mitigation Measure TR-1.1, a construction TMP would be developed in coordination with Caltrans and local jurisdictions before initiating construction activity. The TMP would include street closure information, detour plans, haul routes, staging information, and traffic control strategies. Temporary advance warning signs and detour signs would be installed per the latest California Manual of Uniform Traffic Control Devices (MUTCD) standards and as approved in the TMP. All construction work activities would be conducted in compliance with Occupational Safety and Health Administration (OSHA) and California OSHA.

In addition, construction activities and temporary construction easements may result in temporary construction impacts to businesses adjacent to the corridor. As discussed in Section 2.6, *Right-of-Way and Easement Need*s, and shown in Figures 2-9 through 2-11 in Chapter 2, *Project Description*, the Project would require 23 temporary construction easements, which would be restored upon completion of Project construction and delivered back to the property owner. The temporary easements are not anticipated to substantially increase hazards due to a design feature or incompatible uses. It is anticipated that three businesses would be displaced by the Project easements and ROW requirements, including Safeway Manufacturing, SJR LLC, and Smith Ronald W & Ann E Trustees. The Project would require demolition of the buildings and structures occupied by the businesses to be displaced as well as a small number of other buildings and structures (e.g., those that are not occupied by businesses). The displaced businesses are expected to be relocated to existing buildings, which would not require substantial construction. As such, business relocations are not anticipated to substantially increase hazards due to a geometric design feature or incompatible uses. In addition, new construction would be subject to local land use review and permitting.

Based on the above, construction of the Project would have a less than significant impact related to geometric design hazards and incompatible uses. Impacts would be less than significant.

Mitigation Measure

Mitigation Measure TR-1.1: Transportation Management Plan (TMP) for Project construction

Significance with Application of Mitigation

With implementation of Mitigation Measure TR-1.1, impacts increase hazards due to a geometric design features or incompatible uses during construction of the Project would be less than significant.

Variant H1

Impact Characterization

The impact characterization for Variant H1 is the same as described above for the Project.

Impact Details and Conclusions

The impact detail for Variant H1 is the same as described above for the Project. Therefore, impacts would be less than significant.

Variant H2

Impact Characterization

The impact characterization for Variant H2 is the same as described above for the Project.

Impact Details and Conclusions

Variant H2 does not consist of any additional construction since hydrogen would be transported by truck instead of processing hydrogen on-site. Therefore, there would be no impacts during construction.

Variant H3

Impact Characterization

The impact characterization for Variant H3 is the same as described above for the Project.

Impact Details and Conclusions

The impact details for Variant H3 are the same as described above for Variant H2. Variant H3 does not consist of any additional construction since hydrogen would be transported by rail instead of processing hydrogen on-site. There would be no impacts during construction.

Impact TR-4	Construction of the Project could result in inadequate emergency access.
Level of Impact	**Potentially significant impact**
Mitigation Measures	TR-1.1: Transportation Management Plan (TMP) for Project construction
Level of Impact After Mitigation	**Less-than-significant impact**

Project

Impact Characterization

The Project would result in an impact if construction results in inadequate emergency access with fire or police protection.

Impact Details and Conclusions

Construction activities for the Project would temporarily increase fire and police protection and response times as a result of periodic construction-related street closures or detours. The Project would require temporary road detours during the construction phase and potentially impact emergency response times related to fire and police protection. The aerial guideway would require the installation of supporting columns, bent caps, and guideway beams. Street detours to build the aerial guideway would occur on the streets perpendicular to the alignment between O Street and V Street. At-grade crossings would require the installation of crossing panels, crossing signals, guards/gates, and signal houses where the new track would cross the roadway. The existing roadway adjacent to the at-grade segments of the guideway along Snelling Highway (SR 59) would require roadway modifications that would require lane reduction during construction hours. Street detours, although temporary in nature, may interfere with typical routes and thoroughfares used by emergency responders and therefore require the use of alternative routes. Such instances would increase emergency response times and result in a significant impact. To lessen impacts related to emergency response times, the Project shall implement a construction road traffic control plan as identified in Mitigation Measure TR-1.1. This plan would serve to maintain acceptable response times and performance objectives for emergency response services in accordance with the respective agencies that have jurisdiction. Incorporation of Mitigation Measure TR-1.1 would lessen impacts to less than significant.

Mitigation Measures

Mitigation Measure TR-1.1: Transportation Management Plan (TMP) for Project construction

Significance with Application of Mitigation Measure

Mitigation Measure TR-1.1 requires the preparation of a construction road traffic control plan that describes protocols for coordinating with local jurisdictions on emergency vehicle access and maintaining access for fire protection, law enforcement, and emergency service providers. The construction road traffic control plan would address temporary road closures, detour provisions, allowable routes, and alternatives access. This mitigation measure would reduce such delays to a less than significant level. Local municipalities would adjust their staff and deployment according to these temporary disruptions, preventing substantial increases in staffing, Construction activities associated with the Project would have a less than significant impact on emergency access with implementation of Mitigation Measure TR-1.1.

Variant H1

Impact Characterization

The impact characterization for Variant H1 is the same as described above for the Project.

Impact Details and Conclusions

The impact detail for Variant H1 is the same as described above for the Project. There would be less-than-significant impacts with the implementation of Mitigation Measure TR-1.1.

Variant H2

Impact Characterization

The impact characterization for Variant H2 is the same as described above for the Project.

Impact Details and Conclusions

Variant H2 does not consist of any additional construction since hydrogen would be transported by truck instead of processing hydrogen on-site. Therefore, there would be no impacts during construction.

Variant H3

Impact Characterization

The impact characterization for Variant H3 is the same as described above for the Project.

Impact Details and Conclusions

The impact details for Variant H3 are the same as described above for Variant H2. Variant H3 does not consist of any additional construction since hydrogen would be transported by rail instead of processing hydrogen on-site. There would be no impacts during construction.

Impact TR-5	Operation of the Project would not conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadways, bicycle and pedestrian facilities.
Level of Impact	**Less-than-significant impact**

Project

Impact Characterization

According to Appendix G of the CEQA guidelines, a conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadways, bicycle, and pedestrian facilities, from the operation of a transit project would result from a degradation of the performance of the overall circulation system.

Impact Details and Conclusions

Table 3.16-1 provides a summary of the applicable plans, ordinances, and policies establishing performance of the circulation system for the regional, county, and city jurisdictions where the Project would be located. The Project would expand connectivity of the local and regional public transit network, allowing passengers to transfer between ACE, San Joaquins, and future HSR service. The Project would increase ridership of transit systems at-large in the Merced area. The Project would be consistent with the jurisdiction and state's plans, policies, and goals for future transportation.

Roadways and Circulation

On the regional level the Project is consistent with the regional plans for MCAG. The Project is one of the major projects included in the documents, which serve as the RTP/SCS for the RSA, integrating transportation and land use strategies to manage GHG emissions and plan for future population growth. At the state level, the Project is consistent with the blueprint for meeting future mobility needs.

Overall, one of the main policies identified in the regional and local plans of the MCAG and the City of Merced is the reduction of VMT. Operation of the Project would result in the beneficial impact of reducing VMT. As such, implementation of the Project would not conflict with MCAG regional plans and policies and would result in a less than significant impact.

Transit, Bicycle and Pedestrian Facilities

Operation of the Project would not conflict with policies addressing transit, bicycle, and pedestrian facilities. The Project's operation would not preclude the implementation of the planned bicycle lane along SR 59. The Project would enhance pedestrian facilities at the station area and require at-grade crossings at the intersection of Cooper Avenue/SR 59, an at-grade crossing at Southwest Cooper Avenue for the proposed San Joaquins access line to the approved ACE Merced Layover and Maintenance Facility, and new at-grade crossing at the intersection of SR 59/16th Street. While sidewalks do not exist along SR 59, the Project would not preclude the implementation of pedestrian infrastructure. The Project would not conflict with the plans and policies that prioritize bicycle and pedestrian access and would not preclude expansion and improvement of bicycle and pedestrian facilities in the RSA. Therefore, operation of the Project would have a less than significant impact on programs, plans, ordinances, or policies that address bicycle and pedestrian circulation.

As described in Appendix 2.0-3, *Merced Intermodal Track Connection Ridership and Revenue Memorandum*, and shown in Table 3.16-4, forecasted San Joaquins ridership is approximately 1,200,000 in 2030, an increase of approximately 207,000 compared to the No Project scenario. Forecasted ridership demonstrates that operation of the Project would provide a measurable benefit to transit riders in the corridor.

Table 3.16-4. Project San Joaquins Annual Ridership

Combined System (2030)	No-Build	Build
Annual Ridership	996,600	1,204,500
Train Only (non-transfers)	254,700	261,900
San Joaquins-HSR Transfers	591,600	771,300
San Joaquins Transfers-ACE Transfers	45,000	64,900
ACE/San Joaquins-Thruway Bus Transfers	105,300	106,400

Source: AECOM 2023

Goals related to transit are shown in Table 3.16-1 and include: providing a rail system that offers safe and reliable service for passengers and an efficient and comprehensive public transit system and rail system. The Project would be consistent with transit goals outlined in Table 3.16-1. Therefore, operation of the Project would have a less than significant impact on programs, plans, ordinances, or policies that address transit. As a result, the impact of the Project relative to transit planning would be less than significant.

Variant H1

Impact Characterization

The impact characterization for Variant H1 is the same as described above for the Project.

Impact Details and Conclusions

The impact details for Variant H1 are similar as described above for the Project. Operation of the hydrogen production facility would not conflict with a program, plan, ordinance, or policy addressing the circulation system listed in Table 3.16-1. Therefore, impacts would be less than significant.

Variant H2

Impact Characterization

The impact characterization for Variant H2 is the same as described above for the Project.

Impact Details and Conclusions

Operation of Variant H2 would induce an incremental increase in truck traffic to ship hydrogen to the approved ACE Merced Layover and Maintenance Facility. Hydrogen fuel delivery trucks would service the facility daily in order to provide fuel for the three daily roundtrips to Natomas. Variant H2 would not conflict with a program, plan, ordinance, or policy addressing the circulation system listed in Table 3.16-1. Therefore, impacts would be less than significant.

Variant H3

Impact Characterization

The impact characterization for Variant H3 is the same as described above for the Project.

Impact Details and Conclusions

The impact details for Variant H3 are similar as described above for the Project. Operation of Variant H3 would necessitate weekly delivery to the ACE Merced Layover and Maintenance Facility. Operation of Variant H3 would not conflict with a program, plan, ordinance, or policy addressing the circulation system listed in Table 3.16-1. Therefore, impacts would be less than significant.

Impact TR-6	Operation of the Project would not conflict or be inconsistent with CEQA Guidelines Section 15064.3, subdivision (b)(2).
Level of Impact	**Beneficial impact**

Project

Impact Characterization

The Project would result in a reduction of VMT. According to the definition found in CEQA Guidelines Section 15064.3, subdivision (b)(2) a transportation project that reduces VMT is presumed to cause a less than significant transportation impact.

Impact Details and Conclusions

As shown in Table 3.16-5 the Project with would result in and annual VMT reduction of approximately 234,052,000, as described in Appendix 2.0-3, *MITC Ridership and Revenue Memo* and Appendix 3.3-1, *Air Quality, Greenhouse Gas, and Health Risk Assessment Supporting Documentation.*

Compared to the No Project, the Project would result in an additional VMT reduction of approximately 44.5 million. Therefore, operation of the Project would not conflict or be inconsistent with CEQA Guidelines Section 15064.3, subdivision (b), and there would be no impact.

Table 3.16-5: San Joaquins Existing and Project VMT

Existing/No Service/Proposed Project	VMT
Existing San Joaquins VMT Reduction (2022)	53,987,500
2030 No Project VMT Reduction	189,488,000
2030 Project VMT Reduction	234,052,000
2030 No Project – Project Change	44,564,000

Source: AECOM 2023

Variant H1

Impact Characterization

The impact characterization for Variant H1 is the same as described above for the Project. There would be no impact.

Impact Details and Conclusions

The impact detail for Variant H2 is the same as described above for the Project. There would be no impact.

Variant H2

Impact Characterization

The impact characterization for Variant H2 is the same as described above for the Project.

Impact Details and Conclusions

Operation of Variant H2 would induce an incremental increase in truck traffic to ship hydrogen to the approved ACE Merced Layover and Maintenance Facility. Hydrogen fuel delivery trucks would service the facility daily in order to provide fuel for the three daily roundtrips to Natomas. The VMT increase resulting from Variant H2's operation of truck trips would be marginal in comparison to the Project's net decrease of VMT. Variant H2 in conjunction with the Project would still result in a net reduction of VMT compared with the No-Build Alternative. Therefore, operation of Variant H2 would not conflict or be inconsistent with CEQA Guidelines Section 15064.3, subdivision (b), and there would be no impact.

Variant H3

Impact Characterization

The impact characterization for Variant H3 is the same as described above for the Project.

Impact Details and Conclusions

The impact details for Variant H3 are the same as described above for the Project. There would be no impact.

Impact TR-7	The Project would not substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment).
Level of Impact	**Less-than-significant impact**

Project

Impact Characterization

The Project would result in an impact if it substantially increases hazards due to a geometric design feature or incompatible uses.

Impact Details and Conclusions

The Project would involve operation of two new at-grade crossings on Cooper Avenue. New railroad signal and train control systems would be required to facilitate train operations at the two at-grade crossings. The at-grade crossing located at Copper Avenue and SR 59 would include a new signalized intersection sequencing and various modifications to railroad warning signage on SR 59. The double track at-grade crossing on Cooper Avenue approximately 250 feet north of Ashby Road is primarily industrial access and would likely necessitate assessment of a right-hand turn lane for tractor trailer queuing during active rail crossings. The adherence to the documented local, regional, and Caltrans planning guidance would facilitate safety improvements for the future at-grade crossings through roadway planning and enhanced visual, physical, and auditory signaling paired with MUTCD signage on approach. Design, construction, and operation of the Project's rail elements, including track improvements, stations, signaling systems, and other components, would comply with applicable standards from FRA and/or the California Public Utilities Commission CPUC. During construction, for example, temporary traffic control devices would comply with the California MUTCD.

Given these considerations, the Project would not substantially increase hazards due to a geometric design feature or dangerous intersection, and the Project's hazard-related impacts would be less than significant.

Variant H1

Impact Characterization

The impact characterization for Variant H1 is the same as described above for the Project.

Impact Details and Conclusions

The impact detail for Variant H1 is the same as described above for the Project. Therefore, impacts would be less than significant.

Variant H2

Impact Characterization

The impact characterization for Variant H2 is the same as described above for the Project.

Impact Details and Conclusions

Operation of Variant H2 would consist of trucks utilizing existing roadways. There would be no impact.

Variant H3

Impact Characterization

The impact characterization for Variant H3 is the same as described above for the Project.

Impact Details and Conclusions

Operation of Variant H3 consists of rail operating on active railroad right-of-way. There would be no impact.

Impact TR-8	Operation of the Project would not result in inadequate emergency access.
Level of Impact	**Less-than-significant impact**

Project

Impact Characterization

The Project would result in an impact if it results in inadequate emergency access for fire or police protection.

Impact Details and Conclusions

The existing roadway network within the RSA enables emergency vehicle response. Emergency vehicles often identify and use multiple routes dependent on time of day and traffic conditions.

The Project would construct new or modify existing at-grade crossings and intersections. Operation of the Project would potentially increase fire and police protection response times as a result of delays at new grade crossings and increase train services. Grade crossings could potentially delay fire and police protection vehicles if they arrive at a crossing at the same time as a passing train. Compliancewith code requirements pertaining to emergency vehicle access ensure that response times are maintained at acceptable levels. Therefore, the Project would result in less than significant impact during operations.

Variant H1

Impact Characterization

The impact characterization for Variant H1 is the same as described above for the Project.

Impact Details and Conclusions

The impact detail for Variant H1 is the same as described above for the Project. There would be a less than significant impact.

Variant H2

Impact Characterization

The impact characterization for Variant H2 is the same as described above for the Project.

Impact Details and Conclusions

The impact detail for Variant H2 is the same as described above for the Project. There would be a less than significant impact.

Variant H3

Impact Characterization

The impact characterization for Variant H3 is the same as described above for the Project.

Impact Details and Conclusions

The impact detail for Variant H3 is the same as described above for the Project. There would be a less than significant impact.

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Chapter 4
Cumulative Impacts

4.1 Introduction

This chapter provides additional analyses and information required under the California Environmental Quality Act (CEQA) and includes the following:

- Cumulative Impact Analysis

The focus of the cumulative analysis is to identify the Merced Intermodal Track Connection's (Project's) contribution to significant cumulative impacts and to determine whether that contribution would be considerable.

When cumulative impacts on a resource affected by a project can be clearly shown to be less than significant, and when a project would have no impact on a resource or can be clearly shown to make a less-than-considerable contribution to a cumulative impact, the discussion of cumulative impacts is brief. When a project is likely to contribute considerably to a significant cumulative impact, the analysis provides more detail. The cumulative analysis focuses on the project's potential contribution to the cumulative impact rather than a detailed description of the cumulative impact itself.

4.2 CEQA Requirements

CEQA Guidelines define a cumulative impact as two or more individual impacts that, when considered together, are considerable or that compound or increase other significant environmental impacts. The incremental impact of a project may be considerable when viewed in the context of other closely related past, present, and reasonably foreseeable probable future projects.[1] Cumulative impacts can result from individually minor, but collectively significant, projects taking place over a period of time (CEQA Guidelines Section 15355).

CEQA Guidelines Section 15130(b) indicates that an adequate discussion of potential cumulative effects requires consideration of either a list-based approach or a projection-based approach. This environmental impact report (EIR) uses a combination of a list-based approach and a projection-based/plan-based approach to determine whether significant cumulative impacts would occur.

Under CEQA, the San Joaquin Regional Rail Commission (SJRRC) is not responsible for mitigating overall cumulative impacts. SJRRC is only responsible for identifying and implementing potentially feasible mitigation to address the Project's considerable contributions to identified significant cumulative impacts. Thus, the obligation to assess mitigation is limited to the fair share portion of a significant cumulative impact that is due to the Project's considerable contribution. Other cumulative projects have a similar obligation for their contributions to significant cumulative impacts.

[1] Reasonably foreseeable future projects are defined as projects that have been adopted or have otherwise demonstrated likelihood to occur based on documentation from project sponsors.

4.3 Approach and Methodology

Section 15130(b) of the CEQA Guidelines states that the discussion of cumulative impacts should include the following.

- Either (1) a list of past, present, and probable future projects producing related or cumulative impacts, or (2) a summary of projections contained in an adopted general plan or similar document, or in an adopted or certified environmental document, that described or evaluated conditions contributing to a cumulative impact.
- A description of the geographic scope of the area affected by the cumulative impact.
- A summary of expected environmental effects to be produced by these projects.
- Reasonable, feasible options for mitigating or avoiding the project's contribution to any significant cumulative effects.

The Draft EIR uses a hybrid approach, consisting of a combination of the projection-based (plan-based) and list-based approaches, to best identify cumulative impacts.

- **Projection Approach:** This approach discloses regional cumulative impacts related to regional air quality, greenhouse gas (GHG) emissions, energy, public services, utilities and service systems, recreation, safety and security, and transportation.
- **List Approach:** The Project and specific cumulative projects in or adjacent to the Project corridor were examined for the potential to result in cumulatively significant localized impacts. This analysis considers rail projects planned within or along the Project corridor; other regional transportation improvements; and land development projects adjacent to the Project corridor. The cumulative analysis uses this approach to identify localized impacts related to aesthetics; air quality; biological resources; cultural resources; tribal cultural resources; geology, soils, seismicity, and paleontological resources; hazards and hazardous materials; hydrology and water quality; land use and planning; noise; public services; utilities and service systems; recreation; safety and security; and transportation.

The cumulative impacts analysis will be based on a review of applicable information included in the following sources:

- California Department of Finance
- 2019 Merced County Economic Forecast
- 2022 Merced County of Governments (MCAG) Regional Transportation Plan (RTP)
- January 2023 City of Merced projects list
- California Department of Transportation (Caltrans) District 10 projects list
- Altamont Corridor Express (ACE) Ceres-Merced Station EIR
- 2020 California Freight Mobility Plan
- 2018 California State Rail Plan (CSRP)
- California High-Speed Rail (HSR) Merced to Fresno Final EIR/Environmental Impact Statement

- Southern Alameda County Integrated Rail Analysis (SoCo Rail) Study (including the Phase 1 and Phase 2 Reports)
- Grade crossing data from the Federal Railroad Administration (FRA)

4.4 Projections/Regional Growth Characteristics

To estimate overall growth, the cumulative analysis uses multiple land use and population growth projection sources for the jurisdiction that the Project has the potential to affect. Table 4-1 shows the existing and projected population and housing unit growth in the county of Merced.

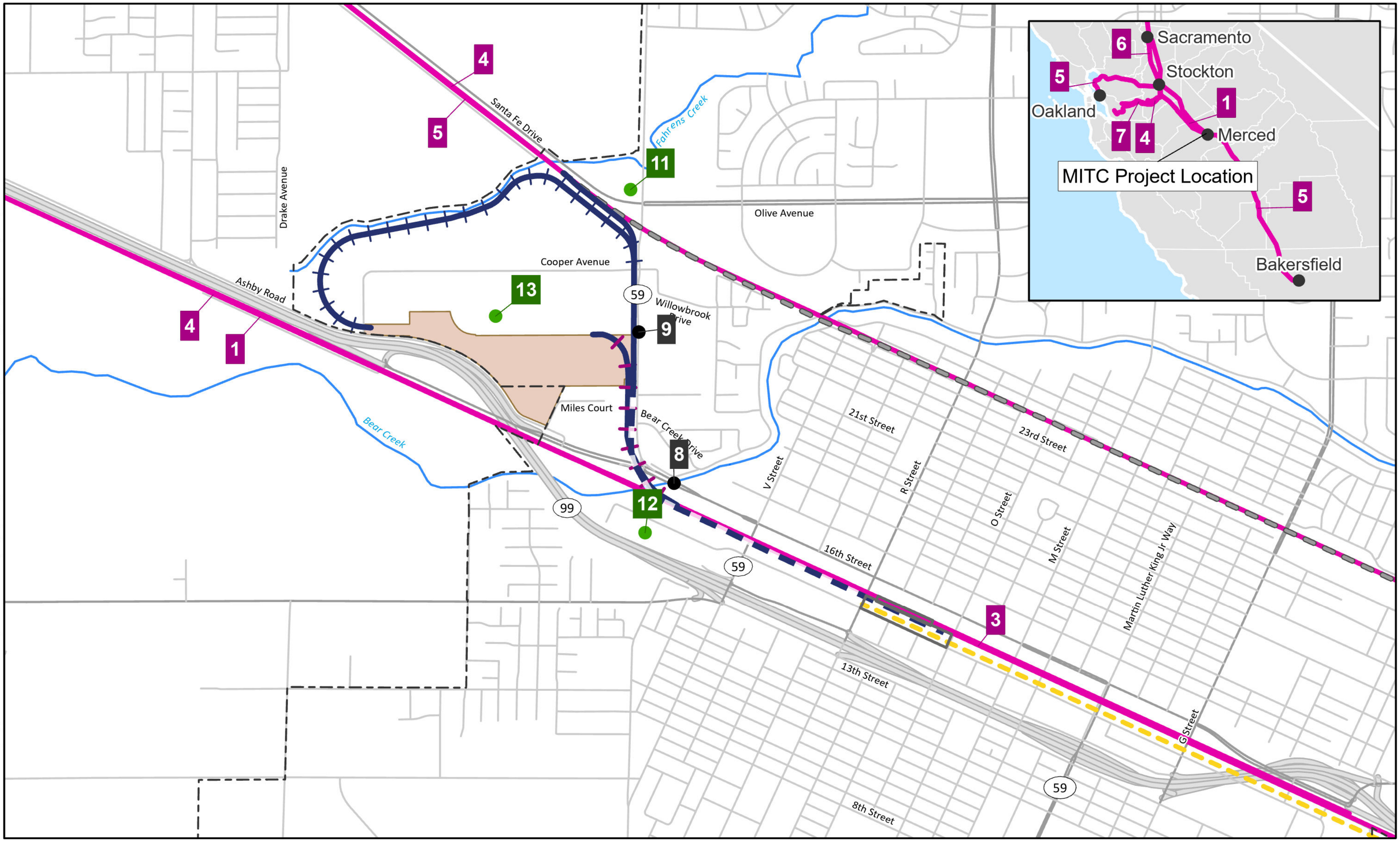
Table 4-1. Existing and Projected Population and Housing Unit Growth in Merced County

	Total Population			Total Housing Units		
County	2023	2040	2023–2040 Difference (%)	2023	2040	2023–2040 Difference (%)
Merced	285,337	358,158	25.5	91,465	113,410	24.0

Source: ICF. 2024. Merced Intermodal Track Connection Project – Cumulative Impacts Approach and List Memorandum. April 9.

4.5 Projects Considered

As discussed above, the list approach to cumulative analysis considers rail projects planned within or along the Project corridor; other regional transportation improvements; and land development projects adjacent to the Project corridor. Brief descriptions of these projects are included below. In addition, Figure 4-1 shows the location of each cumulative project described below.



Approved ACE Merced Layover and Maintenance Facility

Proposed Integrated Merced High-Speed Rail Station

City of Merced Boundary

0 1,000 2,000 Feet

N

MITC Project

San Joaquins: Elevated Track

San Joaquins: At-grade Track

San Joaquins: Layover and Maintenance Access Line

Relocated ACE/UPRR Industrial Spur Track

San Joaquins: To be discontinued under MITC Project

Data Source: AECOM, City of Merced 2023.

Cumulative Projects

(See Section 4.5, Projects Considered, for project names associated with the project numbers)

Rail Projects within the MITC corridor

Other Regional Transportation Improvements within or near the MITC corridor*

Land Development Projects near the MITC corridor

Note: Cumulative Project #2, the SoCo Rail Study, is a regional project without a specific alignment; thus, a specific location for this cumulative project is not indicated in this figure. Cumulative Project #10, the conversion of California's Passenger Train Fleet to Zero Emission, is a statewide project; thus, a specific location for this cumulative project is not shown in this figure.

Figure 4-1
Projects Considered in the Cumulative Analysis
Merced Intermodal Track Connection Project

MITC

4.5.1 Rail Projects Planned within the Project Corridor

ACE Ceres-Merced Extension Project—New Rail Service (Cumulative Project #1)

The ACE Ceres-Merced Extension Project is a key component of the Valley Rail Program, which envisions extensions of ACE service northward to Sacramento and Chico and southward to Merced, with expansion of the San Joaquins service sharing the new passenger rail corridor with ACE between Stockton and the Sacramento region. CEQA clearance for the project has been completed. As part of the project, SJRRC, which manages the ACE service, proposes to extend ACE service from Ceres to Merced along a 34-mile section of the existing Union Pacific Railroad (UPRR) Fresno Subdivision right-of-way with this component of the Valley Rail program.

The ACE Ceres-Merced Extension Project consists of the following:

- The Ceres to Merced Extension Alignment, which consists of upgrades to track, new track, and bridges within the UPRR Fresno Subdivision between Ceres and Merced.
- The Turlock, Livingston, Atwater, and Merced Stations, which would be located along the Ceres to Merced Extension Alignment.
- The approved ACE Merced Layover and Maintenance Facility, which would be located west of downtown Merced to support extension operations.

Six roundtrip trains are planned to operate as part of the ACE Ceres-Merced Extension project, with three running between Merced and the Sacramento region, one running between Merced and San Jose, and two running between Merced and the Union City Bay Area Rapid Transit (BART) station (see SoCo Rail Study details below). Service is anticipated to commence to Merced around 2030.

A related project, the ACE Extension Lathrop to Ceres project, is currently being implemented by SJRRC. The project is fully funded and will enter construction soon with service anticipated to commence around 2026. The ACE Extension Lathrop to Ceres project is the first portion of the larger extension to Merced of ACE service.

SoCo Rail Study (Cumulative Project #2)

The SoCo Rail Study evaluates passenger rail needs and opportunities for rail and bus service connectivity in southern Alameda County and Northern California. The goal of the SoCo Rail Study is to identify and develop a Rail-to-Rail Intermodal Station in the East Bay within the mid-term horizon of approximately 10 years. The study was led by the Metropolitan Transportation Commission, who partnered with the California State Transportation Agency, Caltrans, Alameda County Transportation Commission, Capital Corridor Joint Powers Authority, and the SJJRC.

The SoCo Rail Study builds on the foundation of the 2018 CSRP, which established a 2040 statewide vision for an integrated statewide passenger rail and express bus network, by identifying potential East Bay hub locations to be part of the Northern California megaregional passenger rail network. The study was completed in two project phases. In 2021, Phase 1 identified the existing Union City Intermodal Station, which includes the BART Station, as the best location for the rail-to-rail East Bay Hub as identified in the 2018 CSRP. In coordination with Union City and other study stakeholders, Phase 2 was completed in July 2023 and proposed the “Union City Intermodal Station Phase 3

Project," including proposed operating plans and proposed infrastructure. The service plan for proposed extension of ACE rail service to the proposed Union City Intermodal Station consists of three daily round trips, including one round trip serving Chico (Natomas in the Mid-Term Horizon) and two round trips serving Merced, connecting with HSR trains.

CEQA clearance for the project has not yet been completed.

California High-Speed Rail System (Cumulative Project #3)

The statewide HSR system planned for California would encompass over 800 miles of rail, with up to 24 stations. The project has been broken into 10 separate sections and the California High-Speed Rail Authority (CHSRA) previously prepared a program-level environmental analysis for the statewide HSR system (CHSRA 2005). The program-level analysis included an evaluation of various alignments for the 10 sections. Each separate section has undergone, is undergoing, or will undergo a subsequent project-level analysis prior to project approval and construction. This section describes the HSR section that is within the Project corridor.

To most efficiently integrate the San Joaquins and ACE rail services with the Merced to Bakersfield HSR Early Operating Segment and future Phase I HSR service, CHSRA, California State Transportation Agency, Caltrans, the City of Merced, San Joaquin Joint Powers Authority (SJJPA), and SJRRC are planning for a new integrated station in downtown Merced that will connect three services:

- ACE Rail Service
- HSR Service
- San Joaquins Rail Service

The 2012 Record of Decision for the California HSR Merced to Fresno section approved an HSR station northwest of G Street and 16th Street in Merced (CHSRA 2012). CHSRA, in coordination with SJJPA and the City of Merced, is reviewing the potential relocation of the station from the currently proposed site at G Street to a proposed new integrated station between O and R Streets. The proposed downtown Merced station is anticipated to receive 77 daily trains per day during full service of the California HSR in 2040.

CHSRA is planning to construct the Merced to Bakersfield HSR Early Operating Segment by 2030–2033 and to extend the HSR service to the Bay Area after 2030–2033 (referred to as Silicon Valley to Central Valley HSR). HSR is planned to provide faster, more reliable, and more frequent service than the San Joaquins currently provides between Merced and Bakersfield. As a result, when the Merced to Bakersfield HSR Early Operating Segment is operational, the San Joaquins passenger rail service between Merced and Bakersfield would be replaced by the HSR service and the SJJPA would terminate the San Joaquins intercity rail service in Merced at the integrated station.

Freight Rail Future Plans (Cumulative Project #4)

The *California Freight Mobility Plan 2020* (Caltrans 2020) defines the BNSF Railway (BNSF) Stockton Subdivision on which the Project would operate as a major freight facility. As required by the National Highway Freight Program (NHFP) established by the federal Fixing America's Surface Transportation Act, all states must develop a freight investment plan, including a list of priority projects, by December 4, 2017, to receive NHFP funding. However, the identification of priority projects under the state freight investment plan has been postponed with the passage of Senate Bill (SB) 1, which created the Trade Corridor Enhancement Program (California Transportation Commission 2019). Additional legislation has been approved with the passage of SB 103, which provides more specific direction on the Trade Corridor Enhancement Program funds and combines the federal NHFP funds into this new program. As such, no specific freight rail projects have been identified.

Existing freight rail service levels were identified based on grade crossing data from the FRA and future freight rail service is based on an assumed projection range of freight growth of 2 to 4 percent per annum.

San Joaquins Rail Service Expansion (Cumulative Project #5)

The change in the San Joaquins service plans includes one additional train between Oakland and Merced and three additional trains between Natomas and Merced with one train continuing to Chico (SJJPA 2023).

Table 4-2 summarizes the existing cumulative rail service and assumed future service along the Project corridor by 2040.

Table 4-2. Cumulative Existing (2019) and Future (2040) Daily Train Service in the Project Corridor

System	Lathrop to Ceres	Ceres to Merced	Lathrop to Ceres
	UPRR Fresno Subdivision	*UPRR Fresno Subdivision*	*BNSF Stockton Subdivision*
Existing (2019) Service			
ACE	0	0	0
San Joaquins	0	0	14
Freight	16 to 20	16 to 20	18 to 22
Total	**16 to 20**	**16 to 20**	**32 to 36**
Future (2040) Service			
Existing ACE	0	0	0
Existing San Joaquins	0	0	14
ACE Extension to Ceres	12	0	0
ACE Extension to Merced	0	12	0
Future San Joaquin (Near term)	0	0	2
Valley Rail: Additional San Joaquins	0	0	8
Freight	24 to 43	24 to 43	28 to 48
Total	**36 to 55**	**36 to 55**	**52 to 72**
Change from 2019	**+20 to +35**	**+20 to +35**	**+20 to +36**

Source: ICF. 2024. *Merced Intermodal Track Connection Project – Cumulative Impacts Approach and List Memorandum*. April 9.
Note: Data shown above is for one-way service. For round trips, divide by two.
UPRR = Union Pacific Railroad

Valley Rail Sacramento Extension Project (Cumulative Project #6)

The Valley Rail Sacramento Extension Project contains both Phase I and Phase II improvements. Phase I improvements include the construction of six new stations between Stockton and the

Natomas area of Sacramento. Each proposed station would be located along the existing UPRR alignment Sacramento Subdivision. Phase I includes track improvements to existing UPRR track at various locations along the Sacramento Subdivision. These improvements are necessary to increase allowable train speeds and meet operational requirements. All of the proposed track work will occur within the existing UPRR ROW. Phase II includes the construction of a maintenance and layover facility proposed to be located on a 125-acre site west of the UPRR and east of Levee Road on both sides of West Elkhorn Boulevard. The Natomas Maintenance and Layover Facility will provide for both maintenance of trains and layover track for trains between service runs, and would accommodate seven trains per day.

CEQA clearance for the project has been completed.

Valley Link (Cumulative Project #7)

Valley Link is a new 42-mile, 7-station passenger rail project that will connect the existing Dublin/Pleasanton BART Station in Alameda County to the approved ACE North Lathrop Station in San Joaquin County. Valley Link will use existing transportation corridors: the existing Interstate 580 corridor (11.7 miles) in the Tri-Valley; the Alameda County Transportation Corridor ROW through the Altamont Pass (14.5 miles); and the existing UPRR Corridor (16.1 miles) in Northern San Joaquin County.

Valley Link includes the following stations:

- Dublin/Pleasanton (BART Intermodal)
- Isabel (Livermore)
- Greenville (Livermore)
- Mountain House (San Joaquin County)
- Downtown Tracy Station (Tracy)
- River Islands Station (Lathrop)
- North Lathrop Station (ACE Intermodal)

Valley Link also includes the proposed Tracy Operation and Maintenance Facility, which will be located in the City of Tracy. Valley Link will provide regular service throughout the day in both directions with timed connections with both BART and ACE services. The overall travel time from North Lathrop to the Dublin/Pleasanton BART Station would be approximately 61 to 65 minutes depending on direction of travel. The 2040 service plan includes 12-minute peak period headways and 2-minute off-peak headways with more limited service on the weekend.

CEQA clearance for the project has been completed.

4.5.2 Other Regional Transportation Improvements

Planned and proposed major highway improvements adjacent to or within 0.25 mile of the Project corridor have the potential to overlap with the Project and are described below.

Merced Seismic Retrofit Project (Cumulative Project #8)

Caltrans has identified seven bridges within the county of Merced that are seismically vulnerable to collapse during an earthquake if not properly retrofitted. As part of the retrofit, the Bear Creek Bridges, both northbound (Bridge Number 39-0009 L) and southbound (Bridge Number 39-0009 R) on State Route (SR) 59 would be retrofitted to increase their structural integrity by adding steel column casings and retrofitting hinges with pipe seat extenders and cable restrainers. As of April 2023, the environmental review and permitting processes are still in progress (Caltrans 2020).

SR 59 Widening Project (Cumulative Project #9)

The City of Merced plans to widen SR 59 from two lanes to four lanes between 16th Street and Buena Vista Drive. Additionally, the Black Rascal Canal Bridge and South Black Rascal Bridge would be replaced with a single structure and the Branch Black Rascal Canal Bridge will be widened to accommodate five lanes. The Bear Creek Bridges would also be widened to provide for curb, sidewalk, and barriers improvements. As of April 2023, the design and environmental review processes are still in progress (City of Merced 2020).

Conversion of California's Passenger Train Fleet to Zero Emission (Cumulative Project #10)

The In-Use Locomotive Regulation was approved by the California Air Resources Board on April 27, 2023. The In-Use Locomotive Regulation will achieve emission reductions from diesel-powered locomotives and increase the use of zero-emission (ZE) technology. The In-Use Locomotive Regulation will help meet California's public health, air quality and climate goals by reducing criteria pollutants, toxic air contaminants, and GHG emissions for locomotives in use.

In response to the state's ZE goals, the Caltrans Operations and Maintenance, Division of Rail and Maintenance is planning to convert its full fleet of intercity locomotives to ZE hydrogen vehicles by 2035. By 2025, Caltrans hopes to reduce fuel usage per train mile by 15 percent and launch a 2-year hydrogen pilot program. If the results meet expectations, Caltrans then could begin converting its fleet of locomotives that now use carbon-based fuel to hydrogen or, in some cases, replace old locomotives with new ZE locomotives and/or trainsets. Caltrans has committed to these broad strategies for ZE trains in the intercity rail network:

- Provide leadership and guidance and serve as a positive benchmark for other railways to act quickly in a coordinated manner.
- Enable the launch of important initiatives and accelerate progress.
- Set targets and provide a structured approach to move towards ZE, including setting technological cornerstones.
- Respond to urgent needs and legislation/state mandates.

4.5.3 Land Development Projects

Planned, proposed, and under-construction land development projects adjacent to or within 0.15 mile of the Project corridor have the potential to overlap with the Project. Table 4-3 describes the land use projects, in various stages of development, within approximately 0.15 mile of the Project corridor.

Table 4-3. Land Development Projects Adjacent to the Project Corridor (within approximately 0.15 mile)

Project Name	Description	Estimated Construction Schedule	Location	Location Relative to Project (miles)	Potential Conflict
Bianchi/Norcal Cajun Annexation (Cumulative Project #11)	42,000-square foot retail/commercial development on a 7.83-acre site	Approved, partially developed with new gas station	Northwest Corner of Santa Fe Drive & N. SR 59	0.1 mile northeast of Project corridor	None
Merced Toyota (Cumulative Project #12)	7,220-square foot auto building for service bays, detailing, and a carwash on a 5-acre site	Approved, specific timing unknown	1400 Auto Center Drive	0.15 mile south of Project corridor	None
Prudential Freezer (Cumulative Project #13)	102,176-square foot industrial freezer space on a 7-acre site	Approved, specific timing unknown	2320 Cooper Avenue	0.1 mile west of Project corridor	None

Source: ICF. 2024. Merced Intermodal Track Connection Project – Cumulative Impacts Approach and List Memorandum. April 9.

4.6 Cumulative Impacts Analysis

This section provides the cumulative impact analysis. The cumulative impacts analysis considers the Project in combination with the cumulative projects and cumulative projections.

4.6.1 Construction

There is the potential for cumulative construction impacts where cumulative projects and the Project overlap in location or are adjacent (i.e., affecting the same resource/receptor but potentially at different times), or if they overlap in time (i.e., affecting the same resource/receptor at the same time).

4.6.1.1 Rail Projects Planned within the Project Corridor

Only some of the other rail projects would have construction in or adjacent to the Project corridor. Specifically, the ACE Ceres-Merced Extension Project and California HSR Project could overlap at the Merced Station and Freight Rail Future Plans would be located in the same area where the Project would operate. Some of these projects would be constructed prior to Project construction, some during, and some after Project construction activities would be completed.

4.6.1.2 Other Regional Transportation Improvements

Only some of the other regional transportation improvements would have actual construction in or adjacent to the Project corridor, including the Merced Seismic Retrofit Project and the SR 59

Widening Project. Some of these projects would be constructed prior to Project construction, some during, and some after Project construction activities would be completed.

4.6.1.3 Land Development Projects

None of the land development projects are located within the Project corridor, although they are adjacent to the Project corridor. Some of these cumulative projects would be constructed prior to Project construction, some during, and some after Project construction activities would be completed.

4.6.2 Operation

4.6.2.1 Rail Projects Planned within the Project Corridor

The rail projects planned within the Project corridor and the existing ACE corridor have various planned in-service dates. Freight service could increase incrementally over time with implementation of Freight Rail Future Plans. In addition, based on the 2024 CHSRA Business Plan, the HSR EOS Project (Merced – Bakersfield) for interim operations is expected to commence between 2030 - 2033. Once the Project is operational (by 2030), there is potential for cumulative operational impacts to occur as other passenger and freight rail service increases over time. For assessing cumulative impacts, the analysis considers all of the service increases shown in Table 4-2. For assessing the Project's contribution to cumulative impacts, the analysis considers the effects of the Project in light of the overall cumulative impacts.

4.6.2.2 Other Regional Transportation Improvements

Other transportation projects concerning highways, transit, and other roadways would not result in cumulative operational impacts along the Project corridor itself. However, there is potential for cumulative operational impacts at areas where transportation projects intersect with the Project corridor.

4.6.2.3 Land Development Projects

Land development projects would not affect rail service itself but could result in cumulative operational impacts related to air quality, noise, and other operational issues in combination with the Project. In addition, land development projects adjacent to the Project corridor would result in additional residential and commercial receptors of operational train noise impacts resultant from the Project and other rail projects.

4.6.3 Effects Found Not to Be Significant

4.6.3.1 Agricultural and Forestry Resources, Mineral Resources, and Wildfire

Cumulative impacts are addressed only for those thresholds that would result in a Project-related impact. If the Project would result in no impact with respect to a particular threshold, it would not contribute to a cumulative impact. Therefore, no analysis is required. As discussed in Section 3.1, *Effects Found Not to Be Significant*, the Project would result in no impacts related to agricultural and forestry resources, mineral resources, and wildfire; thus, no further cumulative analysis is required.

4.6.3.2 Population and Housing

As described in Section 3.1, *Effects Found Not to Be Significant*, the Project would have no impact related to displacing existing housing units or people. Cumulative impacts are addressed only for those thresholds that would result in a project-related impact. If the Project would result in no impact with respect to a particular threshold, it would not contribute to a cumulative impact. Therefore, no cumulative analysis related to displacing existing housing units or people is presented here; instead, the focus is on cumulative impacts related to induced population growth.

The geographic context for cumulative impacts on population and housing is Merced County. Cumulative growth projections within this geographic context are summarized in Table 4-1. The cumulative analysis for population and housing relies on a projection approach.

Impact C-POP-1	Construction of the Project, in combination with other foreseeable projects in the surrounding area, would not result in a significant cumulative impact on population and housing. Operation of the Project would not contribute considerably to a significant cumulative impact on population and housing.
Level of Cumulative Impact	<u>Construction</u> Less than Significant <u>Operation</u> Significant (see below in regard to the Project's contribution)
Applicable Mitigation Measures	None
Project's Contribution Considerable?	<u>Construction and Operation</u> No

Construction

Construction of the Project would have the potential to induce local population growth temporarily through employment of workers during the construction period. Similarly, construction of other identified projects would have the potential to induce local population growth temporarily through employment of workers during the construction period. However, most employment opportunities for the Project and other cumulative projects are anticipated to be filled by local workers who already reside in the vicinity and would not contribute to population growth. Non-local labor would commute or temporarily relocate during the construction period; once construction is complete, non-local workers would return to their prior residence or move on to the next construction opportunity. Employment opportunities generated by construction of the Project and other cumulative projects is not anticipated to generate a new permanent population increase. Thus, the cumulative impact on population growth due to construction would be less than significant.

Operation

In general, a project may foster spatial, economic, or population growth in a geographic area if it removes obstacles to population growth (e.g., the establishment or expansion of an essential public service or the extension of a roadway to an area). Included in this definition are the cumulative rail and other regional transportation projects such as the California HSR Project and other projects identified in Section 4.5, *Projects Considered*, which could facilitate travel between areas of California by providing an additional mode of transportation. Generally, induced growth associated with cumulative rail and other regional transportation projects would be minimal and not substantial. These projects alone would not induce substantial population growth beyond that already projected for the region. The employment opportunities created by a large transportation project, such as the California HSR Project, would be filled by the existing local population.

The cumulative land development projects generally consist of commercial and industrial developments, which would not directly increase population and housing in the region but could result in a small amount of induced growth. These land development projects may induce unplanned growth if the project is not consistent with local and regional land use plans. Growth associated with land development projects that are consistent with local land use plans is considered planned for and accounted for in the local jurisdiction's general plan. Many land development projects are consistent with current local land use planning; some of these projects seek general plan and zoning amendments to allow uses that are not consistent with current local planning. All land development projects must be approved by land use jurisdictions, which are required by law to amend local land use plans or make the appropriate findings prior to approving any inconsistent uses and associated growth. If these cumulative projects were to induce substantial population growth in the region that would exceed regional projects, the cumulative impact would be significant.

The potential for Project operations to induce population growth is generally associated with increasing accessibility to existing and new stations. The Project does not include construction of a new station or modification of an existing station. However, the cumulative projects (ACE Ceres-Merced Extension Project and California HSR Project) include construction of new stations and/or modification of existing stations. Modification at existing stations and new stations may induce population growth if the stations result in land use changes that would support intensified development. New stations would provide accessibility, proximity to transit services, and may be an attractive benefit consistent with intensified development. The additional growth may not necessarily be new net growth in a community. Rather, the growth may be a redistribution of planned growth that takes advantage of transit availability in the community. The extent to which a new station may indirectly induce unplanned growth is examined in light of local land use and development policies around the station area. Cumulative project stations are supported by the general plans of the municipalities in which new or replacement stations would be located as well as in regional plans. Where new cumulative project stations are proposed, local growth and development policies generally support the establishment of these stations; as such, the population growth that may result in the station vicinity is already planned for. These policies call for land use intensification and uses that are supportive of transit in the areas where new cumulative project stations are proposed and would suggest that induced growth from a new cumulative project station would not be substantial or unplanned. New cumulative project stations could potentially intensify density surrounding stations, but this intensification would be a redistribution of planned growth taking advantage of transit availability in the community.

Because the Project does not include construction of a new station or modification of an existing station, it would not contribute to a cumulative impact. Thus, the Project's contribution to cumulative induced population growth impacts as a result of operation would be less than considerable.

4.6.4 Aesthetics

The geographic context for potential impacts on aesthetics is the resource study area (RSA), as defined in Section 3.2.3.1, *Resource Study Area*. As stated therein, the RSA for direct and indirect impacts encompasses a 0.5-mile distance from the Project footprint in rural areas and a 0.25-mile distance from the Project footprint in urbanized areas. Where elevated or more expansive views are present or where there are prominent and regionally important visual and scenic features, such as mountains, large iconic structures, or water features, middle ground views (up to 3 miles from the Project footprint) and background views (beyond 3 miles from the Project footprint) are discussed as contributing visual elements to the RSA.

Impact C-AE-1	Construction and operation of the Project, in combination with other foreseeable projects in the surrounding area, would not result in a significant impact on aesthetics.
Level of Cumulative Impact	<u>Construction and Operation</u> Less than significant
Applicable Mitigation Measures	None

4.6.4.1 Construction

A cumulative impact would occur during construction if one or more cumulative projects' construction schedules would overlap, and the combined impact on aesthetics would be considered significant. The construction schedules of the cumulative projects described in Section 4.5, *Projects Considered*, are currently unknown. Therefore, it is not possible to determine whether construction schedules would overlap with the Project.

The most notable cumulative projects in terms of aesthetics are the ACE Ceres-Merced Extension Project and the California HSR System. Both of these projects have components within the Project RSA that the Project would eventually integrate with.

The Project would include components within the footprint of the approved ACE Merced Layover and Maintenance Facility, and would connect with the Integrated Merced HSR Station via the proposed aerial guideway. Since both of these cumulative project components are large in scale, their construction is anticipated to temporarily affect the visual quality and character of the RSA. Construction activities for the Project, as well as for the cumulative projects, would introduce heavy equipment and associated vehicles such as dozers, graders, scrapers, and trucks, into the viewshed. Depending on location, viewers could also view staging and storage areas and worker parking sites.

Construction activities involving heavy equipment use, soil and material transport, and land clearing would generate fugitive dust, which could affect views for travelers and neighbors in the RSA. Residential viewers, such as those living at the Riviera Holiday Mobile Estates, could have views of construction activities occurring near their homes, evoking a sense of invaded privacy. However, the existing visual environment in downtown Merced includes residential, 35 commercial, and industrial landscaping and grassy, vacant parcels that are common to developed 36 areas in the San Joaquin Valley. The existing natural setting is not very harmonious because there is little cohesion in landscaping and vegetative cover, contributing to a natural setting that is moderately low in natural harmony. environment. The commercial, warehouse, and industrial areas tend to be disjointed and detract from residential land uses, contributing to a cultural setting that is moderately low in cultural order. Thus, the overall visual quality in downtown Merced is low. In addition, as described in Section 3.2, *Aesthetics*, construction of the Project would have a less-than-significant impact on aesthetics. Public and panoramic views of the Sierra Nevada Mountains to the north would continue to be available to pedestrians and residents through street corridors and would not be impacted by Project construction activities or construction activities associated with the other foreseeable projects. Further, because construction activities are temporary in nature, construction activities would not result in a substantial adverse effect on a scenic vista. Project construction would represent a temporary change in the visual quality and character of the RSA, similar to other construction projects in the city. Construction would not significantly increase the ambient light levels in the vicinity because construction duration would be short and temporary, would be confined to localized sites, and would not constitute a substantial source of light or glare. There would be no significant cumulative impacts on aesthetics related to construction.

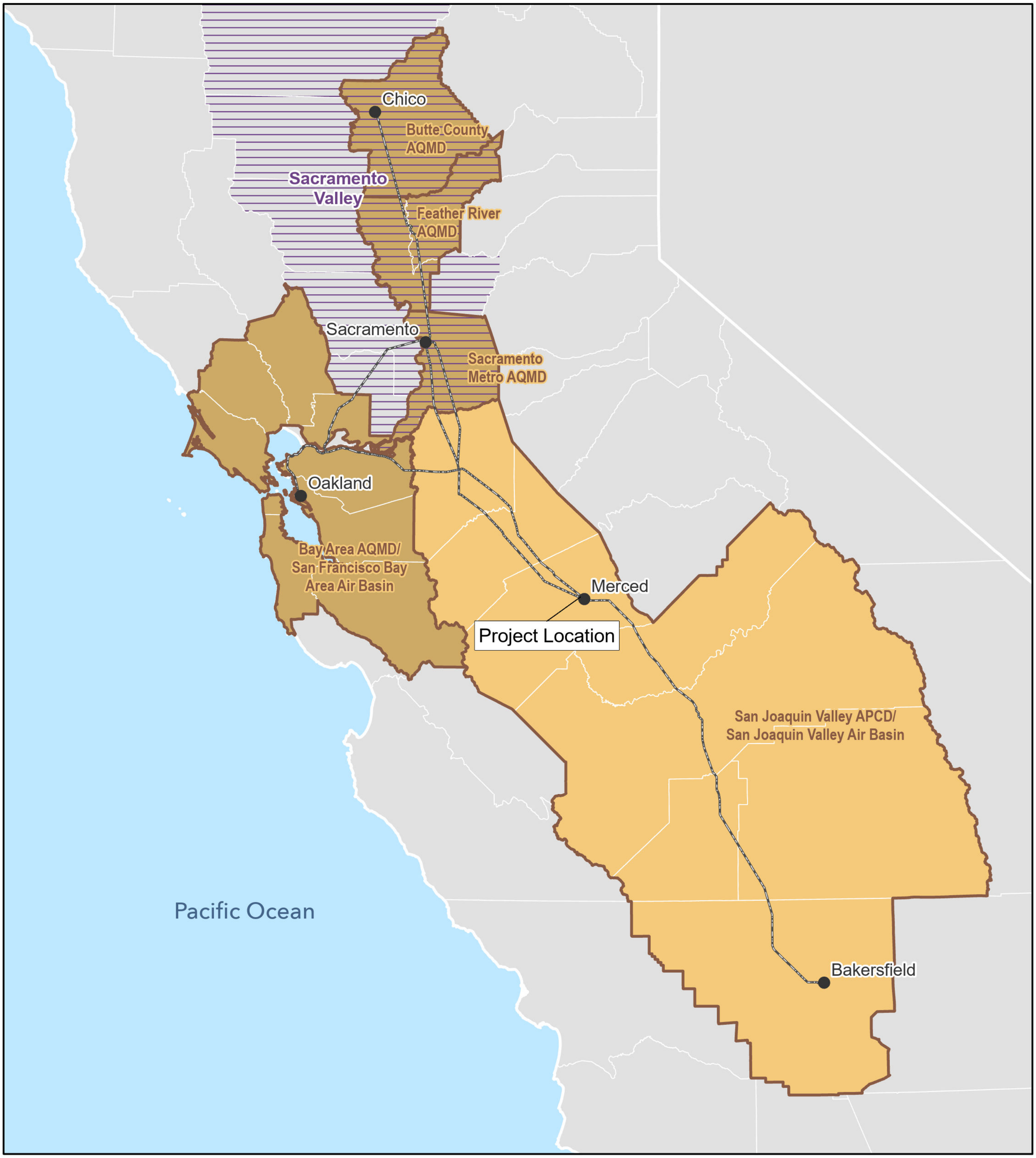
4.6.4.2 Operation

As stated above, the Project would integrate with the ACE Ceres-Merced Extension Project and California HSR System in the RSA. These projects in connection with one another would represent a notable change to visual quality and character in the RSA. The ACE Ceres-Merced Extension Project would redevelop multiple parcels along Cooper Avenue, in addition to establishing new trackway. The HSR Project would also establish new trackway, and would construct a large-scale station between SR 59 and 16th Street. These new features would dominate the form of the RSA, altering existing visual character and potentially blocking views of distant scenic resources such as the Sierra Nevada Mountains. However, as noted above, the overall visual quality in downtown Merced is low. In addition, as described in Section 3.2, *Aesthetics*, operation of the Project would have a less-than-significant impact on aesthetics. Similar to the other foreseeable projects, the Project would not significantly block scenic or panoramic views, such as views of the North and South Bear Creek Drive scenic corridor or long-range views of the Sierra Nevada Mountains. In addition, similar to the other foreseeable projects, operation of the Project would not conflict with local zoning ordinances pertaining to scenic quality. Furthermore, the increase in light that would be generated by the Project and other foreseeable projects would not adversely affect day or nighttime views in the area. Thus, there would be no significant cumulative impacts on aesthetics related to operation.

4.6.5 Air Quality and Greenhouse Gas Emissions

The geographical context for the analysis of potential contributions to cumulative impacts on air quality during construction consists of the San Joaquin Valley Air Basin (SJVAB). Because operation of the Project would increase ridership on ACE and San Joaquins through central and northern California, the geographical context for the analysis of potential contributions to cumulative impacts on air quality during operations consists of the SJVAB and the adjacent San Francisco Bay Area Air Basin (SFBAAB) and Sacramento Valley Air Basin (SVAB). Climate change is a global problem, and GHGs are global pollutants. Thus, the geographical context for the analysis of potential contributions to cumulative GHG impacts consists of the entire state and global atmosphere.

The San Joaquin Valley Air Pollution Control District (SJVAPCD) has local air quality management authority in the SJVAB. The Bay Area Air Quality Management District and the Sacramento Metropolitan Air Quality Management District, Feather River Air Quality Management District, and Butte County Air Quality Management District have local air quality jurisdiction over portions of the cumulative service area in the SFBAAB and SVAB, respectively, as shown on Figure 4-2.



- San Joaquins 12-Train Service & ACE Ceres-Merced Extension Rail Service
- Air District Boundary
- Regional Air Quality Study Area
- Expanded Cumulative Air Quality Study Area
- Air Basin

Figure 4-2
Air Quality Study Area for the Cumulative Analysis
Merced Intermodal Track Connection Project

0 20 40 Miles

MITC

As described in Section 3.3, *Air Quality and Greenhouse Gases*, the evaluation of regional air quality at the air basin level and global climate change at the global level is an inherently cumulative approach because criteria pollutant and GHG emissions, once emitted, mix into the atmosphere and affect a larger area than any individual project site. Thus, the air quality and GHG analyses do not consider individual planned projects in the vicinity of the Project. Rather, they use the same thresholds as the project-level thresholds presented in Section 3.3.4.2, *Thresholds of Significance*. The evaluation of air quality impacts from receptor exposure to diesel particulate matter (DPM) and other localized emissions likewise relies on the project-level health risk thresholds adopted by the SJVAPCD, consistent with air district guidance (Siong pers. comm.).

Impact C-AQ-1	Construction and operation of the Project would not contribute considerably to a significant cumulative impact on air quality or GHG emissions.
Level of Cumulative Impact	Construction and Operation Significant (see below in regard to the Project's contribution)
Applicable Mitigation Measures	None
Project's Contribution Considerable?	Construction and Operation No (beneficial during operation)

4.6.5.1 Construction

Regional Criteria Pollutants

Construction activities for the Project would occur solely in and under the jurisdiction of the SJVAPCD in the SJVAB. The SJVAB is in nonattainment status for several California ambient air quality standards (CAAQS) and national ambient air quality standards (NAAQS) for multiple pollutants as a result of the emissions from past and present projects. Construction of future projects, including the Project, would emit criteria pollutants from use of construction equipment and vehicles that could further contribute to nonattainment of the CAAQS and NAAQS in the SJVAB.

SJVAPCD has established project-level thresholds to identify projects that may contribute to violations of the ambient air quality standards (see Table 3.3-11 in Section 3.3, *Air Quality and Greenhouse Gases*). The mass emissions thresholds represent the maximum emissions a project may generate before contributing to a cumulative impact on regional air quality. As shown in Table 3.3-12 in Section 3.3, Project construction emissions would not exceed SJVAPCD's annual thresholds. The emissions results presented in Table 3.3-12 account for compliance with SJVAPCD Regulation VIII, which is required to control fugitive dust emissions. Additional emission reductions would be achieved through mandatory compliance with Rule 9510 and other SJVAPCD rules, as described in Section 3.3.2.2, *Regional and Local*. Because construction emissions would not exceed SJVAPCD's thresholds and the Project would comply with all applicable air district rules, the Project's contribution to cumulative impacts on air quality would be less than considerable.

Receptor Exposure to Localized DPM

Multiple existing sources and future planned actions located within 1,000 feet of the Project's environmental footprint contribute to cumulative DPM concentrations. As noted above, SJVAPCD does not have separate cumulative health risk thresholds for receptor exposure to DPM. Rather, SJVAPCD considers risks in excess of project-level thresholds to result in a cumulatively considerable impact. As shown in Table 3.3-17 in Section 3.3, *Air Quality and Greenhouse Gases*, construction of the Project would not result in a significant increase in either cancer risk or chronic exposure risk. Thus, the Project's contribution to cumulative impacts on receptor exposure to DPM emissions during construction would be less than considerable.

Receptor Exposure to Other Localized Emissions

As disclosed in Section 3.3, *Air Quality and Greenhouse Gases*, site disturbance during construction of the Project could expose receptors to localized fugitive dust, spores known to cause Valley Fever (if present in the soil), and asbestos-containing materials (if present in demolished structures). Construction of other projects within the vicinity of the Project's environmental footprint could likewise result in these emissions. Localized dust emissions would be substantially reduced with compliance with SJVAPCD's Regulation VIII, which is required of all construction projects in the SJVAPCD. Compliance with the SJVAPCD Regulations III and VIII is also mandatory for all projects in the SJVAPCD in the event asbestos-containing material is found during demolition. Collective implementation of SJVAPCD regulations will thus reduce the cumulative air pollution burden to which local receptors are exposed. Thus, construction of the Project in conjunction with other local projects would not result in impacts on receptor exposure to localized fugitive dust, Valley Fever, and asbestos-containing materials, and therefore would not result in a significant cumulative impact.

4.6.5.2 Operation

Project operations would increase passenger rail ridership throughout the SJVAB and adjacent SFBAAB and SVAB. The Project analysis presented in Section 3.3, *Air Quality and Greenhouse Gases*, evaluates operations emissions under a future service schedule that assumes five daily San Joaquins round trips from Oakland to Merced, two daily round trips from Sacramento to Merced, and one daily round trip from Natomas to Merced (eight total daily round trips). As noted above, air quality thresholds are inherently cumulative and consider relevant past, present, and reasonably foreseeable future projects. Thus, cumulative air quality analyses rely on project-level modeling rather than on a list of individual projects or modeling unique to a cumulative condition. While the eight-train future service schedule can be exclusively used to analyze cumulative operational air quality impacts, this analysis also forecasts operations emissions with the approved ACE Ceres-Merced Extension Project described in Section 4.5.1, *Rail Projects Planned within the Project Corridor*. The additional modeling assumes six daily San Joaquins round trips from Oakland to Merced, two daily round trips from Sacramento to Merced, three daily round trips from Natomas to Merced, and one daily round trip from Chico to Merced (12 total daily round trips).

Regional Criteria Pollutants

As shown in Table 3.3-13 through Table 3.3-15 in Section 3.3, *Air Quality and Greenhouse Gases*, operation of the Project and project variants under an eight-train service schedule would reduce emissions of all criteria pollutants in the SJVAB, SFBAAB, and SVAB, relative to no Project conditions. Operation of the Project under a 12-train service schedule would achieve additional ridership and thus avoid more automobile trips and vehicle miles traveled (VMT), contributing to greater emission reductions than the 8-train service schedule. Estimated net operations emissions under a 12-train service schedule are presented in Appendix 3.3-1, *Air Quality, Greenhouse Gas, and Health Risk Assessment Supporting Documentation*. Emissions were modeled using the same methods as described in Section 3.3 for the Project analysis. The appendix also presents net operations emissions under the 12-train service schedule for the three project variants, which assume operation of eight San Joaquins hydrogen trains. Like the Project analysis, a 12 daily roundtrip service schedule would achieve additional emission reductions under any of the project variants when compared to the 8-train service schedule analyzed in Section 3.3. Thus, the Project's contribution to cumulative impacts on air quality related to criteria pollutants would be less than considerable and beneficial.

Receptor Exposure to Localized DPM

As shown in Table 3.3-18 and Table 3.3-19 in Section 3.3, *Air Quality and Greenhouse Gases*, neither operation of the Project nor the project variants would result in a significant increase in either cancer risk or chronic exposure risk under an eight-train service schedule. Thus, the Project's contribution to cumulative impacts on air quality related to DPM emissions during operation would be less than considerable. Operation of the Project under a 12-train service schedule would result in additional DPM emissions from locomotive use. However, because 12 trains would also be provided under the no Project condition, the incremental change in health risks would be similar to what was modeled for the 8-train analysis in Section 3.3, *Air Quality and Greenhouse Gases*. Moreover, even if modeled risks for the 8-train scenario were doubled to account for increases in other sources (e.g., connecting transit), they would still be well below SJVAPCD thresholds. Thus, the Project's contribution to cumulative impacts on receptor exposure to DPM emissions during operations would be less than considerable.

Receptor Exposure to Localized Carbon Monoxide

Background traffic volumes will increase because of future growth and new development projects in cumulative study. Additionally, Project operations would attract additional motor vehicles to ACE and San Joaquins stations throughout the San Joaquin Valley, Sacramento Region, and Bay Area. While additional traffic associated with the Project and other existing and future projects may increase carbon monoxide (CO) concentrations, cumulative CO effects would not occur because the additional traffic created by the Project in conjunction with background traffic volumes would not result in CO concentrations in excess of the NAAQS or CAAQS and therefore would not result in a significant cumulative impact (see Impact AQ-3a in Section 3.3, *Air Quality and Greenhouse Gases*). Operation of a 12-train service schedule would increase ridership and localized station traffic. However, based on the results of the worst-case CO screening assessment conducted for the 8-train service schedule in Section 3.3, which were well below the NAAQS or CAAQS, a significant cumulative impact under the 12-train service schedule likewise would not occur.

4.6.5.3 Combined Construction and Operation

Consistent with air district guidance, Section 4.6.5.1, *Construction*, and Section 4.6.5.2, *Operations*, separately evaluate the potential for the Project to cumulatively contribute to air quality impacts during construction and operation, respectively (SJVAPCD 2015). Unlike criteria pollutants, which remain in the atmosphere for relatively short durations once emitted, the lifespan of the most emitted GHG, carbon dioxide, can be up to 100 years, and many of the other GHGs can last for decades. Thus, GHG emissions generated during Project construction and operation are not separately evaluated, and instead are combined to evaluate the Project's overall potential impact on global climate change. This cumulative assessment also recognizes that individuals currently residing near the Project's environmental footprint may be exposed to both construction- and operations-generated DPM. SJJPA therefore conservatively estimated the potential lifetime risks to long-term residents that may be present during both Project construction and operation.

Receptor Exposure to Localized DPM

There are several existing receptors within 1,000 feet of the Project's environmental footprint (see Figure 3.3-2 in Section 3.3, *Air Quality and Greenhouse Gases*). If these individuals remain in the same location during and after construction, they would be exposed to Project-generated DPM during construction and then any incremental changes in risk from Project-generated DPM during operations. However, even if modeled health risks from construction and incremental operations were added at the maximally exposed receptor location (Apple Blossom Apartments) (7.0 per million cancer risk and less than 0.1 hazard index), they would be well below SJVAPCD's thresholds. Adding the independent construction and operational results is conservative because both analyses assumed receptor exposure beginning in the third trimester when sensitivity to pollution is greatest. Thus, the Project's contribution to cumulative impacts on receptor exposure to DPM emissions during combined construction and operation would be less than considerable.

Greenhouse Gases

Construction of the Project would result in a one-time increase in GHG emissions. However, as shown in Table 3.3-21 in Section 3.3, *Air Quality and Greenhouse Gases*, operation of the Project and project variants under an 8-train service schedule would reduce GHG emissions, relative to no Project conditions. Operation of the Project and project variants under a 12-train service schedule would achieve additional ridership and thus avoid more automobile trips and VMT, contributing to greater emission reductions than the 8-train service schedule (see Appendix 3.3-1, *Air Quality, Greenhouse Gas, and Health Risk Assessment Supporting Documentation*). Operational GHG reduction benefits from the Project would offset the short-term construction increase in GHG emissions in less than one year. Emissions savings achieved thereafter would contribute to reductions in statewide emissions. These reductions would be an environmental benefit and would assist the state in meeting larger statewide GHG reduction goals. Thus, the Project's contribution to cumulative GHG impacts would be less than considerable and beneficial.

4.6.6 Biological Resources

The geographic context for the analysis of potential contributions to cumulative biological resources impacts includes the Project environmental footprint where improvements are located, as well as the immediate vicinity. For aquatic species, the geographic context also includes the streams traversed (Black Rascal and Bear creeks) by the Project and downstream. Identified projects within this geographic context include the projects listed in Section 4.5.2, *Other Regional Transportation Improvements*, and Table 4-2 and Table 4-3 that are within or adjacent to the Project. The cumulative impacts analysis for biological resources relies on a list-based approach.

Impact C-BIO-1	Construction and operation of the Project would not contribute considerably to a significant cumulative impact on sensitive biological resources.
Level of Cumulative Impact	Construction and Operation Significant (see below in regard to the Project's contribution)
Applicable Mitigation Measures	BIO-2.1: Conduct a Worker Environmental Training Program for Construction Personnel BIO-2.2: Install Fencing to Protect Sensitive Biological Resources BIO-2.3: Retain a Designated Biologist to Conduct Monitoring prior to Construction during Fence Installation and during all Construction Activities BIO-2.4: Avoidance, Minimization, and Compensatory Measures for Valley Elderberry Longhorn Beetle BIO-2.5: Avoidance and Minimization Measures for Western Pond Turtle BIO-2.6: Avoidance and Minimization Measures for Nesting Birds during Construction Activities BIO-2.7: Avoidance and Minimization Measures for Swainson's Hawk BIO-2.8: Compensate for Swainson's Hawk Foraging Habitat Loss BIO-2.9: Avoidance and Minimization Measures for Burrowing Owl BIO-2.10: Compensate for Burrowing Owl Habitat Loss BIO-2.11: Avoidance and Minimization Measures for Tricolored Blackbird BIO-2.12: Avoidance and Minimization Measures for Roosting Bats BIO-2.13: Avoidance, Minimization, and Compensatory Measures for Monarch Butterfly BIO-2.14: Implement Seasonal Restrictions for In-Water Work BIO-3.1: Avoidance and Minimization Measures for Sensitive Natural Communities, including Ruderal Riparian Habitat BIO-3.2: Compensate for Loss of Ruderal Riparian Habitat BIO-3.3: Prevent the Introduction or Spread of Invasive Plant Species BIO-4.1: Avoidance and Minimization Measures for Wetlands and Drainages during Construction BIO-4.2: Compensate for Impacts on Jurisdictional Wetlands and Nonwetland Waters of the United States (aquatic resources) and the state prior to Impacts during Construction BIO-5.1: Compensate for Tree Removal during Construction BIO-7.1: Avoidance and Minimization Measures for Nesting Birds during Operation and Maintenance Activities BIO-7.2: Avoidance and Minimization Measures for Roosting Bats during Operation and Maintenance Activities BIO-7.3: Conduct Pre-Activity Survey for Special-Status Wildlife Species Prior to Conducting Maintenance Activities BIO-10.1: Model Hydraulics of New Bridge before Construction and Design Bridge to Accommodate Fish Migration
Project's Contribution Considerable?	Construction and Operation No

Cumulative rail and other regional transportation projects would not likely affect biological resources if these projects are located entirely within the existing railroad or roadway right-of-way. However, certain features for cumulative rail and other regional transportation projects located outside the existing railroad or roadway right-of-way, such as new railroad or roadway bridges crossing waterways or new alignments, could be located in biologically sensitive areas. For example, the retrofit of the Bear Creek Bridge on SR 59 and the widening of Black Rascal and Bear Creek bridges on SR 59 would be expected to affect the aquatic habitat of Bear Creek and Black Rascal Creek. Although the land uses in the vicinity of the Project corridor are generally urbanized, cumulative land development projects could be located in pockets of areas that are biologically sensitive, especially those in areas previously not developed. The loss of biological resources, including special-status plant, wildlife, and fish species; sensitive natural communities; wetlands/other aquatic resources; and trees constitutes a significant cumulative impact on biological resources.

4.6.6.1 Construction

Construction activities for the cumulative projects could result in the loss of biological resources due to land disturbance activities, such as excavation and grading. Construction of cumulative projects could remove or alter habitat for special-status species, remove or degrade riparian and aquatic habitat from an increase in erosion and sedimentation, and remove trees in biologically sensitive areas. Thus, construction of the Project and other cumulative projects could result in a potentially significant cumulative impact on biological resources.

The Project corridor is primarily located within an existing UPRR right-of-way that passes through urban and suburban areas. The majority of the Project would be located within the existing UPRR right-of-way, roadway right-of-way, or urbanized areas. Biologically sensitive areas for the Project are limited to waterways such as the various creeks and canals where aquatic, wetland, and riparian land cover types are present.

As described in Section 3.4, *Biological Resources*, construction of the Project could have significant impacts on wildlife and fish species; sensitive natural communities; wetlands/other aquatic resources; and trees. However, Mitigation Measures BIO-2.1 through BIO-2.14 for special-status wildlife and fish species; BIO-3.1 through BIO-3.3 for sensitive natural communities, including ruderal riparian habitat; BIO-4.1 and BIO-4.2 for protection of wetlands and drainages; BIO-9.1 for species movement and migratory corridors; and BIO-5.1 for trees are identified to reduce construction impacts to less-than-significant levels. Because construction of the Project would not occur in pristine areas, but rather in developed rail corridors and highly urbanized areas, impacts would be on remnant biological resources in that context. With mitigation, the Project’s residual construction impacts would be limited in scale and extent. Thus, the Project’s contribution to cumulative impacts on biological resources as a result of construction would be less than considerable with mitigation.

4.6.6.2 Operation

Where the Project would be constructed on previously undeveloped sites, in particular new stations and layover facilities, there could be increases in the stormwater runoff that may degrade water quality in surface waters downstream of the Project corridor and affect aquatic species. Similarly, cumulative projects located on undeveloped sites would also increase stormwater runoff, contributing to the degradation of water quality in nearby surface waters. However, compliance with existing water quality regulations and permits would require stormwater runoff treatment for all cumulative projects. Compliance with these existing regulations and permit requirements would ensure each cumulative project’s contribution to stormwater runoff impacts would be less than considerable.

Increased train operations in the Project corridor could result in increased noise effects on wildlife and more train strikes on wildlife, particularly in the portions of the Project corridor where other cumulative rail projects would be located, specifically Freight Rail Future Plans. Noise from cumulative rail projects and freight are expected to increase in the existing UPRR right-of-way where these cumulative rail projects would operate. Future operational conditions along the existing UPRR right-of-way are not expected to be significantly different from existing conditions with respect to special-status wildlife species. Additionally, maintenance activities associated with the Project and other cumulative projects could have significant impacts on special-status species during tree or vegetation management along the Project corridor. Based on the above, a significant cumulative impact could occur. However, the Project would require Mitigation Measures BIO-7.1 through BIO-7.3 to avoid nesting birds during vegetation management, avoid roosting bats during vegetation management, and conduct pre-activity surveys for special-status wildlife species.

New Project permanent structures, such as new bridges over waterways, could have significant impacts on special-status fish species due to changes to channel morphology, hydraulics, and shading where other cumulative projects would be located. Specifically, the retrofit of the Bear Creek Bridge on SR 59 and widening of SR 59 and associated widening of bridges over Black Rascal Creek and Bear Creek could affect both creeks. The Project also entails a new railroad bridge over Bear Creek. However, Mitigation Measure BIO-10.1 would require modeling the hydraulics of new bridges to ensure the least impact on geomorphic integrity of waterways, and modifications to bridge designs to verify water velocities and allow migration of anadromous fish. Thus, the Project's contribution to cumulative impacts on biological resources as a result of operation would be less than considerable with mitigation.

4.6.7 Cultural Resources

The geographic context for the analysis of potential contributions to cumulative impacts on built environment historical resources includes the area within and adjacent to the Project footprint and the parcels surrounding and intersected by the Project. The CEQA study area for the Project includes one historic resource under CEQA. Table 3.5-3 in Section 3.5, *Cultural Resources*, lists the built environment historical resources in the CEQA study area for the Project. For archaeological resources and human remains, the geographic context for potential cumulative impacts includes areas where cumulative projects overlap with the study area. No known archaeological resources exist within the study area. However, archaeological sites are known to exist in the vicinity, and the presence of unknown archaeological resources or human remains cannot be ruled out. Cumulative projects in the geographic area for cultural resources include all projects listed in Section 4.5, *Projects Considered*, that are within or adjacent to the areas planned for Project improvements.

The Project would have no impact on built environment historical resources during operations. However, operations of the Project have been deemed to have potentially significant impacts on archaeological resources during ground-disturbing activities such as the removal of woody debris. The cumulative impacts analysis for cultural resources relies on a list-based approach.

Impact C-CUL-1	Construction and operation of the Project would not contribute considerably to a significant cumulative impact on cultural resources.
Level of Cumulative Impact	Construction and Operation Significant (see below in regard to the Project's contribution)
Applicable Mitigation Measures	CUL-2.1: Stop Work if Archaeological Material or Features Are Encountered during Ground-Disturbing Activities CUL-3.1: Comply with State Laws Relating to Human Remains
Project's Contribution Considerable?	Construction and Operation No

4.6.7.1 Construction

While the Project would not cause an adverse change to a property listed in or eligible for listing in the National Register of Historic Places and California Register of Historical Resources, the construction of cumulative rail and other transportation projects could result in significant impacts on historical resources; however, these impacts would be site-specific and not cumulative.

Additionally, construction activities associated with these cumulative projects could affect unknown archaeological resources or human remains in the study area. If unknown archaeological resources or human remains are disturbed, the cumulative projects could result in significant cumulative impacts.

Construction of other cumulative projects, including land development projects, could also affect cultural resources outside the Project area and its immediate vicinity. Because these impacts would be site specific and would not overlap geographically with the Project, they would not interact with the Project and are not discussed further in this analysis.

Historical Resources

As described in Section 3.5, *Cultural Resources,* the Project would not result in changes to the significance of a historical resource to the point where the resource would no longer be considered historic. Thus, the Project would not contribute to cumulative impacts on historical resources as a result of construction.

Archaeological Resources and Human Remains

Construction activities for the cumulative projects and the Project could result in potentially significant impacts on unknown archaeological resources or human remains due to land disturbance activities, such as excavation and grading. Construction of cumulative projects and the Project could lead to inadvertent discoveries of previously unidentified archaeological resources or human remains, which could result in a potentially significant cumulative impact.

However, Mitigation Measures CUL-2.1 and CUL-3.1 are identified to reduce construction impacts to less-than-significant levels. With mitigation, the Project's residual construction impacts would be limited in scale and extent. Thus, the Project's contribution to cumulative impacts on archaeological resources and human remains as a result of construction would be less than considerable with mitigation.

4.6.7.2 Operation

Historic Resources

Operation of the Project, in combination with other foreseeable projects in the surrounding area, would not result in a significant cumulative impact on historical resources.

Archaeological Resources and Human Remains

Operation activities for the cumulative projects and the Project could result in potentially significant impacts on archaeological resources or human remains due to land disturbance activities during operations and maintenance, such as removal of woody debris. Operation of cumulative projects and the Project could lead to inadvertent discoveries of previously unidentified archaeological resources or human remains. Thus, operation of the Project and other cumulative projects could result in a potentially significant cumulative impact on archaeological resources or human remains.

However, Mitigation Measures CUL-2.1 and CUL-3.1 are identified to reduce operation impacts to less-than-significant levels. With mitigation, the Project's residual operation impacts would be limited in scale and extent. Thus, the Project's contribution to cumulative impacts on archaeological resources and human remains as a result of operations would be less than considerable with mitigation.

4.6.8 Tribal Cultural Resources

The geographic context for the analysis of the cumulative impacts associated with tribal cultural resources considers the study area (as described in section 3.5, *Cultural Resources*) where it overlaps with all projects listed Section 4.5, *Projects Considered*. The cumulative impacts analysis for tribal cultural resources relies on a list-based approach.

Impact C-TCR-1	Construction and operation of the Project would not contribute considerably to a significant cumulative impact on tribal cultural resources.
Level of Cumulative Impact	<u>Construction and Operation</u> Significant (see below in regard to the Project's contribution)
Applicable Mitigation Measures	CUL-2.1: Stop Work if Archaeological Material or Features Are Encountered during Ground-Disturbing Activities CUL-3.1: Comply with State Laws Relating to Human Remains TCR-1.1: Stop Work if Tribal Cultural Resources Are Encountered during Ground-Disturbing Activities
Project's Contribution Considerable?	<u>Construction and Operation</u> No

Because there are no known tribal cultural resources within the Project area, cumulative rail and other regional transportation projects would not likely affect tribal cultural resources if these projects are located entirely within the Project area. However, precontact (Native American) archaeological sites and tribal cultural resources are known to exist in the region. In the event that previously unknown tribal cultural resources are encountered during ground disturbance related to the projects, a substantial adverse change in the significance of an as-yet-unknown tribal cultural resource could occur from its demolition, destruction, relocation, or alteration, and the significance of the resource could be materially impaired (CEQA Guidelines § 15064.5[b][1]). This would be a potentially significant cumulative impact.

4.6.8.1 Construction

Construction activities for the cumulative projects and the Project could result in potentially significant impacts on tribal cultural resources due to land disturbance activities, such as excavation and grading. Construction of cumulative projects and the Project could lead to inadvertent discoveries of previously unidentified tribal cultural resources, which could result in a potentially significant cumulative impact.

However, Mitigation Measures CUL-2.1, CUL-3.1, and TCR-1.1 are identified to reduce construction impacts to less-than-significant levels. With mitigation, the Project's residual construction impacts would be limited in scale and extent. Thus, the Project's contribution to cumulative impacts on tribal cultural resources as a result of construction would be less than considerable with mitigation.

4.6.8.2 Operation

Operation activities for the cumulative projects could result in potentially significant impacts on tribal cultural resources due to land disturbance activities during operation and maintenance, such as removal of woody debris. Operation of cumulative projects and the Project could lead to inadvertent discoveries of previously unidentified tribal cultural resources. Thus, operation of the Project and other cumulative projects could result in a potentially significant cumulative impact on tribal cultural resources.

However, Mitigation Measures CUL-2.1, CUL-3.1, and TCR-1.1 are identified to reduce operation impacts to less-than-significant levels. With mitigation, the Project's residual operation impacts would be limited in scale and extent. Thus, the Project's contribution to cumulative impacts on tribal cultural resources as a result of operation would be less than considerable with mitigation.

4.6.9 Energy

The geographic context for potential contributions to cumulative impacts on energy resources is the service area of Pacific Gas and Electric Company (PG&E), which comprises the larger Northern and Central California areas, including Merced County and the Merced Irrigation District. As explained in Section 4.3, *Approach and Methodology*, the energy analysis relies on the projection approach rather than a list of individual projects for the cumulative analysis.

Impact C-EN-1	Construction and operation of the Project, in combination with other foreseeable projects in the surrounding area, would not result in a significant cumulative impact on energy resources.
Level of Cumulative Impact	<u>Construction and Operation</u> Less than significant
Applicable Mitigation Measures	None

4.6.9.1 Construction

During construction of the Project, along with other cumulative growth in the PG&E service area, there could be a temporary distributed increased demand for energy resources across Merced County and the larger PG&E service area. However, these regions already accommodate substantial construction projects, and the overall level of construction, considered on a regional scale, is not expected to affect local or regional energy supplies and require additional capacity during peak and base demands for energy to meet the increased demand.

In addition, the use of energy during Project construction would be temporary and limited to the duration of the approximately 4-year construction period. Furthermore, many financial incentives are offered to government and utility companies to support energy-efficient investments. Therefore, it is expected that construction materials built and purchased from offsite suppliers would be efficiently produced based on the economic incentives for efficiency. Additionally, the Project, along with other cumulative growth, would adhere to state and local reuse and recycling requirements, such as CALGreen, which would require a minimum of 65 percent of the nonhazardous construction and demolition debris generated during construction to be recycled and/or salvaged. Compliance with the recycling and reuse requirements would reduce the inherent energy cost of construction materials. Thus, with adherence to these incentives and policies, there would be no significant impacts on energy related to construction.

4.6.9.2 Operation

As stated above, continued growth throughout PG&E's service area could contribute to ongoing increases in demand for energy resources. The anticipated increases would be countered, in part, as state and local requirements related to renewable energy become more stringent and energy efficiency increases. The extent to which cumulative growth through 2032, the Project's opening year, could result in the wasteful, inefficient, or unnecessary consumption of energy resources would depend on the specific characteristics of new development. As discussed in Section 3.7, *Energy*, SB 100 obligates utilities to supply 100 percent carbon-free electricity by 2045, and SB 1020 requires that eligible renewable energy resources and zero-carbon resources supply 100 percent of all retail sales of electricity to California end-users by 2045. Similarly, the Pavley standards are expected to lower the demand for fossil fuels by requiring 100 percent of new vehicles sold by 2035 to be ZE vehicles. Therefore, it is anticipated that future energy use will become more efficient and less wasteful over time.

As discussed in Section 3.7, *Energy*, the Project would decrease operational energy consumption by approximately 146.4 billion British thermal units (Btu) and 0.2 billion Btu when compared to existing year (2022) conditions and opening (2032) no project conditions, respectively. Like the Project, other passenger rail projects such as the ACE Ceres-Merced Extension Project and California HSR System, are expected to increase energy efficiency and result in an overall reduction in energy use from a reduction in automobile VMT and subsequently, overall savings in automobile fuel consumption from the modal shift from personal vehicles to mass rail transit. Therefore, there would be no significant impacts on energy related to operation; in fact, there would be an energy savings that would result in an environmental benefit.

4.6.10 Geology, Seismicity, Soils, and Paleontological Resources

Impacts related to geology, soils, seismicity, and paleontological resources are typically site specific and depend on the local geologic and soil conditions. The geographic context for the analysis of potential cumulative impacts on geology, seismicity, soils, and paleontological resources includes areas within and adjacent to the Project environmental footprint. Impacts related to paleontological resources are specific to the geologic units in which activities would occur and depend on the previous disturbance of sediments. The study area for paleontological resources includes the geologic units affected by the Project as listed in Table 3.8-3 in Section 3.8, *Geology, Seismicity, Soils, and Paleontological Resources*.

Cumulative projects within this geographic context include the projects shown on Figure 4-1 and described in Section 4.5, *Projects Considered*, which display all projects that are located within or adjacent to the Project. The cumulative analysis for geology, soils, and paleontological resources relies on a list-based approach.

Impact C-GEO-1	Construction of the Project would not contribute considerably to a significant cumulative impact on geology, seismicity, soils, and unique paleontological/geologic resources. Operation of the Project, in combination with other foreseeable projects in the surrounding area, would not result in a significant cumulative impact on geology, seismicity, soils, and unique paleontological/geologic resources.
Level of Cumulative Impact	<u>Construction</u> Significant (paleontology only; see below in regard to the Project's contribution) Less than significant (geology, seismicity, and soils) <u>Operation</u> Less than significant
Applicable Mitigation Measures	GEO-6.1: Monitor for Discovery of Paleontological Resources, Evaluate Found Resources, and Prepare and Follow a Recovery Plan for Found Resources
Project's Contribution Considerable?	<u>Construction</u> No

4.6.10.1 Construction

Construction impacts are limited to the potential for increased erosion and potential damage to paleontological resources. Impacts related to other geologic and soil conditions are discussed under operations. However, paleontological resources are nonrenewable and are subject to impacts from ground-disturbing activities such as grading, excavation, and vegetation clearing (Society for Vertebrate Paleontology 2010). As a nonrenewable resource, rail and other regional transportation construction activities on geologic units that may contain paleontological resources have the potential to remove such resources irretrievably from the scientific record. Accordingly, in areas of rapid growth where paleontological resource-rich geologic units lie close to the ground surface, such as in the paleontological resources study area described in Section 3.8, *Geology, Seismicity, Soils, and Paleontological Resources*, a cumulative impact on paleontological resources has potential to exist.

Geologic and Soil Conditions

Construction of any of cumulative projects described in Section 4.5, *Projects Considered*, could result in cumulatively significant erosion impacts unless construction activities are controlled. All new projects that disturb 1 or more acres, which includes all of the land development projects and many of the regional transportation improvement cumulative projects listed above, as well as the Project, must comply with the National Pollutant Discharge Elimination System (NPDES) Construction General Permit, which requires substantive controls to prevent erosion during project construction, including preparation of a Stormwater Pollution Prevention Plan (SWPPP). As a result, no significant cumulative erosion impact would occur.

Paleontological Resources

Construction of any of the cumulative rail and other regional transportation projects described in Section 4.5, *Projects Considered,* that are located on geologic units with high or undetermined paleontological sensitivity have potential to result in cumulative impacts on paleontological resources as a result of ground-disturbing construction activities. As shown on Figure 3.8-8 and described in Table 3.8-3 in Section 3.8, *Geology, Seismicity, Soils, and Paleontological Resources*, the Modesto and Riverbank Formations are considered sensitive for paleontological resources. Although some of the cumulative projects described in Section 4.5, *Projects Considered,* would be located in previously disturbed areas, most would be located within the Modesto and Riverbank Formations.

Because the geographical areas described above are subject to population growth, and the sediments at 5 feet and greater below ground surface have largely not been disturbed, construction of these cumulative projects, as well as the Project, could have a significant cumulative impact on paleontological resources.

The Project would be located in areas that are underlain by geologic units that have yielded abundant, diverse, and scientifically important fossil finds, including remains of numerous vertebrates. Where geologic units with high paleontological sensitivity are present, construction related ground disturbance, particularly excavation and grading, could result in disturbance, damage, or loss affecting significant (scientifically important but non-unique) paleontological resources. Ground disturbance by cumulative projects located within these sensitive geologic units presents a similar potential to disturb, damage, or lose such resources. However, Mitigation Measure GEO-6.1 during Project construction would require paleontological monitoring, resource evaluation, and the preparation of recovery plans for found resources. This measure would provide ample protection for paleontological resources during Project construction. Thus, by recovering any paleontological resources found during ground-disturbing activities and conserving information about the context in which they were found, the Project's contribution to cumulative impacts on paleontological resources or unique geologic features as a result of construction would be less than considerable.

4.6.10.2 Operation

Geologic and Soil Conditions

Individual cumulative projects could increase exposure of people or structures to geologic, seismic, and soil hazards that could result in a project-level impact. The Merced County portion of the San Joaquin Valley is likely to experience strong seismic activity that could damage structures or expose people to greater risks of loss of life and injury. However, all individual projects would be subject to applicable state codes, particularly the California Building Standards Code and the requirements of the Alquist-Priolo Act, along with local codes and design standards, all of which are specifically designed to reduce site-specific geologic, seismic, and soils hazards. Septic systems, if necessary, for any identified projects, are regulated by the County's respective Local Agency Management Programs for Onsite Wastewater Treatment Systems, which are in turn regulated by the State Water Resources Control Board (SWRCB). Local Agency Management Programs contain specific septic system design and operational requirements that are intended to reduce the potential for water quality degradation to the maximum extent practicable.

As described in Section 3.8, *Geology, Seismicity, Soils, and Paleontological Resources*, portions of the Project would be sited in areas with known geologic hazards, including corrosive soils and strong ground shaking. However, the Project would be designed and constructed in accordance with industry design standards, guidelines, and regulations, which would ensure that geologic and soil hazards do not compromise the structural integrity of the facilities that are proposed. Therefore, there would be no cumulative geologic and soil hazard impacts during operation.

Paleontological Resources

Operation and maintenance activities associated with cumulative rail and other regional transportation projects that would be located on geologic units with high or undetermined paleontological sensitivity (Modesto or Riverbank Formation) could potentially affect paleontological resources if ground-disturbing maintenance activities are required. While operational activities are generally not ground disturbing, maintenance activities can involve ground disturbance such as vegetation removal, which could result in erosion that may expose or damage paleontological resources. However, because ground disturbance associated with maintenance generally takes place on land previously disturbed during project construction, no significant cumulative operational impact on paleontological resources is expected to occur.

4.6.11 Hazards and Hazardous Materials

Hazardous materials impacts are typically site specific and depend on the soil and groundwater conditions underlying project sites. The geographic context for potential cumulative impacts related to hazardous materials includes areas within 0.25 miles of the Project for transportation projects and 0.15 mile for development projects, respectively. Projects within this geographic context include the projects described in Section 4.5, *Projects Considered*. The analysis for hazardous materials relies on a list-based approach.

Impact C-HAZ-1	Construction and operation of the Project would not contribute considerably to a significant cumulative impact from hazardous materials.
Level of Cumulative Impact	<u>Construction and Operation</u> Significant (see below in regard to the Project's contribution)
Applicable Mitigation Measures	HAZ-2.1: Site Management Plan HAZ-2.2: Conduct a Hazardous Building Materials Survey prior to Demolition Activities TR-1.1: Transportation Management Plan (TMP) for Project construction
Project's Contribution Considerable?	<u>Construction and Operation</u> No

4.6.11.1 Construction

Similar to the Project, reasonably foreseeable projects could result in construction impacts related to the routine transport, disposal, or handling of hazardous materials; intermittent use and transport of petroleum-based lubricants, solvents, and fuels; and transport of affected soil to and from sites, resulting in a significant cumulative impact. However, hazardous waste generated during construction of any project would be collected, properly characterized for disposal, and transported in compliance with federal, state, and local regulations. Hazardous materials are strictly regulated by local, state, and federal laws. Specifically, these laws are designed to ensure that hazardous materials do not result in a gradual increase in toxins in the environment. For each of the reasonably foreseeable projects under consideration, various project-specific measures (such as the ones identified for this Project) would be implemented as a condition of development approval to mitigate risks associated with exposure to hazardous materials. With applicable regulatory requirements, and with implementation of Mitigation Measures HAZ-2.1, 2.2, and TR-1.1, the Project would not result in a cumulatively considerable contribution to a significant cumulative hazard or hazardous materials impact during construction.

4.6.11.2 Operation

Similar to the Project, reasonably foreseeable projects could result in operation impacts related to the routine transport, disposal, or handling of hazardous materials; intermittent use and transport of petroleum-based lubricants, solvents, and fuels; and transport of affected soil to and from sites, resulting in a significant cumulative impact. The Project would contribute to a cumulative increase in the amount of hazardous materials transported to and from the surrounding area. Cumulative increases in the transportation of hazardous materials and wastes would not be significant because the probability of accidents is relatively low due to stringent regulations that apply to transport, use and storage of hazardous materials. The Project, in combination with other development in the immediate vicinity, would add to cumulative traffic congestion on those roadways used for evacuation. However, the Project site and immediate vicinity are well serviced by an extensive vehicular circulation network, allowing multiple possible evacuation routes in the case of an emergency. Moreover, the Project would substantially reduce long-term overall VMT within the Project area, which would correspond to a general reduction in overall traffic congestion on the roadway network. This congestion improvement is expected to more than offset the localized effects at individual stations or support facilities, resulting in a net improvement in emergency response times. As such, the Project would not result in a cumulatively considerable contribution to a significant cumulative impact related to interference with an adopted emergency response plan or emergency evacuation plan.

Development of the Project would contribute to a cumulative increase in the demand for emergency response capabilities. Any growth involving increased use of hazardous materials has the potential to increase the demand for emergency response capabilities. First response capabilities and hazardous materials emergency response capabilities are currently available for all cumulative projects. Substantive hazardous materials accidents within the Project site or its vicinity are expected to be rare, and if such incidents were to occur, only one such incident would be expected at any one time (except during major catastrophes).

For these reasons, the Project would not result in a cumulatively considerable contribution to a significant cumulative hazard or hazardous materials impact during operation.

4.6.12 Hydrology and Water Quality

The geographic context for cumulative impacts on hydrology and water quality consists of the Project footprint, vicinity, and downstream water bodies. Cumulative projects within this geographic context include the projects described in Section 4.5, *Projects Considered*. The cumulative analysis for hydrology and water quality relies on a list approach and considers potential cumulative impacts associated with erosion, stormwater runoff, water quality, groundwater recharge, changes to drainage patterns, and flooding.

Impact C-HYD-1	Construction and operation of the Project would not contribute considerably to a significant cumulative impact on hydrology and water quality.
Level of Cumulative Impact	<u>Construction and Operation</u> Significant (see below in regard to the Project's contribution)
Applicable Mitigation Measures	HYD-8.1: Perform Detailed Hydraulic Evaluations and Modify Designs for Facilities Within Flood Zones if Required to Reduce Potential Flooding Impacts HYD-8.2: Model Hydraulics of New Bridges Before Construction and Design Bridges to Avoid Increased Flooding and Accommodate Fish Migration
Project's Contribution Considerable?	<u>Construction and Operation</u> No

4.6.12.1 Construction

Water Quality, Erosion and Spills

Earthmoving activities associated with the projects listed in Section 4.5, *Projects Considered*, have the potential to increase erosion and result in accidental spills of hazardous materials. During winter storm events, disturbed soils and hazardous materials could be transported to downstream receiving water bodies, resulting in sedimentation and accumulation of pollutants such as fuels, lubricants, and paints that could degrade water quality. Therefore, projects that would also occur adjacent to water bodies, including creeks and canals spanned by the Project, would result in significant cumulative erosion- and pollutant-related water quality impacts during construction.

As described in Section 3.10, *Hydrology and Water Quality*, the Project also has the potential to degrade water quality from soil, sediment, construction materials, and hazardous materials that could be transported to downstream water bodies. Furthermore, the Project would also involve in-water work for the Bear Creek Bridge as well as culverts in a variety of locations. However, projects that disturb 1 acre or more of soil, which includes the Project as well as most of the projects listed in Section 4.5, *Projects Considered*, are required to comply with the requirements of SWRCB's NPDES Construction General Permit. The Construction General Permit requires preparation of a SWPPP and implementation of best management practices that are specifically designed to protect water quality. Additionally, the Project would require implementation of permit requirements from California Department of Fish and Wildlife, U.S. Army Corps of Engineers, and/or the SWRCB. Additional requirements that would also prevent degradation of water quality for in-water work include the Clean Water Act Section 401 Water Quality Certification. Similarly, cumulative projects that potentially require in-water work, including retrofit of the Bear Creek Bridge on SR 59 and widening of SR 59 and associated widening of bridges over Black Rascal Creek and Bear Creek, would be required to adhere to the same regulations. In summary, both the Project and the cumulative projects would be required to adhere to local, state, and federal regulations that require measures to protect water quality. Thus, the Project's contribution to cumulative construction impacts on water quality from erosion would not be considerable.

Water Quality, Flooding

The Project would be located within mapped 100-year floodplains. Other cumulative projects such as ACE Ceres-Merced Extension Project, California HSR System, and San Joaquins Rail Service Expansion would also be located within the 100-year floodplain. If storm-related flooding of construction areas were to occur, stockpiles of construction materials could be inundated and carried into onsite or offsite water bodies, which could result in pollution of surface waters and result in a significant cumulative impact. However, prior to a potential flood event, construction equipment and materials that are located in the floodplain would be relocated as necessary such that release of pollutants due to Project inundation would be minimized and to prevent construction materials and equipment from impeding or redirecting flood flows. Thus, the Project's contribution to cumulative construction impacts on water quality from flooding would be less than considerable.

4.6.12.2 Operation

Water Quality and Stormwater Runoff

Operation of any of the projects listed in Section 4.5, *Projects Considered*, could degrade water quality due to an increase in impervious surfaces and associated increase in the amount of stormwater runoff. Operation of cumulative projects could also increase the potential handling of hazardous materials which could contaminate stormwater runoff. Increases in stormwater runoff could result in increased downstream erosion and sedimentation, resulting in increased turbidity in receiving waters. Contaminated stormwater runoff would result in increased pollutant loading due to contact with petroleum and other contaminants commonly deposited on impervious surfaces. In addition, rail and other regional transportation projects would increase the potential for leakage of diesel, oil, and grease, and for accidental spills of herbicides, which are used for vegetation maintenance along railway corridors; leaks or spills of any of these materials could further degrade surface water quality. This would result in a significant cumulative impact related to water quality and stormwater runoff.

However, the Project and the cumulative projects would be required to adhere to local, state, and federal regulations including the applicable Municipal Separate Storm Sewer System (MS4) Permit and Industrial General Permit, as needed. Compliance with these permits require the implementation of measures to protect water quality including low-impact development source control, site design, and stormwater treatment for pollutant-generating activities. Therefore, the cumulative contribution of these projects related to water quality would be less than considerable.

As described in Section 3.10, *Hydrology and Water Quality*, operation of the Project could result in increased pollutants involving petroleum products (e.g., oil, grease, diesel) and metals. Under typical operating conditions, the amount of these pollutants released by modern trains is minimal because trains undergo regular inspections and maintenance to prevent and fix leaks. Compliance with existing regulations including the Construction General Permit; requirements for Priority Development Projects under the Central Valley Permit or Small MS4 Permit; and Industrial General Permit as well as design of stormwater control systems in in accordance with the Caltrans Project Planning and Design Guide (Caltrans 2019) would ensure that stormwater runoff from the Project would not cause erosion and sedimentation in receiving waters and that runoff from impervious surface areas is managed and treated to remove contaminants. Most, if not all cumulative projects would also be required to comply with applicable NPDES/MS4 permits during operation. Thus, the Project's contribution to cumulative operational impacts on stormwater runoff would be less than considerable.

Groundwater Recharge

The Project, as well as all the projects listed in Section 4.5, *Projects Considered*, would create new impervious surfaces that could impede groundwater recharge because stormwater would run off of the impervious surfaces rather than infiltrating the ground surface and recharging aquifers, resulting in a significant cumulative impact. Stormwater runoff would be conveyed either to local surface drainage ways, where it would percolate through the ground back into the groundwater aquifer or would be conveyed via underground pipelines to larger streams and rivers. Improvements within the existing UPRR right-of-way would be required to comply with the post-construction requirements of the NPDES Construction General Permit, which requires post-construction runoff to match pre-construction runoff for the 85th-percentile storm event. Improvements would also be required to comply with applicable MS4 Permit requirements for stormwater control and treatment, which include low-impact development source control, site design, and stormwater treatment. Thus, the Project's contribution to cumulative impacts on groundwater recharge during operation would be less than considerable.

Changes in Drainage Patterns and Flooding

The Project, as well as all of the projects listed in Section 4.5, *Projects Considered*, would create new impervious surfaces that could result in changes to existing drainage patterns that may create or contribute excessive runoff that would exceed the capacity of stormwater drainage systems and result in localized flooding, resulting in a significant cumulative impact. Local planning requirements would require most, if not all, cumulative projects to prepare an analysis of a project's individual impacts on the existing drainage systems. If a project's impacts are significant, fair-share contributions toward facility improvements over time are generally required. In addition, compliance with regional and countywide stormwater regulations would address substantial sources of increased runoff associated with cumulative projects and require such projects to provide features for retention of water onsite and treatment of stormwater runoff. Project improvements within the existing UPRR right-of-way would include altering drainage patterns by altering or creating trackside ditches and drainage systems. Project improvements outside the UPRR right-of-way would also include new impervious surfaces and stormwater drainage systems at new stations and facilities, which would alter drainage patterns and create new sources of runoff. If stormwater control systems are not appropriately designed for these improvements, stormwater runoff could exceed the capacity of stormwater drainage systems and result in flooding. However, compliance with existing regulations, including post-construction requirements of the Construction General Permit and hydromodification management requirements of applicable MS4 permits, would minimize stormwater runoff.

As described in Section 3.10, *Hydrology and Water Quality*, portions of the Project would be located within the Federal Emergency Management Agency 100-year floodplain that could potentially impede or redirect flood flows during operation. Other cumulative projects located within a 100-year flood zone include ACE Ceres-Merced Extension Project, California HSR System, and San Joaquins Rail Service Expansion. The cumulative projects are also subject to post-construction requirements of the SWRCB's NPDES Construction General Permit and hydromodification management requirements of applicable MS4 permits, which are designed to reduce runoff and thereby limit the potential for flooding created by stormwater runoff. Mitigation Measures HYD-8.1 and HYD-8.2 would require detailed hydraulic evaluations to design structures located in the floodplain such that creek flows would not result in increased siltation or exceed the capacity of storm drainage systems and result in redirected flood flows. Thus, the Project's contribution to cumulative impacts related to changes in drainage patterns and flooding during operation would be less than considerable with mitigation.

4.6.13 Land Use and Planning

The geographic context for cumulative impacts on land use and planning is the city of Merced and Merced County. The cumulative analysis considers rail projects planned within or along the Project corridor; other regional transportation improvements; and land development projects adjacent to the Project corridor as summarized in Section 4.5, *Projects Considered*. The cumulative analysis for land use and planning relies on a list approach.

Impact C-LU-1	Construction and operation of the Project, in combination with other foreseeable projects in the surrounding area, would not result in a significant cumulative impact on land use and planning.
Level of Cumulative Impact	Construction and Operation Less than significant
Applicable Mitigation Measures	None

4.6.13.1 Construction

Construction of rail and road projects (Section 4.5.1, *Rail Projects Planned within the Project Corridor*, and Section 4.5.2, *Other Regional Transportation Improvements*) and land development projects (Table 4-3) along with the Project could result in temporary land use impacts adjacent to the UPRR right-of-way because of temporary construction disruptions to existing land uses. However, road and rail projects would either occur within existing railroad or roadway rights-of-way, on easements temporarily acquired for construction, or on vacant lands adjacent to such features. Land use development projects (Table 4-3) would temporarily displace the parcel's existing land use(s) with a new use but would have to go through local land use permitting processes to ensure consistency with local plans and policies. Therefore, none of the cumulative projects, in combination with the Project, is expected to result in a significant cumulative impact due to temporary disruption in construction related to divisions of a community, or conflicts with land use plans, policy, or regulations for the purpose of avoiding or mitigating an environmental effect.

4.6.13.2 Operation

Community Division

Operation of the Project would occur on new rail corridor adjacent to SR 59 and within the existing UPRR right-of-way. The other cumulative projects that would also use the UPRR right-of-way between Ceres and Merced include the ACE Ceres-Merced Extension Project, California HSR System, and San Joaquins Rail Service Expansion. Additionally, other cumulative regional transportation improvements including the Merced Seismic Retrofit Project and Conversion of California's

Passenger Train Fleet to Zero Emissions Project. The Project would include one at-grade crossing at Cooper Avenue, potentially causing minor travel delays for individuals accessing the industrial area via Cooper Avenue. Operation of the Project through downtown would occur on an aerial guideway primarily within UPRR right-of-way and would contribute to the existing physical barrier created by the at-grade UPRR rail corridor. Project facilities that are located outside the existing UPRR right-of-way consist of new station parking areas. The approved ACE Merced Layover and Maintenance Facility would be located in an industrial area and would not alter or impede connectivity and access in Merced, sever existing roads or crossings, or displace community uses. Thus, there would be no significant cumulative impact related to community division.

Land Use Plan/Policy Consistency

The Project and cumulative projects would generally be consistent with regional and local plans and policies, which emphasize providing energy-efficient alternatives to the automobile and promoting regional passenger rail services in the communities the Project and cumulative projects would service. The Project would be consistent with the local land use plans, community/specific plans, and general plans described in Section 3.11.2, *Regulatory Setting*, and summarized in Table 3.11-1, which prioritize development within city boundaries, promote transit ridership, and promote effective and efficient transit infrastructure. The Project would be consistent with MCAG's RTP/Sustainable Communities Strategy, Merced County's General Plan, and the City of Merced Vision 2030 General Plan. Operation of the Project directly supports MCAG's RTP Plan, which identifies the Project as a critical project for future operations of the Amtrak San Joaquins passenger rail service, enabling direct cross-platform connections to other rail services and transit. The cumulative projects listed above are consistent with adopted regional and local planning policy. Related goals and objectives listed in the MCAG 2018 RTP include:

- Providing a regional transit system that increases mobility for urban and rural populations
- Providing a rail system that offers safe and reliable service for passengers
- Reducing per capita GHG emissions through compact growth and alternative transportation strategies
- Achieving a significant reduction in congestion and roadway incidents
- Providing equitable transportation options for all populations

As such, operation of the Project enables connections between various future passenger rails, including HSR and there would be no significant cumulative impact related to land use plans and policies.

4.6.14 Noise and Vibration

The geographic context for potential cumulative noise and vibration-related impacts consists of the areas adjacent to and in the vicinity of the Project. Cumulative projects within this geographic context include the projects listed in Section 4.5, *Projects Considered*. The cumulative analysis for noise and vibration relies on a list approach.

Impact C-NOI-1	Construction of the Project would contribute considerably to a significant cumulative impact on noise and vibration. Operation of the Project would not contribute considerably to a significant cumulative impact on noise and vibration.
Level of Cumulative Impact	Construction and Operation Significant (see below in regard to the Project's contribution)
Applicable Mitigation Measures	NOI-1.1: Implement a Construction Noise Control Plan NOI-2.1: Implement a Construction Vibration Control Plan
Project's Contribution Considerable?	Construction Yes Operation No

4.6.14.1 Construction

Noise

Construction of the Project would include three elements: (1) new San Joaquins alignment from BNSF to the proposed integrated station, (2) realignment of the UPRR industrial spur, and (3) San Joaquins access and improvements to the approved ACE Merced Layover and Maintenance Facility. The new alignment construction is expected to occur over a period of 30 months, the realignment is expected to occur over a period of 12 months, and the improvements to the approved ACE Merced Layover and Maintenance Facility are expected to occur over 24 months (refer to Table 2-10 in Chapter 2, *Project Description*). As described in Section 3.12, *Noise and Vibration*, construction noise impacts would be limited to residences within 135 to 270 feet from the Project construction site for daytime construction and 430 to 860 feet for nighttime construction. For a cumulative impact to occur, a cumulative project would need to be located near one of the sensitive receptors that the Project would affect and construction for the cumulative project would need to occur at the same time as the Project. The construction schedules for the cumulative projects are not currently known; therefore, it is not possible to determine at this time if there would be potential cumulative impacts. However, due to the proximity of some cumulative projects next to sensitive receptors, the potential exists for a significant cumulative noise impact to occur during construction.

Construction noise impacts for the Project would be greatest during work at locations where pile driving is required for bridge construction. Because part of the Project is located on an active rail line, construction work could occur during the nighttime. Nighttime construction near residential uses would have larger impacts than daytime construction and would result in a potentially significant impact. Even with Mitigation Measure NOI-1.1, which would require preparation of a noise control plan to reduce potential construction noise impacts, noise impacts would not necessarily be reduced at all times during construction to a less-than-significant level, particularly with the likelihood of substantial nighttime construction for the Project. Because there could be other cumulative projects simultaneously under construction adjacent to the Project, the Project could result in a considerable contribution to a cumulative noise impact during construction.

Vibration

As described in Section 3.12, *Noise and Vibration,* construction vibration impacts would extend to distances of 230 to 290 feet from pile-driving activities, depending on the vibration sensitivity of the land use category. Mitigation Measure NOI-2.1 would require preparation of a vibration control plan to reduce potential construction vibration impacts. Although there could be other cumulative projects simultaneously under construction adjacent to the Project, unlike noise, vibration levels do not accumulate (like noise levels can). Thus, there would be no significant cumulative impact related to vibration during construction.

4.6.14.2 Operation

Noise

Cumulative operational noise would occur from the noise generated by trains operating within the UPRR right-of-way, the BNSF right-of-way, the proposed ACE Ceres to Merced Extension and the proposed California HSR Project. The operational noise impacts from the Project, the ACE Ceres to Merced Project and the California HSR Project in the Project area are all less than significant. It is anticipated that from 2016 to 2040, the number of freight trains may almost double, which would result in an increase in noise of approximately 3 decibels. This increase in noise due to freight would represent a significant cumulative impact. However, this significant cumulative operational noise impact would exist even without the Project and as shown in Section 3.12, *Noise and Vibration*, the noise impacts from operation of the Project are less than significant. Thus, the Project would not contribute considerably to this cumulative noise impact.

Vibration

Cumulative rail projects would be the largest contributor to an increase in the number of operational vibration events in the Project area. The only location where there would be cumulative vibration effects due to the increase in the number of events would be in the area along the UPRR right-of-way. Vibration from UPRR freight operations, the proposed ACE Ceres to Merced Extension and the proposed California HSR Project would contribute to a cumulative increase in the number of train events. However, the only operations that would exceed the Federal Transit Administration annoyance thresholds would be the existing and future UPRR freight operations. Existing vibration levels for freight at 100 feet from the outermost track varies between 73 and 81 vibration decibels (VdB), which is considered representative for future freight service increases. These existing levels exceed the Federal Transit Administration annoyance thresholds of 72 VdB for immediately adjacent residences and of 75 VdB for immediately adjacent institutional buildings, but none approach structural damage thresholds. This increase in operational vibration due to freight service increases would represent a significant cumulative impact.

Because of the high volume of existing freight train traffic in the area where Project operations would occur, the increase in passenger trains with Project operations would be very small. Thus, the Project's contribution to cumulative vibration impacts as a result of operations would be less than significant and the Project would not contribute considerably to this cumulative vibration impact.

4.6.15 Public Services and Utilities and Service Systems

The geographic context for cumulative impacts on public services is the county of Merced. Cumulative growth projections within this geographic context are summarized in Table 4-1. The cumulative analysis for public services relies on a projection approach.

The geographic context for cumulative construction impacts on utilities and service systems is the Project corridor and vicinity. The geographic context for the cumulative analysis of operation-related utilities and service systems impacts includes the service area of the utilities and service systems providers to the Project corridor. The cumulative analysis for utility and services relies on a projection approach.

Impact C-PSU-1	Construction and operation of the Project, in combination with other foreseeable projects in the surrounding area, would not result in a significant cumulative impact on public services or utilities. Construction of the Project would not contribute considerably to a significant cumulative impact on construction of new or relocated utilities.
Level of Cumulative Impact	Construction and Operation (all other topics) Less than significant Construction (Construction of New or Relocated Utilities) Significant (see below in regard to the Project's contribution)
Applicable Mitigation Measures	TR-1.1: Transportation Management Plan (TMP) for Project construction
Project's Contribution Considerable?	Construction (Construction of New or Relocated Utilities) No

4.6.15.1 Construction

Public Services

During construction of the cumulative projects, there could be a temporary increase in demand for public services throughout the region. However, the region already accommodates substantial numbers of construction projects. On a regional scale, the overall level of construction associated with the cumulative projects and the Project is not expected to substantially change existing demands on public services. Therefore, none of the cumulative projects, in combination with the Project, is expected to result in the need for new or physically altered public facilities or result in any significant cumulative impacts associated with construction of new public facilities.

Construction of the Project would include a modified at-grade crossing and other improvements that could affect local roadways and streets and increase emergency response times. However, traffic impacts would be short-term and temporary. Nonetheless, Mitigation Measure TR-1.1 requires the implementation of a traffic management plan during construction to minimize impacts. The construction road traffic control plan would address temporary road closures, detour provisions, allowable routes, and alternative access. Traffic control plans would ensure that adequate local emergency access would be maintained throughout the entire construction duration. Coordination with local jurisdictions on emergency vehicle access would be required as part of the traffic control plans to lessen these disruptions and to maintain access by firefighters, law enforcement, and emergency medical responders.

Accidents involving construction workers and equipment and increased potential for crime and vandalism at staging areas could result in increased need for public services; however, California Occupational Safety and Health Administration's Title 8 regulations require an emergency action plan that establishes protocol for any construction worker-related emergency scenarios and establishes safety measures to prevent and respond to medical emergencies. Because traffic disruptions and the potential for construction-related accidents would be temporary, construction of the Project, in addition to the cumulative projects listed above, would not result in a permanent increase in public service demand that could require new or altered facilities. Additionally, cumulative project and Project construction would have no significant impacts on service ratios, or other performance objectives for schools and other public facilities, because construction would be temporary and would not generate growth beyond creating temporary employment opportunities, some of which would be filled locally. As such, Project construction, in combination with construction of any or all of the above listed cumulative projects, would not result in a significant cumulative impact on public services.

Utilities

Construction of the Project, as well as the cumulative projects listed in Section 4.5, *Projects Considered*, would require water and electric power and would generate wastewater and stormwater runoff. Local water providers have available capacity to serve the temporary, incremental demands associated with construction of the Project and cumulative projects. The electric power required for construction would be minimal and would not be expected to require the construction of new or expanded electric power facilities.

Wastewater generated during construction of cumulative project and the Project would be accommodated at existing wastewater treatment facilities and would not require new or expanded water or wastewater treatment facilities. These increases, as well as water and power service needs anticipated for identified construction, are not expected to be substantial, would often be served locally by water tanks and generators, and would be temporary in nature. Thus, there would not be a significant cumulative impact related to demand for utilities infrastructure during construction. Stormwater runoff generation for construction of the Project and cumulative projects would be managed through compliance with site-specific SWPPPs, as required by the NPDES program, and is not expected to be substantial during construction activities. As such, Project construction, in combination with construction of identified cumulative projects, would not result in a significant cumulative impact related to stormwater generation.

Construction activities generate construction and demolition waste such as concrete, rubble, fill, and different types of building materials. State and local standards require that contractors divert construction and demolition waste from landfills by reusing or recycling construction and demolition materials. CALGreen (2022 CALGreen 5.408.1.1 through 5.408.1.3) requires that 65 percent of construction and demolition waste generated during construction be recycled or diverted from the waste stream. Compliance with CALGreen requirements would assist in the attainment of solid waste reduction goals and would reduce the amount of solid waste that would be disposed of in landfills during both Project construction and the construction of cumulative projects subject to the same regulatory requirements. It is assumed that landfill facilities in the Project vicinity would have sufficient remaining capacity (or a throughput) that would accommodate the demand for waste disposal. Therefore, there would not be a significant cumulative impact related to landfill capacity.

4.6.15.2 Operation

Public Services

Although operation of the cumulative projects and the Project would introduce passenger rail service to new areas, substantial localized growth is not anticipated as a result of the cumulative projects, the Project, or the installation of track. Thus, growth in and around the cumulative projects, Project, and variants would not be substantial or unplanned. The resultant demand for public services is expected to be minor and would not require new or altered public service facilities to maintain performance objectives. Thus, there would not be a significant cumulative impact related to public services.

Demand for Utilities Infrastructure

There are several identified development projects that would require water, potentially resulting in a significant cumulative impact related to demand for water. While the Project would require some water for routine maintenance, hydrogen processing associated with Variant H1 would create the highest demand, compared to the Project and Variants H2 and H3. Variant H1 would demand approximately 1,648 gallons of water per day which is the equivalent to 1.84 acre-feet per year. During the Project's horizon year of 2030, the City of Merced would supply a total of 26,751 acre-feet per year for a normal water year and 21,401acre-feet per year for a drought lasting 5 consecutive years. Variant H1's demand of 1.84 acre-feet per year would respectively represent 0.0069 percent and 0.0086 percent of the City of Merced's supply during the normal water year and a drought lasting 5 consecutive years. This measurable increase is less than 0.01 percent and is comparatively small in relation to the City of Merced's available supply in 2030 for normal and drought years.

It is assumed that sufficient water supplies available to serve Variant H1. Additionally, during water shortages, including droughts, the City of Merced would meet shortfalls through water shortage contingency plans that are incorporated by the City of Merced Urban Water Management Plan (City of Merced 2021). The cumulative projects identified in Section 4.5.3, *Land Development Projects*, would be required to comply with each respective municipalities' water efficient landscaping and irrigation ordinances pursuant to statewide Green Building Standards. Given the low water demand described above for the Project and Variant H1, the Project and proposed variants would not have a cumulatively considerable operational contribution to demand for water infrastructure. The regulation of stormwater for the Project and the cumulative projects is required to be in compliance with the NPDES. Ongoing compliance would be achieved through stormwater best management practices and control measures identified in the Merced Stormwater Group Stormwater Management Plan. It is assumed that telecommunication, electrical power, and natural gas capacity is available to maintain operations for both the Project and identified cumulative projects. As a result, operation of the Project would have no significant cumulative impact on utilities and public services.

4.6.16 Recreation

As described in Section 3.14, *Recreation*, the Project would have no impact on recreational resources related to construction or increased demand. As cumulative impacts associated with the construction or expansion of recreational facilities are not anticipated, the focus is instead on cumulative impacts related to increased demand for or degradation of recreational facilities.

The geographic context for cumulative construction impacts on recreational resources is the Project corridor and vicinity. The geographic context for operation-related recreational resources impacts is the jurisdiction that provides recreational resources in the vicinity of the Project. For construction disruption to recreational resources, cumulative projects included within this geographic area are all projects described in Section 4.5, *Projects Considered*. For operational impacts on recreational resources, cumulative growth projections within this geographic context are summarized in Table 4-1. The cumulative analysis for recreation relies on a projection approach.

Impact C-REC-1	Construction and operation of the Project, in combination with other foreseeable projects in the surrounding area, would not result in a significant cumulative impact on recreational resources.
Level of Cumulative Impact	Construction and Operation Less than significant
Applicable Mitigation Measures	None

4.6.16.1 Construction

Construction of cumulative projects located on, adjacent to, or in close proximity to existing recreational resources could potentially disrupt use of the resource. Construction activities near recreational resources could result in temporary increases in noise and dust, and visual degradation experienced by users of these recreational resources. Construction of cumulative projects that are located on or partially on the site of recreational resources could also require temporary construction easements within a recreational resource or the temporary closure or disruption to the use of a recreational resource. A cumulative construction-period impact on recreational resources is considered significant if these activities prevent the function of a recreational resource from continuing or would diminish the ability of users to use or access the recreational resource, leading to the increased use of other park areas, such that substantial physical deterioration of those facilities could occur, be accelerated, or require the construction or expansion of recreation resources that would result in an adverse effect on the environment.

Recreational resources located more than 300 feet from the elevated and at-grade alignment are separated by commercial and industrial uses. Construction of the elevated and at-grade lead tracks to the approved ACE Merced Layover and Maintenance Facility would not disrupt use of or result in construction-related impacts on recreational resources. Additionally, all projects described in Section 4.5, *Projects Considered*, are located within the existing built-up environment designated for commercial and industrial uses, and would not disrupt use of or result in construction-related impacts on these parks. Therefore, there would be no significant cumulative impacts on recreation related to construction.

4.6.16.2 Operation

Cumulatively, operation of rail and other regional transportation projects would not induce substantial population growth beyond that already projected for the region. These projects alone would not induce substantial population growth, requiring the need for additional recreational resources to sustain the population. Cumulative land development projects and general regional growth would not increase demands for recreational resources. Although Project operation would introduce passenger rail service to new areas, substantial localized growth is not anticipated. The resultant demand for existing recreational resources is expected to be minor and substantial physical deterioration is not anticipated to occur necessitating the construction of new facilities. Therefore, there would be no significant cumulative impacts on recreation related to operation.

4.6.17 Safety and Security

The geographic context for safety and security is the RSA for safety and security, which is the same as the RSA for Section 3.13, *Public Services and Utilities and Service Systems*. The cumulative analysis considers rail projects planned within or along the Project corridor; other regional transportation improvements; and land development projects adjacent to the Project corridor as summarized in Section 4.5, *Projects Considered*. The cumulative analysis for safety and security relies on a list approach.

Impact C-SAF-1	Construction and operation of the Project would not contribute considerably to a significant cumulative impact on safety and security.
Level of Cumulative Impact	<u>Construction and Operation</u> Significant (see below in regard to the Project's contribution)
Applicable Mitigation Measures	SAF-1.1: Emergency Service Coordination TR-1.1: Transportation Management Plan (TMP) for Project construction
Project's Contribution Considerable?	<u>Construction and Operation</u> No

4.6.17.1 Construction

Construction of the cumulative projects listed in Section 4.5, *Projects Considered*, may increase traffic volumes due to the additional presence of construction trucks and equipment on local roadways and streets. Increased traffic volumes and circulation and traffic obstructions could affect the ability of emergency responders to reach their destinations in a timely manner, thereby potentially interfering with evacuation capabilities in constrained areas in the event of an emergency. Where one or more projects has construction activities occurring at the same time and in the same area, cumulative impacts to emergency response times and evacuation routes could be significant.

As described in Section 3.15, *Safety and Security*, construction of the Project would not result in a significant impact on safety and hazards as they relate to nearby airports, fire hazard severity zones, or design features. It was determined that construction may result in a significant impact related to the impairment of emergency service response times. However, Mitigation Measures SAF-1.1 and TR-1.1 would ensure coordination with local jurisdictions regarding emergency vehicle access and the construction road traffic control plan would address temporary road closures, detour provisions, allowable routes, and alternative access. Thus, the Project's contribution to cumulative impacts related to emergency response or evacuation as a result of construction would be less than considerable with mitigation.

4.6.17.2 Operation

Operation of the cumulative projects listed in Section 4.5, *Projects Considered*, may increase traffic volumes due to the additional presence of vehicles on local roadways and streets. Increased traffic volumes and circulation and traffic obstructions could affect the ability of emergency responders to reach their destinations in a timely manner, thereby potentially interfering with evacuation capabilities in constrained areas in the event of an emergency. The most relevant cumulative projects within the RSA for safety and security are also rail projects—the ACE Ceres-Merced Extension Project and California HSR System. These cumulative projects are not anticipated to result in increased delays for emergency services during operation. There would be no significant impacts to emergency response times and evacuation routes related to operation.

Operation of the cumulative projects is not expected to result in cumulatively significant impacts on safety and hazards related to airports, fires or design features. In the vicinity of Merced, none of the cumulative projects would affect safety or hazards related to an airport. While some of the cumulative projects are within overflight areas relative to the Merced Municipal Airport and the Merced-Castle Airport, these are areas of low to moderate airport noise. As noted above concerning noise, including freight rail, there could be significant cumulative impacts. In the vicinity of Merced, the cumulative projects are not located in a wildfire hazard zone. None of the cumulative rail projects would include design features that would result in significant hazards. As stated in Section 3.15, *Safety and Security*, operation of the Project would not result in a significant impact on safety and hazards as they relate to nearby airports, fire hazard severity zones, or design features. In addition, the Project would not result in significant operational noise impacts. The Project would not introduce any features that would conflict with nearby airport land use plans (i.e., in terms of height restrictions), and the Project would not be located in a state responsibility or very high fire hazard severity zone. Thus, no cumulative significant impacts are identified relative to safety or hazards at airport, fire, or design features. For noise within a vicinity of an airport, there could be cumulative significant impacts relative to excessive noise including freight rail operations, but the Project's contribution would be less than considerable.

The Project may also result in local onsite generation and storage of hydrogen within the footprint of the approved ACE Merced Layover and Maintenance Facility, if Variant H1 is selected. It is possible, in order to comply with the California In-Use Locomotive Regulation, that ACE may decide to utilize hydrogen fuel cell trains in the future and may fuel its trains from hydrogen at the same layover and maintenance facility in Merced. Operation of Variant H1, as well as any potential future hydrogen storage for ACE, would be required to comply with the Federal Aviation Administration and Airport Land Use Compatibility Plan (ALUCP) building height regulations and would otherwise be compatible with the land uses contemplated for the layover and maintenance facility site under the ALUCP. Hydrogen storage would also comply with all safety regulations for the storage and handling of hydrogen (See discussion in Section 3.9, *Hazards and Hazardous Materials*). Potential cumulative hydrogen storage at the layover facility would not pose a significant safety hazard for people working in the Project area or residents in adjacent area and thus is not considered to be cumulatively significant.

4.6.18 Transportation

The geographic context for transportation is the RSA for transportation, as described in Section 3.16.3, *Environmental Setting*. The cumulative analysis considers rail projects planned within or along the Project corridor; other regional transportation improvements; and land development projects adjacent to the Project corridor as summarized in Section 4.5, *Projects Considered*. The cumulative analysis for transportation relies on a list approach.

Impact C-TR-1	Construction and operation of the Project would not contribute considerably to a significant cumulative impact on transportation.
Level of Cumulative Impact	<u>Construction and Operation</u> Significant (see below in regard to the Project's contribution)
Applicable Mitigation Measures	TR-1.1: Transportation Management Plan (TMP) for Project construction TR-1.2: Mainline railway disruption control plan for Project construction TR-1.3: Passenger railway disruption control plan for Project construction
Project's Contribution Considerable?	<u>Construction and Operation</u> No

4.6.18.1 Construction

Construction of the cumulative projects listed in Section 4.5, *Projects Considered*, could disrupt transit, roadway, bicycle, or pedestrian facilities, which could conflict with programs, plans, ordinances, or policies addressing the circulation system; substantially increase hazards; and/or result in inadequate emergency access. In general, potential effects would be more substantial for transportation projects, which may require substantial, if temporary, changes to the circulation system to accommodate construction activities. However, land development projects could also result in effects in cases where such projects similarly propose substantial changes to the circulation system to facilitate construction (e.g., roadway closures, transit stop relocations, etc.). Potential effects on transportation may be amplified where construction activities are in close proximity or when they take place concurrently. Standard construction practices and regulations require construction contractors to work with relevant parties (e.g., public works departments, transportation agencies, transit service providers) to coordinate construction activities and identify, avoid, and minimize disruptions to the circulation system. Despite these requirements, cumulative impacts to transportation during construction could be significant.

As stated in Section 3.16, *Transportation*, construction of the Project would not conflict or be inconsistent with CEQA Guidelines Section 15064.3, subdivision (b)(2). The Project would not increase capacity, and would actually have the opposite effect (i.e., reducing VMT). Therefore, the cumulative transportation analysis is focused on whether the Project, in connection with cumulative projects, would:

- Conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadways, bicycle, and pedestrian facilities
- Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)
- Result in inadequate emergency access

Construction of the Project would include a modified at-grade crossing and other improvements that could affect local roadways and streets and increase emergency response times. However, traffic impacts would be short-term and temporary. Nonetheless, Mitigation Measure TR-1.1 requires the implementation of a traffic management plan during construction to minimize impacts. The construction road traffic control plan would address temporary road closures, detour provisions, allowable routes, and alternative access. Traffic control plans would ensure that adequate local emergency access would be maintained throughout the entire construction duration. Coordination with local jurisdictions on emergency vehicle access would be required as part of the traffic control plans to lessen these disruptions and to maintain access by firefighters, law enforcement, and emergency medical responders. In addition, Mitigation Measures TR-1.2 and TR-1.3 would require the implementation of a mainline railway disruption control plan and passenger railway disruption control plan for project construction to minimize impacts to railway transit. Thus, the Project's contribution to cumulative impacts related to transportation a result of construction would be less than considerable with mitigation.

4.6.18.2 Operation

The Project is one of many projects in the planning phase to address increased demand on alternative modes of transportation as a result of regional growth. The cumulative projects listed in

Section 4.5, *Projects Considered*, includes a number of key rail projects and other regional transportation improvement projects, but there are many other regionally significant transit improvement efforts not listed because they are in locations more distant from the Project corridor. With respect to roadway, transit, pedestrian, and bicycle systems, operation of the cumulative projects would not conflict or create inconsistences with adopted transit plans, guidelines, policies, or standards adopted by study area cities, counties, SJJPA, or the State of California. Many jurisdictions are locating pedestrian and bicycle facilities in locations near and complementary to proposed integrated HSR stations. In some instances, pedestrian and bicycle infrastructure enhancements are included in a city's or county's pedestrian or bicycle plan. On the state level, the cumulative projects would be consistent with the state's blueprint for meeting future mobility needs.

As stated in Section 3.16, *Transportation*, the Project would result in a less-than-significant project-level impact on transportation during operations. The Project would comply with the applicable transportation-related plans, programs, and policies, and would result in multimodal transportation improvements. As described in Appendix 2.0-3, *Merced Intermodal Track Connection Ridership and Revenue Memorandum*, and shown in Table 3.16-4 in Section 3.16, *Transportation*, forecasted San Joaquins ridership is approximately 1,200,000 in 2030, an increase of approximately 207,000 compared to the no project scenario. Forecasted ridership demonstrates that operation of the Project would provide a measurable benefit to transit riders in the corridor. The Project would involve the operation of two new at-grade crossings on Cooper Avenue. Design, construction, and operation of the Project's rail elements, including track improvements, stations, signaling systems, and other components, would comply with applicable standards from FRA and/or the California Public Utilities Commission. The same considerations are assumed for cumulative projects, such as the ACE Ceres-Merced Extension Project and California HSR System. Thus, the Project's contribution to cumulative impacts related to transportation a result of operation would be less than considerable.

4.7 Cumulative Impact Summary

Table 4-4 summarizes the cumulative impact analysis findings.

Table 4-4. Summary of Cumulative Impact Analysis

Impact	Significance of Cumulative Impact (Project + Cumulative Projects)	Is the Project's Contribution Considerable?
Impact C-AE-1: Construction and operation of the Project, in combination with other foreseeable projects in the surrounding area, would not result in a significant impact on aesthetics.	Less than significant	--
Impact C-AQ-1: Construction and operation of the Project would not contribute considerably to a significant cumulative impact on air quality or GHG emissions.	Significant	No (beneficial during operation)

Impact	Significance of Cumulative Impact (Project + Cumulative Projects)	Is the Project's Contribution Considerable?
Impact C-BIO-1: Construction and operation of the Project would not contribute considerably to a significant cumulative impact on sensitive biological resources.	Significant	No
Impact C-CUL-1: Construction and operation of the Project would not contribute considerably to a significant cumulative impact on cultural resources.	Significant	No
Impact C-TCR-1: Construction and operation of the Project would not contribute considerably to a significant cumulative impact on tribal cultural resources.	Significant	No
Impact C-EN-1: Construction and operation of the Project, in combination with other foreseeable projects in the surrounding area, would not result in a significant cumulative impact on energy resources.	Less than significant	--
Impact C-GEO-1: Construction of the Project would not contribute considerably to a significant cumulative impact on geology, seismicity, soils, and unique paleontological/geologic resources. Operation of the Project, in combination with other foreseeable projects in the surrounding area, would not result in a significant cumulative impact on geology, seismicity, soils, and unique paleontological/geologic resources.	Construction: Significant (paleontology only); Less than significant (geology, seismicity, and soils) Operation: Less than significant	No
Impact C-HAZ-1: Construction and operation of the Project would not contribute considerably to a significant cumulative impact from hazardous materials.	Significant	No
Impact C-HYD-1: Construction and operation of the Project would not contribute considerably to a significant cumulative impact on hydrology and water quality.	Significant	No
Impact C-LU-1: Construction and operation of the Project, in combination with other foreseeable projects in the surrounding area, would not result in a significant cumulative impact on land use and planning.	Less than significant	--
Impact C-NOI-1: Construction of the Project would contribute considerably to a significant cumulative impact on noise and vibration. Operation of the Project would not contribute considerably to a significant cumulative impact on noise and vibration.	Significant	Yes (Construction) No (Operation)
Impact C-PSU-1: Construction and operation of the Project, in combination with other foreseeable projects in the surrounding area, would not result in a significant cumulative impact on public services or utilities. Construction of the Project would not contribute considerably to a significant cumulative impact on construction of new or relocated utilities.	Construction (Construction of New or Relocated Utilities): Significant Construction and Operation (all other topics): Less than significant	No

Impact	Significance of Cumulative Impact (Project + Cumulative Projects)	Is the Project's Contribution Considerable?
Impact C-REC-1: Construction and operation of the Project, in combination with other foreseeable projects in the surrounding area, would not result in a significant cumulative impact on recreational resources.	Less than significant	--
Impact C-SAF-1: Construction and operation of the Project would not contribute considerably to a significant cumulative impact on safety and security.	Significant	No
Impact C-TR-1: Construction and operation of the Project would not contribute considerably to a significant cumulative impact on transportation.	Significant	No

Chapter 5
Other CEQA-Required Analysis

5.1 Introduction

This chapter provides additional analyses and information required under the California Environmental Quality Act (CEQA) and includes the following:

- Significant and Unavoidable Environmental Impacts of the Project
- Significant and Irreversible Environmental Changes
- Growth-Inducing Impacts

5.2 Significant and Unavoidable Environmental Impacts

Impacts related to the following topics would remain significant and unavoidable with the implementation of mitigation.

- **Construction Noise**. As described in Section 3.12, *Noise and Vibration*, construction work could occur during the nighttime. Even with implementation of Mitigation Measure NOI-1.1: Implement a Construction Noise Control Plan, the impact of temporary construction-related noise on nearby noise sensitive receptors could be a significant and unavoidable impact during construction of the Project, in particular where heavy construction would occur at night near residences.
- **Cumulative Construction Noise.** As described in Chapter 4, *Cumulative Impacts*, the potential exists for a significant cumulative noise impact to occur during construction because there could be other cumulative projects simultaneously under construction adjacent to the Project. Even with implementation of Mitigation Measure NOI-1.1: Implement a Construction Noise Control Plan, noise impacts would not necessarily be reduced at all times during construction to a less-than-significant level, particularly with the likelihood of substantial nighttime construction for the Project. Because there could be other cumulative projects simultaneously under construction adjacent to the Project, the Project could result in a considerable contribution to a cumulative noise impact during construction.

5.3 Significant and Irreversible Environmental Changes

The Project would include a new track connection from the Burlington Northern Santa Fe (BNSF) corridor to the proposed integrated Merced High-Speed Rail (HSR) Station in downtown Merced between O and R Streets, in addition to a new platform that would allow for cross-platform transfer between the San Joaquins passenger rail and HSR. The Project only includes the construction of the track connection; it does not include the construction of the proposed integrated Merced HSR Station.

Construction of the Project would require the use of materials such as steel and copper, as well as fossil fuels, during construction. The source metals used, unless they come from recycled materials, would represent an irreversible use of resources. Fossil fuels used during construction would also represent an irreversible use of oil and natural gas.

Operation of the Project would result in expanded connecting transit service at the Merced Transpo Center due to increased ridership, which would increase fuel consumption of diesel and electricity. Operation of the Project would also require the consumption of diesel fuel, electricity, and natural gas associated with the station and facility maintenance activities. However, the Project would also reduce vehicle fuel use due to the displacement of VMT. A quantitative energy demand analysis was conducted for the Project. As shown in Table 3.7-22 in Section 3.7, *Energy*, the annual net energy reductions from operation of the Project would be approximately 180.7 billion BTU per year in 2032, and approximately 190.3 billion BTU per year in 2040, compared to existing conditions. In addition, the Project would result in annual net energy reduction of approximately 0.7 billion BTU per year in 2032, and approximately 0.7 billion BTU per year in 2040, compared to No Project conditions. The continued diesel use for Project operations would be a continuance of non-renewable fossil fuel usage. To the extent that electricity supplying the Project comes from non-renewable sources (natural gas, coal, nuclear), it would represent an irreversible use of those resources but due to the offset of vehicle fuel use, the Project would have a net reduction in the irreversible use of fossil fuels.

Permanent visual alterations would result from the new aerial guideway, photovoltaic panels (Variant H1), and hydrogen storage facility (Variants H2 and H3). As discussed in Section 3.2, *Aesthetics*, the photovoltaic panels proposed under Variant H1 could create a new source of light and glare; in order to mitigate the potential glare impact, trees will be planted along the southern perimeter of the approved ACE Merced Layover and Maintenance Facility. The type of trees and establishment period will be determined during the Project's detailed design phase. These physical changes would alter views from residential viewers, roadway travelers, and recreationists. Although these changes would irreversibly alter current landscapes and viewsheds, the Project would not significantly degrade the existing visual character or quality.

5.4 Growth-Inducing Impacts

CEQA requires a consideration of a project's capacity to induce growth. Growth inducement would occur if the amount of population or employment growth projected to take place as a result of the Project were to exceed planned levels. Increased development and growth in an area are dependent on a variety of factors, including employment and other opportunities; availability of developable land; and availability of infrastructure, water, and power resources.

As discussed in Section 3.1, *Effects Found Not to Be Significant*, the Project would be consistent with the envisioned local growth and development policies of the City of Merced that is outlined in the 2030 Merced Vision General Plan (Merced 2012). These policies support enhanced passenger rail service and promote land use development patterns that enhance the use of public transit. Given the policy direction from the City of Merced, the Project would be supportive of local development plans, and potential future population that may be associated with the Project would not be substantial or unplanned. In addition, the Project does not include constructing new stations or implementing new rail service, which are usually what induce population growth. As such, potential future population growth associated with the Project would not be substantial or unplanned.

Chapter 6
Alternatives

6.1 Introduction

The California Environmental Quality Act (CEQA) requires that an environmental impact report (EIR) describe a range of reasonable alternatives to the project or to the location of the project that could feasibly avoid or lessen any significant environmental impacts while substantially attaining the project's basic objectives. An EIR should also evaluate the comparative merits of the alternatives. As required by CEQA, this chapter describes the No Project Alternative and compares its impacts with those of the Merced Intermodal Track Connection (Project). One alternative to the Project is also analyzed in this chapter. This chapter describes this considered alternative and compares the potential environmental impacts of this alternative with the Project. This chapter also discusses other alternatives considered but dismissed from further evaluation.

Key provisions of CEQA Guidelines Section 15126.6 pertaining to the analysis of alternatives to a project are summarized below.

- The discussion of alternatives will focus on alternatives to the Project or its location that are capable of avoiding or substantially lessening any significant effects of the Project, even if those alternatives would impede, to some degree, the attainment of the Project objectives or be more costly.
- The No Project Alternative will be evaluated along with its impacts. The No Project analysis will discuss the existing conditions at the time the Notice of Preparation was published as well as what would be reasonably expected to occur in the foreseeable future if the Project were not approved based on current plans and consistent with available infrastructure and community services.
- The range of alternatives required in an EIR is governed by a "rule of reason;" therefore, the EIR must evaluate only those alternatives necessary to permit a reasoned choice. Alternatives will be limited to those that would avoid or substantially lessen any of the significant effects of the Project.
- An EIR need not consider an alternative with effects that cannot be reasonably ascertained, when implementation is remote and speculative, and if its selection would not achieve the basic Project objectives.
- The range of feasible alternatives is selected and discussed in a manner to foster meaningful public participation and informed decision-making. Among the factors that may be taken into account when addressing the feasibility of alternatives, as described in CEQA Guidelines Section 34 15126.6(f)(1), are environmental impacts, site suitability, economic viability, social and political acceptability, technological capacity, availability of infrastructure, general plan consistency, regulatory limitations, jurisdictional boundaries, and whether the proponent could reasonably acquire, control, or otherwise have access to the alternative site.
- The EIR will include sufficient information about each alternative to allow meaningful evaluation, analysis, and comparison with the Project. A matrix displaying the major

characteristics and significant environmental effects of each alternative may be used to summarize the comparison. If an alternative would cause one or more significant effects in addition to those that would be caused by the Project as proposed, the significant effects of the alternative will be discussed, but in less detail than the significant effects of the Project as proposed.

The San Joaquin Joint Powers Authority (SJJPA) considered a range of alternatives and the environmental impacts of the Project before selecting the alternatives to be analyzed in this EIR. Alternatives were identified through input from the public, agencies, and stakeholders during scoping. The scoping process for this EIR was formally initiated on January 5, 2023, when SJJPA submitted a Notice of Preparation to the California State Clearinghouse; federal, regional, and local elected officials; and federal, state, and local agencies, including the planning and community development directors in Merced County and the cities where the Project would be located; and the interested public. Appendix 1.0-1, *Merced Intermodal Track Connection Scoping Memorandum*, contains the scoping report detailing the scoping process, including the notification, and scoping activities undertaken.

6.2 Alternatives Considered But Dismissed from Further Analysis

Section 15126.6(c) of the CEQA Guidelines provides that an EIR should "identify any alternatives that were considered by the lead agency but rejected as infeasible during the scoping process and briefly explain the reasons underlying the lead agency's determination." The screening process for identifying the viable EIR alternatives included consideration of the following criteria.

- Ability to meet most of the basic Project objectives
- Ability to substantially lessen or avoid significant environmental effects associated with the Project
- Potential feasibility, taking into account economic, environmental, social, technological, and legal factors

The discussion in this chapter describes the alternatives that were considered during preparation and scoping of this EIR and gives the rationale for SJJPA eliminating these alternatives from further analysis.

6.2.1 North of Merced BNSF/UPRR Connection Alternative

This alternative would include a connection from the BNSF Railway (BNSF) alignment to the Union Pacific Railroad (UPRR) alignment in unincorporated Merced County, at a point approximately 3,5 miles northwest of the proposed integrated Merced High-Speed Rail (HSR) Station in downtown Merced. A new track connection from the BNSF corridor to the UPRR corridor would be constructed roughly parallel to Trindade Drive between the BNSF and UPRR corridors, then cross State Route (SR) 99 and the UPRR right-of-way and would include a new railroad alignment along the south side of the UPRR right-of-way. The alignment would continue southeast and then rise on an elevated viaduct to the proposed integrated Merced HSR Station. This alternative would include a maintenance and layover facility along the Trindade Drive alignment.

The North of Merced BNSF/UPRR Connection Alternative would meet the Project's objective to create a seamless connection between the San Joaquins service and the Merced-Bakersfield HSR Early Operating Segment and future Phase I HSR service in Merced. This alternative would avoid impacts due to construction and operation along SR 59. This alternative would have a greater extent of construction disruption due to a longer connection between UPRR and BNSF and the additional alignment along the UPRR corridor. In addition, this alternative would contribute to operational noise impacts along the UPRR corridor in combination with planned Altamont Corridor Express (ACE) trains as well as new noise impacts along the Trindade Drive alignment. This alternative would result in far larger impacts on agricultural lands due to the BNSF-UPRR connector and the associated maintenance and layover facility. The maintenance and layover facility would be incompatible with the current and designated agricultural and rural residential uses of the Trindade Road corridor. This alternative would also require additional deadhead train travel from the downtown Merced Station to the maintenance and layover facility north of Merced, resulting in additional energy consumption, air quality and greenhouse gas (GHG) emissions, and operational cost. This alternative would avoid significant impacts of the Project related to nighttime construction along SR 59, but could also have significant construction noise near residents along the alternative route. This alternative would result in greater impacts related to construction disruption, agriculture, land use, and operational noise and would have higher construction and operational costs and thus was dismissed from further consideration.

6.2.2 San Joaquins Service on UPRR Between Stockton and Merced

This alternative would reroute San Joaquins trains from operating on the BNSF line between Stockton and Merced to either (1) operate in the UPRR Fresno Subdivision corridor, or (2) on a separate alignment parallel to the UPRR corridor. This alternative was suggested in scoping.

If this alternative would occur within the UPRR right-of-way, it would require additional tracks to be constructed to accommodate the influx of San Joaquins trains, given that an additional six ACE trains will also be in service on the UPRR line. UPRR requires that any reduction of freight capacity for passenger rail use be addressed through adding more track capacity so that there is no loss of freight capacity.

UPRR described in their scoping letter for this EIR that the Project should not use any or affect any of UPRR's facilities. As such, adding San Joaquin service to the UPRR Fresno Subdivision from Merced to Stockton is likely infeasible. If that is the case, then there would need to be new tracks outside the UPRR right-of-way, nominally parallel to the UPRR right-of-way, although it may need to divert from the UPRR corridor in locations.

This alternative would include the approved ACE Merced Layover and Maintenance Facility like the Project. This alternative presumes San Joaquin trains could access the layover and maintenance facility using the existing UPRR spur. If UPRR did not allow that, then a new spur connection would need to be constructed.

This alternative would meet the Project's objectives. The variant of this alternative within the UPRR right-of-way is not considered feasible due to UPRR's stated opposition to the use of UPRR facilities. The variant of this alternative involving a new rail alignment parallel to the UPRR Fresno Subdivision is also not considered feasible due to the substantial additional cost to build the many miles of new rail alignment which could cost multiple times the cost of the Project (see the costs merely for adding track in the ACE extension to Ceres and Merced CEQA documents, which are in many hundreds of millions of dollars).

In addition to feasibility concerns, this alternative was dismissed because it would result in substantial additional environmental impacts due to construction between Merced and Stockton such as substantial land acquisition and displacements, construction air quality impacts, and impacts to agricultural land, and would also result in additional operational noise along the UPRR corridor in addition to freight and planned ACE service.

6.2.3 Stockton Service End Alternative

The Stockton Service End Alternative was suggested in scoping out of concern for the Project's impacts on traffic congestion, noise, and growth (commenter asserted concern about changing Merced from a "small town" to "big town"). This alternative would end San Joaquins service at Stockton, given ACE service plans for the extension of service from Stockton to Merced. This alternative was dismissed because it does not meet the Project's objectives to create a connection between the San Joaquins service and the Merced-Bakersfield HSR. The frequency of the proposed ACE service in this corridor is six round trips per day, whereas San Joaquins service is planning for up to eight round trips per day to provide connectivity to the Merced-Bakersfield HSR and meet future demand. ACE is also focused on commuter service, whereas the San Joaquins are focused on intercity service and non-commute trips 365 days a year. Furthermore, compared to the Project, ending San Joaquins service at Stockton would result in far more people driving that would otherwise use rail, resulting criteria air pollutant and GHG emissions.

6.2.4 Merced Maintenance and Layover Facility Alternative

A Merced Maintenance and Layover Facility Alternative located near Merced on the south side of the UPRR corridor on farmland was identified and analyzed previously in the SJRRC *ACE Ceres-Merced Extension EIR* (SJJPA 2021). This alternative would still need a connection from the BNSF corridor to the UPRR corridor, which is presumed to be the same as the SR 59 alignment in the Project. The Merced Maintenance and Layover Facility Alternative would meet the Project's objectives but would not lessen or avoid the Project's significant and unavoidable construction noise impact at night because it would still need the alignment along SR 59 and to downtown. This alternative would result in permanent impacts on prime farmland that are avoided by the Project's use of the approved ACE Merced Maintenance and Layover Facility. This alternative was dismissed in the *ACE Ceres-Merced Extension EIR* due to greater environmental impacts compared to that project and was dismissed for the same reasons for this Project.

6.2.5 South of Merced Station Maintenance and Layover Facility Alternative

A South of Merced Station Maintenance and Layover Facility Alternative located south of the Merced Station along the BNSF corridor was also considered. This alternative was rejected because it would have greater environmental impacts compared to the Project and a higher cost than modifying and using the approved ACE Merced Maintenance and Layover Facility.

6.3 Alternatives Considered for Further Analysis

As discussed in Section 6.2, *Alternatives Considered But Dismissed from Further Analysis*, SJJPA considered a range of alternatives suggested during the scoping process and otherwise and then conducted a three-part screening evaluation to select the alternatives to be analyzed in this EIR. Alternatives determined to be infeasible, to not avoid or substantially reduce one or more significant impacts of the Project, or to not meet all or most of the Project's objectives were dismissed from further analysis.

Based on the screening process results, this chapter analyzes the following two alternatives:

- No Project Alternative
- North of SR 59 BNSF/Downtown Connection Alternative

6.4 Analysis of Alternatives

The No Project Alternative and one action alternative (i.e., the North of SR 59 BNSF/Downtown Connection Alternative) are analyzed below.

6.4.1 No Project Alternative

6.4.1.1 CEQA Requirements

Section 15126.6(e) of the CEQA Guidelines requires the analysis of a No Project Alternative. The No Project Alternative analysis must discuss the existing conditions as well as what would reasonably be expected to occur in the foreseeable future if the Project were not approved. Section 15126.6(e)(3)(B) of the CEQA Guidelines states the following.

> If the project is…a development project on an identifiable property, the "no project" alternative is the circumstance under which the project does not proceed. Here the discussion would compare the environmental effects of the property remaining in its existing state against environmental effects that would occur if the project were approved. If disapproval of the project under consideration would result in predictable actions by others, such as the proposal of some other project, this "no project" consequence should be discussed. In certain instances, the "no project" alternative means "no build," wherein the existing environmental setting is maintained. However, where failure to proceed with the project will not result in preservation of existing environmental conditions, the analysis should identify the practical result of the project's non-approval and not create and analyze a set of artificial assumptions that would be required to preserve the existing physical environment.

The No Project Alternative is neither required nor expected to meet the Project's basic objectives or avoid or reduce any of the significant impacts associated with the Project.

6.4.1.2 Alternative Description

Under the No Project Alternative, there would be no new track connection from the BNSF corridor to the proposed integrated Merced HSR Station or new platform that would allow for a cross-platform transfer between the San Joaquins and HSR.

San Joaquins service would include the following under the No Project Alternative in 2040.

- 5 daily round trips from Oakland to Merced
- 2 daily round trips from Sacramento to Merced
- 1 daily round trip between Natomas and Merced

The San Joaquins currently provides service from Bakersfield to Oakland, and from Bakersfield to Sacramento. Upon the opening of the HSR, San Joaquins service from Merced to Bakersfield would be terminated but service from the existing Merced station northward could continue. If the Project is not approved, then the San Joaquins service would serve Merced at the existing San Joaquins station. There would still be a need for maintenance and layover operations in Merced as Merced would be the southern terminus of San Joaquins service when HSR service to Merced happens.

Under the No Project Alternative, there would not be as large an increase in ridership compared to the Project. Table 6-1 shows the San Joaquins projected annual ridership in 2030 and 2040 under this alternative. Appendix 2.0-3, *Merced Intermodal Track Connection Ridership and Revenue Memorandum,* includes additional information regarding ridership.

Table 6-1. Annual San Joaquins Ridership with the No Project Alternative

Year	No Project Conditions[a]
2030[b]	4,121,800
2040	4,546,200

Source: Appendix 2.0-3, *Merced Intermodal Track Connection Ridership and Revenue Memorandum.*
[a] No integration with the planned HSR station
[b] 2030 – Assumed year of HSR Early Operating Segment (EOS) operations

At present, the San Joaquins service is supported by a maintenance and layover facility in Bakersfield. Since the San Joaquins service will be truncated at Merced, it would be costly and impractical to travel back and forth from Merced to Bakersfield to use the existing facility and a new facility would be needed close to the existing Merced Station. Consequently, it is presumed that this alternative would also use the approved ACE Merced Layover and Maintenance Facility, like the Project. This would require construction of spur tracks to allow northbound trains to enter the facility after servicing the existing Merced Station and to allow southbound trains to leave the facility to reach the existing Merced Station. There would also be improvements to accommodate the San Joaquins at the approved ACE Merced Layover and Maintenance Facility.

There would be no rail connection from the BNSF corridor to downtown Merced. Given that there would be demand for transfer to HSR operations in downtown Merced, it is presumed that there would be a connecting bus shuttle from the existing Merced Station to the proposed integrated Merced HSR Station.

6.4.1.3 Environmental Impact Analysis

This assessment focuses on the environmental impacts associated with the differences between the No Project Alternative and the Project.

Effects Found Not to Be Significant

The No Project Alternative would not result in significant changes to agricultural and forestry resources, mineral resources, population and housing, and wildfire when compared to existing conditions. The No Project Alternative would result in a similar impact on population and housing to the Project, which is consistent with local planning and land use policies and would not result in substantial or unplanned growth. Under the No Project Alternative, there would be no temporary use of Important Farmland or direct conversion of Important Farmland to nonagricultural use. The No Project Alternative does not include any mineral resources that are currently being extracted in the area. Therefore, the No Project Alternative would have no impact on agricultural resources or mineral resources, and its impacts would be the same as the Project. In addition, the No Project Alternative would have no impact with respect to exacerbating wildfire risks, which is the same as the Project.

Aesthetics

Under the No Project Alternative, there would be no permanent change to visual character, views, nighttime lighting, and daytime glare. This alternative would not involve the construction of extensive track connections (but would require spur connections), aerial guideway, station platform, vegetation removal, tree trimming, intersection and driveway modifications, or new or modified bridge structures. Current railroad right-of-way maintenance of vegetation would continue. The Project would have less-than-significant aesthetic impacts. The No Project Alternative would have limited impacts on aesthetics, and its impacts would be less than the impacts of the Project.

Air Quality and Greenhouse Gas Emissions

Under the No Project Alternative, there would be construction emissions related to construction of spur tracks from the BNSF corridor and improvements at the approved ACE Merced Layover and Maintenance Facility to accommodate San Joaquins trains but less than the Project because no rail connection to downtown would need to be constructed. As noted above, ridership would continue to grow over time, but at lower levels than with the Project.

Operations of both the No Project Alternative and the Project would reduce vehicle miles traveled (VMT) by providing an alternative form of transportation for individuals using vehicles. The ridership is expected to be greater for the Project than the No Project Alternative and as such the Project is expected to result in a greater reduction in VMT and criteria pollutants than the No Project Alternative. As described in Section 3.3, *Air Quality and Greenhouse Gas Emissions*, the Project would provide an overall benefit from reducing all criteria pollutants in the San Joaquin Valley Air Basin (SJVAB), San Francisco Bay Area Air Basin (SFBAAB), and Sacramento Valley Air Basin (SVAB). Within the SJVAB, the Project would also eliminate bus stops at the existing Merced station and the bus bridge that would operate under the No Project Alternative. In addition, the No Project Alternative would result in greater daily emissions of carbon monoxide (CO) and particulate matter less than 10 and 2.5 micrometers in size in 2032 and 2040 than the Project and approximately the same daily emissions of reactive organic gases and sulfur oxides.

Under the No Project Alternative, lower train ridership would mean less VMT reduction and, therefore, there would be more vehicle-related emissions. Overall, the No Project Alternative would result in worse regional and local air quality in the SJVAB, SFBAAB, and SVAB than the Project.

As discussed in Section 3.3, *Air Quality and Greenhouse Gas Emissions*, Project operations would increase localized diesel particulate matter (DPM) emissions along the Project corridor but the Project would result in a less-than-significant incremental cancer risk compared to the No Project

Alternative. The No Project Alternative would not change operational DPM emissions along the BNSF corridor.

Overall, the No Project Alternative is considered to have higher impacts on air quality and GHG emissions compared to the Project due to the lower ridership and VMT displacement.

Biological Resources

The No Project Alternative would have smaller impacts on biological resources than the Project due to less area of construction (including no new crossings of streams) including in areas of greatest biological sensitivity, such as special-status species' habitat, ruderal riparian habitat, and wetlands. Construction and operation of the Project would result in potentially significant impacts on biological resources that would be minimized to a less-than-significant level with mitigation. The No Project Alternative would also disturb some areas of habitat for spur track construction and improvements to the approved ACE Merced Layover and Maintenance Facility, but impacts could be mitigated to a less-than-significant level.

The No Project Alternative would result in greater automobile travel and the associated potential for contaminant (e.g., oil, grease) spills related to automobile operations and maintenance. Overall, given the reduction in vehicle fuel used with the Project, the No Project Alternative is expected to result in a greater potential for spills and/or runoff than the Project, and thus greater potential overall to result in secondary impacts on biological resources in relation to spills and runoff.

Cultural Resources

The No Project Alternative would have less construction- or operation-related effects on cultural resources due to a smaller construction footprint. Construction and operation of the Project would result in impacts on cultural resources that would be minimized to a less-than-significant level with mitigation and the No Project Alternative's impacts would also be less than significant with mitigation.

Tribal Cultural Resources

The No Project Alternative would have less construction- or operation-related effects on tribal cultural resources due to a smaller construction footprint. Construction and operation of the Project would result in impacts on tribal cultural resources that would be minimized to a less-than-significant level with mitigation, which would be the same for the No Project Alternative.

Energy

As discussed in Section 3.7, *Energy*, the increased service and accessibility to transit services with the Project would encourage the diversion of travelers and commuters from automobiles to passenger rail. The reduction in automobile VMT and the related decrease in automobile fuel consumption would offset the operational energy demands of the Project. In addition, with any Project variant, there would be a direct reduction in San Joaquins energy use from the use of hydrogen fuel. Thus, the No Project Alternative energy consumption would be higher than the Project.

The No Project Alternative would reduce less VMT than the Project and would not decrease fuel consumption to the degree the Project would. Thus, the No Project Alternative would consume more energy than the Project.

Geology, Soils, Seismicity, and Paleontological Resources

The No Project Alternative would not result in any new exposure of structures and people to adverse geology, soil, and seismic conditions. Therefore, impacts associated with adverse geology, soil, and seismic conditions would be less than with the Project. However, as described in Section 3.8, *Geology, Soils, Seismicity, and Paleontological Resources*, the Project would not result in significant impacts related to geology, soils, or seismicity, and the differences between the No Project Alternative and the Project are not substantial.

The No Project Alternative would have less construction- or operation-related effects on paleontological resources due to a smaller construction footprint. Construction of the Project could directly or indirectly affect paleontological resources that would be minimized to a less-than-significant level with mitigation measures, which would be the same for the No Project Alternative.

Hazards and Hazardous Materials

The No Project Alternative would result in higher overall diesel and gasoline use compared to the Project because it would require more handling of fuel. The No Project Alternative would involve less construction-related effects on hazards and hazardous materials due to a smaller footprint. Construction of the Project, in comparison, could potentially create a hazard involving the disturbance of existing hazardous materials. However, this would be minimized to a less-than-significant level with mitigation measures.

It is not expected that Project operations would substantially increase hazards to workers, passengers, or adjacent human and environmental receptors along rail routes due to design features and because rail systems must comply with Federal Railroad Administration and California Public Utilities Commission requirements for tracks, equipment, railroad operating rules, and practices. Because the No Project Alternative would reduce less VMT than the Project, resulting in greater potential for highway accidents than the Project, and more fuel handling and use overall, the No Project Alternative is considered to have a greater impact associated with the potential release and exposure of hazardous materials than the Project.

Hydrology and Water Quality

The No Project Alternative would have similar impacts as the Project relative to the approved ACE Merced Layover and Maintenance Facility improvements but less construction effects due to a smaller construction footprint. As noted under *Hazards and Hazardous Materials*, the Project is considered overall to have less potential for spills and runoff in relation to fuel handling and use because it would result in less handling of transportation fuel overall (with the reduction in VMT and automobile fuel consumption). Because the potential operational impact of the Project on water quality could be addressed through applying existing regulations, the No Project Alternative is considered to have a higher risk of spills and water quality effects due to less diversion of vehicle travel.

Land Use and Planning

The No Project Alternative would not physically divide an existing community and would not create conflicts with an applicable land use plan, policy, or regulation for the purpose of avoiding or mitigating an environmental effect. In comparison, the Project's construction activities could physically divide an established community during construction, but with mitigation this would be a less-than-significant impact. Additionally, the Project would not create conflicts with an applicable land use plan, policy, or regulation. Overall, impacts on land use and planning from the No Project Alternative are similar to the Project.

Noise and Vibration

The No Project Alternative would result in less construction noise, due to less construction activity and no construction near sensitive receptors. The Project is expected to result in a significant construction noise impact that can be reduced to a less-than-significant impact exception in relation to nighttime construction near sensitive receptors. The No Project Alternative would result in less noise and vibration from passenger rail operations along along SR 59 and downtown but more noise and vibration along the existing BNSF line to the existing Merced Station, which is adjacent in places to residences. The Project is expected to result in less-than-significant noise and vibration impacts from operations and the No Project Alternative would also have less-than-significant operational impacts as it would not change the number of trains travelling to the existing Merced Station. The No Project Alternative would result in more highway traffic noise between Merced, Stockton, Sacramento, and the San Francisco Bay Area because it would divert less vehicle travel compared to the Project.

Public Services and Utilities and Service Systems

Public Services

As discussed in Section 3.13, *Public Services and Utilities and Service Systems*, the Project would disrupt traffic due to the addition of guard gates at three at-grade crossings, which could interfere with reponse times for fire, police, and other emergency responders but this impact would be less than significant. The No Project Alternative would only include one additional guard-gate at the Cooper Avenue crossing.

Utilities and Service Systems

The No Project Alternative would have less construction-related demand for water, electricity, natural gas, telecommunication facilities or the generation of wastewater, stormwater, or solid waste compared to that is proposed under the Project. Therefore, the No Project Alternative would have less impact on utilities than the Project but the Project's impact on utilities is less than significant with mitigation. Operation of the Project would not require a substantial increase of utilities and service systems and operational impacts would be similar to the No Project Alternative.

Recreation

The No Project Alternative would not have construction- or operation-related effects on recreational resources. Similarly, construction and operation of the Project would have no impact on recreational resources.

Safety and Security

The No Project Alternative would avoid construction-related impacts on safety and security. Like any linear infrastructure project, the Project could result in potentially significant impacts on implementation of emergency response plans but would be mitigated to a less-than-significant impact. Therefore, the No Project Alternative would have less impact on safety and security than the Project.

Transportation

Transit, Bicycle Facilities, Pedestrian Facilities, and Freight

Under the No Project Alternative, corridor population and employment growth accompanied by changes to other transit connections and increases in highway congestion would contribute to the increases in transit ridership, compared with existing conditions. The No Project Alternative would not result in the beneficial impact relative to transit planning to the degree that would occur with the Project.

With increases in transit ridership, the No Project Alternative would result in increased pedestrian and bicyclist volumes at facilities surrounding and leading to transit stations. The increase would be less than under the Project, but the No Project Alternative would not have beneficial impacts relative to expanded service connections and multimodal connectivity to the degree that would occur under the Project. The No Project Alternative would not affect existing freight service except temporarily due to construction of spurs from the BNSF corridor to the approved ACE Merced Layover and Maintenance Facility. As stated in Section 3.16, *Transportation*, no impacts on freight rail are anticipated as a result of the Project.

Vehicle Miles Traveled

As stated in Section 3.16, *Transportation*, the Project would shift travel demand from driving trips to public transit trips and reduce regional vehicle traffic and VMT on major highways and arterials. The Project would reduce overall VMT compared to the No Project Alternative.

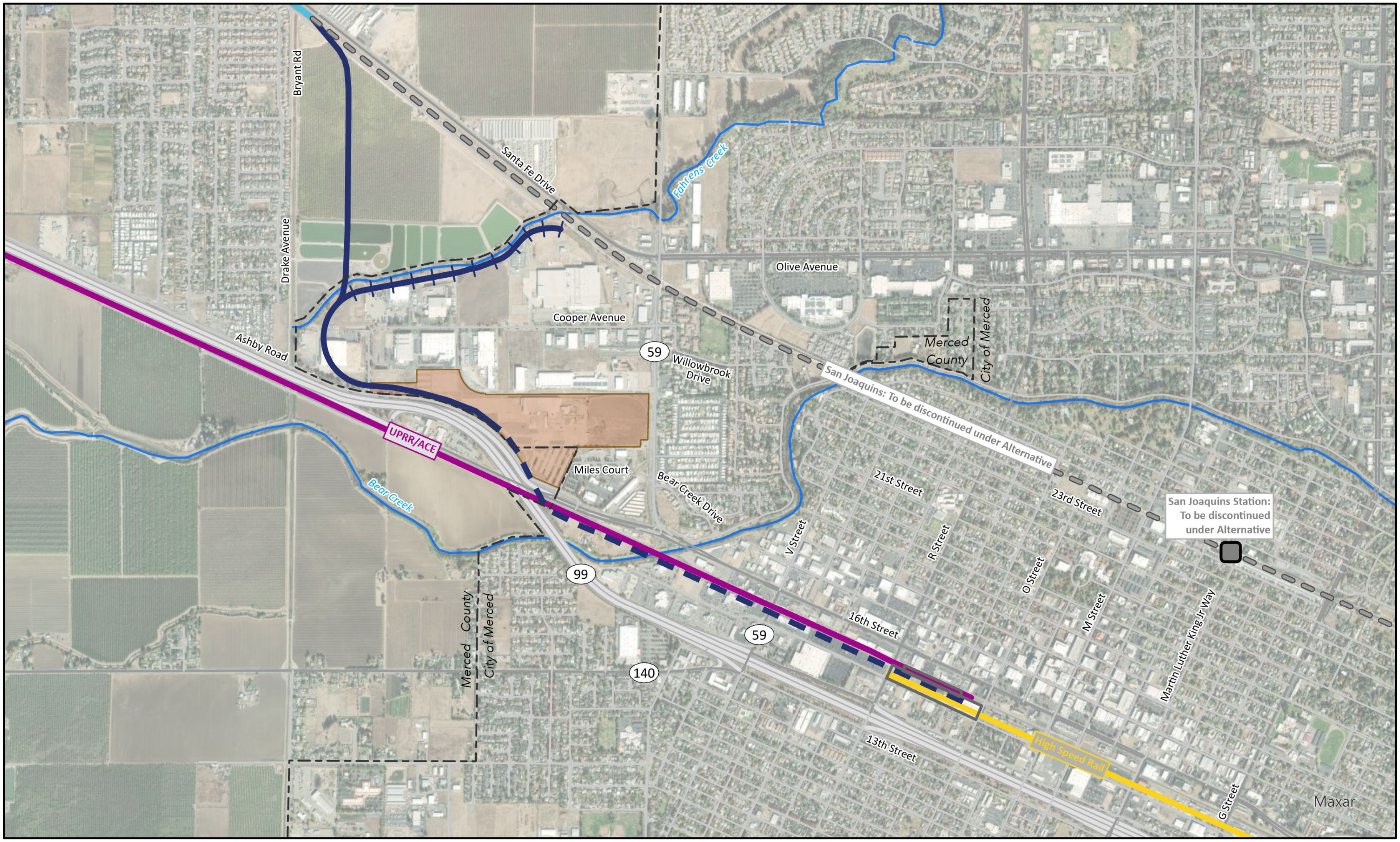
Emergency Access

The No Project Alternative would result in less changes to emergency access compared to existing conditions. As stated in Section 3.16, *Transportation*, the Project could affect emergency vehicle access if an emergency occurs at the same time and locations when construction activities would result in temporary access or egress limitations. However, coordination with local public works departments, local emergency access providers, and the California Department of Transportation, and mitigation measures will ensure that Project impacts related to emergency access would be less than significant. Therefore, the No Project Alternative and Project would result in similar impacts on emergency access.

6.4.2 North of SR 59 BNSF/Downtown Connection Alternative

6.4.2.1 Alternative Description

As shown on Figure 6-1, this alternative would move the proposed connection from the BNSF corridor to the UPRR corridor farther north of downtown Merced compared to the proposed connection along SR 59 under the Project. New track would be constructed through agricultural land and apparent Franklin County Water District wastewater treatment ponds east of Drake Avenue on a north-south alignment with a new bridge over Fahrens Creek leading to the western part of the business park. Within the southern portion of the approved ACE Merced Layover and Maintenance Facility, the alignment would follow the curve of Ashby Road, cross over SR 99 and the UPRR corridor near Miles Court, and then run parallel to the UPRR tracks as it approaches downtown Merced. The alignment would transition from an at-grade alignment to an aerial guideway as it curves around Ashby Road so that it is aerial when it crosses SR 99 and UPRR tracks and then continuing to the east side of the HSR platform at the proposed integrated Merced HSR Station, similar to the Project. With this alternative, access to the approved ACE Merced Layover and Maintenance Facility would change compared to the Project because there would be no relocated ACE/UPRR industrial spur track along SR 59 and the access line would terminate up near the BNSF/San Joaquins line instead of finishing that curve and heading towards SR 59. This alternative would have the same improvements to the approved ACE Merced Layover and Maintenance Facility as the Project. This alternative would have the same operational service level and similar levels of ridership as the Project.



Existing UPRR/Approved ACE
Proposed High Speed Rail
Existing BNSF/San Joaquins
City of Merced Boundary
Proposed Integrated Station
Approved ACE Layover and Maintenance Facility

North of SR 59 BNSF/Downtown Connection Alternative

San Joaquins: Elevated Track
San Joaquins: At-grade Track
San Joaquins: Layover and Maintenance Access Line
San Joaquins: To be discontinued under Alternative

0 1,000 2,000 Feet

N

Figure 6-1
North of SR 59 BNSF/Downtown Connection Alternative
Merced Intermodal Track Connection Project

MITC

6.4.2.2 Environmental Impact Analysis

Effects Found Not to Be Significant

The North of SR 59 BNSF/Downtown Connection Alternative would not result in significant changes to mineral resources, population and housing, and wildfire when compared to existing conditions. This alternative would result in a similar impact on population and housing to the Project, which is consistent with local planning and land use policies and would not result in substantial or unplanned growth. This alternative does not include any mineral resources that are currently being extracted in the area. Therefore, this alternative would have no impact on mineral resources and its impacts would be the same as the Project. In addition, the alternative would have no impact with respect to exacerbating wildfire risks, which is the same as the Project.

Aesthetics

Under the North of SR 59 BNSF/Downtown Connection Alternative, the new track connection from the BNSF corridor to the UPRR corridor would be constructed through existing agricultural land east of Drake Avenue. The alignment would transition to an aerial guideway as it curves around Ashby Road to the proposed integrated HSR station. This alignment would alter the existing flat and rural visual landscape and affect existing visual quality because the aerial guideway would be a new visual feature. However, impacts would continue to be less than significant related to substantial adverse effects on a scenic vista, conflicts with applicable zoning and other regulations governing scenic quality, and new sources of substantial light or glare that would adversely affect daytime or nighttime views in the area because the visual change would be relatively minor through one agricultural field that is currently located between existing development and a railway. There would continue to be no impact related to substantial damage to scenic resources within a state scenic highway, the same as the Project.

This alternative would have a comparatively greater impact on aesthetics than the Project because additional aerial tracks would be constructed in a more rural, agricultural area, as opposed to the Project, which would be constructed in a more urban environment.

Agricultural and Forestry Resources

No portion of the environmental footprint of the North of SR 59 BNSF/Downtown Connection Alternative includes forestland, timberland, or timberland zoned Timberland Production (CDFW 2015). The alternative would not be located in or intersect forestlands within identified timberland production zones. In addition, no land adjacent to or in the vicinity of the environmental footprint of the alternative is zoned for or used for timberland or forestland. Thus, the alternative would not conflict with any existing zoning or forestland or timberland use or involve any changes to the environment that could result in the conversion of forestland or timberland and there would be no impact on forestland or timberland.

However, under the North of SR 59 BNSF/Downtown Connection Alternative, new track would be constructed through existing farmland east of Drake Avenue. This would result in the temporary use and permanent conversion of Unique Farmland and Farmland of Statewide Importance to nonagricultural use (California Department of Conservation 2024a), resulting in a greater impact than under the Project because the Project would not result in the temporary use or permanent conversion of farmland to nonagricultural uses. Although this alternative would convert agricultural land to transportation use, the conversion would be minor in comparison to the total amount of farmland in Merced County.

The alternative would also result in conflicts with existing zoning. The existing land east of Drake Avenue is currently zoned as industrial (Merced County 2010). The alternative would convert it to transportation use, which would also result in a greater impact than the Project because the Project avoids this zoning conflict. However, similar to the Project, there is no land within the alternative's footprint that is under a Williamson Act contract (California Department of Conservation 2024b); thus, there would be no impact related to this topic.

While the conversion of farmland to transportation use would be relatively minor, the alternative would result in significant impacts on Important Farmland that would require mitigation. Mitigation would include measures such as returning any temporarily disturbed agricultural land to pre-project conditions following construction. Regarding the zoning conflict, the alternative would be required to process a general plan amendment and zone change in order to implement the alternative.

As such, this alternative would have a greater impact on agricultural resources than the Project because it would result in the conversion of agricultural land to transportation use and a conflict with existing zoning, whereas the Project would not result in a similar conversion of land or conflict with existing zoning. Impacts to forest lands, timberlands, and Williamson Act lands would be the same between the alternative and the Project because these resources are not present in the study area.

Air Quality and Greenhouse Gas Emissions

Like the Project, the North of SR 59 BNSF/Downtown Connection Alternative would not conflict with implementation of the applicable air quality plans, because it would not result in substantial population or housing growth, would support the goals of the Merced County Association of Governments' Regional Transportation Plan/Sustainable Communities Strategy by expanding intercity passenger service, result in VMT reductions consistent with air quality plans throughout multiple air basins, and result in emissions that are likely to be below the San Joaquin Valley Air Pollution Control District's (SJVAPCD's) thresholds of significance. Thus, this impact for this alternative would be less than significant.

For construction of the North of SR 59 BNSF/Downtown Connection Alternative, the resulting mass emissions would be somewhat higher than the Project due to a longer connection alignment. The Project's new rail connection from the BNSF corridor to the downtown integrated station is approximately 1.7 miles long, while this alternative's connection is approximately 3.0 miles long. Although this alternative and the Project would have different alignments, the type of construction activities required would be similar. For both, construction would consist of linear track construction and require the same type of equipment. As noted in Section 3.3, *Air Quality and Greenhouse Gas Emissions*, daily and annual construction emissions for the Project would below the annual thresholds established to prevent emissions from new projects contributing to violations of the California ambient air quality standards (CAAQS) or national ambient air quality standards (NAAQS). While this alternative would have more construction, daily and annual emissions are also expected to be below relevant thresholds with mitigation, if necessary. This impact would be less than significant with mitigation.

As with the Project during the operational phase, the North of SR 59 BNSF/Downtown Connection Alternative would result in increased passenger rail ridership in the SJVAB, SFBAAB, and SVAB, which would result in decreased driving and thus emissions reductions. Because the specific route that is ultimately constructed to connect the BNSF corridor and integrated HSR station would not appreciably affect passenger ridership, the criteria pollutant and ozone precursor emissions estimated in Table 3.3-13 through Table 3.3-15 in Section 3.3, *Public Services and Utilities and Service Systems*, would be similar for this alternative. There may be minor differences between the Project and this alternative in locomotive operational emissions; however, total emissions for both would be predominantly the same because the same ridership would occur and the operational distances traveled are similar. Thus, this alternative would reduce emissions of all pollutants, and the impact of this alternative's operations on regional criteria pollutants would be less than significant and beneficial.

For criteria pollutant concentrations from construction and operation, the North of SR 59 BNSF/Downtown Connection Alternative would result in a similar potential exposure of sensitive receptors as the Project. As noted for the Project, localized emissions of fugitive dust generated during construction would be reduced from compliance with SJVAPCD regulations. Concentrations of CO were modeled for the Project and discussed in Section 3.3, *Air Quality and Greenhouse Gas Emissions*, and those results would also apply to this alternative because, as noted above, ridership would not be meaningfully affected by the connection between the BNSF corridor and proposed integrated HSR station. As such, localized CO concentrations near the ACE and San Joaquins stations would be below the NAAQS and CAAQS for this alternative.

The potential for the North of SR 59 BNSF/Downtown Connection Alternative to expose sensitive receptors to substantial concentrations of toxic air contaminants and health risks would likely result in lower maximum health risks during construction, because the alignment would, for the most part, be located farther away from sensitive receptors than the Project. As noted above, new track would be constructed through existing agricultural land east of Drake Avenue, where the single-family residences to the west are approximately 400 feet away at the closest (where the new track meets Santa Fe Road). At other locations in the agricultural land, the tracks would be more than 600 feet away from the single-family homes. There is one residence located south of the existing UPRR alignment and north of Bear Creek and SR 99, and construction of the elevated track for this alternative would occur within 200 feet of this residence, which would be the closest distance for any individual receptor that is unique to this alternative (i.e., other receptors that are common to both the Project and alternative would be closer in some locations). Further, construction of this alternative would avoid the areas where exposure and health risks would generally be the highest for the Project, as shown in Table 3.3-17 (residential uses adjacent to SR 59: Apple Blossom Apartments and Woodbridge Place Apartments). Instead of construction occurring adjacent to SR 59, this alternative would result in construction activities occurring within agricultural parcels and generally further away from sensitive receptors. In the agricultural area where construction would occur for this alternative, the cancer risk from Project construction is 0.4 per million, based on the results at Modern Mobile Home Park from Table 3.3-17. Thus, a cancer risk of similar magnitude would be expected for this alternative in this area, because the distance to receptors and predominant wind direction would be approximately the same. Even when construction is occurring close to residences, such as at SR 59 for the Project, the maximum cancer risk and chronic hazard index would be substantially less than the thresholds of significance. At the residence that is 200 feet away from construction, then, the health risks would also likely be less than the thresholds. In areas where the alignments for the Project and alternative are the same, the health risks would also be approximately the same. Consequently, the health risks from this alternative would also be less than significant, because of the overall greater distances to sensitive receptors.

During operations of the North of SR 59 BNSF/Downtown Connection Alternative, health risks from locomotive operations would occur. For the Project, these health risks were determined to be low relative to the thresholds of significance. The maximum contribution in cancer risk from the Project is 0.9 per million, as shown in Table 3.3-18, and the threshold is 20.0 per million. The location of this maximum cancer risk increase is near the station, where locomotive idling would occur and where residences at 15th Street and P Street are in relatively close proximity (100 feet). The new track constructed through the agricultural land, as noted above, would be 400 feet away from sensitive receptors at the closest and more than 600 feet away for other portions of the new track, and it would not be a source of locomotive idling. New elevated track would also be constructed along the existing UPRR alignment, and there is a single residence located approximately 200 feet from this track. This track would also not be a source of locomotive idling and is located further away than the distance between the station and the receptor with the maximum cancer risk increase (100 feet). Thus, the cancer risk from locomotives operating on the new section of track for this alternative would likely be lower than the values presented for the Project, because of the greater distances to sensitive receptors and lack of locomotive idling. In areas where the alignments for the Project and alternative are the same, the health risks would also be approximately the same. Health risks for the alternative would be below the thresholds of significance, and thus less than significant.

The North of SR 59 BNSF/Downtown Connection Alternative would result in similar impacts as the Project with respect to asbestos exposure and Valley fever risk, because demolition of existing structures could result in airborne asbestos, and earthmoving activities could release spores associated with Valley fever. However, compliance with SJVAPCD Regulations III and VIII would ensure that, if asbestos containing materials are present, National Emissions Standards for Hazardous Air Pollutants regulations would be followed to result in proper handling of the material, and Regulation VIII would avoid dusty conditions and reduce the risk of contracting Valley fever. The impact would be less than significant.

Odor impacts for the North of SR 59 BNSF/Downtown Connection Alternative during construction would be similar to the Project and could result from construction diesel exhaust and asphalt paving. All odors would be localized, however, and temporary. For operational odors, the new track connection through the agricultural parcel would increase localized odors from locomotive diesel fuel combustion at receptor locations near the track. Such odors would be intermittent, occurring only as trains pass by receptors, and are not considered a significant odor-generating source.

The quantity of GHG emissions generated during construction of the North of SR 59 BNSF/Downtown Connection Alternative would be somewhat higher to the Project, for the reasons noted above (i.e., construction would consist of linear track and require the same type of equipment but the length of new track would be greater). Like the Project, the construction emissions from this alternative would be offset in less than 1 year by the emissions reductions that would occur during the operational phase, which is discussed below. Because construction emissions from this alternative would be offset, the impact is less than significant.

With respect to GHG emissions during operations, the North of SR 59 BNSF/Downtown Connection Alternative would result in increased passenger rail ridership, which would result in decreased driving and thus GHG emissions reductions. As noted above, the specific route that is ultimately constructed to connect the BNSF corridor and integrated HSR station would not appreciably affect passenger ridership, and thus the GHG emissions estimated in Table 3.3-21 would be the same for this alternative. Thus, this alternative would reduce GHG emissions, and the impact of this alternative's operational emissions would be less than significant and beneficial.

Further, the North of SR 59 BNSF/Downtown Connection Alternative would have the same conclusion as the Project with respect to conflicts with plans adopted to reduce GHG emissions. As with the Project, this alternative would increase passenger rail ridership, alleviate traffic congestion, and reduce automobile VMT and trips throughout Northern California, directly supporting state and local alternative transportation and VMT reduction goals. The emission reductions achieved through operation of this alternative would facilitate attainment of state, regional, and local GHG reduction goals, and this impact would be less than significant and beneficial.

Biological Resources

The North of SR 59 BNSF/Downtown Connection Alternative would traverse an area that was not included in the biological resources study area for the Project, and no field surveys of the northern part of this alternative have been conducted. This evaluation, therefore, is based on interpretation of recent aerial photography for evaluating land cover types and the same regional special-status species information evaluated for the Project.

The alternative would result in removal of portions of an orchard and parts of Franklin County wastewater treatment ponds, which are land cover types that would not be affected by the Project. Orchard is not a sensitive natural community, and the wastewater treatment ponds are regularly maintained, do not support wetland vegetation, and would not be regulated as waters of the United States or waters of the state. The alternative would also affect areas of ruderal annual grassland, ruderal riparian, roadside ditch, perennial drainage (in Fahrens Creek and Bear Creek), and disturbed/unvegetated land cover. If a single-span bridge is constructed over Fahrens Creek, direct impacts on the creek could be avoided, but several ruderal riparian trees along the creek could be removed. Impacts on Bear Creek and the associate ruderal riparian habitat would be less than those described for the Project because only the viaduct would need to cross the creek and the UPRR industrial spur and bridge would not have to be relocated. The alternative would avoid the seasonal wetland area along SR 59 and the freshwater marsh near the BNSF corridor due to the new alignment. Seasonal wetland habitat could be used by tricolored blackbird as discussed under the Project, so effects on tricolored blackbird would be less than under the Project, because their potential habitat would not be disturbed. Construction impacts on ruderal riparian habitat and Fahrens Creek could be slightly greater than that of the Project and would be considered potentially significant but could be mitigated to a less-than-significant level. The alternative would have more effect on western pond turtle and Central Valley steelhead than the Project at Fahrens Creek and less effect than the Project along Bear Creek relative to loss of habitat and disturbance. Construction impacts of this alternative related to compliance with local policies and tree removal would be similar to those of the Project and would be potentially significant.

Operational impacts of this alternative on special-status plant species, state or federally protected wetlands, movement of native resident or migratory fish or wildlife species, and conflict with local policies would be less than significant, as discussed for the Project. Operation of this alternative would have no impact related to a conflict with any adopted habitat conservation plans (HCPs), natural community conservation plans, or approved local, regional, or state HCP provisions. Operation and maintenance impacts of this alternative on ruderal riparian habitat would be potentially significant, as described for the Project.

Cultural Resources

The North of SR 59 BNSF/Downtown Connection Alternative would traverse an area that was not included in the built environment cultural resources identification and evaluation study for the Project. Therefore, it is unknown whether the agricultural area and wastewater treatment ponds bisected by this alternative are built environment cultural resources. A built environment identification and evaluation study of the agricultural and wastewater treatment built environment elements would be necessary if this alternative were advanced. The alternative would cross Black Rascal Creek (Fahrens Creek). This creek is not a historical resource and the crossing and construction of a bridge would not result in an impact on historical resources. The alternative would result in a less-than-significant impact on the Southern Pacific Railroad, a historical resource, because this alternative is not expected to alter the resource's historic alignment and the resource would retain integrity to convey its significance.

The North of SR 59 BNSF/Downtown Connection Alternative would be located within areas of high general prehistoric archaeological resource sensitivity and high buried archaeological resource sensitivity. This work would require an additional records search and map review. Both are expected to result in a less-than-significant impact on archaeological resources and potential human remains after mitigation.

Tribal Cultural Resources

The North of SR 59 BNSF/Downtown Connection Alternative would be located in areas of high general prehistoric archaeological resource sensitivity and high buried archaeological resource sensitivity. This work would require additional consultation with tribal groups. Both are expected to result in a less-than-significant impact on tribal cultural resources after mitigation.

Energy

Energy consumed during construction of the North of SR 59 BNSF/Downtown Connection Alternative would include gasoline and diesel to produce and transport construction materials, operate and maintain construction equipment, and transport construction workers to and from construction sites. Like the Project, energy consumed during construction of this alternative would be temporary and limited to the approximately 4- to 5 -year construction period. The alternative would be required to comply with recycling and reuse requirements, which would reduce the inherent cost of construction materials. As such, the energy resources consumed during construction of this alternative would not be wasteful, inefficient, or unnecessary. Impacts would be less than significant, and similar to the Project.

Operation of the North of SR 59 BNSF/Downtown Connection Alternative would result in increased passenger rail ridership, which would result in reduced automobile VMT and savings in automobile fuel consumption in the form of diesel, gasoline, and electricity, due to the modal shift to commuter rail transit. This modal shift would offset the energy demands associated with overall operation of this alternative. As such, despite increased energy demand as a result of expanded connecting transit services and future operational activities, this alternative would reduce automobile VMT and consequently energy consumption per passenger mile. Therefore, this alternative would result in a beneficial impact on the environment, and the environmental impacts associated with the wasteful, inefficient, or unnecessary consumption of energy resources would be similar to the Project and less than significant.

In addition, the North of SR 59 BNSF/Downtown Connection Alternative would have the same conclusion as the Project with respect to conflicts or obstruction of a state or local plan for renewable energy or energy efficiency. Like the Project, the energy used during operation of this alternative would not result in a substantial increase in energy demand and would not obstruct the ability of energy providers to comply with state and local plan requirements regarding clean energy. In addition, all locomotives would operate Tier 4 engines fueled by renewable diesel, consistent with statewide mandates for locomotives to become increasingly more efficient and increase the use of renewable energy. Furthermore, this alternative would result in a net energy reduction compared to existing conditions, and would therefore support state and local goals related to increased energy efficiency. Thus, this alternative's impacts would be less than significant, and similar to the Project.

Geology, Soils, Seismicity, and Paleontological Resources

The North of SR 59 BNSF/Downtown Connection Alternative would be located in an area with similar geologic hazards as the Project. Impacts associated with adverse geology, soil, and seismic conditions would be less than significant, similar to the Project. Construction of this alternative would be on previously disturbed land. As with most ground-disturbing projects, construction could directly or indirectly affect paleontological resources and would be minimized to a less-than-significant level with mitigation measures. Overall, the impacts on paleontological resources would be similar to the Project.

Hazards and Hazardous Materials

The North of SR 59 BNSF/Downtown Connection Alternative would require new track to be constructed through existing agricultural land south of Santa Fe Road and east of Drake Avenue. As such, there is potential for exposure to agricultural chemicals during ground disturbance activities in that area. As stated in Section 3.9, *Hazards and Hazardous Materials*, several hazardous materials sites (including sites that qualify as Cortese List sites) within and adjacent to (within 0.25 mile) the Project footprint have a history of contamination, including soil and groundwater impacts. As the Project footprint and the alternative overlap, there is a potential risk for the alternative to also expose construction personnel and the surrounding environment (including nearby sensitive receptors, such as schools) to contamination associated with historical land uses in the Project area. Mitigation Measure HAZ-2.1: Site Management Plan would reduce potential impacts associated with exposure to residual contamination and undocumented subsurface conditions associated with these hazardous materials to less than significant via the preparation of a Site Management Plan (SMP). The SMP is designed to protect human health and the environment and include protocols, measures, and techniques for the proper handling, management, and disposition of affected media found on-site during ground-disturbing activities. The SMP would also establish protocols and measures for addressing the discovery of unknown environmental conditions or subsurface structures.

Because the North of SR 59 BNSF/Downtown Connection Alternative would potentially expose construction personnel and the surrounding environment to the aforementioned hazards and hazardous materials impacts, the alternative would have similar impacts to the Project.

Hydrology and Water Quality

The North of SR 59 BNSF/Downtown Connection Alternative would require construction of a new track through existing agricultural land. Introduction of new impervious surfaces as a result of new tracks, could alter existing drainage patterns and provide new sources of polluted runoff associated with train operation. Altered drainage patterns and increased polluted runoff to surface waters associated with the alternative would result in potentially significant impacts on water quality. With existing regulations and mitigation measures, potential impacts on water quality would be less than significant and consistent with applicable water quality standards.

Construction of the North of SR 59 BNSF/Downtown Connection Alternative would involve construction of a new bridge over Fahrens Creek and would cross the 100-year floodplain. Project facilities within mapped flood zones could impede or redirect flood flows if not appropriately designed, which could result in flooding of off-site areas. Construction of a new bridge may also involve the discharge of groundwater or dewatering effluent and potentially result in temporary impacts on water quality. With mitigation measures, potential impacts on hydrology and water quality would be less than significant and consistent with applicable water quality standards.

The North of SR 59 BNSF/Downtown Connection Alternative would have relatively more effects on hydrology and water quality than the Project, as the additional tracks associated with the alternative would be in previously undeveloped land, where drainage currently infiltrates into the ground and provides natural groundwater recharge benefits.

Land Use and Planning

The North of SR 59 BNSF/Downtown Connection Alternative is located in unincorporated Merced County and in the city of Merced. Per the City of Merced General Plan Land Use Diagram (2015), the alternative would be located on land designated as manufacturing/industrial, general commercial, thoroughfare commercial, regional community commercial, business park, and open space. The portion of the alternative in Merced County is designated as industrial/industrial reserve land use and contains the existing farmland east of Drake Avenue. While this alternative would construct new track through this farmland, new rail tracks are not inconsistent with the industrial/industrial reserve land use designation.

The North of SR 59 BNSF/Downtown Connection Alternative would have an impact on land use due to inconsistencies with policies related to agricultural resources, which would be mitigated to a less-than-significant level with mitigation. In comparison, the Project would be consistent with surrounding land uses, designations, and policies. The alternative would have a greater impact on agricultural resources than the Project.

Noise and Vibration

The North of SR 59 BNSF/Downtown Connection Alternative is located approximately 800 feet, or 0.15 mile, east of the residences on Drake Avenue. Noise levels during operation of this alternative would be below both the existing noise and the impact thresholds due to the high existing noise levels and the small number of trains being added as part of this alternative. In addition, operational vibration impacts would be less than significant. As such, this alternative and the Project have similar operational impacts.

For construction, the residences along Drake are outside all the distances for both noise and vibration impacts. However, the North of SR 59 BNSF/Downtown Connection Alternative and Project would have similar noise and vibration impacts along the portion from Bear Creek to the proposed HSR station. Residences along the east side of SR 59 would be within the daytime impact screening distance if impact pile driving were to occur. Residences in this area would also be within the nighttime impact screening distances if nighttime construction occurs. Without impact pile driving, the residences would not be within the screening distance and the impact would be less than significant.

Nighttime construction near residential uses would have larger impacts than daytime construction and would result in a potentially significant impact. If nighttime construction is not anticipated, there would not be potentially significant impacts. Even with mitigation, the impact of temporary construction-related noise on nearby noise sensitive receptors could be a significant and unavoidable impact during construction of this alternative, in particular where heavy construction would occur at night near residences.

Overall, noise and vibration impacts from the North of SR 59 BNSF/Downtown Connection Alternative would be similar to the impacts of the Project, although slightly less because there are fewer residences and they are located slightly farther from construction and operation of the alternative.

Public Services and Utilities and Service Systems

Public Services

The construction of the North of SR 59 BNSF/Downtown Connection Alternative has the potential to increase fire protection, law enforcement, and emergency response services demand through the corridor, resulting in a significant impact, similar to the Project. Mitigation Measure TR-1.1: TMP for Project construction would also be required for the alternative, which requires the preparation of a construction road traffic control plan that describes protocols for coordinating with local jurisdictions on emergency vehicle access and maintaining access for fire protection, law enforcement, and emergency service providers. With Mitigation Measure TR-1.1, construction activities associated with the alternative would have a less-than-significant impact on public services, similar to the Project. Operation of the alternative would result in less-than-significant impacts on public services for the same reasons as described for the Project.

The North of SR 59 BNSF/Downtown Connection Alternative would have a slightly greater impact on public services than the Project because additional tracks would be constructed over a larger area, which could expand the amount of demand for additional fire protection, law enforcement, and emergency response services compared to the Project. The Project would be constructed in a smaller, more urban environment, requiring less additional demand for public services.

Utilities and Service Systems

The North of SR 59 BNSF/Downtown Connection Alternative would require connections to utilities along the BNSF line, UPPR line, and through undeveloped agricultural land and an area currently occupied by Franklin County Water District wastewater treatment ponds. Construction of the alternative would conflict with existing utilities infrastructure, requiring the relocation of some existing utilities. In particular, this alternative would require relocation of a portion of the treatment ponds to compensate for the lost pond area for the new rail alignment. While this relocation appears feasible, it would require additional disturbance of orchard area just north of the existing wastewater treatment ponds. It is possible that relocation or accidental disruption during construction of the alternative could disrupt utility service or damage utilities, resulting in a potentially significant impact on utilities infrastructure, similar to the Project. Mitigation Measure USS-1.1: Implement Utility Relocation Plan, will be implemented under the alternative, which will require development and implementation of a utility relocation plan to minimize service interruption and safely relocate, repair, or replace affected utilities. With Mitigation Measure USS-1.1 and reconfiguraiton/relocation of a portion of the wastewater treatment ponds lost to the new rail alignment, impacts on utilities infrastructure duuring construction of the alternative would be less than significant, similar to the Project. Construction and operation impacts of the alternative related to water supply, wastewater treatment provider capacity, generation of solid waste, solid waste regulations, and relocation of existing utilities during operation would be less than significant with mitigation for the same reasons as described for the Project.

The North of SR 59 BNSF/Downtown Connection Alternative would have a comparatively greater impact on utilities and service systems than the Project because new tracks would be constructed through undeveloped agricultural land, which could expand the number of new connections required and would require reconfiguration/relocation of a portion of the wastewater ponds. The Project would be constructed in a more compact, urban environment, requiring fewer new utility connections and less potential for utility disruptions.

Recreation

Under the North of SR 59 BNSF/Downtown Connection Alternative, the new track connection would extend through agricultural land. Construction and operation of these new tracks would not result in substantial population increases and thus would not increase the use of existing neighborhood and regional parks or other recreational resources, which would not experience physical deterioration or acceleration or might result in demand for new recreational facilities, such that construction or expansion would be required. Impacts would be less than significant, similar to the Project.

The North of SR 59 BNSF/Downtown Connection Alternative would have similar impacts on recreation because neither the Project nor the alternative would result in substantial population increases, minimizing the degree of impact on recreational facilities.

Safety and Security

The North of SR 59 BNSF/Downtown Connection Alternative would require five public right-of-way crossings at R Street, V Street, 16th Street, Ashby Road and Cooper Avenue. The crossings at R Street, V Street and 16th Street would be the same as the Project. These are major through routes providing freeway access; however, none of these crossings provide direct or sole access points for any of the fire, medical or law enforcement facilities. The crossings at 16th Street and Ashby Road would be elevated on a viaduct over the roadways. The crossing at Cooper Avenue under this alternative would be at grade like the Project. Potential impacts at these locations during construction would be temporary, geographically limited, and dependent on detailed construction plans and timing. Like the Project, the alternative is a linear infrastructure project with the potential to disrupt traffic and interfere with response times for fire, police, and other emergency responders during construction. This alternative would require temporary road detours during construction and could potentially affect emergency response times related to fire and police protection. These construction impacts would be mitigated to a less-than-significant impact; therefore, impacts would be similar to the Project.

For operations, the only new at-grade crossing with this alternative would be at Cooper Avenue near the existing Safeway. This is not a major roadway as it is only used for access to the business park. Periodic delays as trains crossed would not be expected to result in any substantial safety concerns.

Transportation

Transit, Bicycle Facilities, Pedestrian Facilities, and Freight

At-grade and aerial guideway construction activities for the North of SR 59 BNSF/Downtown Connection Alternative would require lane closures and/or temporary detours during the construction phase. These closures and/or detours are not likely to impact existing transit routes or travel times, but could increase resident travel times. Lane closures and detours, though temporary in nature, may interfere with typical routes and thoroughfares used by Merced residents and therefore require the use of alternative routes, similar to the Project.

Active transportation including biking and pedestrians could be temporarily impacted due to closures of roadway segments adjacent to railway construction. This would primarily take place near the proposed integrated HSR station location between O Street and R Street.

Implementation of a construction road traffic control plan would serve to maintain acceptable performance objectives for general vehicles and active transportation in accordance with the respective agencies that have jurisdiction, resulting in a less than significant impact for this alternative, similar to the Project.

Disruption to active freight rail operations, including on the UPRR mainline, would result in a significant impact. In the event that construction disrupts active freight rail operations, coordination would need to occur well in advance of construction activity. Implementation of a mainline railway disruption control plan for construction would serve to maintain acceptable freight travel times, schedule retention and performance objectives in accordance with the respective agencies that have jurisdiction. Incorporation of the plan would less the impacts of this alternative to less than significant, similar to the Project.

To reduce impacts related to transit travel times on passenger rail and minimize disruptions, implementation of an ACE/San Joaquins railway disruption control plan for construction would serve to maintain acceptable passenger rail travel times, and retention of scheduled headways in accordance with respective agencies that have jurisdiction. Incorporation of this plan would lessen the impacts of this alternative to less than significant, similar to the Project.

Vehicle Miles Traveled

Similar to the Project, the North of SR 59 BNSF/Downtown Connection Alternative would shift travel demand from driving trips to public transit trips and reduce regional vehicle traffic and VMT on major highways and arterials. This alternative is expected to have the same beneficial effects on reducing VMT as the Project.

Construction of the alternative would temporarily generate additional VMT related to construction work activities, construction labor trips, and the transport of excavated materials and construction equipment and supplies. This additional VMT would terminate upon completion of construction and would not be in effect during operation of the alternative. The temporary nature of construction-related VMT and construction-related traffic circulation changes (e.g., detours) would not result in a substantial or long-term change in regional travel patterns such that construction of the alternative would result in a significant impact related to VMT. Therefore, construction of the alternative would result in a less-than-significant impact, similar to the Project.

Emergency Access

Construction activities for the North of SR 59 BNSF/Downtown Connection Alternative would temporarily increase fire and police protection and response times as a result of periodic construction-related street closures or detours. This alternative would require temporary road detours during the construction phase and potentially impact emergency response times related to fire and police protection. The aerial guideway would require the installation of supporting columns, bent caps, and guideway beams. Street detours to build the aerial guideway would occur on the streets perpendicular to the alignment between O Street and V Street. At-grade crossings, such as at Cooper Avenue, would require the installation of crossing panels, crossing signals, guards/gates, and signal houses where the new track would cross the roadway. Street detours, although temporary in nature, may interfere with typical routes and thoroughfares used by emergency responders and therefore require the use of alternative routes. Such instances would increase emergency response times and result in a significant impact. Implementation of a transportation management plan would serve to maintain acceptable response times and performance objectives for emergency response services in accordance with the respective agencies that have jurisdiction, and would lessen impacts for this alternative to less than significant, similar to the Project.

6.5 Environmentally Superior Alternative

CEQA Guidelines Section 15126.6(e)(2) require an EIR to identify an "environmentally superior alternative" from among the alternatives considered to the Project. The guidelines also state that if the environmentally superior alternative is the No Project Alternative, then the EIR must also identify an environmentally superior alternative among the other alternatives. As such, from a technical CEQA perspective, an EIR cannot identify a Project as the "environmental superior alternative" even if the Project has better environmental performance than all the alternatives. As discussed below, the Project would be environmentally superior to any other alternative.

The Project as well as any of the alternatives considered would provide benefits including providing additional mobility from connection between the San Joaquins service and the future HSR service, lowering criteria air pollutants and GHG emissions due to diversion of riders from passenger vehicles.

As described in Section 6.2, *Alternatives Considered But Dismissed from Further Analysis*, all of the other alternatives considered were dismissed from further consideration as they either did not meet most of the Project objectives, were infeasible, or would not avoid or reduce a significant impact of the Project. Table 6-2 provides a compassion of the impacts of the Project, the No Project Alternative, and the North of SR 59 BNSF/Downtown Connection Alternative.

Table 6-2. Comparison of Environmental Impacts of the No Project Alternative and the North of SR 59 BNSF/Downtown Connection Alternative to the Project

Impact Criteria [a]	Project	No Project Alternative	North of SR 59 BNSF/Downtown Connection Alternative
Aesthetics (Operation)	Less than significant (Project) Less than significant with mitigation (Variant H1)	Less impacts than Project due to no elevated viaduct to downtown	Greater impacts than Project and No Project Alternative due to new rail alignment through orchard
Agriculture (Construction and Operation)	Less than significant	Same as the Project	Greater impact than Project and No Project Alternative due to new rail alignment through orchard
Air Quality/GHG Emissions (Construction)	Less than significant	Less construction emissions than Project due to no rail connection to downtown Merced	Greater construction emissions due to longer rail connection between BNSF and downtown Merced. May require mitigation to be less than significant.
Air Quality/GHG Emissions (Operation)	Beneficial	Greater air quality/GHG emissions than the Project because less VMT reduction due to lower ridership	Same air quality/GHG emissions reduction benefits as Project
Biology (Construction)	Less than significant with mitigation	Less impacts than Project due to smaller construction footprint	Similar impacts as Project
Cultural (Construction)	Less than significant with mitigation	Less potential impact on undiscovered resources due to smaller construction footprint	Greater potential impact on undiscovered resources due to greater construction footprint
Land Use and Planning (Operation)	Less than significant	Same impacts as Project	Greater impacts than the Project and the No Project Alternative due to new rail alignment in area of existing wastewater treatment ponds and orchard

Impact Criteria [a]	Project	No Project Alternative	North of SR 59 BNSF/Downtown Connection Alternative
Noise (Construction and Operation)	Construction: less than significant with mitigation with the exception of construction noise at night near residents which is unavoidable. Operation: less than significant.	Would avoid construction and operational noise impacts along SR 59 and would have less impacts than Project. Would result in more highway traffic noise between Merced, Stockton, Sacramento, and the San Francisco Bay Area because it would divert less vehicle travel compared to the Project.	Would avoid construction and operational noise impacts along SR 59 and would have lower impacts than Project and No Project Alternative
Utilities and Service Systems (Construction)	Less than significant with mitigation	Less impacts than Project because of smaller construction footprint	Would require reconfiguration/relocation of portion of wastewater treatment ponds resulting in greater impact than Project and No Project Alternative
Vehicle Miles Traveled (Operation)	Beneficial	Less VMT reduction benefits than the Project due to lower ridership	Same VMT reduction benefits as Project

Source: Quantitative data from analysis in Chapter 3, *Environmental Impact Analysis*, for the Project.
[a] The summary analysis in this column focuses on the topics that have the greatest potential to disclose differences in environmental impacts for the different alternatives. There would be no substantial differences in the other environmental topics.

While the No Project Alternative would avoid or lessen the construction impacts of the Project and the North of SR 59 BNSF/Downtown Connection Alternative, it is not considered the "environmentally superior alternative" because it would have lower ridership and thus lower air quality and GHG emissions reduction benefits.

The "environmentally superior alternative" among the alternatives is the North of SR 59 BNSF/Downtown Connection Alternative. As discussed in Section 6.4.2, *North of SR 59 BNSF/Downtown Connection Alternative*, there are some environmental tradeoffs between this alternative and the Project. These environmental tradeoffs are summarized in Table 6-2 and include the following.

- The construction footprint is smaller, resulting in less construction impacts related to aesthetics, air quality, GHG emissions, cultural resources, and utilities.
- It avoids displacing wastewater treatment ponds and unique farmland that the North of SR 59 BNSF/Downtown Connection Alternative would displace.

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Chapter 7
List of Preparers

The California Environmental Quality Act (CEQA) Lead Agency for this environmental impact report (EIR) is the San Joaquin Joint Powers Authority (SJJPA).

This EIR was prepared for the SJJPA by the following entities.

- AECOM (overall project management and engineering).
- ICF (lead on environmental analysis and document development, including all sections not listed for other firms).
- Cross-Spectrum Acoustics (noise analysis).
- Kearns & West (planning and outreach).
- JMA Civil (track design).
- KSN Engineering (survey and utilities).

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Chapter 8
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None

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