San Joaquin Regional Rail Commission

San Joaquin Joint Powers Authority

SCH #2019090306

Valley Rail
Sacramento Extension Project

Final Environmental Impact Report

Volume I

September 2020

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STATE CLEARINGHOUSE #2019090306

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Prepared for:

San Joaquin Regional Rail Commission

San Joaquin Joint Powers Authority

San Joaquin Regional Rail Commission
949 East Channel Street
Stockton, CA 95202
Contact: Kevin Sheridan
ace.sacramentoextension@gmail.com

Prepared by:

AECOM

AECOM
2020 L Street, Suite 400
Sacramento, CA 95811

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List of Acronyms

°C	degrees Celsius
µg/m^3	micrograms per cubic meter
AB	Assembly Bill
ACE	Altamont Corridor Express
ACHP	Advisory Council on Historic Preservation
ACM	asbestos-containing materials
Act	California Wild and Scenic Rivers Act
AD	*anno domini*
ADA	Americans with Disabilities Act
AGL	above ground level
Alquist-Priolo Act	Alquist-Priolo Earthquake Fault Zoning Act
ALS	advanced life support
amsl	above mean sea level
Assembly Bill 32	California Global Warming Solutions Act of 2006
B.P.	Before Present
bgs	below ground surface
BLS	basic life support
BMP	best management practice
BNSF	Burlington Northern Sant Fe
C&D	construction and demolition
CAA	Clean Air Act
CAA	Clean Air Act Amendment
CAAQS	California Ambient Air Quality Standards
CAFE	Corporate Average Fuel Economy
cal	calibrated
Cal/EPA	California Environmental Protection Agency
CalEEMod	California Emissions Estimator Model
Caltrans	California Department of Transportation
CAPCOA	California Air Pollution Control Officers Association
CARB	California Air Resources Board
CBC	California Building Standards Code
CCIC	Central California Information Center
CCR	California Code of Regulations
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CFC	California Fire Code
CFR	Code of Federal Regulations

CH_4	Methane
CHRIS	California Historical Resources Information System
CLUP	Comprehensive Land Use Plan
CNDDB	California Natural Diversity Database
CNEL	community noise equivalent level
CNPS	California Native Plant Society
CO_2	carbon dioxide
CPRR	Central Pacific Railroad
CPUC	California Public Utilities Commission
CRHR	California Register of Historical Resources
CRMP	Construction Risk Management Plan
CRPR	California Rare Plant Rank
CUPA	Certified Unified Program Agencies
CVFPB	Central Valley Flood Protection Board
CVFPP	Central Valley Flood Protection Plan
CWA	Clean Water Act
dB	decibels
dBA	A-weighted decibels
DDT	dichlorodiphenyltrichloroethane
DOC	Department of Conservation
DOF	Department of Finance
DPM	diesel particulate matter
DPR	California Department of Parks and Recreation
DPS	Distinct Population Segment
DTSC	Department of Toxic Substances Control
DWR	California Department of Water Resources
EC	Engineering Circular
EFH	Essential Fish Habitat
EIR	Environmental Impact Report
EMFAC	CARB Emission FACtor
EMS	Emergency Medical Services
ENEC	East Natomas Education Complex
EO	Executive Order
EOP	Emergency Operations Plan
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
ESU	Evolutionary Significant Unit
FAA	Federal Aviation Administration
FAR	Federal Aviation Regulation
FEMA	Federal Emergency Management Agency
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act

FIRM	Flood Insurance Rate Map
FMMP	Farmland Mapping and Monitoring Program
FRA	Federal Railroad Administration
FSZ	Farmland Security Zone
FTA	Federal Transit Administration
g/bhp-hr	grams per brake horsepower-hour
GAMAQI	Guide for Assessing and Mitigating Air Quality Impacts
General Plan	San Joaquin County 2035 General Plan
GHG	Greenhouse Gas
GIS	Geographic Information System
GWP	global warming potential
H&S	Health and Safety
HABS	Historic American Buildings Survey
HAPC	Habitat Areas of Particular Concern
HI	hazard index
HSR	high-speed rail
I-5	Interstate 5
I-80	Interstate 80
ICCTA	Interstate Commerce Commission Termination Act
IPCC	Intergovernmental Panel on Climate Change
JRP	JRP Historical Consulting Services
K-9	canine
KOP	key observations point
LBP	lead-based paint
L_{dn}	day-night sound level
L_{eq}	equivalent sound level
LESA	Lake and Streambed Alteration Agreement
LID	low-impact design
L_{max}	maximum sound level
LOS	level of service
LRT	light rail transit
LT	long-term
L_v	vibration velocity level
MBTA	Migratory Bird Treaty Act
MEI	maximum exposed individual
mg/m^3	milligrams per cubic meter
MGD	million gallons per day

MLRA	Major Land Resource Area
MMA	Management Agency Agreement
MOU	memorandum of understanding
mph	miles per hour
MPO	Metropolitan Planning Organization
MRP	Monitoring and Reporting Program
MRZ	Mineral Resources Zone
MS4	Municipal Separate Storm Sewer Systems
$MTCO_2e$	metric tons of CO_2 equivalents
MTP/SCS	Metropolitan Transportation Plan/Sustainable Communities Strategy
MUTCD	Manual on Uniform Traffic Control Devices
N_2O	nitrous oxide
NAAQS	national ambient air quality standards
NAGPRA	Native American Graves Protection and Repatriation Act
NAHC	Native American Heritage Commission
NALP	North Area Local Project
NCIC	North Central Information Center
NCRC&SL	North County Recycling Center and Sanitary Landfill
NEHRP	National Earthquake Hazards Reduction Program
NEHRPA	National Earthquake Hazards Reduction Program Act
NEMDC	Natomas East Main Drainage Canal
NESHAP	National Emissions Standards for Hazardous Air Pollutants
NFIP	National Flood Insurance Program
NHL	National Historic Landmark
NHPA	National Historic Preservation Act
NHTSA	National Highway Traffic Safety Administration
NMFS	National Marine Fisheries Service
NOA	naturally occurring asbestos
NOAA	National Oceanic and Atmospheric Administration
NOP	Notice of Preparation
NOx	nitrogen oxide
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NRHP	National Register of Historic Places
NWI	National Wetlands Inventory
OEHHA	California Office of Environmental Health Hazard Assessment
OES	Office of Emergency Services
OHP	Office of Historic Preservation
OSHA	Occupational Safety and Health Administration
PAH	polycyclic aromatic hydrocarbons

PCBs	polychlorinated biphenyls
PCJPB	Peninsula Corridor Joint Powers Board
PG&E	Pacific Gas and Electric Company
PHMSA	Pipeline and Hazardous Materials Safety Administration
PM	particulate matter
ppb	parts per billion
PPDG	Project Planning and Design Guide
Ppm	parts per million
PPV	Peak particle velocity
PQS	Professional Qualification Standards
PRC	Public Resources Code
Proposed project	Valley Rail Sacramento Extension Project
RCRA	Resource Conservation and Recovery Act
RD	Reclamation District
RLECWD	Rio Linda/Elverta Community Water District
RMP	risk management plan
RMS	Root-mean-square
ROG	reactive organic gasses
ROW	right-of-way
RPS	renewable portfolio standard
RTA	Rail Transit Agencies
RWQCB	Regional Water Quality Control District
SACOG	Sacramento Area Council of Governments
SacRT	Sacramento Regional Transit
SAFCA	Sacramento Area Flood Control Agency
SAFE	Safer Affordable Fuel-Efficient
SASD	Sacramento Area Sewer District
SB	Senate Bill
SC	species of concern
SCS	Sustainable Communities Strategy
SED	Safety and Enforcement Division
SEL	sound exposure level
Senate Bill 375	California Sustainable Communities and Climate Protection Act
SFHA	special flood hazard areas
SFNA	Sacramento Federal Nonattainment Area
SHPO	State Historic Preservation Officer
SIP	state implementation plan
SJCEMSA	San Joaquin County Emergency Medical Services Agency
SJCOG	San Joaquin Council of Governments
SJJPA	San Joaquin Joint Powers Authority
SJMSCP	San Joaquin County Multi-Species Habitat Conservation Plan

SJRRC	San Joaquin Regional Rail Commission
SJVAB	San Joaquin Valley Air Basin
SJVAPCD	San Joaquin Valley Air Pollution Control District
SLF	Sacred Lands File
SMAQMD	Sacramento Metropolitan Air Quality Management District
SMUD	Sacramento Municipal Utility District
SO_2	sulfer dioxide
SOI	Secretary of the Interior
SPRR	Southern Pacific Railroad
SR	State Route
SRCSD	Sacramento Regional County Sanitation District
SRFCP	Sacramento River Flood Control Project
SSC	species of special concern
SSHCP	South Sacramento Habitat Conservation Plan
SSOA	State Safety Oversight Agency
SSPP	System Safety Program Plan
ST	short-term
SVAB	Sacramento Valley Air Basin
SVE	Soil Vapor Extraction
SVP	Society of Vertebrate Paleontology
SWAT	Special Weapons and Tactics
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Resources Control Board (State Water Board)
TAC	toxic air contaminant
TCP	Traditional Cultural Properties
TMDL	total maximum daily load
TOD	transit-oriented development
TSCA	Toxic Substances Control Act
U.S.C.	United States Code
UAIC	United Auburn Indian Community
UCMP	University of California, Berkeley Museum of Paleontology
UDA	Urban Development Area
ULDC	Urban Levee Design Criteria
UPRR	Union Pacific Railroad
USACE	U.S. Army Corps of Engineers
USCG	U.S. Coast Guard
USDOT	U.S. Department of Transportation
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VdB	vibration velocity level in decibels
VELB	valley elderberry longhorn beetle

VMT	vehicle miles traveled
VOC	volatile organic compound
WDR	waste discharge requirement
WPRR	Western Pacific Railroad

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Executive Summary

ES.1 Project Background

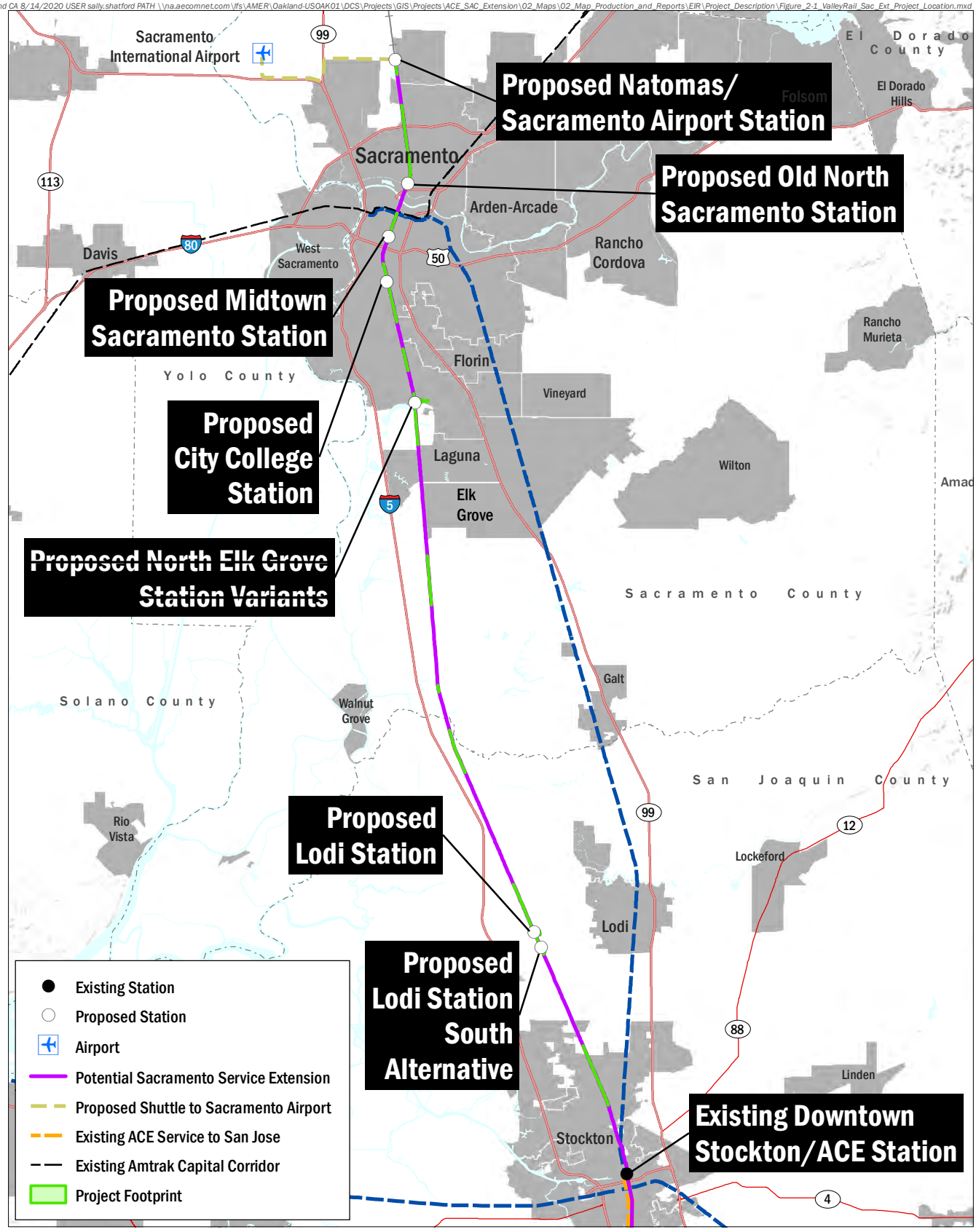
The San Joaquin Joint Powers Authority (SJJPA) and the San Joaquin Regional Rail Commission (SJRRC), which manage the Amtrak San Joaquins and the Altamont Corridor Express (ACE), respectively, are jointly undertaking the planning, design, and environmental review of the Valley Rail Sacramento Extension Project (proposed project), a proposed passenger rail service between Stockton and Sacramento.

The primary objectives of the proposed project are to expand passenger rail service to new markets in San Joaquin and Sacramento counties; increase frequency of service; increase passenger rail ridership; reduce travel time between the San Joaquin Valley and the Sacramento area; augment existing transit capacity and provide transit connections; provide an alternative to automobile traffic congestion; improve regional air quality; reduce greenhouse gas (GHG) emissions; and support local and regional land use development plans and policies. The proposed project would also contribute to geographic equity by providing increased connectivity within the Central Valley, including Sacramento, San Joaquin, Stanislaus, Merced, Madera, and Fresno counties; the Bay Area; and the greater California rail network via two future high-speed rail (HSR) connections in Merced and San Jose.

This proposed project would expand Amtrak San Joaquins and ACE passenger rail services to the greater Sacramento area through the construction of five ~~six~~ new rail stations and track improvements along the Union Pacific Railroad (UPRR) Sacramento Subdivision (Figures ES-1 and ES-2).[1] The proposed stations would include one new station in Lodi and four ~~five~~ new stations in Sacramento (~~North Elk Grove along Cosumnes River Boulevard in South Sacramento;~~ City College; Midtown Sacramento; Old North Sacramento; and Natomas/Sacramento Airport). Increased passenger rail service would include one additional round trip of Amtrak San Joaquins service between the existing Fresno Amtrak Station and the proposed Natomas/Sacramento Airport Station, and one additional round trip of Amtrak San Joaquins service between the existing Bakersfield Amtrak Station and the proposed Natomas/Sacramento Airport Station. The proposed project would also include one additional round trip of ACE service between the proposed Natomas/Sacramento Airport Station and the existing San Jose Diridon Station, one additional round trip between the proposed Natomas/Sacramento Airport Station and the existing the Stockton Downtown/ACE Station, and three round trips between the proposed Ceres ACE Station (included in the ACE Extension Lathrop to Ceres/Merced project) and the proposed Natomas/Sacramento Airport Station.[2]

[1] A *subdivision* is a portion of railroad or railway that operates under a single timetable (authority for train movement in the area).

[2] On August 2, 2018, the SJRRC Board certified the Environmental Impact Report (EIR) and approved the ACE Extension Lathrop to Ceres/Merced project. Operation of Phase I of the ACE Extension Lathrop to Ceres/Merced project (which includes the Ceres Station) is anticipated to begin between 2020 and 2023.



Data Source: ESRI, 2019; AECOM, 2019; San Joaquins and Capital Corridor Rail Alignments: California Department of Transportation, 2013.

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Note: The North Elk Grove Station, including all access and siding variants, is no longer under consideration as part of the proposed project.

FIGURE ES-1

Project Location Map

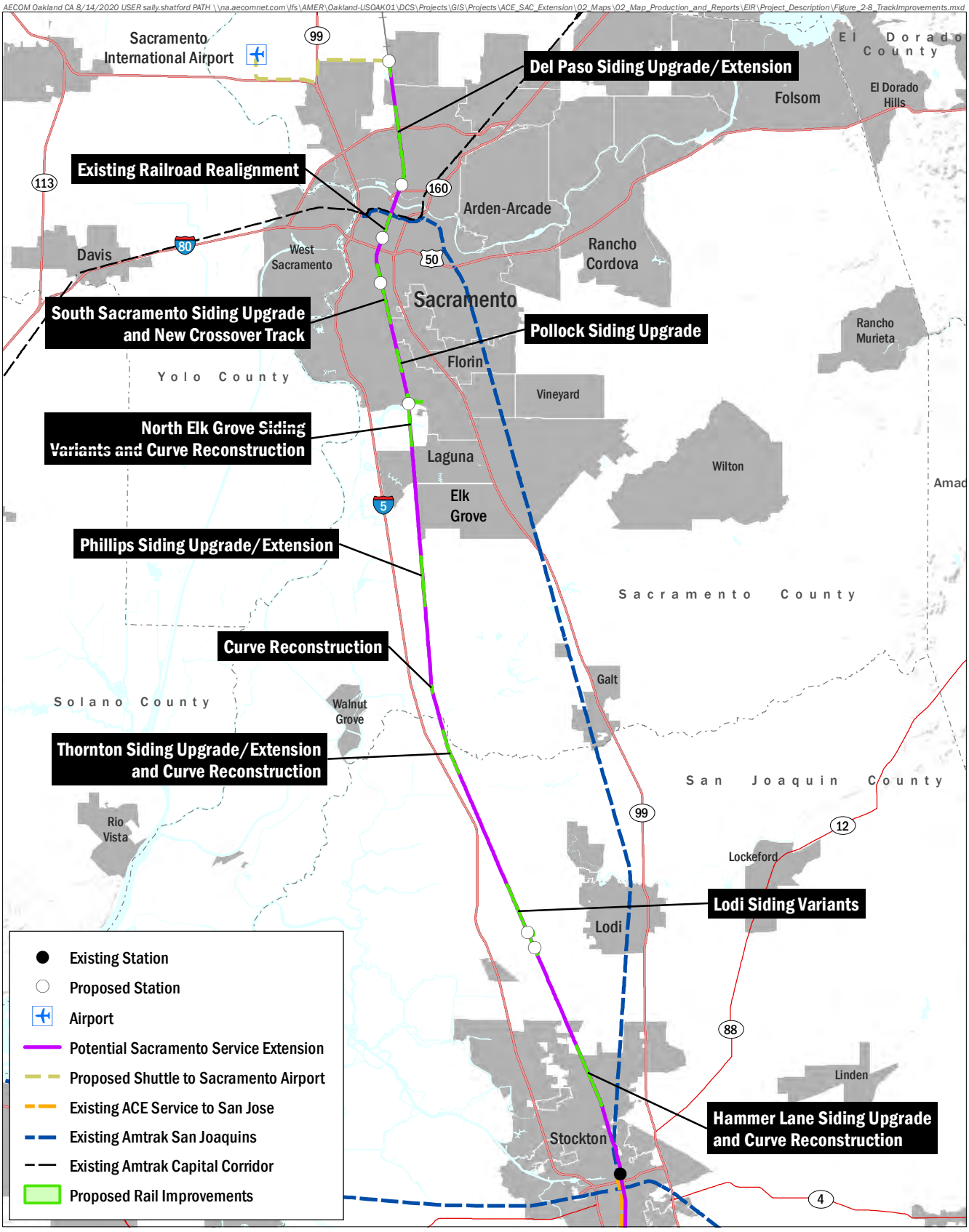

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FIGURE ES-2

Project Track Improvements

Note: The North Elk Grove Station, including all access and siding variants, is no longer under consideration. Therefore, the footprint shown above would be reduced to only the portion of the proposed project that includes the Track Curve Reconstruction North of Elk Grove.

ES.2 Project Goals

The Central Valley population to be served by the proposed project is one of the fastest-growing in the state. Job growth in Sacramento County is expected to increase by 1.3 percent annually.[3] As the Central Valley's population grows, the region's unbalanced ratio of housing and jobs will continue to diverge, with even more people moving out of the Bay Area and Sacramento to find affordable housing in the San Joaquin Valley. There is a need to not only increase service between the San Joaquin Valley and Sacramento but also to provide more service between Sacramento, the San Joaquin Valley, and the Bay Area.

Interstate 5 (I-5) and State Route (SR) 99 are the primary links between the Fresno and Stockton areas to the Sacramento area. These already congested corridors are expected to see continued growth and travel demand. However, existing passenger rail service levels between the San Joaquin Valley and the Sacramento area are low; currently, there are only two daily round trips offered by Amtrak San Joaquins. By 2040, statewide interregional travel is forecasted to increase by 50.9 percent, to 544.7 million two-way trips annually. Over 150 million of those trips are expected to originate or terminate in, or pass through, Sacramento and the San Joaquin Valley.

As further described below, the goals of the proposed project include the following:

- Enhanced intercity and commuter rail service
- Improved connectivity
- Improved regional air quality
- Improved access
- Transit Oriented Development.

ES.2.1 Enhanced Intercity and Commuter Rail Service

The proposed project would support enhanced intercity and commuter rail service between the Sacramento region, the Central Valley, and the San Francisco Bay Area by implementing direct passenger rail service between Sacramento and the cities of Stockton, San Jose, and Merced.

ES.2.2 Improved Connectivity

The proposed project would provide direct rail connections between the Sacramento area, the South San Francisco Bay Area, and the Central Valley via ACE and Amtrak San Joaquins rail service. The proposed project would also increase connectivity to other transportation networks throughout California via potential transfers at the San Jose Diridon Station to Caltrain, the Amtrak Capitol Corridor, and Santa Clara Valley Transportation Authority transit services; transfers to local transportation networks in Sacramento, including Sacramento Regional Transit (SacRT) light rail trains and buses at the proposed City College Station, Midtown Sacramento Station, and Old North Sacramento Station; transfers to the Sacramento International Airport via a shuttle from

[3] Sacramento County Economic Forecast (Caltrans 2016).

the proposed Natomas/Sacramento Airport Station; and transfers to the future California HSR system at the San Jose Diridon Station and Merced.

ES.2.3 Improved Regional Air Quality

The proposed project would improve regional air quality by reducing automobile vehicle miles traveled (VMT) and related GHG emissions. The expanded and improved San Joaquins and ACE services would provide transportation alternatives to automobile use along highway corridor segments on SR 99, SR 120, I-205, I-580, I-680, and I-880, and would result in air quality benefits and GHG emissions reductions.

Reductions in air pollutant emissions can lead to long-term health benefits for residents and employees along the existing rail corridors, addressing health problems associated with air pollution such as lung irritation, inflammation, asthma, heart and lung disease, and worsening of existing chronic health conditions. In addition, reduction of GHG emissions would help California meet its goals under Assembly Bill 32 (the California Global Warming Solutions Act of 2006) as well as GHG emissions reduction goals beyond 2020.

ES.2.4 Improved Access

The proposed project would improve access to economic opportunities and affordable housing all along the corridors of service and would particularly benefit the disadvantaged communities it would serve. The proposed project is well positioned to dramatically increase employment access to residents throughout the service area, particularly access for disadvantaged communities. The existing ACE service corridor from Stockton to San Jose provides access to approximately 1.04 million jobs in a 2.5-mile radius of the stations; existing San Joaquins service provides access to just under 600,000 jobs in the same station area radius. The proposed service expansions north and south of Stockton would provide access to an additional half-million jobs. All told, residents in the combined service areas would have access to more than 2.25 million jobs.

California's high housing costs make it difficult for many to find affordable housing. The combined service area would also provide rail connectivity to nearly 9,000 units of affordable housing within a half-mile of station areas.

ES.2.5 Transit-Oriented Development

Transit-oriented development (TOD) is a type of urban development that maximizes the amount of residential, business, and leisure space within walking distance of public transportation facilities. Around rail stations TOD can lead to increased transit ridership and farebox revenues; spur neighborhood revitalization and economic development; and improve quality of life for residents by providing direct, walkable access to transit and other necessary land uses, such as restaurants, entertainment, and community spaces. Development focused around rail stations would support initial ridership and scale up with growth in service levels over time, providing a return on investment to the State and communities served by the proposed project. TOD can increase employment and housing opportunities, as well as economic and environmental sustainability, all while lowering household transportation costs, public infrastructure costs, and overall pollution. TOD opportunities exist in legacy housing and commercial developments near the proposed stations and in underdeveloped or vacant sites near proposed stations, enabling

sustainable development and combatting the impacts and negative externalities of continued sprawl.

Implementation of ACE and San Joaquins service on the Sacramento Subdivision would serve key TOD opportunities in Central Sacramento. By 2020, more than 1,100 residential units and 1.3 million square feet of commercial development are planned within a 1-mile radius of the proposed City College Station, Midtown Sacramento Station, and Old North Sacramento Station.

ES.3 Project Description

ES.3.1 Stations

The proposed project includes the construction of five ~~six~~ new stations between Stockton and the Natomas area of Sacramento (Figure ES-1). Each proposed station would be located along the existing UPRR alignment Sacramento Subdivision. For stations that include alternatives (Lodi Station) ~~or variants (North Elk Grove Station)~~, only one alternative or variant would be selected for implementation. All stations would be designed in compliance with Americans with Disabilities Act (ADA) regulations and applicable federal transportation standards. The stations would also include passenger amenities, such as platform shelters, benches, lighting, security cameras, signage, ticketing machines, bicycle storage facilities, landscaping, and emergency call boxes. The proposed stations are briefly described below.

ES.3.1.1 Lodi Station

The Lodi Station would be constructed on a 13-acre site along the south side of SR 12 just east of the existing UPRR alignment. The site is currently being used for agriculture. Access to the station would be provided from along SR 12 and from Devries Road.

ES.3.1.2 Lodi Station South Alternative

An alternative to the Lodi Station is also under consideration. Under the Lodi Station South Alternative, the station would be constructed on a 15-acre site along the north side of West Harney Lane just east of the UPRR alignment. The site is currently being used for agriculture. Access to the station would be provided from along West Harney Lane and Devries Road.

~~ES.3.1.3 North Elk Grove Station~~

~~The North Elk Grove Station (including all access and platform variants) would be constructed on a 32-acre site beneath the Cosumnes Boulevard/Morrison Creek viaduct near the existing SacRT Franklin light rail transit (LRT) station in Sacramento. The site is currently an undeveloped property owned by the Sacramento Regional County Sanitation District. Access to the station would be provided by a new frontage road that would be constructed just south of Cosumnes Boulevard. As described below, there are two platform variants and two station access variants under consideration.~~

~~North Elk Grove Station Platform Location Variant 1 (P1)~~

~~Under Platform Location Variant P1, the platform location would begin just south of the storm drain channel that runs parallel to the Cosumnes River Boulevard viaduct. The platform would be~~

~~30 feet wide, and the north end of the platform would end 500 feet south of the Cosumnes River Boulevard viaduct.~~

~~North Elk Grove Station Platform Location Variant 2 (P2)~~

~~Under Platform Location Variant P2, the platform location would begin north of the storm drain channel that runs parallel to the Cosumnes River Boulevard viaduct. The platform would be 30 feet wide, and the north end of the platform would end at the Cosumnes River Boulevard viaduct. This variant would require a new railroad bridge crossing of Union House Creek north of the proposed station to accommodate the required station siding.~~

~~North Elk Grove Station Access Variant 1 (A1)~~

~~Under Access Variant A1, access to the station would be via a new, signalized three-way intersection on Cosumnes River Boulevard west of the existing Franklin LRT station access intersection. The proposed frontage road would parallel Cosumnes River Boulevard up to the new intersection.~~

~~North Elk Grove Station Access Variant 2 (A2)~~

~~Under Access Variant A2, access to the station would be via the existing Cosumnes River Boulevard/Franklin LRT station intersection. The proposed frontage road would parallel Cosumnes River Boulevard up to the existing intersection, where the intersection would be converted from the existing three-way configuration to a full four-way configuration.~~

ES.3.1.4 City College Station

The City College Station would be constructed adjacent to the existing SacRT City College LRT station north of Sutterville Road in Sacramento. The proposed station would consist of a new 15-foot-wide by 1,000-foot-long at-grade side-loading passenger platform with an 8-foot-wide by 300-foot-long back side extension for transfers to and from the existing LRT platform. The station would also include the construction of tracks for ACE trains within the existing station area. No expansion of existing parking or bus facilities is included as part of the proposed City College Station.

ES.3.1.5 Midtown Sacramento Station

The Midtown Sacramento Station would be constructed near Q Street between 19th Street and 20th Street in Sacramento. This site was selected to minimize potential impacts to east-west roadways in Midtown during times when ACE and San Joaquins trains are at the station. While at the station, the trains would stop across Q Street; therefore, train doors in the portion of the train that traversed Q Street would remain closed, and passengers would need to board and disembark from other train cars. No new parking or facilities would be constructed as part of the proposed Midtown Sacramento Station. However, additional station area improvements are included to facilitate station access and integration of the station into the Midtown Neighborhood.

ES.3.1.6 Old North Sacramento Station

The Old North Sacramento Station would be constructed on an 8-acre site along the west side of Acoma Street just north of El Monte Avenue in Sacramento. The site is currently developed for

commercial/industrial uses. Access to the station would be provided from two new driveways along Acoma Road.

ES.3.1.7 Natomas/Sacramento Airport Station

The Natomas/Sacramento Airport Station would be constructed on an 8.4-acre site along the east side of Blacktop Road just south of West Elkhorn Boulevard. Access to the station would be provided via Blacktop Road. The site proposed for Natomas/Sacramento Airport Station is currently developed with commercial/industrial uses. Shuttle services to and from Sacramento International Airport would be provided and timed to meet all incoming and departing trains.

The Natomas/Sacramento Airport Station would also include layover tracks south of the platform to accommodate ACE and Amtrak train layovers between service runs. The layover tracks would accommodate four trains (plus one train layover at the station platform). The tracks would also allow for interior train cleaning during layovers. Employee access to the layover tracks would be from an access road that would be constructed west of the proposed tracks.

ES.3.2 Track Improvements

The proposed project includes track improvements to existing UPRR track at various locations along the Sacramento Subdivision (see Figure ES-2). These improvements are necessary to increase allowable train speeds and meet operational requirements. All of the proposed track work would occur within the existing UPRR right-of-way (ROW).

ES.3.2.1 Track Curve Reconstruction

At four locations, existing track curves would be reconstructed by increasing the curve radii and shifting the centerline of the mainline tracks. These improvements would increase the allowable speed of the curves from 60 miles per hour (mph) to 90 mph to accommodate the typical 79 mph operation of San Joaquins and ACE trains along the corridor.

ES.3.2.2 Existing Passing Siding Track Upgrades

Six existing UPRR sidings would require upgrades to accommodate the operational requirements UPRR needs to allow passenger service to run along the Sacramento Subdivision, including:

- Hammer Lane Siding Upgrade
- Thornton Siding Upgrade/Extension
- Phillips Siding Upgrade/Extension
- Pollock Siding Upgrade
- South Sacramento Siding Upgrade
- Del Paso Siding Upgrade/Extension

ES.3.2.3 New Passing Siding Tracks

~~Two~~ One new UPRR siding~~s are~~ is required to accommodate the operational requirements UPRR needs to allow passenger service to run in this corridor, including:

- Lodi Siding Variants – Including construction of a second mainline track starting just south of West Harney Lane and extending north for approximately 18,500 feet. The new track

would go around the proposed station platform to be constructed for the Lodi Station or the Lodi Station South Alternative.

- ~~North Elk Grove Siding Variants – Including construction of a 10,000-foot-long siding track starting south of Sims Road extending to just north of the proposed North Elk Grove Station. The actual limits of the siding would be based on which of the two North Elk Grove Station platform variants is selected. There would also be a new railroad bridge crossing of Laguna Creek and, depending on the platform variant selected, a second railroad bridge crossing of Union House Creek north of the proposed station.~~

ES.3.2.4 New Crossover Track

A crossover track and signaling would be installed just south of the proposed City College Station to allow northbound and southbound passenger trains to pass, using the existing track siding south of the proposed station.

ES.3.3 Conceptual Service Plan

ACE currently operates four westbound trains weekday mornings from Stockton to San Jose and four eastbound trains weekday afternoons from San Jose to Stockton. Saturday ACE service currently includes two westbound morning trains from Stockton to San Jose and two eastbound afternoon trains from San Jose to Stockton. There is no Sunday ACE service.

Amtrak's current San Joaquins service includes trains between Sacramento and Bakersfield (three daily southbound trains and two daily northbound trains) and between Oakland and Bakersfield (five daily southbound and northbound trains).

The proposed project includes the addition of both Amtrak San Joaquins trains and ACE trains along the Sacramento Subdivision serving the six new stations described above. The preliminary conceptual service plan is described below.

ES.3.3.1 San Joaquins

With implementation of the proposed project, there would be two new round trip San Joaquins operating on the Sacramento Subdivision. One round trip would operate between the proposed Natomas/Sacramento Airport Station and the existing Fresno Amtrak Station, and one round trip would operate between the proposed Natomas/Sacramento Airport Station and the existing Bakersfield Amtrak Station. Both of these round trips would operate on the Sacramento Subdivision between the proposed Natomas/Sacramento Airport Station and the existing Stockton Downtown/ACE Station. The existing alignment south of Stockton would remain unchanged; the service would continue to operate over the BNSF Stockton Subdivision, with trains stopping at the existing Amtrak stations along the subdivision before terminating at either Fresno or Bakersfield.

To maximize the efficiency of the proposed service, some of the existing departure and arrival locations would be revised and the schedule would be adjusted to represent a "pulse" scenario in which train arrivals and departures occur at set intervals. The schedules for existing Amtrak Thruway bus services would be adjusted to reflect the new service schedules.

ES.3.3.2 ACE

The proposed project also includes an extension of existing ACE service to the proposed Natomas/Sacramento Airport Station. One existing ACE train would originate at the proposed Natomas/Sacramento Airport Station in the morning (rather than at the existing Stockton Downtown/ACE Station) and operate to the Stockton Downtown/ACE Station. The subdivisions operated upon by the ACE service would be the same as those proposed for the San Joaquins service north of the Stockton Downtown/ACE Station. Once at the Stockton Downtown/ACE Station, the ACE train would operate in the same manner as the existing ACE service to the San Jose Diridon Station. In the afternoon, one existing ACE train would depart the San Jose Diridon Station and operate to the Stockton Downtown/ACE Station (as is currently the operation), then continue north to terminate at the proposed Natomas/Sacramento Airport Station and layover overnight in the station.

The proposed project also includes service between the proposed Ceres Station (included in the ACE Extension Lathrop to Ceres/Merced project), and the Natomas/Sacramento Airport Station. This service would provide three ACE trips that would originate in Ceres in the morning, traveling to Natomas and stored during the day. One of the trains would make a midday trip south to Stockton and back. In the afternoon, the three ACE trains would return to the Ceres Station.

ES.3.3.3 Airport Shuttle Services

The proposed project would include the establishment of a new shuttle service between the proposed Natomas/Sacramento Airport Station and Sacramento International Airport. While an operator of the proposed shuttle service has not yet been identified, service would be established such that each arriving and departing train would be met by an airport shuttle.

ES.3.3.4 Construction Schedule and Durations

SJRRC proposes to implement the ACE service extension to Natomas no later than 2023. Table ES-1 identifies the duration for construction of each improvement. The construction durations presented are not sequential; construction could occur simultaneously at several locations. The durations noted in the table are for actual construction activity. Improvements 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 ES-1. Construction Durations

Improvement	Construction Duration (Months)
Stations	
Lodi Station or Lodi Station South Alternative	14
~~North Elk Grove Station (including all access and platform variants); any variant~~	~~14~~
City College Station	8
Midtown Sacramento Station	12
Old North Sacramento Station	14
Natomas/Sacramento Airport Station	12
Track Improvements	

Improvement	Construction Duration (Months)
Track Curve Reconstruction East March Lane to East Swain Road	1
Hammer Lane Siding Upgrade	2
Lodi Siding Variants (either variant)	8
Thornton Siding Upgrade/Extension	4
Track Curve Reconstruction North of North New Hope Road	1
Track Curve Reconstruction South of Desmond Road	1
Phillips Siding Upgrade/Extension	2
~~North Elk Grove Siding Variants (either variant)~~	~~8~~
Track Curve Reconstruction North of ~~the North~~ Elk Grove ~~Station~~	1
Pollock Siding Upgrade	2
South Sacramento Siding Upgrade	4
Crossover Track South of City College Station	2
Del Paso Siding Upgrade/Extension	12

ES.3.4 Right-of-Way and Easement Needs

Table ES-2 lists the parcels outside the UPRR ROW that would be affected by project improvements.[4] These parcels may be acquired or may require easements for roadway improvements and stations.

Table ES-2. Right-of-Way Requirements

Accessor's Parcel Number (APN)	Ownership	Area (Acres)	Reason for Acquisition
Lodi Station			
05517026	Private	10.38	Station Parking
Lodi Station South Alternative			
05524028	Private	500 (Sq. Ft.)	Pedestrian Access and PG&E Easement
05524026	Private	9.86	Station Parking
~~North Elk Grove Station (including all access and platform variants)~~			
~~119-0080-036~~	~~Public~~	~~484 (Sq. Ft.)~~	~~Station Parking~~
~~119-0080-037~~	~~Public~~	~~7.96~~	~~Station Parking~~
~~119-0080-040~~	~~Public~~	~~4.35~~	~~Station Parking~~
~~119-0080-027~~	~~Public~~	~~0.31~~	~~Station Parking~~
~~119-0080-046~~	~~Public~~	~~0.54~~	~~Station Parking~~
~~119-0080-043~~	~~Public~~	~~1.67~~	~~Station Parking~~
~~119-0080-044~~	~~Public~~	~~0.76~~	~~Access Road A1~~
~~119-0080-047~~	~~Public~~	~~0.18~~	~~Access Road A1~~
~~119-0080-045~~	~~Public~~	~~2.41~~	~~Access Road A2~~
~~119-0080-048~~	~~Public~~	~~0.88~~	~~Access Road A2~~

[4] Construction of all track improvements, as well as the proposed Midtown Sacramento Station, would occur within the existing UPRR ROW.

Table ES-2. Right-of-Way Requirements

Accessor's Parcel Number (APN)	Ownership	Area (Acres)	Reason for Acquisition
~~119-0080-047~~	~~Public~~	~~0.44~~	~~Access Road A2~~
~~119-0080-042~~	~~Public~~	~~5.79~~	~~Access Road A2~~
Old North Sacramento Station			
275-0111-006	Private	5.82	Station Parking
Natomas/Sacramento Airport Station			
214-0010-013	Public	0.25	Station Layover
214-0290-001	Private	1.74	Station Parking
214-0290-002	Private	2.14	Station Parking
214-0290-003	Private	0.24	Station Layover
214-0290-034	Private	0.17	Station Layover
214-0290-037	Private	0.80	Station Layover
214-0290-038	Private	0.17	Station Layover

Sq. Ft = square feet

ES.4 Costs and Revenues

ES.4.1 Costs and Revenues

ES.4.1.1 Capital Costs

As shown in Table ES-3, capital costs associated with the proposed project would be between ~~$319 - $328~~ $262 and $264 depending on the selected station at Lodi ~~and North Elk Grove~~. Capital costs are presented in more detail in Appendix F, *Sacramento Extension Capital Cost Basis Report.*

Table ES-3. 2020 Construction Cost Estimates (In Thousands of $)

Improvement	Construction Cost
Lodi Station	$30,702
Lodi Station South Alternative *	$32,152
~~North Elk Grove Station Platform Variant 1~~	~~$33,163~~
~~North Elk Grove Station Platform Variant 2 *~~	~~$34,104~~
~~North Elk Grove Station Access Variant 1~~	~~$5,549~~
~~North Elk Grove Station Access Variant 2 *~~	~~$9,836~~
City College Station	$17,747
Midtown Sacramento Station	$25,735
Old North Sacramento Station	$31,215
Natomas/Sacramento Airport Station	$32,942
Curve Correction Between East March Lane and East Swain Road	$283
Hammer Lane Siding Upgrade	$8,899
Lodi Siding Variants	$26,862
Thornton Siding Upgrade/Extension	$13,258
Curve Correction North of North New Hope Road	$329

Improvement	Construction Cost
Curve Correct South of Desmond Road	$344
Phillips Siding Upgrade/Extension	$12,601
~~Elk Grove Siding Variant 1~~	~~$17,729~~
~~Elk Grove Siding Variant 2 *~~	~~$19,989~~
Curve Correction North of Elk Grove ~~Station~~	$301
Pollock Siding Upgrade	$5,301
South Sacramento Siding Upgrade	$13,489
Crossover Track South of City College Station	$3,136
Del Paso Siding Upgrade/Extension	$39,741
Total	**$262,885** ~~**319,325**~~

* Omitted from the Total

ES.4.1.2 Operations and Maintenance Costs and Revenues

Table ES-4 provides a summary of existing and projected operations and maintenance (O&M) costs associated with increased ACE and San Joaquins services included in the proposed project.

Table ES-4. Summary of Annual Projected Operations & Maintenance (O&M) Cost and Fare Revenue ($-million)

Service	Existing O&M (2017)	Projected O&M (2020)	Projected Fare Revenue (2020)
ACE	$21.6	$32.5	$12.5
San Joaquins	$86.0	$110	$47.0

Source: AECOM, 2018.

ES.5 Summary of Environmental Impacts and Mitigation Measures

The potential environmental impacts of the proposed project (including construction and operational impacts) are described in Chapter 3, *Environmental Impact Analysis*. Potential cumulative impacts are described in Chapter 4, *Other CEQA Required Analysis.* Both chapters also describe mitigation measures (where feasible) to reduce significant impacts to less-than-significant levels. As applicable, significant and unavoidable impacts are also disclosed. The impacts, mitigation measures, and resulting levels of significance for the proposed project are summarized in Table ES-5.

Table ES-5. Summary of Impacts and Mitigation Measures

Impact	Significance before Mitigation	Mitigation Measure(s)	Significance after Mitigation
3.1 Aesthetics			
AE-1: The proposed project would not have a substantial effect on a scenic vista.	LTS	None Required	N/A
AE-2: The proposed project would not substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings, within a state scenic highway.	NI	None Required	N/A
AE-3: The proposed project would 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). Where the proposed project is in an urbanized area, the proposed project would conflict with applicable zoning and other regulations governing scenic quality.	PS	AE-3.1: Landscape all station parking lots. AE-3.2: Apply aesthetic design treatments to pedestrian overcrossings, aerial structures, tunnel openings, bridges, and retaining walls. AE-3.3: Apply aesthetic surface treatments to fencing, pedestrian bridge safety barriers, light standards, cable railings, pedestrian shelters, and signal houses.	LTS
AE-4: The proposed project could create a source of substantial light or glare, which would adversely affect daytime or nighttime views in the area.	PS	AE-4.1: Install screened construction fencing between residents and nighttime work areas where no visual screening is present.	LTS
C-AE-1: Implementation of the proposed project, in combination with other foreseeable projects in the surrounding area, could result in a significant cumulative impact on aesthetics.	PS	AE-3.1: Landscape all station parking lots. AE-3.2: Apply aesthetic design treatments to pedestrian overcrossings, aerial structures, tunnel openings, bridges, and retaining walls. AE-3.3: Apply aesthetic surface treatments to fencing, pedestrian bridge safety barriers, light standards, cable railings, pedestrian shelters, and signal houses. AE-4.1: Install screened construction fencing between residents and nighttime work areas where no visual screening is present.	LCC

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Table ES-5. Summary of Impacts and Mitigation Measures

Impact	Significance before Mitigation	Mitigation Measure(s)	Significance after Mitigation
3.2 Agricultural Resources			
AG-1: The proposed project would temporarily convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to nonagricultural use during construction.	PS	AG-1.1: Restore Important Farmlands used for temporary staging areas.	LTS
AG-2: The project would permanently convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to nonagricultural use.	PS	AG-2.1: Conserve Important Farmlands (Prime Farmland, Farmland of Statewide Importance, and Unique Farmland).	LTS
AG-3: The proposed project would conflict with a Williamson Act contract.	LTS	None Required	N/A
AG-4: The proposed project would conflict with existing zoning for an agricultural use resulting in a significant impact.	PS	AG-4.1: Consult with the San Joaquin County Community Development Department and Board of Supervisors on the adoption of a change in zoning designation for the parcels proposed for the Lodi Station or the Lodi Station South Alternative.	SU
AG-5: The proposed project would not create unviable remnant or severed Important Farmland parcels.	LTS	None Required	N/A
AG-6: The proposed project would not result in conversion of Farmland to nonagricultural use through temporary or permanent noise and vibration impacts on confined farm animals.	LTS	None Required	N/A
C-AG-1: Implementation of the proposed project, in combination with other foreseeable projects in the surrounding area,	PS	AG-1.1: Restore Important Farmlands used for temporary staging areas.	CCU

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Table ES-5. Summary of Impacts and Mitigation Measures

Impact	Significance before Mitigation	Mitigation Measure(s)	Significance after Mitigation
could result in a significant cumulative impact on agriculture.		AG-2.1: Conserve Important Farmlands (Prime Farmland, Farmland of Statewide Importance, and Unique Farmland). AG-4.1: Consult with the San Joaquin County Community Development Department and Board of Supervisors on the adoption of a change in zoning designation for the parcels proposed for the Lodi Station or the Lodi Station South Alternative.	
3.3 Air Quality			
AQ-1: Implementation of the proposed project could conflict with or obstruct implementation of applicable air quality plans.	PS	AQ-2.1: Implement advanced emissions controls for off-road equipment. AQ-2.2: Implement advanced emissions controls for locomotives used for construction. AQ-2.3: Implement fugitive dust control measures at all construction and staging areas to reduce construction-related fugitive dust, consistent with SJVAPCD Regulation VIII and SMAQMD Basic Emission Control Practices. AQ-2.4: Offset construction NO_X emissions.	LTS
AQ-2: Implementation of the proposed project could result in a cumulatively considerable net increase of criteria pollutants for which the project region is non-attainment under an applicable federal or state ambient air quality standard.	PS	AQ-2.1: Implement advanced emissions controls for off-road equipment. AQ-2.2: Implement advanced emissions controls for locomotives used for construction. AQ-2.3: Implement fugitive dust control measures at all construction and staging areas to reduce construction-related fugitive dust, consistent with SJVAPCD Regulation VIII and SMAQMD Basic Emission Control Practices. AQ-2.4: Offset construction NO_X emissions.	LTS
AQ-3: Implementation of the proposed project would not expose sensitive receptors to substantial pollutant concentrations.	PS ~~LTS~~	AQ-2.1: Implement advanced emissions controls for off-road equipment. AQ-2.2: Implement advanced emissions controls for locomotives used for construction. ~~None Required~~	LTS ~~N/A~~
AQ-4: Implementation of the proposed project would not result in other emissions	LTS	None Required	N/A

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Table ES-5. Summary of Impacts and Mitigation Measures

Impact	Significance before Mitigation	Mitigation Measure(s)	Significance after Mitigation
(such as those leading to odors) adversely affecting a substantial number of people.			
C-AQ-1: Implementation of the proposed project, in combination with other foreseeable projects in the surrounding area, could result in a significant cumulative impact on air quality.	PS	AQ-2.1: Implement advanced emissions controls for off-road equipment. AQ-2.2: Implement advanced emissions controls for locomotives used for construction. AQ-2.3: Implement fugitive dust control measures at all construction and staging areas to reduce construction-related fugitive dust, consistent with SJVAPCD Regulation VIII and SMAQMD Basic Emission Control Practices. AQ-2.4: Offset construction NO_X emissions.	LCC
3.4 Biological Resources			
BIO-1: The proposed project could have a substantial adverse effect, either directly or through habitat modifications, on species identified as candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or the U.S. Fish and Wildlife Service.	PS	BIO-1.1: Minimize the temporary construction impact footprint. BIO-1.2: Conduct a worker environmental awareness training program for construction personnel. BIO-1.3: Conduct preconstruction botanical surveys for special-status plants; avoid and minimize impacts during construction. BIO-1.4: Develop and implement a revegetation and weed control plan. BIO-1.5: Document affected special-status plant species and prepare a salvage, relocation, or propagation and monitoring plan for special-status plant species. BIO-1.6: Avoid and minimize impacts on, and compensate for loss of, potentially occupied habitat for vernal pool fairy shrimp and vernal pool tadpole shrimp through consultation with the U.S. Fish and Wildlife Service and implementation of appropriate mitigation. BIO-1.7: Conduct a preconstruction VELB shrub survey, establish avoidance buffers, and/or compensate for removal of potentially occupied habitat for VELB through consultation with the U.S. Fish and Wildlife Service and implementation of appropriate mitigation. BIO-1.8: Avoid and minimize impacts on special-status fish while pile driving and implement seasonal restrictions for in-water work.	LTS

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Table ES-5. Summary of Impacts and Mitigation Measures

Impact	Significance before Mitigation	Mitigation Measure(s)	Significance after Mitigation
		BIO-1.9: Minimize impacts on wildlife and retain biological monitors during construction. BIO-1.10: Implement measures to avoid western pond turtle and giant garter snake during construction. BIO-1.11: Conduct a preconstruction survey for Swainson's hawk and white-tailed kite, and implement avoidance measures, as needed. Compensate for loss of Swainson's hawk and white-tailed kite foraging habitat. BIO-1.12: Conduct a preconstruction survey for western burrowing owl and implement avoidance measures, as needed. BIO-1.13: Conduct a preconstruction survey for greater sandhill crane roost sites and implement avoidance measures, as needed. BIO-1.14: Conduct a preconstruction survey for nesting birds and other raptors, and implement avoidance measures, as needed. BIO-2.1: Avoid and minimize impacts on sensitive natural communities and riparian habitat. BIO-2.2: Comply with the Section 1600 Streambed Alteration Agreement. BIO-2.3: Implement siting constraint measures. BIO-3.1: Avoid and minimize impacts on wetlands and other waters. BIO-3.2: Compensate for impacts on wetlands and other waters. AQ-2.3: Implement fugitive dust control measures at all construction and staging areas to reduce construction-related fugitive dust, consistent with SJVAPCD Regulation VIII and SMAQMD Basic Emission Control Practices. HAZ-2.3: Implement a construction risk management plan (CRMP). HYD-1.1: Avoid water quality impacts from groundwater or dewatering discharges. HYD-1.2: Avoid water quality impacts from construction adjacent to, within, and crossing over surface waters.	

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Table ES-5. Summary of Impacts and Mitigation Measures

Impact	Significance before Mitigation	Mitigation Measure(s)	Significance after Mitigation
BIO-2: The proposed project could have a substantial adverse effect on riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations or by the California Department of Fish and Game or the U.S. Fish and Wildlife Service.	PS	BIO-1.1: Minimize the temporary construction impact footprint. BIO-1.2: Conduct a Worker Environmental Awareness Training Program for construction personnel. BIO-1.4: Develop and implement a revegetation and weed control plan. BIO-1.9: Minimize impacts on wildlife and retain biological monitors during construction. BIO-2.1: Avoid and minimize impacts on sensitive natural communities and riparian habitat. BIO-2.2: Comply with the Section 1600 Streambed Alteration Agreement. BIO-2.3: Implement siting constraint measures. AQ-2.3: Implement fugitive dust control measures at all construction and staging areas to reduce construction-related fugitive dust, consistent with SJVAPCD Regulation VIII and SMAQMD Basic Emission Control Practices. HAZ-2.3: Implement a construction risk management plan (CRMP). HYD-1.1: Avoid water quality impacts from groundwater or dewatering discharges. HYD-1.2: Avoid water quality impacts from construction adjacent to, within, and crossing over surface waters.	LTS
BIO-3: The proposed 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.	PS	BIO-1.1: Minimize the temporary construction impact footprint. BIO-1.2: Conduct a Worker Environmental Awareness Training Program for construction personnel. BIO-1.4: Develop and implement a revegetation and weed control plan. BIO-2.2: Comply with the Section 1600 Streambed Alteration Agreement. BIO-2.3: Implement siting constraint measures. BIO-3.1: Avoid and minimize impacts on wetlands and other waters. BIO-3.2: Compensate for impacts on wetlands and other waters.	LTS

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Table ES-5. Summary of Impacts and Mitigation Measures

Impact	Significance before Mitigation	Mitigation Measure(s)	Significance after Mitigation
		AQ-2.3: Implement fugitive dust control measures at all construction and staging areas to reduce construction-related fugitive dust, consistent with SJVAPCD Regulation VIII and SMAQMD Basic Emission Control Practices. HAZ-2.3: Implement a construction risk management plan (CRMP). HYD-1.1: Avoid water quality impacts from groundwater or dewatering discharges. HYD-1.2: Avoid water quality impacts from construction adjacent to, within, and crossing over surface waters.	
BIO-4: The proposed project could interfere 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.	PS	BIO-1.1: Minimize the temporary construction impact footprint. BIO-1.2: Conduct a Worker Environmental Awareness Training Program for construction personnel. BIO-1.4: Develop and implement a revegetation and weed control plan. BIO-1.9: Minimize impacts on wildlife and retain biological monitors during construction. BIO-1.14: Conduct a preconstruction survey for nesting birds and other raptors, and implement avoidance measures, as needed. BIO-2.3 Implement siting constraint measures.	LTS
BIO-5: The proposed project may conflict with local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.	PS	BIO-1.1: Minimize the temporary construction impact footprint. BIO-1.2: Conduct a Worker Environmental Awareness Training Program for construction personnel. BIO-1.3: Conduct preconstruction botanical surveys for special-status plants; avoid and minimize impacts during construction. BIO-1.4: Develop and implement a revegetation and weed control plan. BIO-1.5: Document affected special-status plant species and prepare a salvage, relocation, or propagation and monitoring plan for special-status plant species. BIO-1.6: Avoid and minimize impacts on, and compensate for loss of, potentially occupied habitat for vernal pool fairy shrimp and	LTS

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Table ES-5. Summary of Impacts and Mitigation Measures

Impact	Significance before Mitigation	Mitigation Measure(s)	Significance after Mitigation
		vernal pool tadpole shrimp through consultation with the U.S. Fish and Wildlife Service and implementation of appropriate mitigation. BIO-1.7: Conduct a preconstruction VELB shrub survey, establish avoidance buffers, and/or compensate for removal of potentially occupied habitat for VELB through consultation with the U.S. Fish and Wildlife Service and implementation of appropriate mitigation. BIO-1.8: Avoid and minimize impacts on special-status fish while pile driving and implement seasonal restrictions for in-water work. BIO-1.9: Minimize impacts on wildlife and retain biological monitors during construction. BIO-1.10: Implement measures to avoid western pond turtle and giant garter snake during construction. BIO-1.11: Conduct a preconstruction survey for Swainson's hawk and white-tailed kite, and implement avoidance measures, as needed. BIO-5.1: City of Sacramento Code compliance for trees. BIO-5.2: Sacramento County Code compliance for trees.	
BIO-6: The proposed 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.	LTS	None Required	N/A
C-BIO-1: Implementation of the proposed project, in combination with other foreseeable projects in the surrounding area, could result in a significant cumulative impact on biological resources.	PS	BIO-1.1: Minimize the temporary construction impact footprint. BIO-1.2: Conduct a Worker Environmental Awareness Training Program for construction personnel. BIO-1.3: Conduct preconstruction botanical surveys for special-status plants; avoid and minimize impacts during construction. BIO-1.4: Develop and implement a revegetation and weed control plan.	LCC

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Table ES-5. Summary of Impacts and Mitigation Measures

Impact	Significance before Mitigation	Mitigation Measure(s)	Significance after Mitigation
		BIO-1.5: Document affected special-status plant species and prepare a salvage, relocation, or propagation and monitoring plan for special-status plant species. BIO-1.6: Avoid and minimize impacts on, and compensate for loss of, potentially occupied habitat for vernal pool fairy shrimp and vernal pool tadpole shrimp through consultation with the U.S. Fish and Wildlife Service and implementation of appropriate mitigation. BIO-1.7: Conduct a preconstruction VELB shrub survey, establish avoidance buffers, and/or compensate for removal of potentially occupied habitat for VELB through consultation with the U.S. Fish and Wildlife Service and implementation of appropriate mitigation. BIO-1.8: Avoid and minimize impacts on special-status fish while pile driving and implement seasonal restrictions for in-water work. BIO-1.9: Minimize impacts on wildlife and retain biological monitors during construction. BIO-1.10: Implement measures to avoid western pond turtle and giant garter snake during construction. BIO-1.11: Conduct a preconstruction survey for Swainson's hawk and white-tailed kite, and implement avoidance measures, as needed. Compensate for loss of Swainson's hawk and white-tailed kite foraging habitat. BIO-1.12: Conduct a preconstruction survey for western burrowing owl and implement avoidance measures, as needed. BIO-1.13: Conduct a preconstruction survey for greater sandhill crane roost sites and implement avoidance measures, as needed. BIO-1.14: Conduct a preconstruction survey for nesting birds and other raptors, and implement avoidance measures, as needed. BIO-2.1: Avoid and minimize impacts on sensitive natural communities and riparian habitat. BIO-2.2: Comply with the Section 1600 Streambed Alteration Agreement. BIO-2.3: Implement siting constraint measures.	

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Table ES-5. Summary of Impacts and Mitigation Measures

Impact	Significance before Mitigation	Mitigation Measure(s)	Significance after Mitigation
		BIO-3.1: Avoid and minimize impacts on wetlands and other waters. BIO-3.2: Compensate for impacts on wetlands and other waters. AQ-2.3: Implement fugitive dust control measures at all construction and staging areas to reduce construction-related fugitive dust, consistent with SJVAPCD Regulation VIII and SMAQMD Basic Emission Control Practices. HAZ-2.3: Implement a construction risk management plan (CRMP). HYD-1.1: Avoid water quality impacts from groundwater or dewatering discharges. HYD-1.2: Avoid water quality impacts from construction adjacent to, within, and crossing over surface waters.	
3.5 Cultural Resources			
CUL-1: The proposed project would not cause a substantial adverse change in the significance of a historical resource pursuant to Section 15064.5.	NI	None Required	N/A
CUL-2: The proposed project could cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5.	PS	CUL-2.1: Worker cultural resources training. CUL-2.2: Native American monitoring. CUL-2.3: Inadvertent archaeological discovery.	LTS
CUL-3: The proposed project could disturb human remains, including those interred outside of formal cemeteries.	PS	CUL-3.1: Discovery of previously unknown human remains.	LTS
C-CUL-1: Implementation of the proposed project, in combination with other foreseeable projects in the surrounding area, could result in a significant cumulative impact on cultural resources.	PS	CUL-2.1: Worker cultural resources training. CUL-2.2: Native American monitoring. CUL-2.3: Inadvertent archaeological discovery. CUL-3.1: Discovery of previously unknown human remains.	LCC
3.6 Energy			
ENG-1: Implementation of the proposed project would not result in potentially significant environmental impacts due to	LTS	None Required	N/A

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Table ES-5. Summary of Impacts and Mitigation Measures

Impact	Significance before Mitigation	Mitigation Measure(s)	Significance after Mitigation
wasteful, inefficient, or unnecessary consumption of energy resources during project construction or operation.			
ENG-2: Implementation of the proposed project would not conflict with or obstruct a state or local plan for renewable energy or energy efficiency.	LTS	None Required	N/A
C-ENG-1: Implementation of the proposed project, in combination with other foreseeable projects in the surrounding area, would not result in a significant cumulative impact on energy resources.	LCC	None Required	N/A
3.7 Geology and Soils			
GEO-1: The proposed project would not cause potential substantial adverse effects, including the risk of loss, injury, or death involving rupture of a known earthquake fault; strong seismic ground shaking; seismic-related ground failure, including liquefaction; or landslides.	NI	None Required	N/A
GEO-2: The proposed project could result in substantial soil erosion or the loss of topsoil.	PS	GEO-2.1: Implement Best Management Practices to reduce soil erosion.	LTS
GEO-3: The proposed project would not 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.	NI	None Required	N/A
GEO-4: The proposed project could potentially be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994, as updated), creating	LTS	None Required	N/A

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Table ES-5. Summary of Impacts and Mitigation Measures

Impact	Significance before Mitigation	Mitigation Measure(s)	Significance after Mitigation
substantial direct or indirect risks to life or property.			
GEO-5: The proposed project would not have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water.	NI	None Required	N/A
GEO-6: The proposed project could directly or indirectly destroy a unique paleontological resource or site, or a unique geologic feature.	PS	GEO-6.1: Conduct construction personnel education and implement periodic monitoring, stop work if paleontological resources are discovered, assess the significance of the find, and prepare and implement a recovery plan, as required.	LTS
C-GEO-1: Implementation of the proposed project, in combination with other foreseeable projects in the surrounding area, would not result in a significant cumulative impact on geology and soils.	PS	GEO-2.1: Implement Best Management Practices to reduce soil erosion.	LCC
C-GEO-2: Implementation of the proposed project, in combination with other foreseeable projects in the surrounding area, could result in a significant cumulative impact on paleontological resources.	PS	GEO-6.1: Conduct construction personnel education and implement periodic monitoring, stop work if paleontological resources are discovered, assess the significance of the find, and prepare and implement a recovery plan, as required.	LCC
3.8 Greenhouse Gas Emissions			
GHG-1: The proposed project could generate greenhouse gas (GHG) emissions, either directly or indirectly, that may have a significant impact on the environment.	PS	GHG-1.1: Implement construction emission reductions to minimize construction-related GHG emissions.	LCC
GHG-2: The proposed project would not conflict with an applicable plan, policy or regulation adopted for the purpose of reducing GHG emissions.	LCC	None Required	N/A
C-GHG-1: Implementation of The proposed project, in combination with other	PS	GHG-1.1: Implement construction emission reductions to minimize construction-related GHG emissions.	LCC

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NI = No Impact; PS = Potentially Significant; SU = Significant and Unavoidable

Table ES-5. Summary of Impacts and Mitigation Measures

Impact	Significance before Mitigation	Mitigation Measure(s)	Significance after Mitigation
foreseeable projects in the surrounding area, could result in a significant cumulative GHG emissions impact.			
3.9 Hazards and Hazardous Materials			
HAZ-1: The proposed project would not create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials.	LTS	None Required	N/A
HAZ-2: The proposed project could create a significant hazard to the public or the environment through reasonably foreseeable upset and/or accident conditions involving the release of hazardous materials into the environment.	PS	HAZ-2.1: Implement voluntary oversight agreement. HAZ-2.2: Conduct site investigations. HAZ-2.3: Implement a construction risk management plan (CRMP). AQ-2.3: Implement fugitive dust control measures at all construction and staging areas to reduce construction-related fugitive dust, consistent with SJVAPCD Regulation VIII and SMAQMD Basic Emission Control Practices.	LTS
HAZ-3: The proposed project would emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school.	PS	HAZ-2.3: Implement a construction risk management plan (CRMP). AQ-2.3: Implement fugitive dust control measures at all construction and staging areas to reduce construction-related fugitive dust, consistent with SJVAPCD Regulation VIII and SMAQMD Basic Emission Control Practices.	LTS
HAZ-4: Various project improvements would be located on sites which are included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5.	PS	HAZ-2.1: Implement voluntary oversight agreement. HAZ-2.2: Conduct site investigations. HAZ-2.3: Implement a construction risk management plan (CRMP). AQ-2.3: Implement fugitive dust control measures at all construction and staging areas to reduce construction-related fugitive dust, consistent with SJVAPCD Regulation VIII and SMAQMD Basic Emission Control Practices.	LTS
HAZ-5: The proposed project would not be located within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use	NI	None Required	N/A

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Table ES-5. Summary of Impacts and Mitigation Measures

Impact	Significance before Mitigation	Mitigation Measure(s)	Significance after Mitigation
airport, nor would the project result in a safety hazard or excessive noise for people residing or working in the project area.			
HAZ-6: The proposed project would not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.	LTS	None Required	N/A
HAZ-7: The proposed project would not expose people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires.	NI	None Required	N/A
C-HAZ-1: Implementation of the Project, in combination with other foreseeable projects in the surrounding area would not result in a significant cumulative impact from hazardous materials.	LCC	None Required	N/A
C-HAZ-2: Implementation of the proposed project, in combination with other foreseeable projects in the surrounding area may result in a significant cumulative impact from hazardous materials.	LCC	None Required	N/A
3.10 Hydrology and Water Quality			
HYD-1: The proposed project could violate water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality.	PS	HYD-1.1: Avoid water quality impacts from groundwater or dewatering discharges. HYD-1.2: Avoid water quality impacts from construction adjacent to, within, and crossing over surface waters. HAZ-2.2: Conduct site investigations. HAZ-2.3: Implement a construction risk management plan (CRMP).	LTS
HYD-2: The proposed project would not substantially decrease groundwater supplies or interfere substantially with groundwater	LTS	None Required	N/A

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Table ES-5. Summary of Impacts and Mitigation Measures

Impact	Significance before Mitigation	Mitigation Measure(s)	Significance after Mitigation
recharge such that the project may impede sustainable groundwater management of the basin.			
HYD-3: The proposed project would substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which could: result in substantial erosion or siltation on- or off-site; substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- 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.	PS	HYD-3.1: Perform detailed hydraulic evaluations and implement new or modify existing stormwater controls as required to prevent storm drainage system capacity exceedance and reduce pollutant transport.	LTS
HYD-4: Project-related construction could risk release of pollutants due to project inundation in a flood hazard, tsunami, or seiche zones.	PS	HYD-4.1: Prevent construction materials from being exposed to storm flooding hazards.	LTS
HYD-5: The proposed project could conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan.	PS	HYD-1.1: Avoid water quality impacts from groundwater or dewatering discharges. HYD-1.2: Avoid water quality impacts from construction adjacent to, within, and crossing over surface waters. HYD-3.1: Perform detailed hydraulic evaluations and implement new or modify existing stormwater controls as required to prevent storm drainage system capacity exceedance and reduce pollutant transport. HYD-4.1: Prevent construction materials from being exposed to storm flooding hazards. HAZ-2.2: Conduct site investigations.	LTS

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NI = No Impact; PS = Potentially Significant; SU = Significant and Unavoidable

Table ES-5. Summary of Impacts and Mitigation Measures

Impact	Significance before Mitigation	Mitigation Measure(s)	Significance after Mitigation
		HAZ-2.3: Implement a construction risk management plan (CRMP).	
HYD-6: Project-related operation could impede or redirect flood flows and result in downstream transport of pollutants.	PS	HYD-6.1: Perform hydrologic and hydraulic studies for project improvements to be located in floodplains, implement appropriate engineering designs, coordinate with regulatory agencies, and obtain required permits.	LTS
C-HYD-1: Implementation of the proposed project, in combination with other foreseeable projects in the surrounding area, could result in a significant cumulative impact on hydrology and water quality.	PS	HYD-1.1: Avoid water quality impacts from groundwater or dewatering discharges. HYD-1.2: Avoid water quality impacts from construction adjacent to, within, and crossing over surface waters. HYD-3.1: Perform detailed hydraulic evaluations and implement new or modify existing stormwater controls as required to prevent storm drainage system capacity exceedance and reduce pollutant transport. HYD-4.1: Prevent construction materials from being exposed to storm flooding hazards. HYD-6.1: Perform hydrologic and hydraulic studies for project improvements to be located in floodplains, implement appropriate engineering designs, coordinate with regulatory agencies, and obtain required permits. HAZ-2.3: Implement a construction risk management plan (CRMP).	LCC
3.11 Land Use and Planning			
LU-1: The proposed project would not physically divide an established community.	LTS	None Required	N/A
LU-2: The proposed project would not cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect.	LTS	None Required	N/A
C-LU-1: Implementation of the proposed project, in combination with other foreseeable projects in the surrounding area,	LCC	None Required	N/A

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Table ES-5. Summary of Impacts and Mitigation Measures

Impact	Significance before Mitigation	Mitigation Measure(s)	Significance after Mitigation
would not result in a significant cumulative impact on land use and planning.			
3.12 Noise and Vibration			
NOI-1: Construction of The proposed project could expose sensitive receptors to substantial increases in noise levels.	PS	NOI-1.1: Implement a construction noise control plan.	SU
NOI-2: The new passenger service could result in moderate noise impacts. However, the moderate increase in noise levels would be less than significant.	LTS	None Required	N/A
NOI-3: The new passenger service could result in substantial increases in ground-borne vibration levels.	PS	NOI-3.1: Conduct a detailed design-level vibration analysis.	LTS
NOI-4: Construction of track improvements could expose sensitive receptors to substantial increases in Ground-borne vibration levels.	PS	NOI-4.1: Implement a construction vibration control plan.	LTS
Impact C-NOI-1: Implementation of the proposed project, in combination with other foreseeable projects in the surrounding area, would not result in a significant cumulative impact on noise.	LCC	None Required	N/A
3.13 Population and Housing			
PH-1: Implementation of The proposed project would not induce substantial unplanned population growth in an area, either directly or indirectly.	LTS	None Required	N/A
PH-2: Implementation of The proposed project would not displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere.	NI	None Required	N/A

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Table ES-5. Summary of Impacts and Mitigation Measures

Impact	Significance before Mitigation	Mitigation Measure(s)	Significance after Mitigation
C-PH-1: Implementation of the proposed project, in combination with other foreseeable projects in the surrounding area, would not result in a significant cumulative impact on population and housing.	LCC	None Required	N/A
3.14 Public Services			
PS-1: The proposed project would not result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, or the need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for Fire protection or Police protection.	LTS	None Required	N/A
PS-2: The proposed project would not result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, or the need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for Schools; Parks; Other Public Facilities.	LTS	None Required	N/A
C-PS-1: Implementation of the proposed project, in combination with other foreseeable projects in the surrounding area would not result in a significant cumulative impact on public services.	LTS	None Required	N/A

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Table ES-5. Summary of Impacts and Mitigation Measures

Impact	Significance before Mitigation	Mitigation Measure(s)	Significance after Mitigation
3.15 Recreation			
REC-1: The proposed project could increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated.	PS	REC-1.1: Coordinate with the officials with jurisdiction over potentially impacted recreational facilities during the construction phase to minimize impacts to organized athletic events/practices. REC-1.2: Coordinate with the City of Sacramento to maintain access for the Sacramento Northern Bike Trail.	LTS
The proposed project would include a recreational facility but would not require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment.	LTS	None Required	N/A
C-REC-1: Implementation of the proposed project, in combination with other foreseeable projects in the surrounding area, would not result in a significant cumulative impact on recreation.	LCC	None Required	N/A
3.16 Transportation			
TRA-1: The proposed project could conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities.	PS	TRA-1.1: Transportation Management Plan for project construction. TRA-1.2: Freight rail disruption control plan for project construction. TRA-1.3: Light rail disruption control plan for project construction.	LTS
TRA-2: The proposed project would not conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b).	LTS	None Required	N/A
TRA-3: The proposed 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).	LTS	None Required	N/A
TRA-4: The proposed project would not result in inadequate emergency access.	LTS	None Required	N/A

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Table ES-5. Summary of Impacts and Mitigation Measures

Impact	Significance before Mitigation	Mitigation Measure(s)	Significance after Mitigation
C-TRA-1: Implementation of the Project, in combination with other foreseeable projects in the surrounding area, could result in a significant cumulative impact on transportation.	PS	TRA-1.1: Transportation Management Plan for project construction. TRA-1.2: Freight rail disruption control plan for project construction. TRA-1.3: Light rail disruption control plan for project construction.	LCC
3.17 Tribal Cultural Resources			
TRI-1: The proposed project could cause a substantial adverse change in the significance of a tribal cultural resource, as defined in Public Resources Code section 21074, 5020.1(k), or 5024.1(c).	PS	CUL-2.1: Worker cultural resources training. CUL-2.2: Native American monitoring. CUL-2.3: Inadvertent archaeological discovery. CUL-3.1: Discovery of previously unknown human remains.	LTS
3.18 Utilities and Service Systems			
UT-1: The proposed project could 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.	PS	UT-1.1: Implement a Utility Relocation Plan.	LTS
UT-2: The proposed project would have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years.	LTS	None Required	N/A
UT-3: The proposed project would not result in a determination by the wastewater treatment provider that 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.	LTS	None Required	N/A
UT-4: The proposed project would not generate solid waste in excess of State or local standards, or in excess of the capacity	LTS	None Required	N/A

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Table ES-5. Summary of Impacts and Mitigation Measures

Impact	Significance before Mitigation	Mitigation Measure(s)	Significance after Mitigation
of local infrastructure, or otherwise impair the attainment of solid waste reduction goals.			
UT-5: The proposed project would comply with federal, State, and local management and reduction statutes and regulations related to solid waste.	LTS	None Required	N/A
C-UT-1: Implementation of the proposed project, in combination with other foreseeable projects in the surrounding area, could result in a significant cumulative impact on utilities and service systems.	PS	UT-1.1: Implement a Utility Relocation Plan.	LCC

Notes: NI = No Impact; LTS = Less than Significant; PS = Potentially Significant; SU = Significant and Unavoidable;
LCC = Less than Considerable Contribution; CCU = Cumulatively Considerable and Unavoidable; N/A = Not Applicable

Acronyms and Abbreviations:

NO_x = nitrogen oxide

SJVAPCD = San Joaquin Valley Air Pollution Control District

SMAQMD = Sacramento Metropolitan Air Quality Management District

VELB = valley elderberry longhorn beetle

ES.6 Alternatives Considered

A wide range of alternatives was considered during the planning and scoping process for the proposed project prior to selecting the alternatives to be evaluated in this Final EIR. Alternatives considered and eliminated from consideration included the use of the Fresno Subdivision for increased passenger rail service; construction of new track outside the existing UPRR ROW along the Fresno Subdivision to accommodate the proposed project; and alternative locations for the Lodi Station, North Elk Grove Station, and Natomas/Sacramento Airport Station.

Alternatives determined not to meet all or most of the goals of the proposed project, to be infeasible, or not to avoid or substantially reduce one or more significant impacts of the proposed project were eliminated from further analysis in this EIR. All of the alternatives considered but eliminated from future consideration, as well as the reasons for their elimination, are discussed in Chapter 5, *Alternatives.* Chapter 5 also includes an analysis of the No Project Alternative, albeit to a lessor level of detail than that of the proposed project.

ES.7 Comparison of Alternatives and the Environmentally Superior Alternative

CEQA Guidelines Section 15126.6(e)(2) states 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. The environmentally superior alternative is not the No Project Alternative. Any of the alternatives/variants included in the proposed project would result in environmental benefits, such as reducing vehicle trips on freeways and reducing regional air pollutants and GHG emissions, that would not be realized under the No Project Alternative.

The environmentally superior alternative is identified as a combination of the different alternatives/variants by segment for the proposed project. Specifically, the environmentally superior alternative includes the following:

- Lodi Station South Alternative due to slightly reduced impacts on aesthetics and agricultural resources, and related to hazardous materials
- ~~North Elk Grove Station Variant P1/A1 or North Elk Grove Station Variant P1/A2 due to slightly reduced construction air quality impacts and reduced biological impacts associated with the omission of a new railroad bridge over Beacon Creek~~

CEQA does not require a lead agency to select the environmentally superior alternative as its proposed project. Implementing the proposed project (or an alternative) would have adverse environmental impacts regardless of which alternative is selected. However, the proposed project would provide project benefits that include reducing VMT and associated regional traffic, air quality emissions, and GHG emissions, as well as increasing ridership.

ES.8 Issues of Controversy and Issues to be Resolved

Areas of controversy raised during the scoping process and review of the Draft EIR included the following issues:

- Proposed Maintenance and Layover Facility—Numerous commenters raised concerns over aesthetic, air quality, hazardous waste, land use, noise, and transportation impacts associated with a potential maintenance and layover facility west of Levee Road. In response, this alternative was eliminated from future consideration.
- Natomas Maintenance and Layover Facility—Concern was expressed regarding potential right-of-way impacts related to the proposed Natomas Maintenance and Layover Facility. This project improvement has since been dropped from further consideration.
- Interim Natomas/Sacramento Airport Station—Concern was expressed regarding potential ROW impacts related to the proposed Interim Natomas/Sacramento Airport Station. In response, this alternative was eliminated from future consideration.
- Traffic—Concern was expressed regarding increased traffic at intersections surrounding proposed station sites. Further response to these comments is not required as part of the CEQA environmental review process, but will be addressed in later design stages of the proposed project.
- North Elk Grove Station—Subsequent to the circulation of the Draft EIR, SJRRC and SJJPA have continued coordination with the City of Elk Grove on an appropriate site for a station to serve the Elk Grove community. Additional information on a more ideal location for the station has been identified. In addition, SJRRC and SJJPA received numerous comments on the Draft EIR questioning the viability of the proposed North Elk Grove Station described in Draft EIR Chapter 2, *Project Description*. As such, the proposed North Elk Grove Station is no longer under consideration.

The following project issues remain to be resolved:

- ~~Consideration of Comments on this Draft EIR—SJRRC will consider and respond to substantive CEQA comments on this Draft EIR as part of the Final EIR, scheduled for completion later in 2020.~~
- Certification of the EIR and Project Adoption—SJRRC will need to consider the Final EIR, once prepared, and decide whether to certify the CEQA document. If certified, the SJRRC Board would determine whether to approve the Valley Rail Sacramento Extension as is, or to adopt one of the project alternatives (the Lodi Station South Alternative).
- Design of the Improvements—The final design of proposed improvements would be completed following completion of the environmental review process and approval of the proposed project.
- Regulatory Permitting—Permits from a wide range of local, state, and federal agencies would need to be obtained prior to implementation of the proposed project.

1 Introduction

1.0 Preface

This Final Environmental Impact Report (Final EIR) for the Valley Rail Sacramento Extension Project (proposed project) has been prepared in compliance with the California Environmental Quality Act (CEQA) Guidelines. The San Joaquin Regional Rail Commission (SJRRC) is the CEQA lead agency for the proposed project.

Per Section 15132 of the CEQA Guidelines, a Final EIR shall consist of:

1. The Draft EIR or a revision of that draft.
2. Comments and recommendations received on the Draft EIR either verbatim or in a summary.
3. A list of persons, organizations, and public agencies commenting on the Draft EIR.
4. The response of the lead agency to significant environmental points raised in the review and consultation process.
5. Any other information added by the lead agency.

This Final EIR has been prepared by SJRRC in accordance with Sections 15089 and 15132 of the CEQA Guidelines and consists of the Draft EIR (as revised in response to comments), appendices, comments received during public review of the Draft EIR, responses to comments, and the mitigation monitoring plan.

Consistent with the requirements of CEQA and Section 15088 of the CEQA Guidelines, a reasoned response to all comments on environmental issues raised on the Draft EIR are provided in this Final EIR. Responses are not required on comments regarding the merits of the proposed project or on issues not related to a proposed project's environmental impacts. Section 15088(c) of the CEQA Guidelines states that the level of detail contained in the response may correspond to the level of detail provided in the comment (i.e., responses to general comments may be general). A general response may be appropriate when a comment does not contain or specifically refer to readily available information, or does not explain the relevance of evidence submitted with the comment.

Subsequent to the circulation of the Draft EIR, SJRRC received additional information and significant expressions of concern regarding siting of the proposed Natomas Maintenance and Layover Facility – a potential Phase II component of the proposed project. The site identified in the Draft EIR for the Natomas Maintenance and Layover Facility would require purchase or condemnation of two operating business ventures and property owned by a joint landlord. Such purchase or condemnation could be prohibitively expensive for SJRRC and could also result in the loss of significant jobs to the region. For those reasons, SJRRC has deem it infeasible to site the Natomas Maintenance and Layover Facility as shown in the Draft EIR. As such, consideration of all potential Phase II improvements, including the Natomas Maintenance and Layover Facility, the West Elkhorn Boulevard Overpass, and expansion of the Natomas/Sacramento Airport Station parking lot are no longer under consideration. All references to Phase II have been deleted

from this Final EIR. If Phase II proceeds at a future date, SJRRC would site the Natomas Maintenance and Layover Facility at a more desirable location, subject to additional CEQA documentation and public review.

SJRRC and SJJPA have also continued coordination with the City of Elk Grove on an appropriate site for a station to serve the Elk Grove community. Additional information on a more ideal location for the station has been identified subsequent to the circulation of the Draft EIR. In addition, SJRRC and SJJPA received numerous comments on the Draft EIR questioning the viability of the proposed North Elk Grove Station (including all access and siding variants) described in Draft EIR Chapter 2, *Project Description*. As such, the proposed North Elk Grove Station is no longer under consideration. All text related to the proposed North Elk Grove Station has been formatted as ~~strikethrough~~ in this Final EIR. Because the North Elk Grove Station is no longer under consideration, comments received on the North Elk Grove Station are no longer applicable to the proposed project and are not addressed in this Final EIR.

Final approval of a future Elk Grove Station at a site agreed to by all interested parties will be subject to a separate, stand-alone CEQA document that will be circulated for public review and comment at a later date.

For clarity all remaining text changes in this Final EIR (when compared to the Draft EIR) are shown with underline for additions and ~~strikethrough~~ for deletions. These text changes reflect both edits in response to comments received on the Draft EIR, and well as staff initiated text changes.

Section 15088.5(a) of the CEQA Guidelines, recirculation of a Draft EIR is required when new significant information identifies:

1. A new significant environmental impact would result from the project or from a new mitigation measure proposed to be implemented;
2. A substantial increase in the severity of an environmental impact would result unless mitigation measures are adopted that reduce the impact to a level of insignificance;
3. A feasible project alternative or mitigation measure considerably different from others previously analyzed would clearly lessen the significant environmental impacts of the project, but the project's proponents decline to adopt it;
4. The draft EIR was so fundamentally and basically inadequate and conclusory in nature that meaningful public review and comment were precluded.

Recirculation of a Draft EIR is not required where the new information merely clarifies, amplified, or makes minor modifications to an adequate EIR (CEQA Guidelines Section 15088.5(b)). After considering all comments received on the Draft EIR, the lead agency has determined that the text changes included in this Final EIR do not result in a need to recirculate the Draft EIR.

1.1 Overview

The San Joaquin Joint Powers Authority (SJJPA) and the San Joaquin Regional Rail Commission (SJRRC) are jointly undertaking the planning, design, and environmental review of the Valley Rail Sacramento Extension Project (proposed project), a proposed passenger rail service between

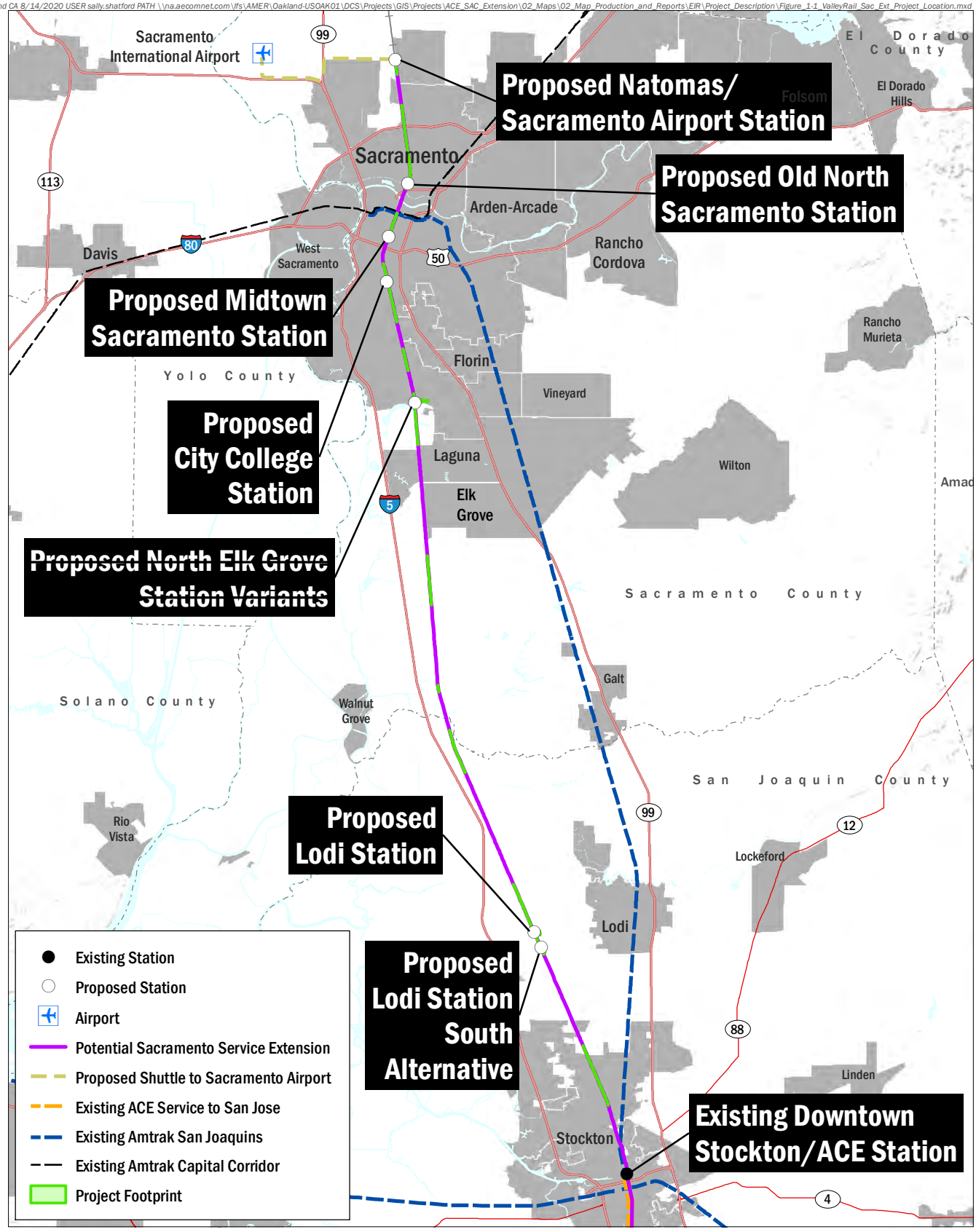
Stockton and Sacramento. SJJPA and SJRRC manage the Amtrak San Joaquins and the Altamont Corridor Express (ACE), respectively.

The primary objectives of the proposed project are to expand passenger rail service to new markets in San Joaquin and Sacramento counties; increase frequency of service; increase passenger rail ridership; reduce travel time between the San Joaquin Valley and the Sacramento area; augment existing transit capacity and provide transit connections; provide an alternative to automobile traffic congestion; improve regional air quality; reduce greenhouse gas (GHG) emissions; and support local and regional land use development plans and policies. The proposed project would also contribute to geographic equity by providing increased connectivity in the Central Valley including Sacramento, San Joaquin, Stanislaus, Merced, Madera, and Fresno counties; the Bay Area; and the greater California rail network via two future high-speed rail (HSR) connections in Merced and San Jose.

This proposed project would expand Amtrak San Joaquins and ACE passenger rail services to the greater Sacramento area through the construction of five ~~six~~ new rail stations and track improvements along the Union Pacific Railroad (UPRR) Sacramento Subdivision (Figures 1-1 and 1-2).[1] The proposed stations would include one new station in Lodi and four ~~five~~ new stations in Sacramento: ~~North Elk Grove along Cosumnes River Boulevard in South Sacramento,~~ City College, Midtown Sacramento, Old North Sacramento, and Natomas/Sacramento Airport. Increased passenger rail service would include one additional round trip of Amtrak San Joaquins service between the existing Fresno Amtrak Station and the proposed Natomas/Sacramento Airport Station, and one additional round trip of Amtrak San Joaquins service between the existing Bakersfield Amtrak Station and the proposed Natomas/Sacramento Airport Station. The proposed project would also include one additional round trip of ACE service between the proposed Natomas/Sacramento Airport Station and the existing San Jose Diridon Station, one additional round trip between the proposed Natomas/Sacramento Airport Station and the existing the Stockton Downtown/ACE Station, and three round trips between the proposed Ceres ACE Station (included in the ACE Extension Lathrop to Ceres/Merced project) and the proposed Natomas/Sacramento Airport Station.[2]

[1] A subdivision is a portion of railroad or railway that operates under a single timetable (authority for train movement in the area).

[2] On August 2, 2018, the SJRRC Board certified the environmental impact report (EIR) and approved the ACE Extension Lathrop to Ceres/Merced project. Operation of Phase I of the ACE Extension Lathrop to Ceres/Merced project (which includes the Ceres Station) is anticipated to begin between 2020 and 2023.



Data Source: ESRI, 2019; AECOM, 2019; San Joaquins and Capital Corridor Rail Alignments: California Department of Transportation, 2013.

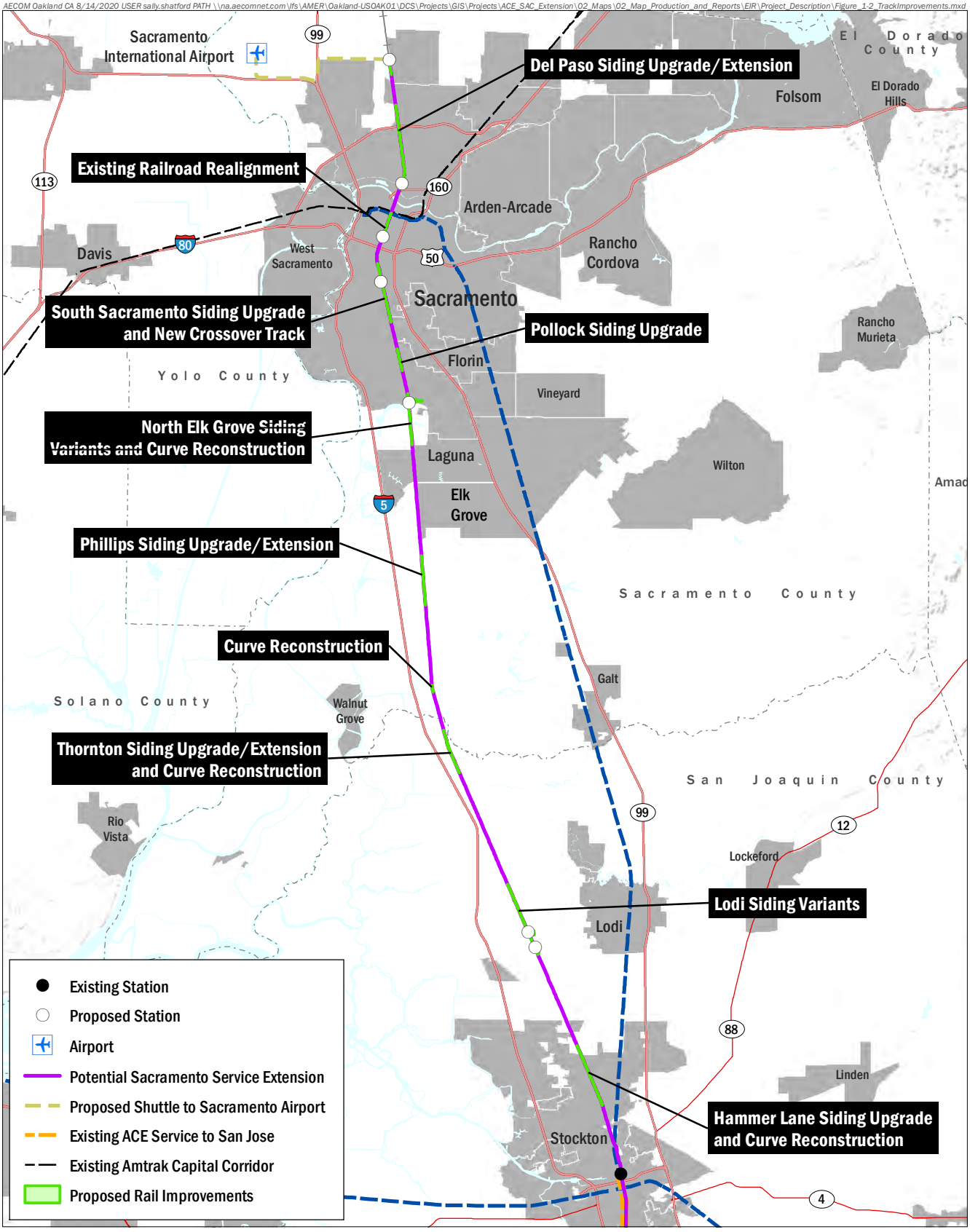
AECOM

San Joaquin Regional Rail Commission

Note: The North Elk Grove Station, including all access and siding variants, is no longer under consideration as part of the proposed project.

FIGURE 1-1

Project Location Map



AECOM

San Joaquin Regional Rail Commission

FIGURE 1-2

Project Track Improvements

Note: The North Elk Grove Station, including all access and siding variants, is no longer under consideration. Therefore, the footprint shown above would be reduced to only the portion of the proposed project that includes the Track Curve Reconstruction North of Elk Grove.

1.2 Project History

The proposed project is one part of the larger Valley Rail Project, a scalable plan intended to improve intercity and commuter rail connectivity, improve air quality, improve access to economic opportunities and affordable housing to disadvantaged communities, and create opportunities for transit-oriented development (TOD) in the Central Valley. In addition to the proposed project, the larger Valley Rail Project also includes an extension of ACE service to Merced, which builds upon ACE funding from Senate Bill 132 and would provide connectivity to future California HSR service.

By 2040, statewide interregional travel is forecasted to increase by 50.9 percent to 544.7 million two-way trips annually. Over 150 million of those trips are expected to originate/terminate or pass through Sacramento and the San Joaquin Valley (California High Speed Rail Authority 2016). Markets that would be served by the proposed project include:

- Sacramento to/from Central Valley North
- Central Valley North to/from South
- San Joaquin Valley South to/from Sacramento Region

The proposed project would also serve commute travel in Sacramento County, which totals more than 500,000 daily trips (University of the Pacific 2017)[3] In addition to these core areas, the proposed project would Valley Rail will benefit travel in other markets by supporting connections and increased service. These secondary markets that will benefit from the proposed project would Valley Rail include:

- San Francisco Bay Area to/from San Joaquin Valley North
- San Francisco Bay Area to/from San Joaquin Valley South
- San Francisco Bay Area to/from Sacramento Region

The proposed project is consistent with numerous planning initiatives at the state and local level, addressing mid- and long-term policy and strategic goals identified in the *California Transportation Plan 2040*, *2018 California State Rail Plan*, California High-Speed Rail Authority's *Connected Corridors Study – North*, the *SJJPA 2019 Business Plan*, and regional transportation, sustainable communities strategies, and general development plans.

In April 2018, the California State Transportation Agency awarded a Transit and Intercity Rail Capital Program grant of more than $500 million to the SJJPA and SJRRC toward the larger Valley Rail Project.

1.3 Background

1.3.1 Altamont Corridor Express

SJRRC manages and operates ACE, which currently provides commuter and intercity rail service between San Jose and Stockton. The existing 86-mile ACE service corridor passes through Santa Clara, Alameda, and San Joaquin counties. At the western end of the ACE corridor, ACE operates

on an approximately 4-mile segment of track between San Jose and Santa Clara owned and operated by the Peninsula Corridor Joint Powers Board (PCJPB; also referred to as Caltrain). North of the Santa Clara Station to Stockton, ACE operates on approximately 82 miles of track owned by UPRR. ACE operates on portions of UPRR's Coast, Niles, Oakland, and Fresno subdivisions.

SJRRC does not own the tracks that ACE operates on, but instead has entered into passenger rights agreements with both the PCJPB and UPRR to operate on portions of their respective tracks. ACE shares tracks with freight trains dispatched by UPRR in the UPRR ROW and with freight trains dispatched by Caltrain in the Caltrain corridor. In addition, other passenger train services (Caltrain, Amtrak Coast Starlight, and Capitol Corridor) also operate on PCJPB and UPRR tracks where ACE trains travel.

ACE currently operates four westbound trains weekday mornings from Stockton to San Jose, and four eastbound trains weekday afternoons from San Jose to Stockton. Saturday ACE service currently includes two westbound morning trains from Stockton to San Jose and two eastbound afternoon trains from San Jose to Stockton. There is no Sunday ACE service.

There are 10 ACE stations along the existing route (from west to east): San Jose Diridon, Santa Clara and Great America stations in Santa Clara County; Fremont, Pleasanton, Livermore, and Vasco Road stations in Alameda County; and Tracy, Lathrop/Manteca, and Stockton stations in San Joaquin County.[4] ACE currently does not operate on Sundays. ACE trains usually consist of one diesel locomotive and five to seven bi-level passenger coaches and can reach a top speed of 79 miles per hour.

1.3.2 Amtrak San Joaquins

SJJPA manages the Amtrak San Joaquins, which currently provides service in the Sacramento Valley, San Joaquin Valley, and the San Francisco Bay Area. The 10 member agencies that make up the SJJPA include Alameda County, the Contra Costa Transportation Authority, the Fresno Council of Governments, the Kings County Association of Governments, the Madera County Transportation Commission, the Merced County Association of Governments, Sacramento Regional Transit, the San Joaquin Regional Rail Commission, the Stanislaus Council of Governments, and the Tulare County Association of Governments.

San Joaquins trains currently offer five daily round trips between Oakland and Bakersfield and two daily round trips between Sacramento Valley Station and Bakersfield. The existing San Joaquins service runs from the Truxtun Avenue Station in Bakersfield, north on the BNSF Railway's Mojave Subdivision within Bakersfield, the Bakersfield Subdivision from Bakersfield to Calwa (Fresno), then on the Stockton Subdivision from Calwa to Stockton. Stations between Bakersfield and Stockton include Wasco, Allensworth (by special arrangement only), Corcoran,

[4] PCJPB owns the San Jose Diridon and Santa Clara stations, and Capitol Corridor Joint Powers Authority (CCJPA) owns the Great America and Fremont stations. SJRRC owns and maintains the parking areas and station platforms at Pleasanton, Vasco Road, Tracy, Lathrop/Manteca, and Stockton. Portions of ACE parking areas at Pleasanton, Livermore, and Vasco Road stations are owned by the Alameda County Fairgrounds (eastern portion of Pleasanton Station's surface parking lot) and the City of Livermore (Livermore Station's parking structure and Vasco Road Station's surface parking lot); however, SJRRC maintains these facilities.

Hanford, Fresno, Madera, Merced, Turlock-Denair, and Modesto. At Stockton, the route splits with final destinations to either Oakland or Sacramento. Oakland bound trains continue west on the Stockton Subdivision to Port Chicago. At Port Chicago trains cross to the UPRR's Tracy Subdivision to Martinez, continue on the Martinez Subdivision to Emeryville, and finally travel a few miles on the Niles Subdivision to Oakland's Jack London Square station. Stations between Stockton and Oakland include Antioch-Pittsburg, Martinez, Richmond, and Emeryville. Sacramento bound trains diverge in Stockton and run north to Sacramento on UPRR's Fresno Subdivision and on the Martinez Subdivision in Sacramento. Stations between the Stockton and Sacramento include Lodi and Sacramento Valley Station.

1.4 Project Goals

The Central Valley population that would be served by the proposed project is one of the fastest-growing in the state. Job growth in Sacramento County is expected to increase by 1.3 percent annually (California Department of Transportation, Sacramento County Economic Forecast 2016). As the Central Valley's population grows, the region's unbalanced ratio of housing and jobs will continue to diverge, with even more people moving out of the Bay Area and Sacramento to find affordable housing in the San Joaquin Valley. There is a need to not only increase service between the San Joaquin Valley and Sacramento, but also to provide more service between Sacramento, the San Joaquin Valley, and the Bay Area.

Interstate 5 (I-5) and State Route (SR) 99 are the primary links between the Fresno and Stockton areas to the Sacramento area. These already congested corridors are expected to see continued growth and travel demand. However, existing passenger rail service levels between the San Joaquin Valley and the Sacramento area are low; currently, there are only two daily round trips offered by the Amtrak San Joaquins. By 2040, statewide interregional travel is forecasted to increase by 50.9 percent to 544.7 million two-way trips annually. Over 150 million of those trips are expected to originate/terminate or pass through Sacramento and the San Joaquin Valley.

As further described below, the goals of the proposed project include the following:

- Enhanced intercity and commuter rail service;
- Improved connectivity;
- Improved regional air quality;
- Improved access; and
- Transit Oriented Development.

1.4.1 Enhanced Intercity and Commuter Rail Service

The proposed project would support enhanced intercity and commuter rail service between the Sacramento region, the Central Valley, and the San Francisco Bay Area by implementing direct passenger rail service between Sacramento and the cities of Stockton, San Jose, and Merced.

1.4.2 Improved Connectivity

The proposed project would provide direct rail connections between the Sacramento area, the South San Francisco Bay Area, and the Central Valley via ACE and Amtrak San Joaquins rail service. The proposed project would also increase connectivity to other transportation networks throughout California via potential transfers at the San Jose Diridon Station to Caltrain, the Amtrak Capitol Corridor, and Santa Clara Valley Transportation Authority transit services; transfers to local transportation networks in Sacramento, including Sacramento Regional Transit (SacRT) light rail trains and buses at the proposed City College Station, Midtown Sacramento Station, and Old North Sacramento Station; transfers to the Sacramento International Airport via a shuttle from the proposed Natomas/Sacramento Airport Station; and transfers to the future California HSR system at the San Jose Diridon Station and Merced.

1.4.3 Improved Regional Air Quality

The proposed project would improve regional air quality by reducing automobile vehicle miles traveled (VMT) and related GHG emissions. The expanded and improved San Joaquins and ACE services would provide transportation alternatives to automobile use along highway corridor segments on SR 99, SR 120, I-205, I-580, I-680, and I-880, and would result in air quality benefits and GHG emissions reductions.

Reductions in air pollutant emissions can lead to long-term health benefits for residents and employees along the existing rail corridors, addressing health problems associated with air pollution such as lung irritation, inflammation, asthma, heart and lung disease, and worsening of existing chronic health conditions. In addition, reduction of GHG emissions would help California meet its goals under Assembly Bill 32 (the California Global Warming Solutions Act of 2006) as well as GHG emissions reduction goals beyond 2020.

1.4.4 Improved Access

The proposed project would improve access to economic opportunities and affordable housing all along the corridors of service and would particularly benefit the disadvantaged communities it would serve. The proposed project is well positioned to dramatically increase employment access to residents throughout the service area, particularly access for disadvantaged communities. The existing ACE service corridor from Stockton to San Jose provides access to approximately 1.04 million jobs in a 2.5-mile radius of the stations; existing San Joaquins service provides access to just under 600,000 jobs in the same station area radius. The proposed service expansions north and south of Stockton would provide access to an additional half-million jobs. All told, residents in the combined service areas would have access to more than 2.25 million jobs.

California's high housing costs make it difficult for many to find affordable housing. The combined service area would also provide rail connectivity to nearly 9,000 units of affordable housing within a half-mile of station areas.

1.4.5 Transit-Oriented Development

TOD is a type of urban development that maximizes the amount of residential, business, and leisure space within walking distance of public transportation facilities. TOD around rail stations

can lead to increased transit ridership and farebox revenues; spur neighborhood revitalization and economic development; and improve quality of life for residents by providing direct, walkable access to transit and other necessary land uses, such as restaurants, entertainment, and community spaces. Development focused around rail stations would support initial ridership and scale up with growth in service levels over time, providing a return on investment to the State and communities served by the proposed project. TOD can increase employment and housing opportunities, as well as economic and environmental sustainability, all while lowering household transportation costs, public infrastructure costs, and overall pollution. TOD opportunities exist in legacy housing and commercial developments near the proposed stations and in underdeveloped or vacant sites proximate to proposed stations enabling sustainable development and combatting the impacts and negative externalities of continued sprawl.

Implementation of ACE and San Joaquins service on the Sacramento Subdivision would serve key TOD opportunities in Central Sacramento. By 2020, more than 1,100 residential units and 1.3 million square feet of commercial development are planned within a 1-mile radius of the proposed City College Station, Midtown Sacramento Station, and Old North Sacramento Station.

1.5 Environmental Review Process

1.5.1 California Environmental Quality Act

The 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 [PRC] 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 CEQA Guidelines are the primary source of rules and interpretations of CEQA (PRC 21000 et seq.; 14 California Code of Regulations [15000 et seq.).

1.5.2 Purpose of this Environmental Impact Report

The purpose of this EIR is to provide the information necessary for SJRRC and SJJPA to make an informed decision about the improvements included under the proposed project, and to supply the information necessary to support related permit applications and review processes.

This Final EIR has been prepared in compliance with CEQA to achieve the following goals:

Identify potential direct, indirect, and cumulative environmental impacts associated with the proposed project.

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 proposed improvements that meet the project goals, 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 for the proposed project was conducted from September 12, 2019 through November 30, 2019. Four scoping meetings were held in communities the project would serve in Lodi, Sacramento, and Natomas; comments were invited on the scope of the environmental analysis of the EIR.

~~Following the release of this Draft EIR, SJRRC and SJJPA will provide a public review period of 45 days from its release for comment. SJRRC and SJJPA will also conduct public meetings to receive comments during the comment period.~~

~~Once the public review period is complete, SJRRC and SJJPA will prepare a Final EIR that will include all comments received on the Draft EIR, responses to comments related to the CEQA analysis, and any necessary revisions to the Draft EIR.~~

As required by CEQA, the Draft EIR for the proposed project was made available to the public and regulatory agencies for review and comment between March 30, 2020 and June 5, 2020. Virtual open houses were held on April 23, 2020, April 28, 2020, and May 11, 2020 to receive comments on the Draft EIR.

CEQA requires the SJRRC decision-making body, the SJRRC Board, to review and consider the information in the EIR before making a decision on the proposed 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. A description of the formal scoping activities undertaken for the proposed project is described in the following subsections.

1.6.1 Notice of Preparation and Scoping Meetings

The scoping process for this EIR was formally initiated on September 13, 2019, when SJRRC submitted a Notice of Preparation (NOP) to the California State Clearinghouse; federal, regional, and local elected officials; and federal, state, and local agencies; and the interested public. The purpose of the NOP was to solicit participation from relevant agencies and the public in determining the scope of the EIR. The scoping period was originally scheduled to end on October 14, 2019; however, due to public concern, the scoping period was extended to November 30, 2019.

Four public meetings were held in September and October 2019 to provide the public with an opportunity to be informed about the alternatives under consideration and to comment on environmental issues of concern. Public scoping meetings were held on September 30, 2019, in Lodi, October 1, 2019, October 2, 2019, and November 13, 2019 in Sacramento.

Appendix A, *NOP and Scoping Summary Report*, contains the scoping report detailing the 2019 scoping process, including the notification and scoping activities undertaken. Comments received during the scoping period are also included in the report. It should be noted that as a result of scoping and community input, a number of project improvements are no longer under consideration and are not analyzed in this EIR. Improvements included in the NOP and Draft EIR but no longer under consideration include: ~~a~~ passenger stations in North Elk Grove and west of East Levee Road, a maintenance and layover facility at the north end of the corridor ~~west of East Levee Road~~, and an interim passenger station south of Cement Way.

1.6.2 Resource Topics

Consistent with Appendix G the CEQA Guidelines, this Final EIR evaluates the potential impacts of the proposed project for the following resource areas:

Aesthetics

Agricultural and Forestry Resources

Air Quality

Biological Resources

Cultural Resources

Energy

Geology and Soils

Greenhouse Gas Emissions

Hazards and Hazardous Materials

Hydrology and Water Quality

Land Use and Planning

Noise and Vibration

Population and Housing

Public Services

Recreation

Transportation and Traffic

Tribal Cultural Resources

Utilities and Service Systems

The following topics are also analyzed in this Final EIR:

Cumulative Impacts

Alternatives

A review of the California Geological Survey's Mineral Resources Zones (MRZs) Maps determined that the study areas are located in areas designated as MRZ-1 and MRZ-3. This designation is for areas that do not likely contain any significant mineral deposits and areas that have not been designated as containing minerals or significance. Therefore, impacts to mineral resources are not evaluated in this Draft EIR.

In addition, according to the California Department of Forestry and Fire Protection Fire and Resource Assessment Program fire hazards severity zone maps for San Joaquin and Sacramento counties, none of the proposed improvements would occur in areas identified as moderate, high, or very high fire hazard severity zones (CAL FIRE 2007a; 2007b; 2012a; 2012b). Therefore, impacts related to wildfire are not evaluated in this Draft EIR.

1.6.3 Environmental Impact Report Organization

This Final 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 Sacramento Valley Rail Extension Project; the project goals and 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 Sacramento Valley Rail Extension Project.

Chapter 3, *Environmental Impact Analysis*, provides an evaluation of impacts of the project for each of the environmental resource topics listed above. Each resource-specific section discusses the environmental setting, regulatory setting, and any impacts and mitigation measures.

Chapter 4, *Other CEQA-Required Analysis*, provides a discussion of cumulative impacts, significant environmental impacts that cannot be avoided, and potential growth-inducing impacts.

Chapter 5, *Alternatives*, provides a description of the No Project Alternative, an explanation of the development of the near-term and longer-term alternatives, and an evaluation of the alternatives considered but dismissed from further consideration.

Chapter 6, *Public and Agency Involvement*, provides a description of the outreach by SJRRC to the public, stakeholders, and agencies over the course of project definition, alternatives development, and environmental review.

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 A: NOP and Scoping Summary Report

- Appendix B: Air Quality, Health Risk Assessment, Greenhouse Gas, and Energy ~~Quantification of Criteria Air Pollutant and Greenhouse Gas Emissions, and Energy Use~~
- Appendix C: Supporting Biological Resources Information
- Appendix D: Supporting Cultural Resources Information
- Appendix E: Regional Plans and Local General Plans
- Appendix F Sacramento Extension Capitol Cost Basis Report
- Appendix G Valley Rail Sacramento Extension 15% Preliminary Engineering Plan Set
- Appendix H Supporting Noise and Vibration Analysis Documentation
- Appendix I Responses to Comments on the Draft EIR

2 Project Description

2.1 Introduction

The San Joaquin Joint Powers Authority (SJJPA) and the San Joaquin Regional Rail Commission (SJRRC), which manage the Amtrak San Joaquins and the Altamont Corridor Express (ACE), respectively, are jointly undertaking the planning, design, and environmental review of the Valley Rail Sacramento Extension Project (proposed project), a proposed passenger rail service between Stockton and Sacramento with further connections to San Jose, Ceres, and Bakersfield. The proposed project would support the proposed rail service extension to Sacramento no later than 2023.

As described in this section, the proposed project would include the construction of a new station in Lodi and four ~~five~~ new stations in Sacramento (~~"North Elk Grove" – along Cosumnes River Boulevard;~~ City College; Midtown Sacramento; Old North Sacramento; and Natomas/Sacramento Airport). SJJPA and SJRRC propose to extend passenger rail service to the greater Sacramento area using San Joaquins Service and ACE Service. As further described below, the proposed project would include the following preliminary service plan:

San Joaquins:

- One round trip between the existing Fresno Amtrak Station and the proposed Natomas/Sacramento Airport Station.
- One round trip between the existing Bakersfield Amtrak Station and the proposed Natomas/Sacramento Airport Station.

ACE:

- One round trip between the proposed Natomas/Sacramento Airport Station and the existing San Jose Diridon Station.
- One round trip between the proposed Natomas/Sacramento Airport Station and the existing the Stockton Downtown/ACE Station.
- Three round trips between the proposed Ceres ACE Station (included in the ACE Extension Lathrop to Ceres/Merced project) and the proposed Natomas/Sacramento Airport Station.[1]

Preliminary engineering plans for all proposed improvements are included in Appendix G, *Valley Rail Sacramento Extension 15% Preliminary Engineering Plan Set.*

[1] On August 2, 2018, the SJRRC Board certified the Environmental Impact Report (EIR) and approved the ACE Extension Lathrop to Ceres/Merced project. Operation of Phase I of the ACE Extension Lathrop to Ceres/Merced project (which includes the Ceres Station) is anticipated to begin between 2020 and 2023.

2.2 Proposed Project

2.2.1 Stations

The proposed project includes the construction of five ~~six~~ new stations between Stockton and the Natomas area of Sacramento (Figure 2-1). These stations and station alternatives/variants (where applicable), are described below. Each proposed station would be located along the existing UPRR alignment Sacramento Subdivision.[2] For stations that include alternatives (Lodi) ~~or variants (North Elk Grove)~~, only one alternative ~~or variant~~ would be selected for implementation. All stations would be designed in compliance with Americans with Disabilities Act (ADA) regulations and applicable federal transportation standards.

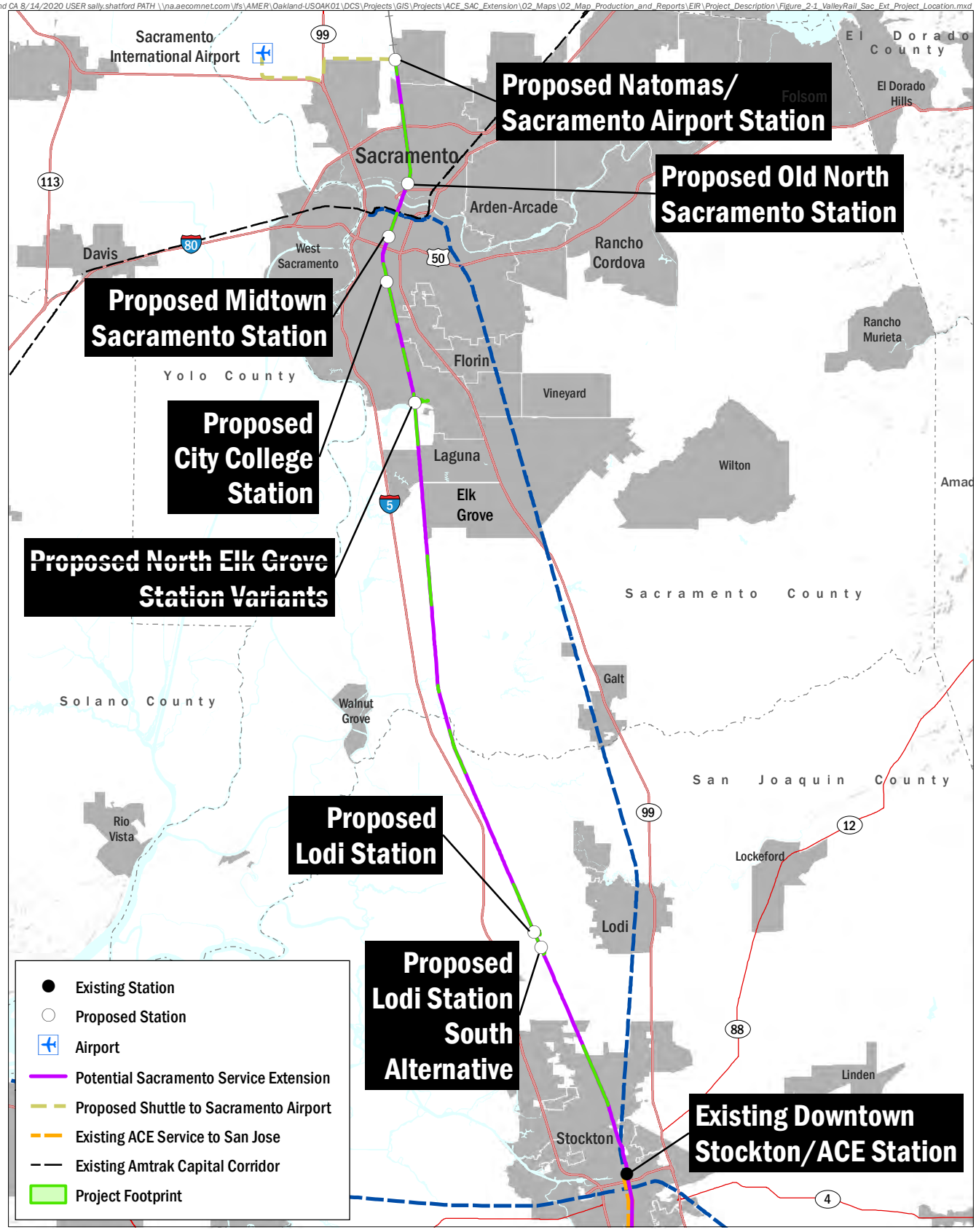
2.2.1.1 Lodi Station

The Lodi Station would be constructed on a 13-acre site along the southern side of State Route (SR) 12 just east of the existing UPRR alignment. The site is currently being used for agriculture. Access to the station would be provided from along SR 12 and from Devries Road. As shown in Figure 2-2A, improvements that would be constructed as part of the Lodi Station include:

- Construction of a 30-foot-wide by 1,000-foot-long at-grade center loading passenger platform.
- Construction of a surface parking lot providing approximately 280 parking spaces and 3 bus bays.
- Construction of a pedestrian undercrossing with ramps and stairs near the center of the platform (approximately 12 feet below existing grade), and a separate at-grade walkway at the northern end of the platform providing access from the parking lot to the passenger platform.
- Improvements to SR 12, including a new signalized station access driveway with striping for right and left turn lanes.
- Construction of a stormwater basin south of SR 12.

Also shown in Figure 2-2A are project-related track improvements proposed in the vicinity of the Lodi Station (further described in Section 2.2.2). The station would also include passenger amenities such as platform shelters (approximately 8 to 10 feet high), benches, lighting, security cameras, signage, ticketing machines, bicycle storage facilities, landscaping, and emergency call boxes.

[2] A *subdivision* is a portion of railroad or railway that operates under a single timetable (authority for train movement in the area).



Data Source: ESRI, 2019; AECOM, 2019; San Joaquins and Capital Corridor Rail Alignments: California Department of Transportation, 2013.

AECOM

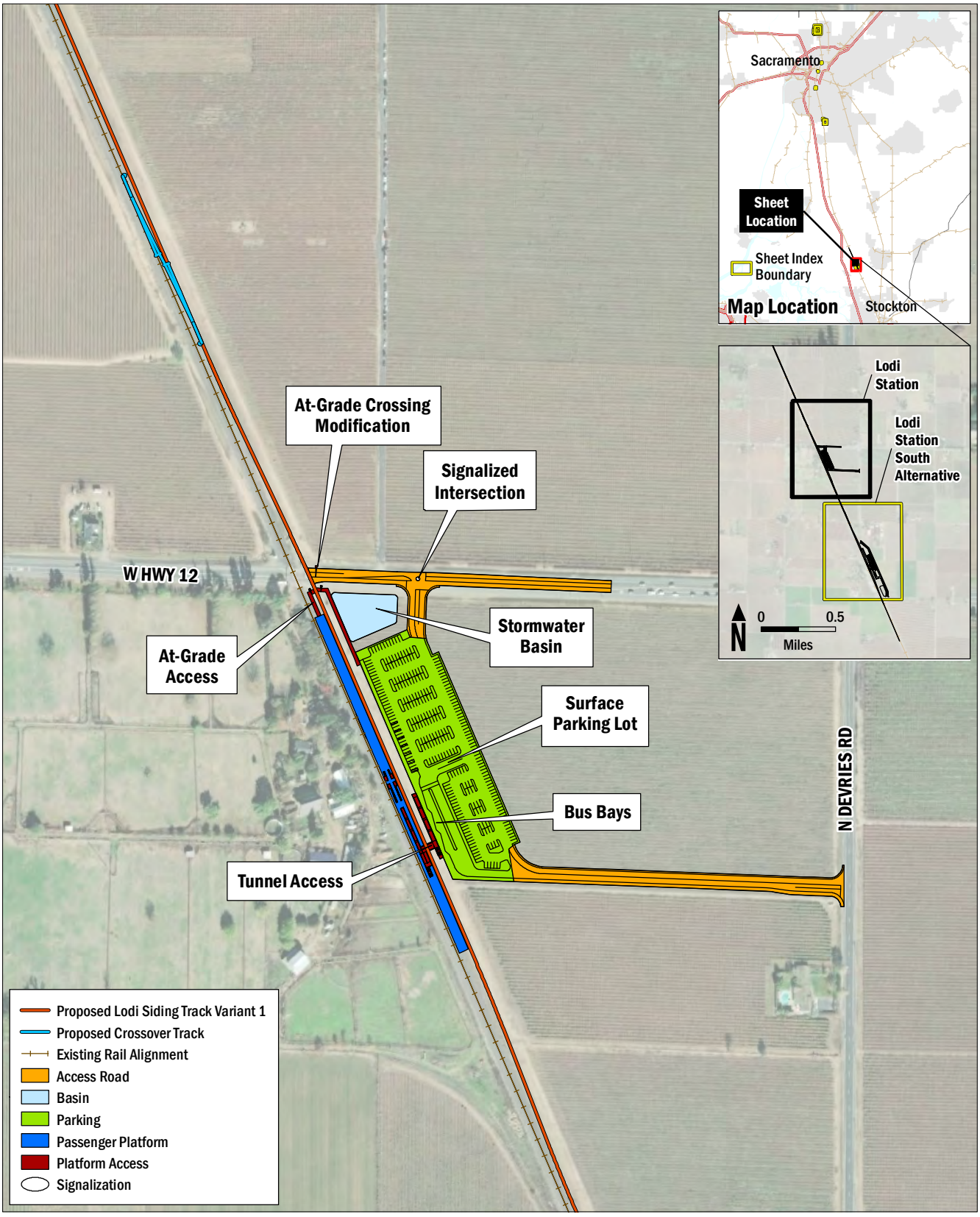
San Joaquin Regional Rail Commission

Note: The North Elk Grove Station, including all access and siding variants, is no longer under consideration as part of the proposed project.

FIGURE 2-1

Project Location Map

1:4,800
1 inch = 400 feet



Data Sources: Imagery: ESRI, 2018; Rail alignment: AECOM, 2019.

AECOM

San Joaquin Regional Rail Commission

FIGURE 2-2A

Lodi Station

2.2.1.2 Lodi Station South Alternative

An alternative to the Lodi Station is also under consideration. Under the Lodi Station South Alternative, the station would be constructed on a 15-acre site along the northern side of West Harney Lane just east of the UPRR alignment. The site is currently being used for agriculture. Access to the station would be provided from along West Harney Lane and Devries Road. As shown in Figure 2-2B, improvements that would be constructed as part of the Lodi Station South Alternative include:

- Construction of a 30-foot-wide by 1,000-foot-long at-grade center loading passenger platform.
- Construction of a surface parking lot providing approximately 240 parking spaces and 3 bus bays.
- Construction of a pedestrian undercrossing with ramps and stairs near the center of the platform (approximately 12 feet below existing grade), and a separate at-grade walkway at the northern end of the platform providing access from the parking lot to the passenger platform.
- Construction of station access driveways from West Harney Lane and Devries.
- Construction of a stormwater basin north of West Harney Lane.

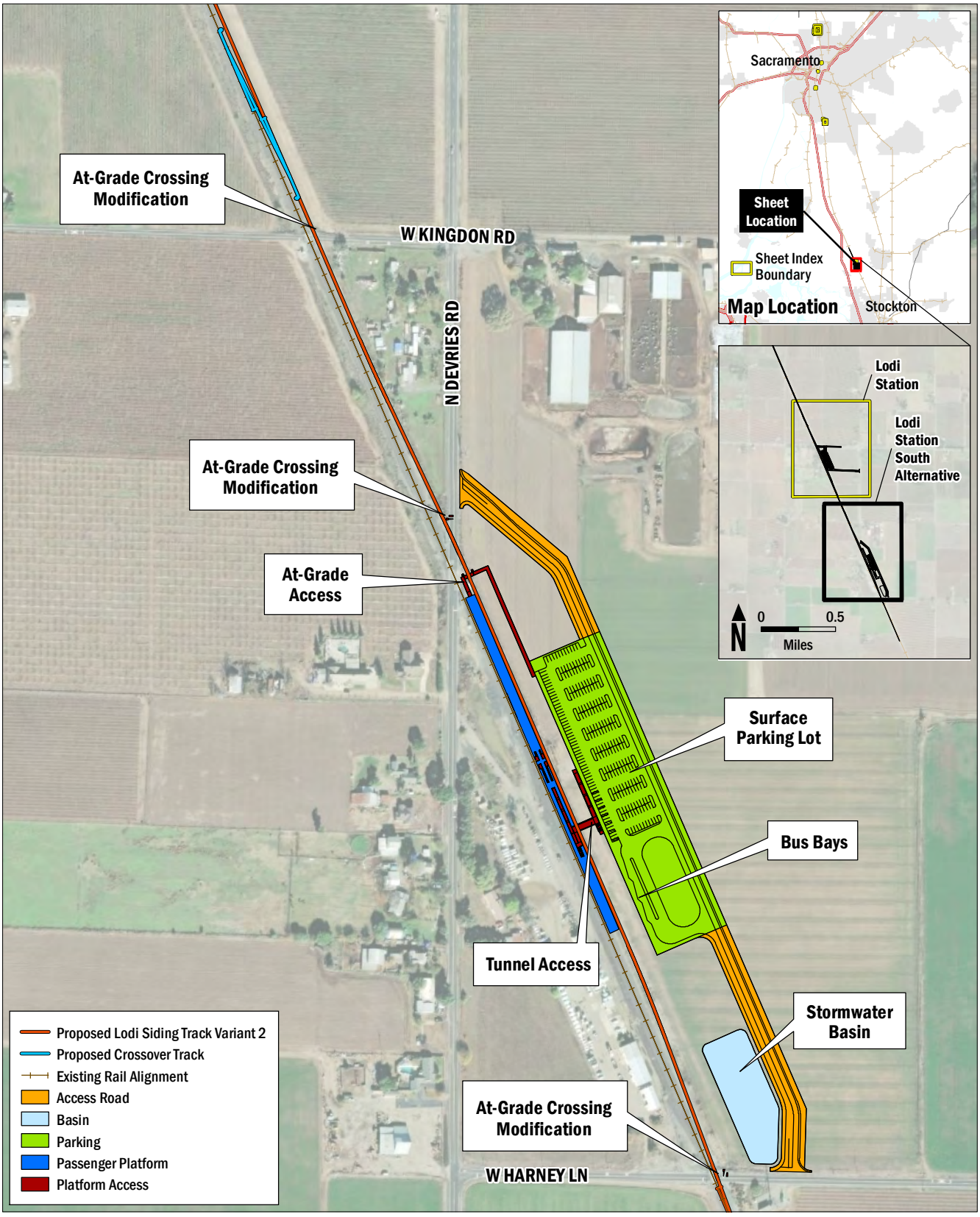
Also shown in Figure 2-2B are project-related track improvements proposed in the vicinity of the Lodi Station Alternative (further described in Section 2.2.2). Similar to the Lodi Station, the Lodi Station Alternative would also include passenger amenities such as platform shelters (approximately 8 to 10 feet high), benches, lighting, security cameras, signage, ticketing machines, bicycle storage facilities, landscaping, and emergency call boxes.

~~2.2.1.3 North Elk Grove Station~~

~~The North Elk Grove Station would be constructed on a 32-acre site beneath the Cosumnes Boulevard/Morrison Creek viaduct near the existing Sacramento Regional Transit (SacRT) Franklin light rail transit (LRT) station in Sacramento. The site is currently is undeveloped property owned by the Sacramento Regional County Sanitation District (SRCSD). Access to the station would be provided by a frontage road to be constructed just south of Cosumnes Boulevard. As described below, there are two platform variants and two station access variants under consideration. However, as shown in Figures 2-3A through 2-3D, all variants would include the following improvements:~~

- ~~Construction of a 30-foot-wide by 1,000-foot-long at-grade center loading passenger platform.~~
- ~~Construction of a surface parking lot providing approximately 700 parking spaces and 3 bus bays.~~
- ~~Construction of a pedestrian overcrossing with stairs and an elevator (approximately 40 feet above existing grade) providing access from the parking lot to the passenger platform.~~

1:4,800
1 inch = 400 feet



Data Sources: Imagery: ESRI, 2018; Rail alignment: AECOM, 2019.

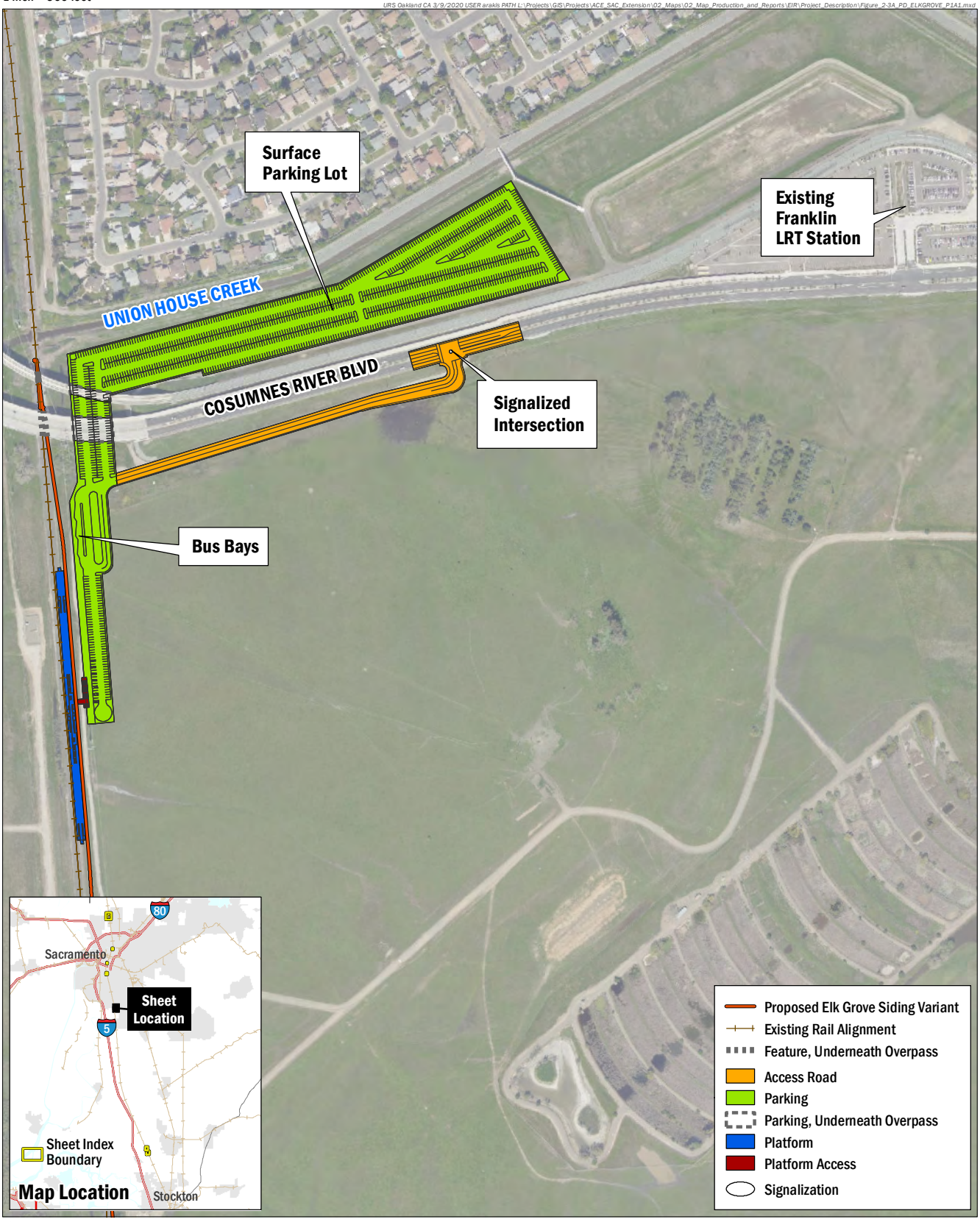
AECOM

San Joaquin Regional Rail Commission

FIGURE 2-2B

Lodi Station South Alternative

1:6,000
1 inch = 500 feet



AECOM

San Joaquin Regional Rail Commission

Note: The North Elk Grove Station, including all access and siding variants, is no longer under consideration as part of the proposed project. This figure is deleted.

~~FIGURE 2-3A~~

~~*North Elk Grove Station Platform Variant 1 (P1) with Access Variant 1 (A1)*~~

1:6,000
1 inch = 500 feet

AECOM

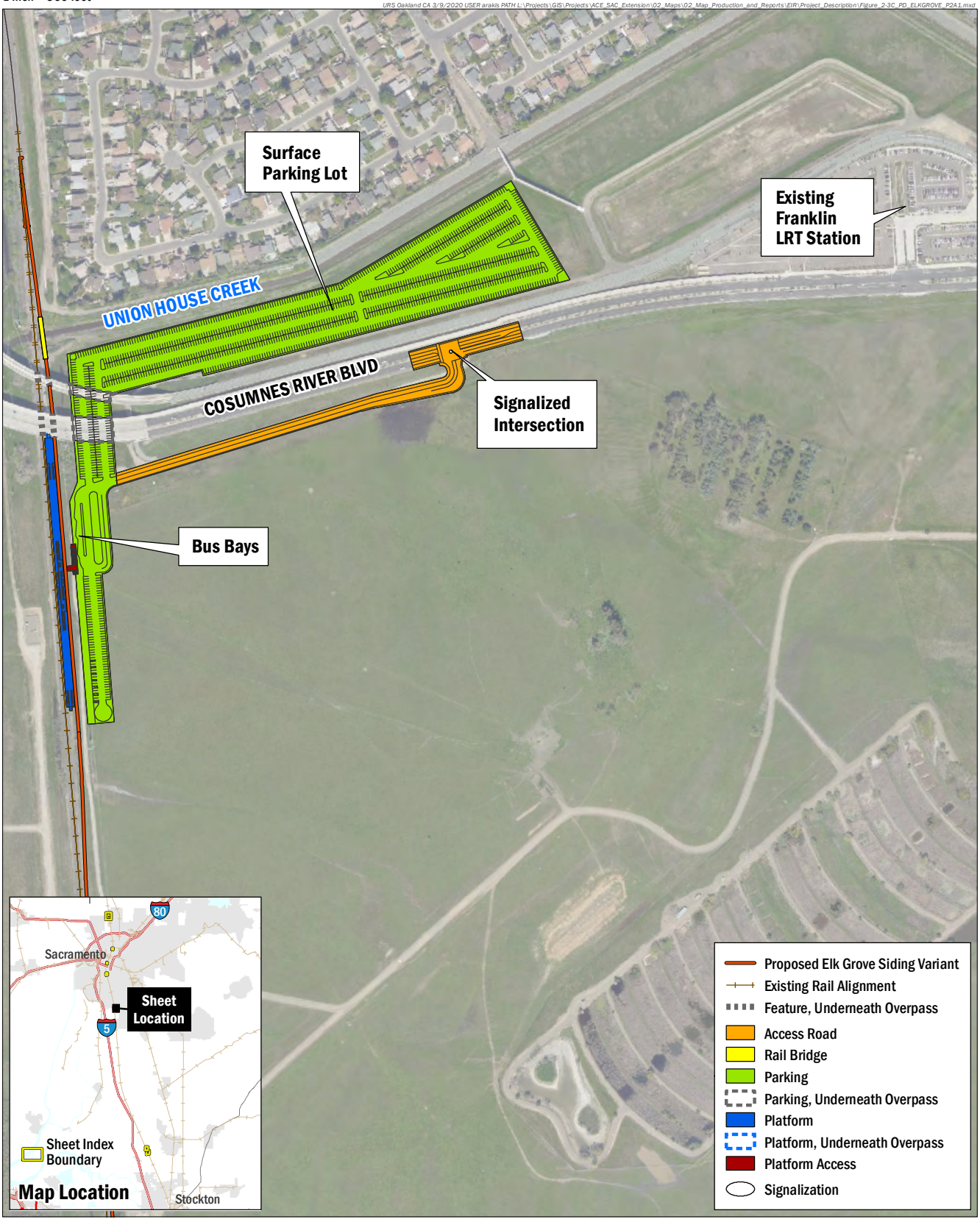
San Joaquin Regional Rail Commission

Note: The North Elk Grove Station, including all access and siding variants, is no longer under consideration as part of the proposed project. This figure is deleted.

~~FIGURE 2-3B~~

~~*North Elk Grove Station Platform Variant 1 (P1) with Access Variant 2 (A2)*~~

1:6,000
1 inch = 500 feet



Sources: Roads, Hydrology, Counties: ESRI, 2016;

AECOM

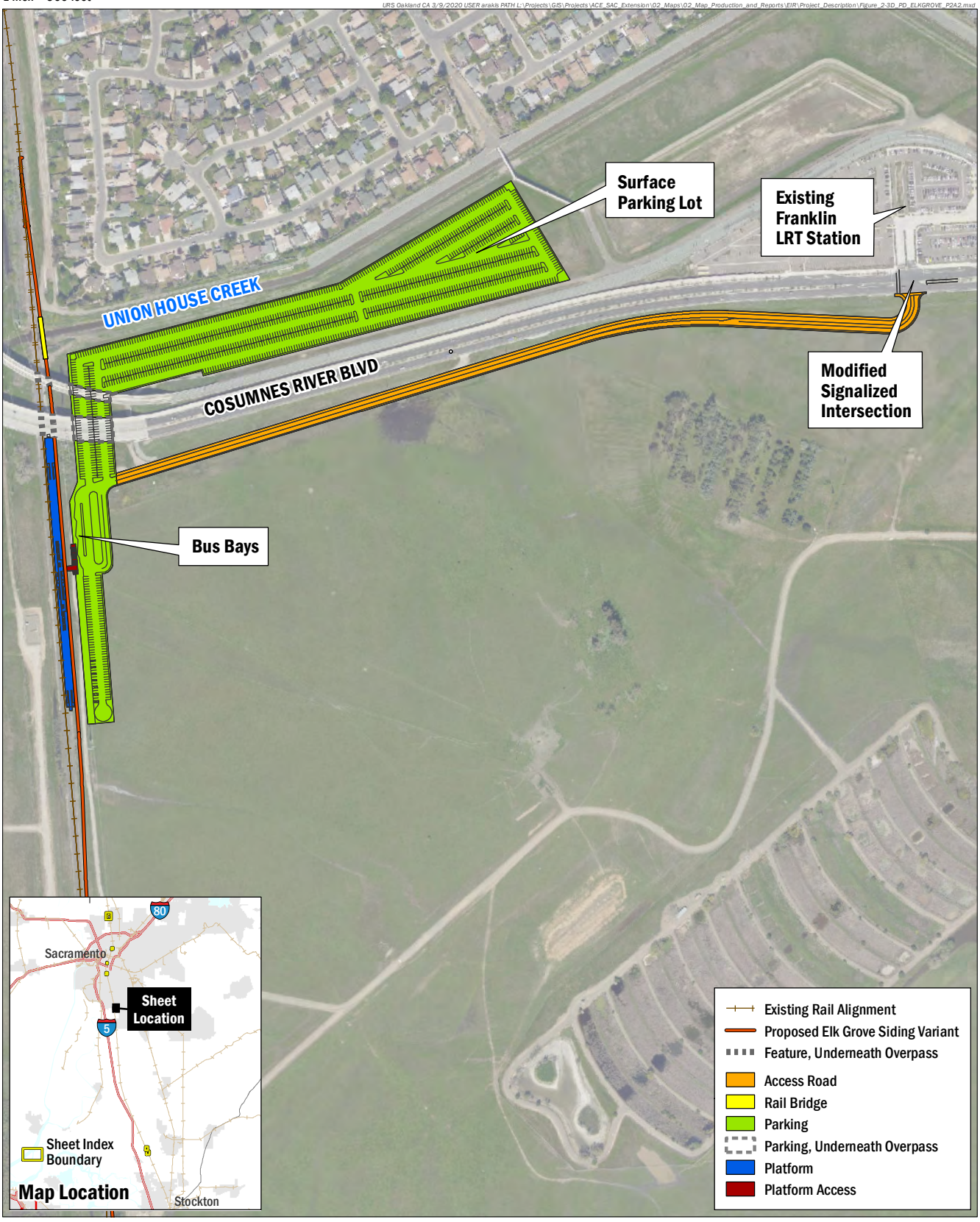
San Joaquin Regional Rail Commission

Note: The North Elk Grove Station, including all access and siding variants, is no longer under consideration as part of the proposed project. This figure is deleted.

~~FIGURE 2-3C~~

~~*North Elk Grove Station Platform Variant 2 (P2) with Access Variant 1 (A1)*~~

1:6,000
1 inch = 500 feet



Sources: Roads, Hydrology, Counties: ESRI, 2016; Rail alignment: AECOM, 2019.

AECOM

San Joaquin Regional Rail Commission

Note: The North Elk Grove Station, including all access and siding variants, is no longer under consideration as part of the proposed project. This figure is deleted.

~~FIGURE 2-3D~~

~~*North Elk Grove Station Platform Variant 2 (P2) with Access Variant 2 (A2)*~~

- ~~Improvements to Cosumnes Boulevard (further described below under North Elk Grove Station Access Variants 1 and 2).~~

~~Also shown in Figures 2-3A through 2-3D are project-related track improvements proposed in the vicinity of the North Elk Grove Station (further described in Section 2.2.2). The station would also include passenger amenities such as platform shelters (approximately 8 to 10 feet high), benches, lighting, security cameras, signage, ticketing machines, bicycle storage facilities, landscaping, and emergency call boxes.~~

~~North Elk Grove Station Platform Location Variant 1 (P1)~~

~~Under Platform Variant P1, the platform would begin just south of the storm drain channel that runs parallel to the Cosumnes River Boulevard viaduct. The platform would be 30 feet wide, with the northern end of the platform ending 500 feet south of the Cosumnes River Boulevard viaduct.~~

~~North Elk Grove Station Platform Location Variant 2 (P2)~~

~~Under Variant P2, the platform location would begin north of the storm drain channel that runs parallel to the Cosumnes River Boulevard viaduct. The platform would be 30 feet wide, with the northern end of the platform ending at the Cosumnes River Boulevard viaduct. As described below, construction of Variant P2 would require the construction of a new bridge crossing of Strawberry Creek at MP 130.45 to accommodate the proposed North Elk Grove Siding.~~

~~North Elk Grove Station Access Variant 1 (A1)~~

~~Under Variant A1, access to the station would be via a new signalized three-way intersection on Cosumnes River Boulevard west of the existing Franklin LRT station access intersection. The proposed frontage road would parallel Cosumnes River Boulevard up to the new intersection.~~

~~North Elk Grove Station Access Variant 2 (A2)~~

~~Under Variant A2, access to the station would be via the existing Cosumnes River Boulevard/Franklin LRT station intersection. The proposed frontage road would parallel Cosumnes River Boulevard up to the existing intersection, where the intersection would be converted from the existing three-way configuration to a full four-way configuration.~~

2.2.1.4 City College Station

The City College Station would be constructed adjacent to the existing SacRT City College LRT station north of Sutterville Road in Sacramento. The proposed station would consist of a new 15-foot-wide by 1,000-foot-long at-grade side-loading passenger platform with an 8-foot-wide back side extension 300 feet long for transfers to and from the existing LRT platform (Figure 2-3~~4~~). This new platform would allow for platform-to-platform transfers to and from LRT trains. The station would also include the construction of tracks for ACE trains in the existing station area. No expansion of existing parking or bus facilities is included as part of the proposed City College Station.

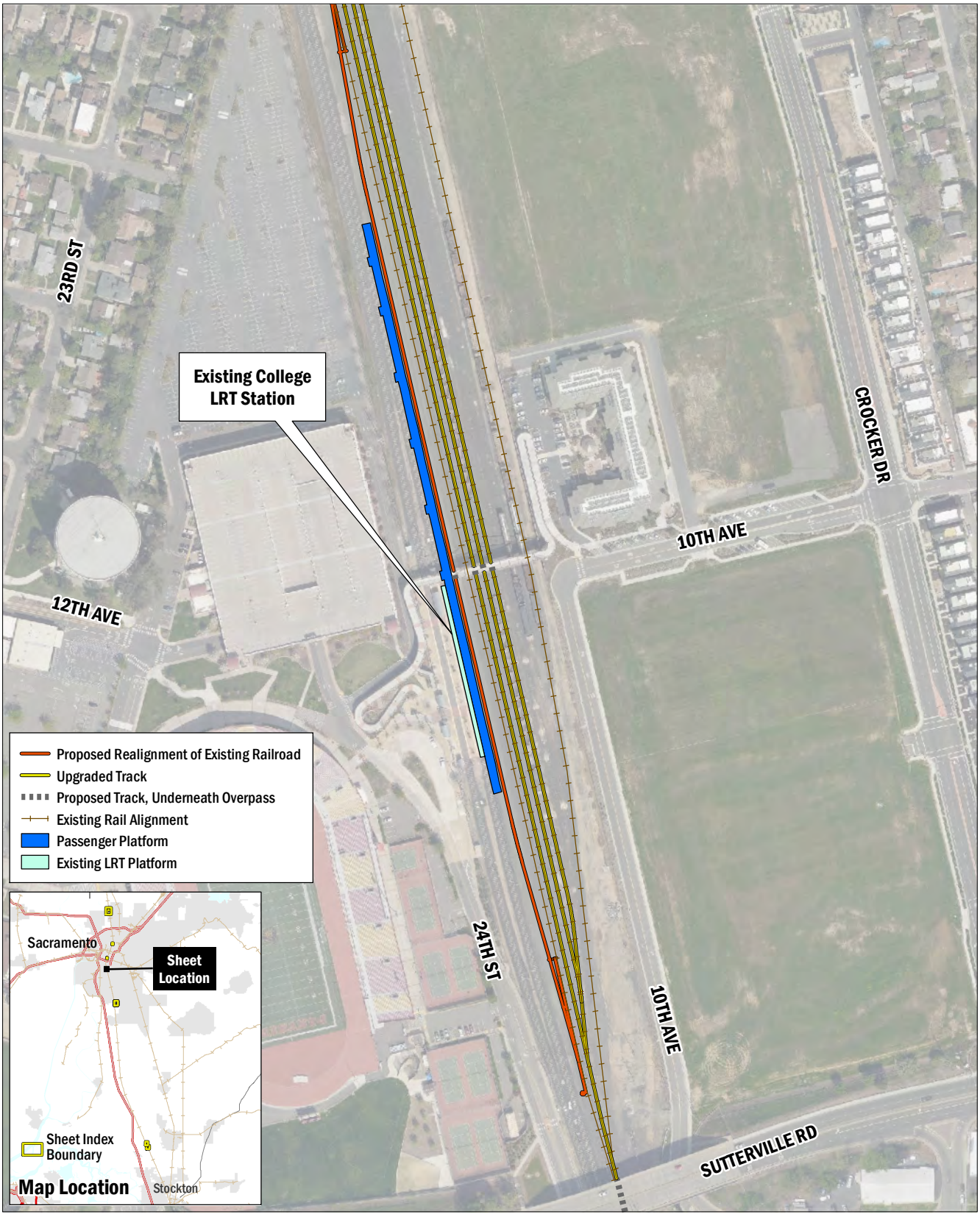
2.2.1.5 Midtown Sacramento Station

The Midtown Sacramento Station would be constructed near Q Street between 19th Street and 20th Street in Sacramento. This site was selected to minimize potential impacts to east-west roadways in Midtown during times when ACE and San Joaquins trains are at the station. While at the station, the train would stop across Q Street; therefore, train doors in the portion of the train that traversed Q Street would remain closed, and passengers would need to board and disembark from other train cars. No new parking or bus facilities would be constructed as part of the proposed Midtown Sacramento Station. However, additional station area improvements are included to facilitate station access and integration of the station into the Midtown Neighborhood. As shown in Figure 2-4~~5~~, improvements that would be constructed as part of the Midtown Sacramento Station include:

- Construction of a 15-foot-wide by 565-foot-long at-grade side-loading passenger platform that would extend south of Q Street; and a 15-foot-wide by 250-foot-long at-grade side-loading passenger platform that would extend north of Q Street in the existing UPRR right-of-way (ROW).
- Extension and upgrade of the existing railroad, including modifications of the two existing at-grade crossings at P Street and at Q Street; removal of the railroad switch just south of Q Street; and the installation of a new switch north of P Street.
- Construction of a plaza area behind station platform.
- Construction of enhanced platform shelters approximately 8 to 10 feet high.
- Construction of an enhanced bicycle/pedestrian plaza under the LRT guideway.
- An upgrade to the existing UPRR ROW fencing.
- Enhancements to the pedestrian crossing at Q Street with active warning devices.
- Construction of an enhanced path to 19th Street under the LRT guideway.
- Construction of a signalized mid-block crossing of 19th Street just north of the LRT tracks and guideway.
- Construction of a bicycle/pedestrian path in UPRR ROW from the Midtown Sacramento Station north to C Street, including pedestrian crossings with active warning devices at D Street, E Street, F Street, G Street, H Street, I Street, J Street, K Street, L Street, Capitol Avenue, N Street, O Street, and P Street.[3]
- Expansion of the existing SacRT bus stops along the western side of 19th Street adjacent to the Truitt Bark Park to accommodate passenger drop-off and bus loading.

[3] Funds for the construction of the bicycle/pedestrian path in the UPRR ROW from the Midtown Sacramento Station north to C Street have not yet been identified.

1:3,000
1 inch = 250 feet



Data Sources: Imagery: ESRI, 2018; Rail alignment: AECOM, 2019.

AECOM

San Joaquin Regional Rail Commission

FIGURE 2-34

City College Station

1:1,800
1 inch = 150 feet

Data Sources: Imagery: ESRI, 2018; Rail alignment: AECOM, 2019.

AECOM

San Joaquin Regional Rail Commission

FIGURE 2-~~45~~

Midtown Sacramento Station

2.2.1.6 Old North Sacramento Station

The Old North Sacramento Station would be constructed on an 8-acre site along the western side of Acoma Street just north of El Monte Avenue in Sacramento. The site is currently developed for commercial/industrial uses. Access to the station would be provided from two new driveways along Acoma Street. As shown in Figure 2-5~~6~~, improvements that would be constructed as part of the Old North Sacramento Station include:

- Construction of a 30-foot-wide by 1,000-foot-long at-grade center loading passenger platform.
- Construction of a surface parking lot providing approximately 250 parking spaces and 3 bus bays.
- Construction of a pedestrian undercrossing and ramps near the center of the platform (approximately 5 feet below existing grade), and a separate at-grade walkway at the northern end of the platform providing access from the parking lot to the passenger platform.
- Improvements to Acoma Street and El Monte Avenue, including relocation of existing stop signs.

Also shown in Figure 2-5~~6~~ are project-related track improvements proposed in the vicinity of the Old North Sacramento Station (see Section 2.2.2). The station would also include passenger amenities such as platform shelters (approximately 8 to 10 feet high), benches, lighting, security cameras, signage, ticketing machines, bicycle storage facilities, landscaping, and emergency call boxes.

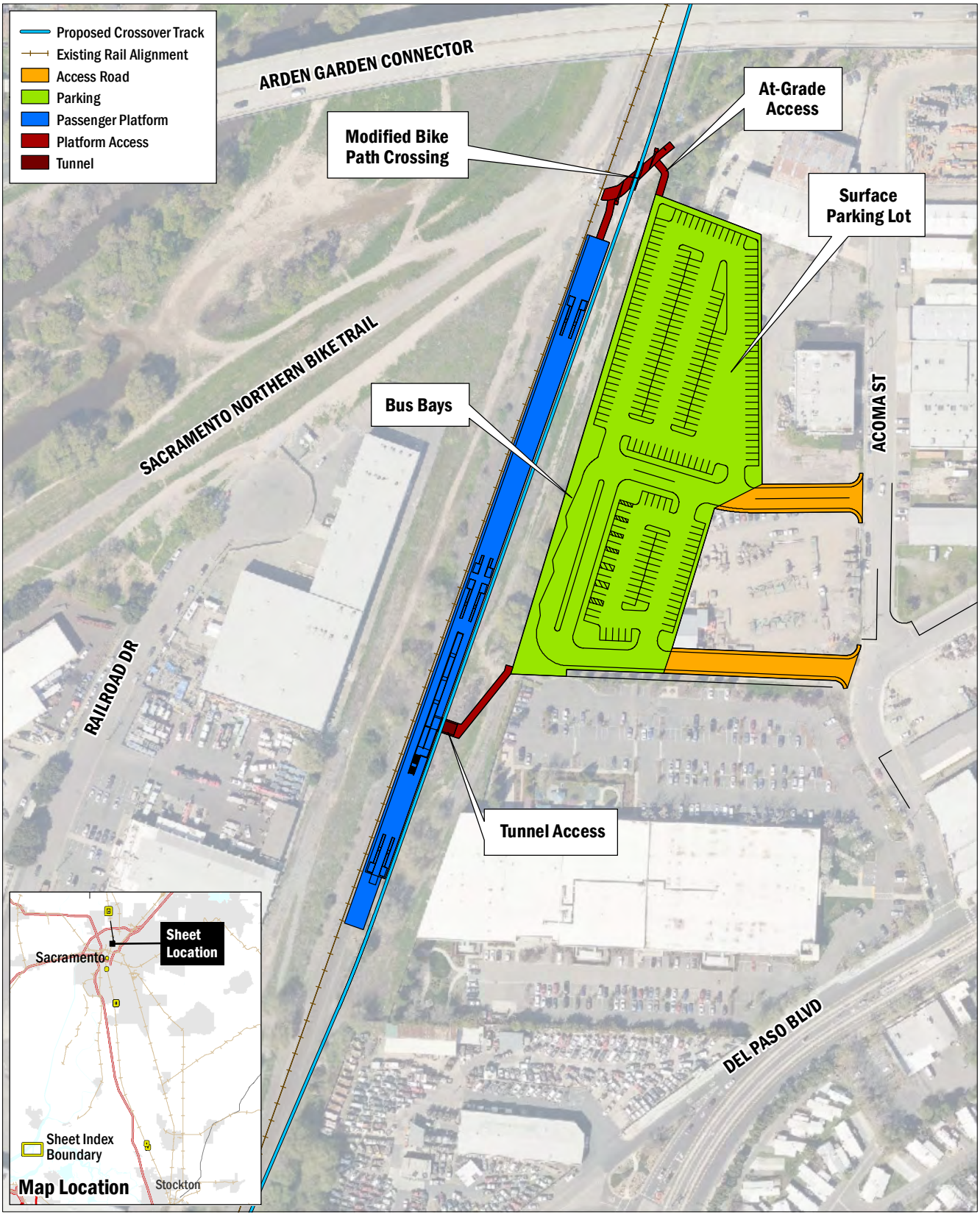
2.2.1.7 Natomas/Sacramento Airport Station

The Natomas/Sacramento Airport Station would be constructed on an 8.4-acre site along the eastern side of Blacktop Road just south of West Elkhorn Boulevard. Access to the station would be provided via Blacktop Road. The site proposed for Natomas/Sacramento Airport Station is currently developed with commercial/industrial. As shown in Figure 2-6~~7~~, improvements that would be constructed as part of the Natomas/Sacramento Airport Station East Alternative include:

- Construction of a 15-foot-wide by 1,000-foot-long at-grade side-loading passenger platform.
- Construction of a surface parking lot providing approximately 250 parking spaces and 3 bus bays.

The Natomas/Sacramento Airport Station would include passenger amenities such as platform shelters (approximately 8 to 10 feet high), benches, lighting, security cameras, signage, ticketing machines, bicycle storage facilities, landscaping, and emergency call boxes. Shuttle services to and from Sacramento International Airport would be provided, and timed to meet all incoming and departing trains.

1:2,400
1 inch = 200 feet



N

0 500
Feet

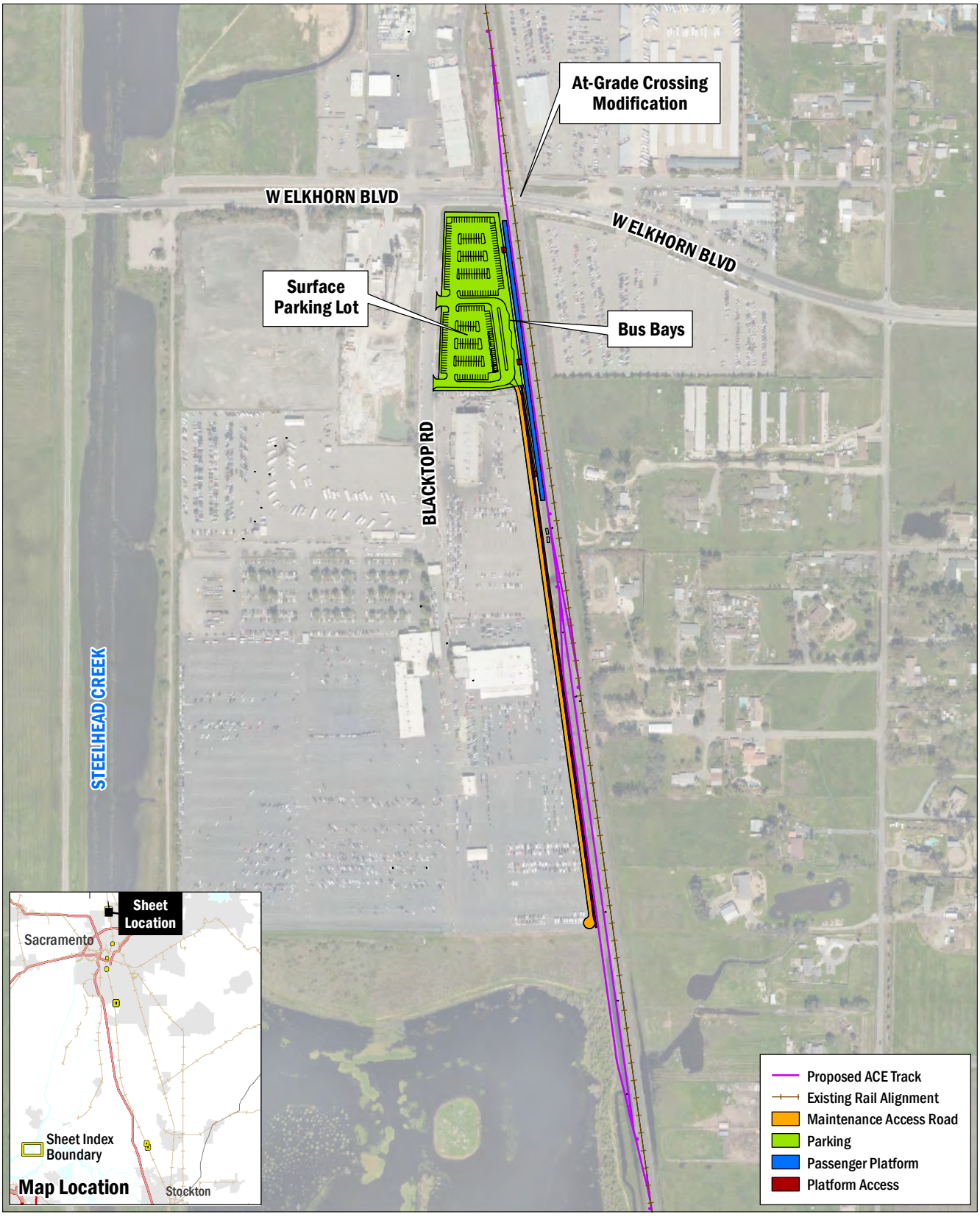
Data Sources: Imagery: ESRI, 2018; Rail alignment: AECOM, 2019.

AECOM
San Joaquin Regional Rail Commission

FIGURE 2-56

Old North Sacramento Station

1:6,000
1 inch = 500 feet



Data Sources: Imagery: ESRI, 2018; Rail alignment: AECOM, 2019.

AECOM

San Joaquin Regional Rail Commission

FIGURE 2-~~67~~

Natomas / Sacramento Airport Station

The Natomas/Sacramento Airport Station would also include layover tracks south of the platform to accommodate ACE and Amtrak train layovers between service runs. The layover tracks would accommodate four trains (plus one train layover at the station platform). The tracks would also allow for interior train cleaning during layovers. Employee access to the layover tracks would be from an access road to be constructed west of the proposed tracks.

2.2.2 Track Improvements

The proposed project also includes track improvements to existing UPRR track at various locations along the Sacramento Subdivision (see Figure 2-7~~8~~). These improvements, described below, are necessary to increase allowable train speeds and meet operational requirements. All of the proposed track work would occur in existing UPRR ROW.

2.2.2.1 Track Curve Reconstruction

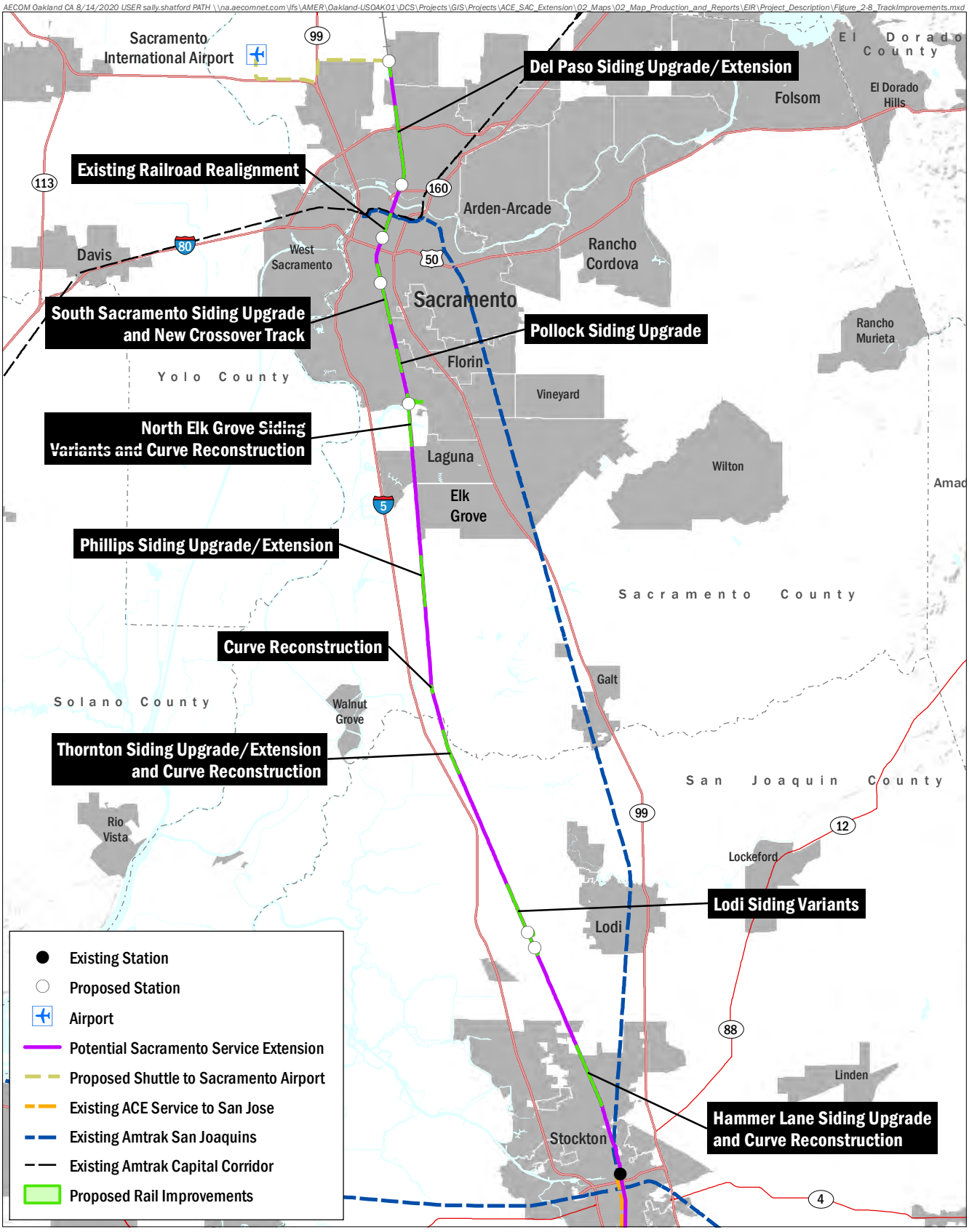
At four locations, existing track curves would be reconstructed by increasing the curve radii and shifting the centerline of the mainline tracks. These improvements would increase the allowable speed of the curves from 60 mph to 90 mph to accommodate the typical 79 mph operation of San Joaquins and ACE trains along the corridor. Track curve reconstruction would occur at the following locations:

- Between East March Lane and East Swain Road (Mile Post [MP] 97.30 and MP 97.52) in the City of Stockton.
- North of North New Hope Road between MP 114.67 and MP 114.85.
- South of Desmond Road between MP 117.29 and MP 117.60.
- North of ~~the North~~ Elk Grove ~~Station~~ between MP 130.78 and MP 130.58.

2.2.2.2 Existing Passing Siding Track Upgrades

There are six existing UPRR sidings that require upgrades to accommodate the operational requirements UPRR needs to allow passenger service to run in this corridor, including:

- Hammer Lane Siding Upgrade – Including upgrade of the switches at each end of the siding, and signal upgrades (MP 97.73 to MP 100.59).
- Thornton Siding Upgrade/Extension – Including upgrade of the southern switch, signal upgrades, removal of the northern switch, extension of the siding north by 10,000 feet, modification of the existing at-grade crossing at New Hope Road to allow for a second set of tracks, and installation of a new switch at the new northern terminus (MP 113.47 to MP 115.48).
- Phillips Siding Upgrade/Extension – Including upgrade of the southern switch, signal upgrades, removal of the northern switch, extension of the siding north by 10,000 feet, modification of the existing at-grade crossing at Core Road to allow for a second set of tracks, and installation of a new switch at the new northern terminus (MP 121.26 to MP 123.46).



AECOM

San Joaquin Regional Rail Commission

FIGURE 2-78

Project Track Improvements

Note: The North Elk Grove Station, including all access and siding variants, is no longer under consideration. Therefore, the footprint shown above would be reduced to only the portion of the proposed project that includes the Track Curve Reconstruction North of Elk Grove.

- Pollock Siding Upgrade – Including upgrade of the switches at each end of the siding, and signal upgrades (MP 131.89 to MP 132.88).
- South Sacramento Siding Upgrade – Including upgrade of the switches at each end of the siding, and line and surface, for increased speed. This also includes upgrading the two yard tracks adjacent to the siding in the vicinity of the proposed City College Station (MP 134.17 to MP 136.82).
- Del Paso Siding Upgrade/Extension – Including upgrade of the northern switch, signal upgrades, removal of the southern switch, extension by 19,000 feet creating two mainline tracks, modification of the existing crossing at the bike/ped path just north of the platform to allow for a second set of tracks, and installation of a new switch at the new southern terminus (MP 140.36 to MP 144.23). A universal crossover would be constructed in the center of the section between MP 141.6 and MP 141.96. There would be a new bridge at MP 141.69. On each end of the bridge are flood gates that would be modified to accommodate the additional track. The southern end would pass around the proposed Old North Sacramento Station Platform.

2.2.2.3 New Passing Siding Tracks

~~There are two~~ One new UPRR siding~~s that are~~ is required to accommodate the operational requirements UPRR needs to allow passenger service to run in this corridor, including:

- Lodi Siding Variant – Including construction of a second mainline track starting just south of West Harney Lane at MP 104.51, and extending north for approximately 18,500 feet to MP 107.95. The new track would go around the proposed station platform to be constructed for the Lodi Station or the Lodi Station Alternative. The new track would also include modifications to the existing at-grade crossings at West Harney Lane, Devries Road, Kingdon Road, and SR 12 to allow for a second set of tracks.
- ~~North Elk Grove Siding Variant – Including construction of a 10,000-foot-long siding track starting south of Sims Road, extending to just north of the proposed North Elk Grove Station. The new track would go around the proposed North Elk Grove Station Platform. The actual limits of the siding would be based on which North Elk Grove Station Platform Variant is selected, and would extend from MP 128.49 to MP 130.43; or from MP 128.64 to MP 130.58. The new track would include modifications to the existing UPRR at-grade crossing at Sims Road to allow for a second set of tracks. There would also be a new bridge crossing of Laguna Creek at MP 129.78, and (depending on the platform variant selected) a second bridge crossing of Strawberry Creek at MP 130.45.~~

2.2.2.4 Crossover Track South of City College Station

A crossover track and signaling would be installed just south of the proposed City College Station to allow northbound and southbound passenger trains to pass using the existing track siding south of the proposed station. Work would occur just north of 26th Avenue at MP 135.20.

2.2.3 Conceptual Service Plan

ACE currently operates four westbound trains weekday mornings from Stockton to San Jose, and four eastbound trains weekday afternoons from San Jose to Stockton. Saturday ACE service currently includes two westbound morning trains from Stockton to San Jose, and two eastbound afternoon trains from San Jose to Stockton. There is no Sunday ACE service.

Amtrak's current San Joaquins service includes trains between Sacramento and Bakersfield (three daily southbound trains and two daily northbound trains), and between Oakland and Bakersfield (five daily southbound and northbound trains).

The proposed project includes the addition of both Amtrak San Joaquins trains and ACE trains along the Sacramento Subdivision serving the five ~~six~~ new stations described above. The preliminary conceptual service plan is described below.

2.2.3.1 San Joaquins

With implementation of the proposed project, there would be two new round trip San Joaquins operating on the Sacramento Subdivision. One round trip would operate between the proposed Natomas/Sacramento Airport Station and the existing Fresno Amtrak Station, and one round trip would operate between the proposed Natomas/Sacramento Airport Station and the existing Bakersfield Amtrak Station. Both of these round trips would operate on the Sacramento Subdivision from the proposed Natomas/Sacramento Airport Station to the existing Stockton Downtown/ACE Station. The existing alignment south of Stockton would remain unchanged; the service would continue to operate over the BNSF Stockton Subdivision, with trains stopping at the existing Amtrak stations along the subdivision before terminating at either Fresno or Bakersfield.

To maximize the efficiency of the proposed service, some of the existing departure and arrival locations would be revised, and the schedule would be adjusted to represent a "pulse" scenario, in which train arrivals and departures occur at set intervals. The schedules for existing Amtrak Thruway Bus services would be adjusted to reflect the new service schedules.

2.2.3.2 ACE

The proposed project also includes an extension of existing ACE service to the proposed Natomas/Sacramento Airport Station. One existing ACE train would originate at the proposed Natomas/Sacramento Airport Station in the morning, and operate to the Stockton Downtown/ACE Station. The subdivisions operated on by the ACE service would be the same as proposed for the San Joaquins service north of the Stockton Downtown/ACE Station. Once at the Stockton Downtown/ACE Station, the ACE train would operate in the same manner as the existing ACE service to the San Jose Diridon Station. In the afternoon, one existing ACE train would depart the San Jose Diridon Station and operate to the Stockton Downtown/ACE Station (as currently occurs), then continue north to terminate at the proposed Natomas/Sacramento Airport Station and layover overnight in the station.

The proposed project also includes service between the proposed Ceres Station (included in the ACE Extension Lathrop to Ceres/Merced project), to the Natomas/Sacramento Airport Station. This service would provide three ACE trips that would originate in Ceres in the morning, traveling

to Natomas, and stored during the day. One of the trains would make a mid-day trip south to Stockton and back. In the afternoon, the three ACE trains would return to the Ceres Station.

2.2.3.3 Airport Shuttle Services

The proposed project includes the establishment of shuttle services between the proposed Natomas/Sacramento Airport Station and Sacramento International Airport. Although an operator of the proposed shuttle service has not yet been identified, service would be established so that each arriving and departing train would be met by an airport shuttle.

2.2.4 Construction Methods

2.2.4.1 Track Work

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 or wood ties would then be 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 main track in the UPRR ROW would occur in segments; once the subgrade, ballast, and main track are installed for one segment, construction would continue down the alignment. The duration of construction activities for a modified track generally lasts approximately 2 to 3 months for a given location. The duration of construction activities for a new track generally lasts approximately 4 to 12 months for a given location.

Track construction could conflict with existing utility lines, and these lines would be relocated or protected in place. Table 2-1 depicts the potential utility conflicts associated with proposed track improvements, and whether the utility would be protected or relocated.

Table 2-12. Potential Utility Conflicts: Track Improvements

Track Improvement	Approx. Station	Relocate or Protect?
Hammer Lane Siding Upgrade and Track Curve Reconstruction Between East March Lane and East Swain Road		
Parallel Utility in Conflict		
Sprint – Fiber Optic	133+16 to 144+36	Protect
City of Stockton – Storm Drain	133+16 to 144+36	Protect
PG&E – Electric Transmission Overhead	208+00 to 228+50	Protect
Perpendicular Utility in Conflict		
City of Stockton – Storm Drain	138+00	Protect
East Bay Municipal Utility District – Water	137+90	Protect
East Bay Municipal Utility District – Water	138+00	Protect
East Bay Municipal Utility District – Water	138+10	Protect
PG&E – Electric Transmission Overhead	204+80	Protect
PG&E – Electric Transmission Overhead	262+40	Protect
New Lodi Siding Variants		
Parallel Utility in Conflict		
PG&E – Gas	522+50 to 693+80	Relocate
PG&E – Gas	538+10 to 548+00	Relocate
PG&E – Electric Overhead	685+00 to 701+00	Protect
Perpendicular Utility in Conflict		
PG&E – Gas	524+90	Protect
Joint – Overhead	525+50	Protect
PG&E – Gas	538+10	Protect
PG&E – Electric Overhead	544+00	Protect

Table 2-12. Potential Utility Conflicts: Track Improvements

Track Improvement	Approx. Station	Relocate or Protect?
PG&E – Gas	579+10	Protect
PG&E – Electric Overhead	641+70	Protect
PG&E – Gas	693+80	Protect
PG&E – Electric Overhead	701+05	Protect
PG&E – Electric Overhead	701+15	Protect
Thornton Siding Upgrade/Extension and Track Curve Reconstruction North of North New Hope Road		
Parallel Utility in Conflict		
Century Link – Fiber Optic	994+10 to 1100+00	Protect
Level 3 – Fiber Optic	994+10 to 1100+00	Protect
Sprint – Fiber Optic	994+10 to 1100+00	Protect
Century Link – Fiber Optic	1060+73 to 1070+65	Protect
Level 3 – Fiber Optic	1060+73 to 1070+65	Protect
Sprint – Fiber Optic	1060+73 to 1070+65	Protect
Perpendicular Utility in Conflict		
None		
Track Curve Reconstruction South of Desmond Road		
Parallel Utility in Conflict		
Sprint – Fiber Optic	1199+90 to 1214+01	Protect
Perpendicular Utility in Conflict		
None		
Phillips Siding Upgrade/Extension		
Parallel Utility in Conflict		
Century Link – Fiber Optic	1404+50 to 1511+20	Protect
Level 3 – Fiber Optic	1404+50 to 1511+20	Protect
Sprint – Fiber Optic	1404+50 to 1511+20	Protect
PG&E – Electric Transmission Overhead	1511+20 to 1520+60	Protect
Perpendicular Utility in Conflict		
PG&E – Electric Transmission Overhead Pole	1511+20	Protect
~~**North Elk Grove Siding Variants and**~~ **Track Curve Reconstruction North of ~~the North~~ Elk Grove ~~Station~~**		
Parallel Utility in Conflict		
~~Sprint Fiber Optic~~	~~1870+70 to 1890+00~~	~~Protect~~
~~Sacramento Area Regional Sanitation~~	~~1870+0 to 1890+00~~	~~Protect~~
~~PG&E – Electric Transmission Overhead~~	~~1877+00 to 1886+50~~	~~Protect~~
Sprint – Fiber Optic	1897+00 to 1908+20 ~~1900+30 to 1906+20~~	Protect
PG&E – Electric Transmission Overhead	1897+00 to 1908+20 ~~1900+30 to 1906+20~~	Protect
Sacramento Area Regional Sanitation	1897+00 to 1908+20 ~~1900+30 to 1906+20~~	Protect
Perpendicular Utility in Conflict		
~~Electric Overhead~~	~~1791+85~~	~~Protect~~
~~Electric Overhead~~	~~1802+50~~	~~Protect~~
~~Water~~	~~1806+50~~	~~Protect~~
~~PG&E – Electric Transmission Overhead~~	~~1825+75~~	~~Protect~~
~~PG&E – Electric Transmission Overhead~~	~~1845+00~~	~~Protect~~
~~PG&E – Electric Transmission Overhead~~	~~1886+50~~	~~Protect~~
Pollock Siding Upgrade		
Parallel Utility in Conflict		
PG&E – Electric Transmission Overhead	2016+00 to 2019+00	Protect
Perpendicular Utility in Conflict		
PG&E – Electric Transmission Overhead	1195+50	Protect
South Sacramento Siding Upgrade and Crossover Track South of City College Station		
Parallel Utility in Conflict		
None		
Perpendicular Utility in Conflict		
PG&E – Electric Transmission Overhead	2185+50	Protect

Table 2-12. Potential Utility Conflicts: Track Improvements

Track Improvement	Approx. Station	Relocate or Protect?
PG&E – Electric Transmission Overhead	2227+10	Protect
Del Paso Siding Upgrade/Extension		
Parallel Utility in Conflict		
Sprint – Fiber Optic	2421+00 to 2439+00	Protect
Electric Overhead	2486+50 to 2490+50	Protect
Perpendicular Utility in Conflict		
Gas	2434+00	Protect
Electric Overhead	2435+50	Protect
Electric Overhead	2458+00	Protect
Electric Overhead	2490+90	Protect
Electric Overhead	2526+50	Protect

2.2.4.2 Stations

Station improvements would include the construction of new station facilities, such as station platforms, station tracks, and passenger amenities, including surface parking lots and pedestrian overcrossings between the parking areas and station platform.

Construction activities associated with station platforms include clearing and grubbing, rough grading, structural excavation for walls, forming and pouring concrete for the walls, access stairs and ramps, platform surface, installation of signage, shelters, lighting, security, railings, benches, and trash receptacles.

Construction activities associated with station tracks would be similar to track work activities described above.

Construction activities associated with surface parking areas would include clearing and grubbing, rough grading, installation of drainage and utilities, final grading, installation of aggregate base, installation of curb and gutter, paving, landscaping, installation of lighting and security, and installation of signage and striping.

Construction activities associated with pedestrian overpasses and underpasses include clearing and grubbing, rough grading, installation of utilities, installation of cast-in-drilled-hole piles, installation of ramp footings, placing column reinforcing steel, pouring structural concrete for columns, placing falsework for ramps and abutments, pouring structural concrete for ramps and abutments, placing reinforcing steel and pouring structural concrete for decks, placing handrails for ramps, erecting steel superstructure, and installation of lighting.

To minimize the creation of new sources of light and glare, all artificial outdoor lighting would be limited to safety and security requirements, designed using Illuminating Engineering Society's design guidelines, and in compliance with International Dark-Sky Association approved fixtures. All lighting would be designed to have minimum impact on the surrounding environment; and would use downcast, cut-off–type fixtures that direct the light only towards objects requiring illumination. Shielding would be used, where needed, to ensure light pollution is minimized. Therefore, lights would be installed at the lowest allowable height and cast low-angle illumination, while minimizing incidental light spill onto adjacent properties, open spaces, or backscatter into the nighttime sky. The lowest allowable illuminance level would be used for all lighted areas, and the amount of nighttime lights needed to light an area would be minimized to the highest degree possible. Light fixtures would have non-glare finishes that would not cause reflective daytime

glare. Lighting would be designed for energy efficiency and have daylight sensors or be timed with an on/off program. Parking lot lighting would be designed to meet safety requirements, but would use locational motion-activated sensing to use regular-intensity lighting while a person is near a row of vehicles, then relays to lower-intensity lighting after a period of inactive movement, when there are no persons near the vehicles. Lights would provide good color rendering with natural light qualities with the minimum intensity feasible for security, safety, and personnel access. Lighting, including light color rendering and fixture types, would be designed to be aesthetically pleasing.

Station construction could conflict with existing utility lines, and these lines would be relocated or protected in place. Table 2-2 depicts the potential utility conflicts associated with proposed stations, and whether the utility would be protected or relocated.

Table 2-2~~1~~. Potential Utility Conflicts: Stations ~~Track Improvements~~

Station	Approx. Station	Relocate or Protect?
Lodi Station		
Parallel Utility in Conflict		
Joint – Overhead	522+50 to 524+80	Protect
Perpendicular Utility in Conflict		
PG&E – GAS Transmission Underground	Tunnel Access	Relocate
Lodi Station South Alternative		
Parallel Utility in Conflict		
Joint – Overhead	522+50 to 524+80	Protect
Perpendicular Utility in Conflict		
PG&E – GAS Transmission Underground	Tunnel Access	Relocate
~~**North Elk Grove Station**~~		
~~***Parallel Utility in Conflict***~~		
~~PG&E – Electric Transmission Overhead~~	~~Along Access Roadway~~	~~Protect~~
~~***Perpendicular Utility in Conflict***~~		
~~None~~		
City College Station		
Parallel Utility in Conflict		
PG&E – Electric Overhead	2185+50	Protect
Perpendicular Utility in Conflict		
PG&E – Electric Overhead	2185+50	Protect
Midtown Sacramento Station		
Parallel Utility in Conflict		
Sprint – Fiber Optic	2300+00 to 2372+00	Protect
PG&E – Electric Transmission Overhead	2300+00 to 2320+20	Protect
Perpendicular Utility in Conflict		
Joint – Overhead	2306+00	Protect
PG&E – Electric Transmission Overhead	2308+50	Protect
PG&E – Electric Overhead	2314+20	Protect
PG&E – Electric	2316+25	Protect
Joint – Overhead	2318+50	Protect

Table 2-21. Potential Utility Conflicts: Stations ~~Track Improvements~~

Station	Approx. Station	Relocate or Protect?
PG&E – Electric	2320+50	Protect
PG&E – Electric	2324+70	Protect
Joint – Overhead	2326+90	Protect
PG&E – Electric	2329+00	Protect
Joint – Overhead	2331+30	Protect
PG&E – Electric	2333+30	Protect
Joint – Overhead	2335+50	Protect
PG&E – Electric	2337+50	Protect
City of Sacramento – Storm Drain	2342+10	Protect
Joint – Overhead	2344+20	Protect
PG&E – Electric	2346+00	Protect
Joint – Overhead	2348+40	Protect
PG&E – Electric	2350+20	Protect
Joint – Overhead	2352+50	Protect
City of Sacramento – Storm Drain	2354+55	Protect
Joint – Overhead	2356+60	Protect
PG&E – Electric	2358+50	Protect
Joint – Overhead	2361+00	Protect
Joint – Overhead	2365+00	Protect
City of Sacramento – Storm Drain	2367+25	Protect
AT&T Telephone	2367+30	Protect
PG&E – Electric	2367+35	Protect
Joint – Overhead	2369+30	Protect
Joint – Overhead	2371+00	Protect
Old North Sacramento Station		
Parallel Utility in Conflict		
Electric Overhead	At Parking Access	Protect
Electric Overhead	At bus parking area	Relocate
AT&T Telephone	At Parking Access	Protect
Electric Overhead	NE parking lot	Relocate
Gas	NW parking lot	Protect
Perpendicular Utility in Conflict		
None		
Natomas/Sacramento Airport Station		
Parallel Utility in Conflict		
Sprint – Fiber Optic	2717+60 to 2728+00	Protect
Perpendicular Utility in Conflict		
Rio Linda Elverta Community Water District	2728+00	Protect
Rio Linda Elverta Community Water District	2729+00	Protect
Joint – Overhead	2729+20	Protect

2.2.4.3 Bridges, Underpasses, and Overpasses

Track work would also involve the construction of track-supporting structures, such as new bridges (track over waterway) and modifications to existing at-grade crossings.

Bridges over Waterways

~~At the proposed Laguna Creek crossing, construction access to the southern end of the proposed bridge would be through the SRCSD yard to the southwestern corner of the existing structure, or along the graded track bed of the planned second track on the eastern side of the existing track (see Figure 2-9). Construction access to the northern end of the new structure would be through the maintenance access roads in the SRCSD Bufferlands to the new graded track bed of the planned second track on the eastern side of the existing track. The existing bridge across Laguna Creek is a ballasted deck timber trestle composed of fourteen 14-foot to 15-foot simple spans supported by driven pile bents, for a total length of approximately 100 feet. The proposed bridge would also be supported by driven piling, but may use more efficient UPRR/BNSF Standard Plan precast/prestressed concrete double-cell box girders to increase the span length and reduce the number of foundation elements in the channel. If a temporary low-water crossing is not permittable, the bridge could be constructed from the ends to limit the potential impacts to sensitive resources.~~

~~At the proposed Union House Creek crossing, the existing bridge is a ballasted deck, continuous steel beam trestle composed of five 30-foot-long spans bearing on steel bent caps supported by driven steel H-pile bents, for a total length of approximately 150 feet (see Figure 2-3C and Figure 2-3D). Construction access to the southern end of the proposed bridge would be through area cleared and graded for the planned station parking area that passes under the eastern end of the SacRT and Cosumnes River Boulevard Morrison Creek Overhead structures. Access to the northern end of the new structure would be along the graded track bed of the planned second track on the eastern side of the existing track. The proposed bridge would match the span arrangement of the existing bridge to minimize impacts to the conveyance capacity of the channel. It would also be supported by driven piling, but may use more efficient UPRR/BNSF Standard Plan precast/prestressed concrete double-cell box girders. If a temporary low-water crossing is not permittable, the proposed bridge could be constructed from the ends to limit the potential impacts to sensitive resources.~~

The proposed bridge at the Arcade Creek crossing would match the existing span arrangement and hydraulic waterway opening characteristics of the existing bridge, which is a ballasted deck trestle composed of three 30-foot spans with a total length of approximately 90 feet (see Figure 2-8~~9~~). Construction access to the southern end of the proposed bridge would be through existing levee maintenance roads and along the graded track bed of the proposed second track on the eastern side of the existing track. The proposed bridge would also be supported by driven piling, and will use the current UPRR/BNSF Standard Plan precast/prestressed concrete double-cell box girders. If a temporary low-water crossing is not permittable, the structure could be constructed from the ends to limit the potential impacts to sensitive resources.

Abutment and pier foundations are typically accessed by temporary dirt roads, with the construction equipment working in the disturbed areas of the new track bed, station parking areas, and levee modifications. Pile foundations in waterways may be accessed from the ground by

1:1,200
1 inch = 100 feet

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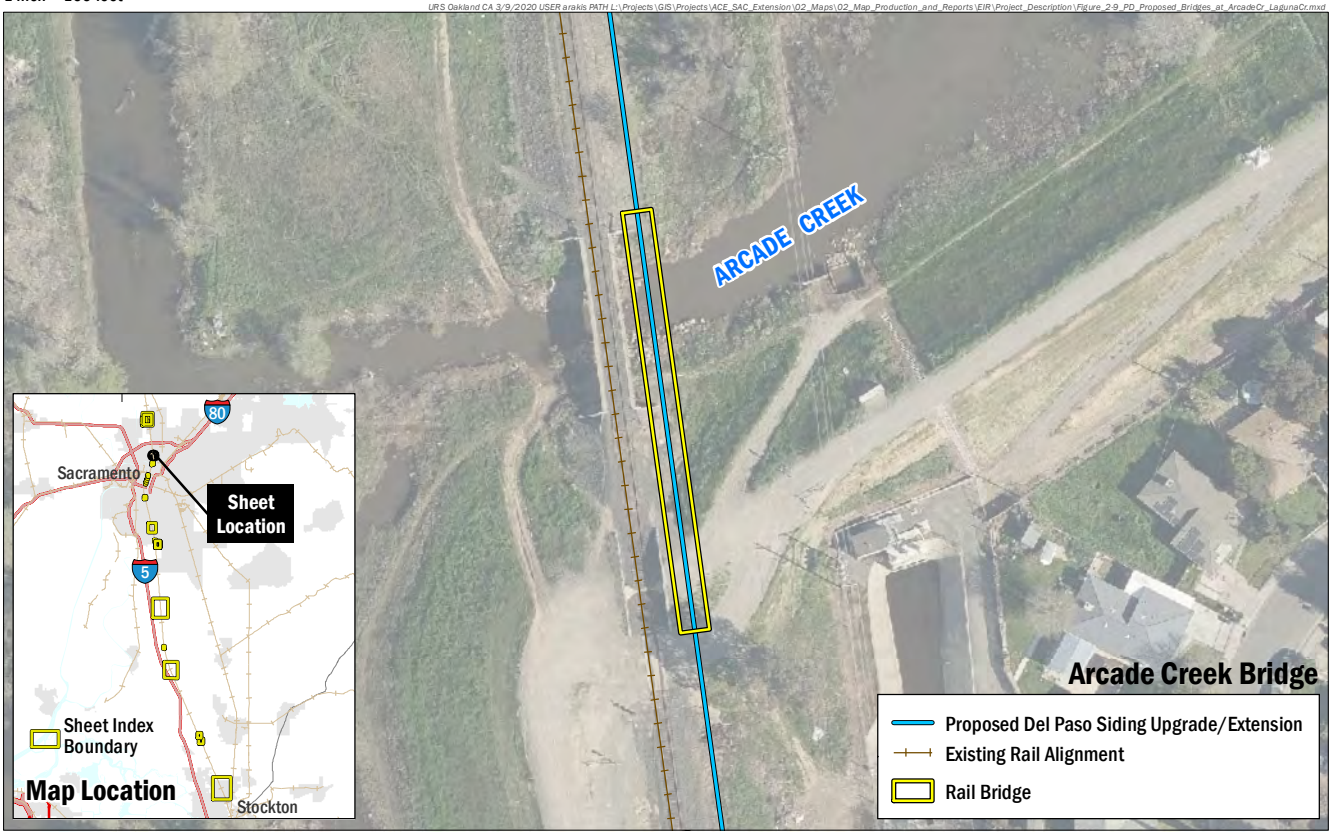

N

0 100
Feet

Sources: Roads, Hydrology, Counties: ESRI, 2016; Rail alignment: AECOM, 2019.

AECOM

San Joaquin Regional Rail Commission

FIGURE 2-~~8~~9

Proposed Bridges at Arcade Creek ~~and Laguna Creek~~

Note: The North Elk Grove Station, including all access and siding variants, is no longer under consideration as part of the proposed project. Therefore, a new railroad bridge across Laguna Creek is no longer under consideration.

pushing clean fill into the waterway on top of temporary pipe culverts, or narrowing or diverting the waterway, then restoring to the original condition when done.

A typical construction sequence for the bridges (track over water) would include the following:

- Install temporary culvert crossing in the waterway if permittable.
- Excavate abutment areas.
- Layout and install piling, bent caps, and abutments.
- Erect girders and bridge deck.
- Complete any channel work and construct approaches in preparation for track work.

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 up, 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 a railroad bridge crossing the river could last approximately 8 to 12 months, depending on the access and in-water work windows.

Modifications to At-Grade Crossings

Modifications to existing at-grade crossings would include installation of concrete panels over the new tracks across the roadway, replacement of the railroad signal guards and gates, and pavement marking on the side with the new track. Modifications would also include updating the profile of the road to match the new track crossing. 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. The following existing at-grade crossings would be modified as part of the proposed project:

- West Harney Lane
- Devries Road
- West Kingdon Road
- SR 12
- W. Sargent Road
- North New Hope Road

- Point Pleasant Road
- Private Road approximately 0.6 mile south of Core Road
- Core Road
- Simms Road
- Fruitridge Road
- 26th Avenue
- S Street
- Q Street
- P Street
- West El Camino
- West Elkhorn ~~Elk Horn~~ Boulevard.

2.2.4.4 Construction Schedule and Durations

SJRRC proposes to implement the ACE service extension to Natomas no later than 2023. Table 2-3 identifies the duration for construction of each improvement. The construction durations presented are not sequential; construction could occur simultaneously at several locations. The durations noted below are for actual construction activity. Improvements would require permitting, contractor selection, and final design prior to construction; therefore, the total duration could be longer than the construction durations noted in the table.

Table 2-3. Construction Durations for Proposed Improvements

Proposed Improvement	Construction Duration (Months)
Stations	
Lodi Station	14
Lodi Station South Alternative	14
~~North Elk Grove Station (all variants)~~	~~14~~
City College Station	8
Midtown Sacramento Station	12
Old North Sacramento Station	14
Natomas/Sacramento Airport Station	12
Track Improvements	
Track Curve Reconstruction Between East March Lane and East Swain Road	1
Hammer Lane Siding Upgrade	2
Lodi Siding (both variants)	8
Thornton Side Upgrade/Extension	4
Track Curve Reconstruction North of North New Hope Road	1
Track Curve Reconstruction South of Desmond Road	1
Phillips Siding Upgrade/Extension	2
~~North Elk Grove Siding (both variants)~~	~~8~~
Track Curve Reconstruction North ~~of the North~~ Elk Grove ~~Station~~	1
Pollock Siding Upgrade	2
South Sacramento Siding Upgrade	4
Crossover Track South of City College Station	2
Del Paso Siding Upgrade/Extension	12

2.2.5 Right-of-Way and Easement Needs

Table 2-4 lists the parcels outside the UPRR ROW that would be affected by project improvements. These parcels may be acquired, or require easements for roadway improvements and station.

Table 2-4. Right of Way Requirements

Accessor's Parcel Number (APN)	Ownership	Area (Acres)	Reason for Acquisition
Lodi Station			
05517026	Private	10.38	Station Parking
Lodi Station South Alternative			
05524028	Private	500 (Sq. Ft.)	Pedestrian Access and PG&E Easement
05524026	Private	9.86	Station Parking
~~North Elk Grove Station (including all access and platform all variants)~~			
~~119-0080-036~~	~~Public~~	~~484 (Sq. Ft.)~~	~~Station Parking~~
~~119-0080-037~~	~~Public~~	~~7.96~~	~~Station Parking~~
~~119-0080-040~~	~~Public~~	~~4.35~~	~~Station Parking~~
~~119-0080-027~~	~~Public~~	~~0.31~~	~~Station Parking~~
~~119-0080-046~~	~~Public~~	~~0.54~~	~~Station Parking~~
~~119-0080-043~~	~~Public~~	~~1.67~~	~~Station Parking~~
~~119-0080-044~~	~~Public~~	~~0.76~~	~~Access Road A1~~
~~119-0080-047~~	~~Public~~	~~0.18~~	~~Access Road A1~~
~~119-0080-045~~	~~Public~~	~~2.41~~	~~Access Road A2~~
~~119-0080-048~~	~~Public~~	~~0.88~~	~~Access Road A2~~
~~119-0080-047~~	~~Public~~	~~0.44~~	~~Access Road A2~~
~~119-0080-042~~	~~Public~~	~~5.79~~	~~Access Road A2~~
Old North Sacramento Station			
275-0111-006	Private	5.82	Station Parking
Natomas/Sacramento Airport Station			
214-0010-013	Public	0.25	Station Layover
214-0290-001	Private	1.74	Station Parking
214-0290-002	Private	2.14	Station Parking
214-0290-003	Private	0.24	Station Layover
214-0290-034	Private	0.17	Station Layover
214-0290-037	Private	0.80	Station Layover
214-0290-038	Private	0.17	Station Layover

2.2.6 Costs and Revenues

2.2.6.1 Capital Costs

As shown in Table 2-5, capital costs associated with the proposed project would be between million depending on the selected station at Lodi ~~and North Elk Grove~~. Capital costs are presented in more detail in Appendix F, *Sacramento Extension Capital Cost Basis Report.*

Table 2-5. 2020 Construction Cost Estimates (In Thousands of $)

Improvement	Construction Cost
Lodi Station	$30,702
Lodi Station South Alternative *	$32,152
~~North Elk Grove Station Platform Variant 1~~	~~$33,163~~
~~North Elk Grove Station Platform Variant 2 *~~	~~$34,104~~
~~North Elk Grove Station Access Variant 1~~	~~$5,549~~
~~North Elk Grove Station Access Variant 2 *~~	~~$9,836~~
City College Station	$17,747
Midtown Sacramento Station	$25,735
Old North Sacramento Station	$31,215
Natomas/Sacramento Airport Station	$32,942
Curve Correction Between East March Lane and East Swain Road	$283
Hammer Lane Siding Upgrade	$8,899
Lodi Siding Variants	$26,862
Thornton Siding Upgrade/Extension	$13,258
Curve Correction North of North New Hope Road	$329
Curve Correction South of Desmond Road	$344
Phillips Siding Upgrade/Extension	$12,601
~~Elk Grove Siding Variant 1~~	~~$17,729~~
~~Elk Grove Siding Variant 2 *~~	~~$19,989~~
Curve Correction North of Elk Grove ~~Station~~	$301
Pollock Siding Upgrade	$5,301
South Sacramento Siding Upgrade	$13,489
Crossover Track South of City College Station	$3,136
Del Paso Siding Upgrade/Extension	$39,741
Total	**$262,885** **~~319,325~~**

* Omitted from the Total

2.2.6.2 Operations and Maintenance Costs and Revenues

Table 2-6 provides a summary of existing and projected operations and maintenance (O&M) costs associated with increased ACE and San Joaquins services included in the proposed project.

Table 2-6. Summary of Annual Projected Operations & Maintenance (O&M) Cost and Fare Revenue ($-million)

Service	Existing O&M (2017)	Projected O&M (2020)	Projected Fare Revenue (2020)
ACE	$21.6	$32.5	$12.5
San Joaquins	$86.0	$110	$47.0

Source: AECOM, 2018.

2.3 Permits and Approvals

Table 2-7 lists the permits and approvals that could be required for the proposed project. SJRRC will continue to coordinate with all local, regional, and state agencies to ensure that all necessary permits and approvals are received to support the schedule for the proposed project.

Table 2-7. Permits, Funding, and Other Approvals Anticipated

Agency	Funding, Approval, or Permit
Federal Agencies	
Federal Railroad Administration (FRA)	Potential National Environmental Policy Act (NEPA) review and approval if federal funding is available for the project.
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.
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. 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.
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; potential source of funding.
California Public Utilities Commission (CPUC)	Approvals required for rail crossing improvements.
Central Valley Flood Protection Board (CVFPB)	Encroachment permit for encroachment on CVFPB floodways and levees.
Regional Water Quality Control Board (Regional Water Board)—Central Valley	Permits 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.
State Water Resources Control Board (State Water Board)	General construction activity stormwater permit under Section 402 National Pollutant Discharge Elimination System (NPDES).
Regional Agencies and Transportation Agencies	
San Joaquin Regional Rail Commission and San Joaquin Joint Powers Authority	Certification of CEQA environmental document; project proponent; project funding.
San Joaquin Council of Governments	Funding coordination.
Sacramento Area Council of Governments	Funding coordination.
Local Agencies	
San Joaquin County	Encroachment permit for construction in county ROW. Use and building permits for improvements outside rail ROW.
Sacramento County	Encroachment permit for construction in county ROW. Use and building permits for improvements outside rail ROW.
City of Elk Grove	Encroachment permit for construction in city ROW. Use and building permits for improvements outside rail ROW
City of Sacramento	Encroachment permit for construction in city ROW. Use and building permits for improvements outside rail ROW.
Other Parties	
Pacific Gas and Electric Company (PG&E)	Approval required for utilities relocation.
Union Pacific Railroad (UPRR)	Project approval; right-of-entry permit(s) for work conducted in UPRR ROW; design and installation permits/construction maintenance agreements for structures and facilities.

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3.0 Environmental Impact Analysis

3.0.1 Introduction

This chapter provides a discussion of the regulatory setting, environmental setting, and impact analyses (including mitigation measures for potentially significant impacts), associated with construction, operation, and maintenance of the Valley Rail Sacramento Extension Project (proposed project).

This analysis is based on the 15 percent preliminary engineering plans contained in Appendix G, *Valley Rail Sacramento Extension 15% Preliminary Engineering Plan Set* and uses a "reasonable worst-case" approach to analyzing potential impacts (i.e., the greatest level of potential impact).

The following abbreviations are used throughout this chapter to designate specific environmental resources:

- AE = Aesthetics
- AG = Agriculture and Forestry
- AQ = Air Quality
- BIO = Biological Resources
- CUL = Cultural Resources
- ENG = Energy
- GEO = Geology and Soils
- GHG = Greenhouse Gas Emissions
- HAZ = Hazards and Hazardous Materials
- HYD = Hydrology and Water Quality
- LU = Land Use and Planning
- NOI = Noise and Vibration
- PH = Population and Housing
- PS = Public Services
- REC = Recreation
- TRA = Transportation
- TRI = Tribal Cultural Resources
- UT = Utilities and Service Systems

3.0.2 Chapter Organization

This chapter is organized into the following environmental resource sections:

- 3.1, *Aesthetics*
- 3.2, *Agriculture and Forestry*
- 3.3, *Air Quality*
- 3.4, *Biological Resources*
- 3.5, *Cultural Resources*
- 3.6, *Energy*
- 3.7, *Geology and Soils*
- 3.8, *Greenhouse Gas Emissions*
- 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, *Population and Housing*
- 3.14, *Public Services*
- 3.15, *Recreation*
- 3.16, *Transportation*
- 3.17, *Tribal Cultural Resources*
- 3.18, *Utilities and Service Systems*

Each environmental resource section in this chapter includes the information listed below.

- **Introduction**—Presents an overview of the environmental resource and cross-references related issues addressed elsewhere in the EIR.
- **Regulatory Setting**—Identifies the federal, state, regional, and local laws, regulations, ordinances, and policies that are relevant to each environmental resource area and applicable to construction, operation, and maintenance of the proposed project. Appendix I, *Regional Plans and Local General Plans,* provides a list of applicable goals, policies, and objectives from regional and local plans of the jurisdictions along the project corridor.
- **Environmental Setting**—Provides an overview of the existing physical conditions of an environmental resource in the project area at the time of, or prior to, publication of the Notice of Preparation that could be affected by implementation of the proposed project.

As applicable, a specific study area is identified for each environmental resource because the extent of the study area may vary by resource. The study area is defined as the limits where impacts could be expected to occur. The environmental setting provides the basis of analysis of potential impacts related to each environmental resource.

- **Impact Analysis**—Describes the methodology used for the analysis, identifies the criteria used to determine the significance of potential impacts, and provides a corresponding discussion of impacts associated with implementation of proposed improvements. For each potential impact, a significance determination is made (i.e., no impact, less than significant, less than significant with mitigation, or significant and unavoidable). If required, feasible mitigation measures are identified to reduce significant impacts.

A discussion of the proposed project's potential contribution to cumulative impacts is discussed separately in Chapter 4, *Other CEQA-Required Analysis*.

3.0.3 Approach to Impact Analysis

3.0.3.1 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 San Joaquin Regional Rail Commission uses significance criteria that are based on CEQA Guidelines Appendix G; factual and scientific information and data; and the regulatory standards of the federal, state, regional, and local jurisdictions (as applicable) where the ~~proposed~~ project improvements are proposed.

3.0.3.2 Impact Identification and Levels of Significance

Each environmental resource section identifies impacts and lists them sequentially. For example, CUL-1 denotes the presentation of the first impact in the cultural resources section. An impact statement precedes the discussion of each impact and provides a summary of the impact topic.

The level of significance associated with an impact is determined by comparing the environmental effects of constructing, operating, and maintaining the proposed project to existing environmental conditions and applying the identified significance threshold.

This EIR uses a variety of terms to describe the levels of significance for the impacts identified in the environmental analysis. Each impact is categorized as one of the following:

- **No impact**—Project implementation would not cause any adverse change in the environment.
- **Less than Significant Impact**—A project impact is considered less than significant when it does not reach the applicable standard of significance and would therefore cause no substantial change in the environment (no mitigation required).

- **Less than significant with mitigation**—Project implementation would cause a substantial adverse change in the physical conditions of the environment that would be in excess of the specified standard of significance; however, one or more of the feasible mitigation measures would reduce environmental effects to levels that would be below the specified standard of significance.
- **Potentially Significant Impact**—A potentially significant impact is an environmental effect that may cause a substantial adverse change in the environment; however, additional information is needed regarding the extent of the impact to make the determination of significance. For CEQA purposes, a potentially significant impact is treated as if it were a significant impact.
- **Significant Impact**—A project impact is considered significant if it results in a substantial adverse change in the physical conditions of the environment. Significant impacts are identified by the evaluation of project effects in the context of specified significance criteria. Mitigation measures and/or project alternatives are identified to reduce these effects to the environment where feasible.
- **Significant and Unavoidable Impact**—A project impact is considered significant and unavoidable if it would result in a substantial adverse change in the environment that cannot be feasibly avoided or mitigated to a less than significant level if the project is implemented. A Statement of Overriding Considerations must be adopted if the project is approved and significant impacts cannot be mitigated to less than significant levels.

3.0.3.3 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 designed to reduce, minimize, or avoid potential environmental impacts associated with construction, operations, and maintenance of the proposed project. The mitigation measures are numbered to correspond to the impacts they address. For example, Mitigation Measure CUL-2.1 refers to the first mitigation measure for Impact CUL-2 in the cultural resources section. As applicable, the description of the mitigation measure identifies which specific project improvement or activities the mitigation measure applies to.

3.0.4 Topics Considered but Dismissed from Further Analysis

Although forestry resources, mineral resources, and wildfire are identified in Appendix G of the CEQA Guidelines, this EIR does not include these topics as described below.

3.0.4.1 Forestry Resources

The project area is not zoned as forestland, timberland, or a Timberland Production Zone and does not contain 10 percent native tree cover that would be classified as forestland under Public

Resources Code Section 12220(g).[1] Therefore, the proposed project would not conflict with existing zoning for, or cause rezoning of, forestry resources or result in conversion of forest land to non-forest use, and analysis of these resources is not discussed further.

3.0.4.2 Mineral Resources

A review of the California Department of Conservation's Mineral Land Classification Maps for San Joaquin and Sacramento counties determined that no significant mineral deposits are present in the project area. Therefore, the proposed project would not result in the loss of availability of a known mineral resources, and analysis of these resources is not discussed further.

3.0.4.3 Wildfire

None of the proposed project improvements would be in or near state responsibility areas or lands classified as very high fire hazard severity zones. Therefore, this subject is not discussed further.

[1] Section 12220(g) defines forest land as land that can support 10 percent native tree cover of any species—including riparian woodland and hardwoods—under natural conditions and that allows for management of timber, aesthetics, fish and wildlife, biodiversity, water quality, recreation, and other public benefits.

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3.1 Aesthetics

3.1.1 Introduction

This section describes the regulatory setting and environmental setting for aesthetic resources in the vicinity of the Valley Rail Sacramento Extension Project (proposed project). It also describes the impacts on aesthetic resources that would result from implementation of the proposed project and mitigation measures that would reduce significant impacts, where feasible. Cumulative impacts from hazardous materials, in combination with planned, approved, and reasonably foreseeable projects, are discussed in Chapter 4, *Other CEQA-Required Analysis*.

During the public scoping comment period, the following comment relevant to aesthetic resources was received:

- Light pollution from nighttime lighting at the proposed Midtown Sacramento Station, Natomas/Sacramento Airport Station is a concern.

This section addresses these concerns. The comments received during the scoping period are included in Appendix A, *NOP and Scoping Summary Report.*

3.1.2 Regulatory Setting

This section summarizes federal, state, regional, and local regulations related to aesthetic resources and applicable to the proposed project.

3.1.2.1 Federal

Wild and Scenic Rivers

The National Wild and Scenic Rivers Act of 1968 was enacted to preserve selected rivers or sections of rivers in their free-flowing condition, to protect the quality of the river waters, and to fulfill other national conservation purposes. Approximately 23 miles of the American River, from the confluence with the Sacramento River to Nimbus Dam, are designated as a National Wild and Scenic River (National Wild and Scenic Rivers System 2019). The river is designated as "recreational" rather than "wild" or "scenic" because of the degree of modification of its shoreline from natural conditions and the level of public accessibility. Generally, projects would not conflict with the Wild and Scenic River designation if they would not adversely affect the resources for which the river was designated or adversely affect the river's "free-flowing" status.

National Recreation Trail

The American River Parkway is a river corridor/open space greenbelt that extends along the American River from the confluence with the Sacramento River to Nimbus Dam. The parkway's trail system, which has been designated a "National Recreation Trail," includes the 32-mile-long multiuse (pedestrian, equestrian, and bicycle) Jedediah Smith Memorial Trail, which parallels the American River from Folsom to downtown Sacramento.

Federal Scenic Byways

There are no federally-designated scenic byways in the vicinity of the proposed project (FHA 2019).

3.1.2.2 State

Wild and Scenic Rivers

The California Wild and Scenic Rivers Act (Act) (Public Resources Code, Section 5093.50 et seq.) was passed into law in 1972 to preserve designated rivers or river segments that are free-flowing and possess extraordinary scenic, recreational, fishery, or wildlife values. The Lower American River, from its confluence with the Sacramento River to the Nimbus Dam (a distance of approximately 23 miles), is a state-designated Wild and Scenic River. The river designation is "recreational" (Water Education Foundation 2019). As stated above, the river is designated as "recreational' rather than "wild" or "scenic" because of the degree of modification of its shoreline from natural conditions and the level of public accessibility. Generally, projects would not conflict with the Wild and Scenic River designation if they would not adversely affect the resources for which the river was designated or adversely affect the river's "free-flowing" status.

State Scenic Highways

There are no state-designated scenic highways in the vicinity of the proposed project (Caltrans 2017).

3.1.2.3 Regional and Local

The San Joaquin Joint Powers Authority (SJJPA), a state joint powers agency, and the San Joaquin Regional Rail Commission (SJRRC) propose improvements within and outside of the Union Pacific Railroad (UPRR) right-of-way (ROW). The Interstate Commerce Commission Termination Act (ICCTA) affords railroads engaged in interstate commerce considerable flexibility in making necessary improvements and modifications to rail infrastructure, subject to the requirements of the Surface Transportation Board.[1] ICCTA broadly preempts state and local regulation of railroads, and this preemption extends to the construction and operation of rail lines. Therefore, activities in existing UPRR ROW are exempt from local building and zoning codes and other land use ordinances. Project improvements proposed outside of the UPRR ROW, however, would be subject to regional and local plans and regulations. Although ICCTA does broadly preempt state and local regulation of railroads, SJJPA and SJRRC intend to obtain local agency permits for construction of facilities that fall outside of the UPRR ROW, even though SJRRC has not determined that such permits are legally necessary, and such permits may not be required.

Appendix E, *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 project improvements are proposed. 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

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

preparation of this analysis, and reviewed to assess whether the proposed project would be consistent with the plans of relevant jurisdictions.[2] The proposed project would be generally consistent with the applicable goals, policies, and objectives related to aesthetics identified in Appendix E.

There are no Sacramento County-designated scenic routes from which the proposed improvements would be visible (Sacramento County 2017a). In San Joaquin County, Interstate 5 (I-5) is a locally designated scenic roadway from downtown Stockton north to the Sacramento County line (San Joaquin County 2016). Proposed improvements associated with the Thornton Siding Upgrade/Extension would be approximately 0.5 mile east of I-5 (at the closest point).

The Walter S. Ueda Parkway consists of approximately 12.5 miles of paved recreation trails that are mostly on the crown of existing levees along the Natomas East Main Drainage Canal (NEMDC)/Steelhead Creek, and along the levees of Arcade, Dry, and Robla (Rio Linda) creeks. The Parkway also includes approximately 3.5 miles of nonpaved trail in the Hansen Ranch area. The trail network links the American River Parkway and the Dry Creek Parkway. The northern trailhead for the Parkway is immediately adjacent to and south of West Elkhorn Boulevard, on the east side of the NEMDC/Steelhead Creek levee. From this point, the Parkway runs south along the Wolf Ranch Wildlife Sanctuary and continues south along the NEMDC/Steelhead Creek east levee to the intersection with the Parkway. The trail also runs eastward along the levee crowns of Arcade, Dry, and Robla (Rio Linda) creeks (in the vicinity of the proposed Del Paso Siding Upgrade/Extension).

3.1.3 Environmental Setting

Aesthetic resources consist of the objects (artificial and natural, moving and stationary) and features (e.g., landforms and water bodies) that are visible on a landscape. These resources add to or detract from the scenic quality of the landscape (i.e., the visual appeal of the landscape). A visual impact results from the creation of an intrusion or perceptible contrast that affects the scenic quality of a viewshed. A visual impact can be perceived by an individual or group as either positive or negative, depending on a variety of factors or conditions (e.g., type of viewer, sensitivity to visual change, distance from the visual change, or seasonal conditions).

Visual character is a description of the landscape components and is defined by the relationships between the existing visible natural and built landscape features. These relationships are considered in terms of dominance, scale, diversity, and continuity. Visual character-defining resources and features include landforms, vegetation, buildings, transportation facilities, open space, water bodies, geologic features, historic structures, downtown skylines, and apparent upkeep and maintenance of property.

Viewer groups within the study area represent such people as motorists and rail commuters, residents, business employees, recreationists, and agricultural and industrial workers. Sensitivity to visual change varies among viewer types. Sensitivity to views and the degree of project visibility or visual exposure affect the viewer response. Generally, as a viewer group, residents and recreationists are highly sensitive viewers. Viewers are defined by their relationship to the study

[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.

area, their visual preferences, and their sensitivity to changes associated with the proposed project improvements. Visual preferences, or what viewers like and dislike about the study area's visual character, define the study area's *visual quality*. Visual quality serves as the baseline for determining the degree of visual impacts and whether a project's visual impacts would be adverse, beneficial, or neutral.

Visual quality is an assessment of the composition of the character-defining features of the landscape. Visual quality is determined by evaluating the viewshed characteristics in terms of vividness, intactness, and unity (which are defined below). Visual quality is rated as low, moderate, or high. The following three factors determine visual quality:

- Vividness is the degree of drama, memorability, or distinctiveness of the landscape components as seen in a particular view.
- Intactness is a measure of the visual integrity of the natural and human-built landscape and its freedom from encroaching elements.
- Unity is the landscape's degree of visual coherence and compositional harmony considered as a whole.

Photographic exhibits showing the regional and local landscape character at various locations where project improvements are proposed (i.e., key observations points [KOPs]) are provided below. These photographs are representative of the types of visual resources that are present in each study area segment. They have also been selected based on viewer groups, which are primarily residents, recreationists, and motorists. Brief descriptions of the foreground, middle ground, and background characteristics of each KOP are presented.

3.1.3.1 Stockton to Lodi

Existing Visual Character and Quality in the Study Area

The Stockton to Lodi segment is located within the flat alluvial plain of the northern San Joaquin Valley, east of the San Joaquin River. The north Stockton project area is heavily developed and urbanized, with mostly single-story residential, commercial, office, and industrial uses on both sides of the existing UPRR tracks. The area around the proposed track curve reconstruction between East March Lane and East Swain Road consists of a three-story assisted-living residential-care center, commercial shopping and a storage facility, and one-story residential housing on both sides of the existing UPRR tracks. The alignment crosses over the Mokelumne Aqueduct (located underground), which consists of an approximately 100-foot-wide, flat, linear, open space easement covered with perennial grasses, adjacent to the back sides of residences, commercial uses, and a variety of residential fencing. Overhead power lines and trash are present. There is a low degree of vividness, intactness, and unity, and therefore the visual quality is considered low. The viewer sensitivity is considered low.

The area around the proposed Hammer Lane Siding Upgrade is primarily surrounded by high-density residential development. The alignment traverses Mosher Slough and ends just south of Bear Creek. Mosher Slough consists of a leveed canal approximately 50 feet wide that runs along the back sides of adjacent one- and two-story urban housing. The canal is shallow, does not include any trees or trails, and is not publicly accessible. The flat linear canal, which has weedy

vegetation and perennial grasses on the sides, is surrounded by residential yard fencing consisting of a variety of materials. There is a low degree of vividness, intactness, and unity, and therefore the visual quality is considered low. The viewer sensitivity is considered low.

The area around Bear Creek in the immediate project vicinity consists of flat, open, agricultural fields. Bear Creek is an approximately 80-foot-wide leveed channel running east-west. The sides of the channel are covered with perennial grasses, and there are no shrubs or trees. There are no water-related recreational activities associated with the Bear River in the project area. The Bear River Pedestrian/Bicycle Trail runs along the Bear River levee crown from Lower Sacramento Road (approximately 2,000 feet west of the UPRR tracks) approximately 8 miles to the west. On the west side of Lower Sacramento Road, the area around the Bear River is heavily developed with one-story residential uses. A large industrial processing facility is located approximately 500 feet to the north, between the end of the alignment and the Bear River. The viewshed is dominated by low-growing row crops and the large, white buildings associated with the industrial facility. There is a moderate degree of vividness, intactness, and unity, and therefore the visual quality is considered moderate. The viewer sensitivity is considered low.

West of Lodi, in the vicinity of the existing UPRR crossing over State Route (SR) 12 (West Kettleman Lane), the project area consists of flat, agricultural cropland with scattered rural residences and agricultural buildings. The area is traversed by a variety of local, narrow, two-lane roadways. Overhead electrical lines are present along roadways and near buildings. The foothills of the Coast Ranges are intermittently visible in the background to the west. KOP 1 shows the visual character of the location of the proposed Lodi Station, south of SR 12 and west of Devries Road. The viewshed of the proposed Lodi Station is dominated by the coarse texture, linear nature, and green (in the summer, brown in the winter) colors of the agricultural cropland and the adjacent landscape trees. Single-family one-story residences associated with the West 13 Ranch are present on the west side of the proposed Lodi Station. This location exhibits a high degree of vividness, intactness, and unity, and therefore the visual quality is considered high.

KOP 2 shows the visual character of the location of the proposed Lodi Station South Alternative, north of West Harney Lane and east of Devries Road. The viewshed of the proposed Lodi Station South Alternative is dominated by the large, angular, block-style, white agricultural buildings and processing facilities immediately adjacent to the west side of the UPRR tracks. Single-family residences are present on the west side of the agricultural buildings at the proposed Lodi Station South Alternative. There is a moderate degree of vividness, intactness, and unity, and therefore the visual quality is considered moderate. The viewer sensitivity is considered high.

The proposed Lodi Siding Variants extending northwestward from the proposed station would be constructed in agricultural land consisting of orchards and row crops, within the UPRR ROW adjacent to the existing UPRR tracks. Scattered rural residences, mostly one-story, are present throughout the area. The viewshed in this area is dominated by the coarse texture, linear nature, and green (in the summer, brown in the winter) colors of the agricultural crops. This area exhibits a high degree of vividness, intactness, and unity, and therefore the visual quality is considered high. The viewer sensitivity is also considered high.

Source: Google Maps 2018

Figure 3.1-1. KOP 1: View of the Proposed Lodi Station Site.

Looking southwest from SR 12, Lodi. Young orchard trees and the proposed Lodi Station site are visible in the foreground. The UPRR tracks and embankment, and landscape trees associated with the West 13 Ranch are visible in the middle ground. Orchard trees and mature trees associated with rural residences are visible in the background.

Source: Google Maps 2018

Figure 3.1-2. KOP 2: View of the Proposed Lodi Station South Alternative Site.

Looking north from West Harney Lane, Lodi. Agricultural crops (corn), the proposed Lodi Station South Alternative site, overhead electrical lines and wood power poles, and the UPRR tracks and embankment are visible in the foreground. White agricultural buildings and processing facilities, overhead power lines and power poles, the UPRR tracks and embankment, and corn crops are visible in the middle ground. Landscape trees and the roofs of agricultural buildings are visible in the background.

3.1.3.2 Lodi to Elk Grove

Existing Visual Character and Quality in the Study Area

The Thornton area consists of a cluster of primarily small, rural, one- and two-story residences set among a variety of agricultural operations. Most houses are screened from the UPRR tracks by large, mature landscape trees and smaller shrubs. A large industrial facility (Universal Forest Products, Inc.) with numerous tall, white, block-style buildings covers approximately 120 acres on the east side of the UPRR tracks in Thornton. Several small commercial businesses, generally surrounded by landscape trees, are scattered among the residential uses in town. Roadways consist of local, two-lane feeder roads with overhead utility lines and wood power poles. A variety of architectural styles and colors are present. The Thornton area typifies the viewshed of a small, rural agricultural community. This area exhibits a low degree of vividness and a moderate degree of intactness and unity, and therefore the visual quality is considered moderate. The viewer sensitivity is moderate to high.

Flat agricultural fields consisting of row crops and orchards surround the Thornton area and are present on both sides of the UPRR tracks in the northern half of the proposed Thornton Siding Upgrade/Extension area (see KOP 3). Rural residences (mostly one-story) and agricultural buildings and equipment are scattered throughout this area. Overhead utility lines and wood power poles are present along roadways. Mature landscape trees and shrubs generally surround each rural residence, along with lawn grass; they are green in spring and summer, exhibit a variety of colors in the fall, and are brown in winter. Tall, mature, deciduous trees along the Mokelumne River to the east, which provide color in the summer and fall, are visible in middle-ground views from Thornton Road and from nearby rural residences.

Source: Google Earth 2019

Figure 3.1-3. KOP 3: View of the Thornton Siding Upgrade/Extension Area.

Looking northeast from Thornton Road north of New Hope Road, Thornton. Overhead utility lines, white fencing and landscaping associated with a rural residence, grass, row crops (grapes), and metal fencing are visible in the foreground. The UPRR embankment and tracks in the Thornton Siding Upgrade/ Extension area are visible in the middle ground. Trees along the Mokelumne River are visible in the background.

The Lower Mokelumne River is approximately 615 feet east of the UPRR tracks in this area north of Thornton, at the closest point. The river is accessible by small boats, but views of the surrounding landscape from the river are limited by the tall mature trees and shrubs that line both banks. Occasional glimpses of agricultural fields in the foreground with the UPRR embankment in the middle ground are visible to boaters on the Lower Mokelumne River in the project vicinity. The tall, mounded forms of the mature trees throughout the area provide a pleasing visual contrast with the linear nature of the orchards and row crops. The colors of the landscape elements and the built environment tend to blend together and present a harmonious viewshed. This area is typical of the rural, agricultural nature of farming communities in the northern San Joaquin Valley, and despite the minor detraction of overhead power lines along roadways, exhibits a high degree of vividness, intactness, and unity. Therefore, the visual quality is considered high. The viewer sensitivity is also considered high.

The area of proposed track curve reconstruction south of Desmond Road is approximately 65 feet east of Franklin Road, immediately adjacent to and north of the northern end of the Cosumnes River Preserve. There are no residences or businesses in this area. This area is approximately 1 mile north of the Cosumnes River, and due to the intervening vegetation, it is not visible from the river. However, the Lost Slough Wetlands trail inside the Cosumnes River Preserve travels northward next to the UPRR tracks before turning west and crossing over Franklin Boulevard just south of the proposed track curve reconstruction. The viewshed consists of high quality managed wetland habitat, flat agricultural land and scattered trees and shrubs, and large areas of water are present in the winter and spring. Wetland and oak tree habitats dominate the viewshed. The preserve is home to more than 250 bird species, including Sandhill cranes, more than 40 fish species, and more than 400 plant species. During winter months, large concentrations of migratory birds are present in the preserve. This area exhibits a high degree of vividness, intactness, and unity; therefore, the visual quality is considered high. The viewer sensitivity is also considered high.

The viewshed in the vicinity of the proposed Phillips Siding Upgrade/Extension is similar to the area described above, north of Thornton, as it consists of flat agricultural fields (row crops and orchards) interspersed with one- and two-story rural residences and agricultural buildings and machinery. Scattered landscape trees and shrubs are present around the rural residences. Overhead power lines and wood power poles are present along local roadways. Numerous drainage canals and ditches traverse the area, but do not stand out in the landscape. Substantially fewer trees are present in this area as compared to the Thornton area. Franklin Road, the main roadway in the project vicinity, is a local two-lane road approximately 880 feet to the west. The viewshed in this area is typical of the rural, agricultural nature of the southern Sacramento Valley. This area exhibits a high degree of vividness, intactness, and unity; therefore, the visual quality is considered high. The viewer sensitivity is also considered high.

~~The proposed North Elk Grove Station (including all access and platform variants) is located in a planned industrial area northeast of the Sacramento Regional Wastewater Treatment Plant, on the north, east, and south sides of Cosumnes River Boulevard. The floodwalls and flood control channel of Unionhouse Creek abut the proposed parking area to the north. Medium-density, two-story residential housing with associated fencing and landscaping is present on the north side of the flood control channel. Views to the south from the backyards of residences along McNamara Way consist of the concrete sides of the in-ground flood control channel and barren land on either~~

~~side of it in the flood control ROW (approximately 10 acres of flat vacant land covered with annual and perennial grasses that are green in the spring and brown the rest of the year), and the back side of the tall, grey sound wall along Cosumnes River Boulevard. The Sacramento Regional Transit (SacRT) Franklin light rail transit (LRT) station and the associated 8-acre paved parking area with young landscape trees are prominent features in the viewshed from the at-grade portion of Cosumnes River Boulevard to the north. Views from the above-grade portion of Cosumnes River Boulevard looking east and north in the project vicinity are blocked by a tall grey sound wall. KOP 4 illustrates the existing visual character of the proposed boarding platform area for the North Elk Grove Station (including all access and platform variants), which is visible to motorists traveling on Cosumnes River Boulevard looking south.~~

~~Source: Google Earth 2019~~

~~Figure 3.1-4. KOP 4: View of the Proposed North Elk Grove Station (including All Access and Platform Variants) Boarding Platform Area.~~

~~Looking south from Cosumnes River Boulevard, Elk Grove. Agricultural fields covered with grasses, the proposed boarding platform site for the North Elk Grove Station (including all access and platform variants), fencing, a gravel access road, the UPRR tracks and embankment, a pump station and paved access road, and overhead power lines with metal power poles are visible in the foreground. Agricultural land and buildings associated with the Sacramento Regional Wastewater Treatment Plant are visible in the middle ground and background.~~

Views from residences south of McNamara Way exhibit a low degree of vividness, intactness, and unity, and therefore the visual quality in this area is considered low. Views from motorists traveling on Cosumnes River Boulevard looking south exhibit a low degree of vividness and a moderate degree of intactness and unity, and therefore the visual quality in this area is considered moderate. Viewer sensitivity is considered high (i.e., residences) to moderate (i.e., motorists).

The viewshed in the area of the proposed track curve reconstruction north of Cosumnes River Boulevard ~~the proposed North Elk Grove Station (including all access and platform variants)~~ encompasses medium-density residential housing (both one- and two-story), the UPRR tracks, the Morrison Creek flood control levee with a paved levee crown road, water and adjacent shrubs and trees along the Morrison Creek stream channel, SacRT light rail tracks, and vacant land covered with annual and perennial grasses. Westward views from residential housing located

east of the UPRR tracks are blocked by a tall, concrete block wall. Views looking north for motorists traveling on Cosumnes River Boulevard are blocked by a tall, concrete block wall. The existing visual character exhibits a low degree of vividness, intactness, and unity, and therefore the visual quality in this area is considered low. Viewer sensitivity is considered low.

~~The viewshed in the area of the proposed North Elk Grove Siding Variants, between Big Horn Boulevard and the proposed North Elk Grove Station (including all access and platform variants), consists primarily of vacant land covered with annual and perennial grasses. This area is associated with the Sacramento Regional Wastewater Treatment Plant Bufferlands. The grasses are green in the spring, but are brown the remainder of the year. The area is flat. A variety of tall white-and grey buildings, facilities, and parking areas associated with the Sacramento Regional Wastewater Treatment Plant to the west dominate the viewshed. The UPRR tracks in this area cross over the streambed of Laguna Creek; water and green vegetation associated with Laguna Creek wetlands are present to the east. Views of this area are only available to Sacramento Regional Wastewater Treatment Plant employees. The existing visual character exhibits a low degree of vividness, intactness, and unity, and therefore the visual quality in this area is considered low. The viewer sensitivity is also considered low.~~

3.1.3.3 Elk Grove to Natomas

Existing Visual Character and Quality in the Study Area

The proposed Pollock Siding Upgrade area between Meadowview Drive and Florin Road would be constructed in a heavily urbanized area of south Sacramento. The built environment consists of the SacRT Meadowview Station and paved 10-acre parking area with shade trees, medium- and high-density (one- and two-story) residential housing, an electrical substation, Burbank School Park (which includes an outdoor football stadium and track and field athletic oval, along with baseball and soccer fields), and a commercial area consisting of autobody shops and a self-storage facility. The residential developments on both sides of the UPRR tracks are bounded by high concrete walls and landscape trees on the back sides that block views. Views are limited to urban landscape trees, roadways, walls, commercial development, the football stadium and adjacent athletic fields, and the SacRT and UPRR gravel embankments and metal tracks. The existing visual character exhibits a low degree of vividness, intactness, and unity, and therefore the visual quality in this area is considered low. The viewer sensitivity is also considered low.

The proposed South Sacramento Siding Upgrade would be constructed just to the northeast of Sacramento Executive Airport in a heavily urbanized area. The built environment along the UPRR and SacRT light rail tracks consists of the 47th Avenue and Fruitridge Sac RT light rail stations, an electrical substation and power generating plant, a 120-acre industrial warehouse complex, Airport Park (which consists of a small area of open playing fields in back of Collis P. Huntington Elementary School), one-story residential housing, and a variety of smaller commercial and industrial buildings and facilities. Chain-link fencing separates the various commercial and industrial land uses, and solid block walls separate the backyards of residential housing from the UPRR and SacRT tracks. Views are limited to urban landscape trees, roadways, walls, fencing, commercial and industrial development, and the SacRT and UPRR gravel embankments and metal tracks. North of the existing SacRT City College Station, one-story residential housing and the 4th Avenue/Wayne Hultgren SacRT LRT station are located on the west side of the railroad tracks, north of the existing SacRT City College Station. one-story residential housing is present

on the west side of the railroad tracks, along with the 4th Avenue/Wayne Hultgren SacRT LRT station. Vacant land (planned for transit-oriented development) is present on the east side of the railroad tracks. The residential housing is separated from the UPRR and SacRT tracks by a high concrete wall that blocks all views. The existing visual character along the railroad track alignment exhibits a low degree of vividness, intactness, and unity, and therefore the visual quality in this area is considered low. The viewer sensitivity is also considered low.

The proposed City College Station would be constructed adjacent to the existing SacRT City College LRT station north of Sutterville Road in Sacramento. The viewshed in this area consists of large concrete commercial buildings, a multi-story concrete parking structure, an overpass connecting land uses on the east and west sides of City College Station, roadways, fencing, overhead power lines and wood power poles, and the concrete sides of Hughes Stadium (a football and track stadium associated with Sacramento City College). A three-story apartment building is present on the east side of the existing City College Station and UPRR tracks, and is connected to the station by the existing pedestrian/bicycle overpass. As shown in KOP 4~~5~~, the existing SacRT City College Station and City College area exhibit a high degree of vividness, intactness, and unity, and therefore the visual quality is considered high. The viewer sensitivity is also considered high.

Source: Google Earth 2019

Figure 3.1-~~45~~. KOP 4~~5~~: View of the Proposed City College Station Area.

Looking northeast from 24th Street, Sacramento. Pavement, signage, landscaping, light standards, the SacRT City College Station boarding platform, pedestrian boarding shelter, and a pedestrian walkway are visible in the foreground. The concrete pedestrian overpass over the SacRT and UPRR tracks, light standards, SacRT light rail tracks and embankment, high-density residential housing (on the east side of the UPRR ROW), the City College Station parking structure, landscape trees, and metal architectural features associated with the LRT station and overpass are visible in the middle ground and background.

The proposed Midtown Sacramento Station and associated track improvements would be constructed in the heavily urbanized Midtown area of Sacramento. This is an older area of Sacramento, and the viewshed along the UPRR tracks consists entirely of built environment features. This area is heavily developed, with one- and two-story single-family residences and multi-story high-density residential uses along with commercial and industrial land uses. Mature

street trees are present throughout the area. The proposed station would be installed near Q Street and would be partially underneath an existing railway overpass. New three-story, high-density residential housing is present on the east side of the UPRR tracks, while a variety of large, white industrial buildings and a redeveloped restaurant are present on the west side immediately adjacent to the proposed station; a new four-story, high-density residential housing complex is also present on the west side near the station. The new high-density residential housing complexes and the restaurant exhibit a high degree of architectural interest, vividness, and intactness, while the older industrial buildings exhibit a low degree of vividness and intactness (see KOP 5~~6~~). The multi-story residences afford views of the UPRR railroad tracks and the proposed Midtown Sacramento Station to the east and west, respectively. This area is considered to have a moderate degree of visual quality, and the viewer sensitivity is considered high.

Source: Google Earth 2019

Figure 3.1-5~~6~~. KOP 5~~6~~: View of the Proposed Midtown Sacramento Station Area.

Looking west from Q Street, Sacramento. Vehicles, the UPRR and SacRT light rail tracks and crossing signals, high-density residential housing, a restaurant, landscape trees, and the proposed Midtown Sacramento Station site are visible in the foreground. Vehicles and landscaping along Q Street are visible in the middle ground and background.

Commercial and industrial land uses are present at the south end of the proposed Del Paso Siding Upgrade/Extension. The American River Parkway bicycle/pedestrian trail is approximately 650 feet south of the southern end of the proposed Del Paso Siding Upgrade/Extension track improvements. However, the trail is located on the south side at the base of the elevated Lower American River North Levee embankment, which is approximately 18 to 24 feet high. The site of the proposed Old North Sacramento Station is bordered on the east, south, and southeast side by commercial and industrial development (see KOP 6~~7~~). Immediately adjacent to the north end of the proposed Old North Sacramento Station, the paved Sacramento Northern Bike Trail crosses the UPRR tracks. This trail runs for approximately 10 miles, following the former Sacramento Northern Electric Railroad bed from the NEMDC east levee and the junction with the American River Parkway Trail northeast to the junction of Rio Linda Boulevard and Elverta Road. Tall, mature shade trees line both sides of the trail in the project vicinity, screening views of the industrial area to the south. This industrial area south of Arden Way exhibits a low degree of

vividness, intactness, and unity, and therefore the visual quality is considered low. The viewer sensitivity is also considered low, except in the immediate vicinity of the Sacramento Northern Bike Trail crossing, where the viewer sensitivity is high.

Source: Google Maps 2018

Figure 3.1-6~~7~~. KOP 6~~7~~: View of the Proposed Old North Sacramento Station Area.

Looking southeast from the elevated Arden-Garden Connector/Arden Way, Sacramento. The NEMDC east levee; the paved Sacramento Northern Bike Trail; the UPRR embankment, tracks, and signals; and overhead power lines and wood poles are visible in the foreground. A Quonset building and equipment lot (site of the proposed Old North Sacramento Station) and other industrial buildings are visible in the middle ground. Landscape trees, vegetation in the American River Parkway, and high-tension power lines and metal towers are visible in the background.

The proposed Del Paso Siding Upgrade/Extension would be constructed along the east side of the existing UPRR tracks, which are located on top of the elevated NEMDC east levee; the levee height ranges from 18 to 24 feet above the natural ground surface. North of the proposed Old North Sacramento Station, land uses adjacent to the east side of the railroad alignment are primarily medium-density residential consisting of one-story, single-family residences. Redwood Park, an approximately 3-acre City of Sacramento park on Western Avenue, has one lighted softball field that is available for use by reservation only. A line of large, mature shade trees is present along the western edge of the park adjacent to the NEMDC east levee and the existing UPRR tracks. Johnston Park—a 26.9-acre park with picnic areas, baseball fields, soccer fields, basketball courts, playgrounds, a swimming pool, and a community center—is immediately north of Pacific Gas & Electric Company's (PG&E) North Sacramento Gas Underground Storage Facility (which appears as vacant land on the surface). A line of tall, mature shade trees is present along the western edge of the park adjacent to the NEMDC east levee and existing UPRR tracks. The Del Paso Siding Upgrade/Extension would require a new bridge crossing over the southwestern end of Arcade Creek, immediately adjacent to and east of the existing UPRR overcrossing. Arcade Creek has elevated flood control levees on both the north and south sides; the levee crown roads are part of the Walter S. Ueda Parkway pedestrian/bicycle trail system. The viewshed from the trails on the levee crowns includes the water in Arcade Creek and in the NEMDC/Steelhead Creek along with the adjacent riparian vegetation (including shrubs and trees),

residential housing and associated landscape trees and shrubs, the UPRR railroad tracks, and the Sacramento skyline (see KOP 7~~8~~). In the vicinity of Silver Eagle Avenue and northward to Interstate 80 (I-80), land on the east side of the NEMDC east levee is primarily vacant, although a few commercial buildings are present along Western Avenue. This area exhibits a high degree of vividness, intactness, and unity, and therefore the visual quality is considered high. The viewer sensitivity is also considered high.

Source: Google Earth 2019

Figure 3.1-7~~8~~. KOP 7~~8~~: View of the Proposed Del Paso Siding Upgrade/Extension Area.

Looking south from the elevated Silver Eagle Road overcrossing, Sacramento. The UPRR embankment and tracks, the grass-covered NEMDC east and west levees, the water and riparian vegetation in NEMDC/Steelhead Creek, and Western Avenue are visible in the foreground. Residential housing and associated landscape trees are visible in the middle ground. The downtown Sacramento skyline is visible in the background.

North of I-80, the Pell/Main Industrial Park is located immediately adjacent to the east side of the NEMDC east levee and the UPRR tracks. The viewshed in this area consists primarily of large, two-story, block-style industrial buildings colored tan, grey, and white. Small areas of lawn grass and landscape trees are scattered throughout the industrial park. The industrial park area has a low degree of vividness, and a moderate degree of intactness and unity. The visual quality is considered moderate. The viewer sensitivity is considered low.

The pedestrian/bicycle trail along the Rio Linda Creek south levee is approximately 580 feet north of the northern end of the Del Paso Siding Upgrade/Extension area. Views to the south from the western end of the trail are blocked by large two-story office buildings with associated landscape trees and by the elevated four-lane Main Avenue roadway overcrossing.

The proposed Natomas/Sacramento Airport Station would be located between the NEMDC/Steelhead Creek on the west and the UPRR tracks on the east, and north of the Wolf Ranch Wildlife Sanctuary. The area between West 6th Street and Sorento Road, and extending along Blacktop Road on the north and south sides of West Elkhorn Boulevard, is heavily industrialized. This area is completely covered with paved and gravel parking lots and storage yards, paved roadways, and large white and grey block-style industrial buildings. The elevated

tan cylindrical towers and ramps of the Syar Concrete cement plant, which are approximately 40 feet above the ground surface, dominate the skyline (see KOP 8~~9~~). The proposed ACE tracks north of West Elkhorn Boulevard would be located on a portion of the existing Wilbur-Ellis agricultural production, storage, and distribution ~~and forestry products manufacturing~~ facility, which occupies approximately 18 acres on the west side of the existing UPRR tracks. This industrial facility consists of paved parking and drive aisles; large white and grey block-style industrial buildings; and large white and grey aboveground storage and processing facilities and tanks.

Source: Google 2020

Figure 3.1-8~~9~~. KOP 8~~9~~: View of the Proposed Natomas/Sacramento Airport Station Area.

Looking north along Blacktop Road, Natomas. Pavement and vehicles on Blacktop Road. Industrial land uses including the Syar Concrete cement plant, the single-story warehouses, landscape trees, Blacktop Road, and the Natomas/Sacramento Airport Station site are visible in the middle ground.

This area contains a variety of architectural styles, forms, and textures associated with industrial buildings, industrial storage yards and equipment, auto wrecking yards, concrete processing sites, and other heavy industrial uses. Landscaping is generally absent, aside from a few scattered trees. The Walter S. Ueda Parkway trail begins on the west side of this industrial area, adjacent to NEMDC/Steelhead Creek. A few scattered trees are present around the trailhead parking area and along the west side of the Syar Concrete facility (on the east side of the trail). Piles of aggregate, vehicles, equipment, and processing facilities dominate the viewshed from this portion of the Walter S. Ueda Parkway trail. Most westward views from the trailhead are blocked by the industrial facilities; however, the proposed Natomas/Sacramento Airport Station would be visible in eastward-facing foreground views from the adjacent Walter S. Ueda Parkway trail because this area currently consists of an approximately 20-acre, flat, paved parking lot associated with the Brasher's Sacramento Auto Auction yard.

The channelized NEMDC/Steelhead Creek, which holds water year-round, and associated grass-covered east and west levees, are visible on the west side of the Walter S. Ueda Parkway trail. North-facing views from the Walter S. Ueda Parkway trailhead are dominated by the white

industrial buildings of the Wilbur-Ellis agricultural production, storage, and distribution ~~manufacturing~~ facility. Pavement and vehicles on West Elkhorn Boulevard, the concrete roadway bridge crossing over Steelhead Creek, wood power poles and overhead electrical lines, water in Steelhead Creek, scattered rural residences with associated landscaping, and overhead high-tension power poles and lines are visible to the northwest. Despite the presence of the NEMDC/Steelhead Creek on the west side, this area has low degree of vividness, intactness, and unity, and the visual quality is also considered low due to the dominating presence of a wide variety of large intruding elements (i.e., industrial development) without a harmonious composition. The viewer sensitivity from the Walter S. Ueda Parkway trail is considered high, particularly in the area south of the Brasher's Sacramento Auto Action facility.

3.1.4 Environmental Analysis

This section describes the environmental impacts of the proposed project related to aesthetics. It describes the thresholds used to determine whether an impact would be significant, and measures to mitigate significant impacts are provided where appropriate.

3.1.4.1 Thresholds of Significance

The State 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 aesthetic resources. The project would result in a significant impact on aesthetics if it would:

- Have a substantial adverse effect on a scenic vista.
- Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway.
- 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, would the project conflict with applicable zoning and other regulations governing scenic quality?
- Create a new source of substantial light or glare that would adversely affect daytime or nighttime views in the area.

Identification of the visual resources and aesthetics impacts of the proposed project were based on the following three components:

- An objective inventory of the visual features or visual resources that comprise the landscape
- An assessment of the character and quality of the visual resources in the context of the overall character of the regional visual landscape
- A determination of the importance to viewers, or the sensitivity of the viewers, to the identified visual resources in the landscape

3.1.4.2 Impacts and Mitigation Measures

Impact AE-1: The proposed project would not have a substantial effect on a scenic vista (Less-than-Significant Impact).

No designated scenic vistas are present in the project vicinity. While some of the proposed improvements would be constructed in rural areas of the northern San Joaquin Valley and southern Sacramento Valley where the scenic quality is high, the viewshed in these areas includes the existing UPRR embankment, tracks, and such associated equipment as signals and signage. Furthermore, although the visual quality is high in these areas, the existing visual character is typical of rural agricultural land in the Central Valley and does not represent examples of any particular outstanding scenic viewshed. Therefore, this impact is considered less than significant.

Impact AE-2: The proposed 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).

Project improvements would not be visible from any state-designated scenic highway. Proposed improvements associated with the Thornton Siding Upgrade/Extension and the proposed track curve reconstruction would be implemented approximately 0.5 mile east of I-5, which is a San Joaquin County-designated scenic highway from Stockton north to the Sacramento County line. However, due to the intervening topography, vegetation, and buildings, the project footprint would not be visible from I-5. Thus, there would be no impact on scenic resources.

Impact AE-3: The proposed project would 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.) Where the proposed project is in an urbanized area, project improvements would conflict with applicable zoning and other regulations governing scenic quality. However, implementation of Mitigation Measures AE-3.1, AE-3.2, and AE-3.3 would reduce this significant impact to a less-than-significant level (Less-than-Significant Impact with Mitigation).

Track Improvements

In urban areas, most residences are one-story buildings and views of the proposed track improvements would be blocked either by an existing concrete block wall or the residences are located 18 to 24 feet below the level of the proposed tracks. Two-story residences would have views of the proposed track improvements. In rural areas, there are a limited number of one- and two-story residences that would have views of the proposed track improvements; however, the views from most residences would be screened by tall trees. The track improvements would also be visible to recreationists from several trails in natural areas such as the Cosumnes River Preserve, Wolf Creek Wildlife Sanctuary, Sacramento Northern Bike Trail, and the Walter S. Ueda Parkway. Finally, views of the proposed track improvements would be visible to motorists throughout all of the improvement areas. Construction crews and equipment associated with the proposed track improvements would be visible at each location where improvements are proposed, but potential construction impacts would be short-term and temporary. At the completion of the proposed improvements, the railway embankment, tracks, and associated equipment, such as train signals, would have a visual appearance that is substantially similar to

or the same as the existing UPRR facilities in both rural and urban areas and the existing SacRT facilities in urban areas, and would blend into the existing landscape. Therefore, construction and operation of the proposed track improvements would not substantially degrade the existing visual character or quality, and track improvement impacts are considered less than significant.

Station Alternatives

In its capacity as a state joint powers agency, improvements proposed by SJRRC within the existing UPRR ROW are not subject to local or regional plans or regulations. However, proposed improvements outside of the UPRR ROW, which include the proposed stations, would be subject to regional and local plans and regulations. Impact LU-2 in Section 3.11, *Land Use and Planning*, presents an analysis of the proposed project's consistency with applicable local land use plans and policies. As noted therein, most of the proposed new stations, alternatives, and variants would be constructed in urban areas and would be consistent with applicable zoning and general plan policies related to scenic quality, and no impact would result. There are two exceptions—the Lodi Station and the Lodi Station South Alternative—which are discussed separately below. In addition, due to the level of public comment on the proposed facilities in the Natomas area, the Natomas/Sacramento Airport Station is also discussed in detail below.

The San Joaquin County 2035 General Plan (San Joaquin County 2016) is the governing land use plan for the areas in which the Lodi Station or the Lodi Station South Alternative would be implemented. The plan does not contain any policies specifically related to the aesthetic quality of rail facilities; however, it does contain policies that are intended to encourage high-quality design, the integration of new development with existing visual surroundings, and the reduction of glare and light pollution throughout the county.

The proposed Lodi Station and the Lodi Station South Alternative would be constructed in rural areas that are designated and zoned for agricultural uses (see Section 3.2, *Agricultural Resources* and Section 3.11, *Land Use and Planning*, for additional details). The Lodi Station would be constructed immediately across from and east of a cluster of rural residences associated with the West 13 Ranch; however, existing visual screening is already present in the form of a narrow, linear belt of tall landscape trees and shrubs on the west side of West 13 Ranch property, between the ranch buildings and the existing UPRR tracks. The proposed station would be constructed adjacent to SR 12, which is a major east-west connector in this area. The viewshed is dominated by agricultural cropland in all directions. The proposed Lodi Station would be clearly visible in the foreground of southern views to motorists traveling SR 12 (see KOP 1) as well as motorists on Devries Road.

The proposed Lodi Station South Alternative would be constructed adjacent to and east of a variety of large white agricultural storage buildings and processing facilities, which dominate the viewshed. These existing structures and the tall mature trees that line Devries Road in this area would block views of the proposed station and parking area from all but one residence on the west side of Devries Road immediately across from the station and parking area. The two rural residences approximately 1,000 feet to the north of the proposed Lodi Station South Alternative are surrounded by landscape trees and shrubs that would block most views of the proposed facilities. The proposed Lodi Station South Alternative would only be partially visible for a few seconds from Devries Road. Furthermore, although the station would be clearly visible in the

foreground in northbound views from West Harney Lane, this roadway is a small local road that is generally traveled only by local residents.

Construction crews and equipment associated with the proposed stations would be visible at each location where improvements are proposed, but impacts would be short-term and temporary. From a visual perspective, compared to the Lodi Station, the operation of Lodi Station South Alternative station would be more consistent with the existing visual character of the existing agricultural and industrial facilities and buildings on Devries Road and would result in fewer views from both public and private vantage points.

The Sacramento County 2030 General Plan (Sacramento County 2017a) is the governing land use plan for the area in which the Natomas/Sacramento Airport Station would be implemented. The plan does not contain any policies specifically related to the aesthetic quality of rail facilities. However, it does contain policies related to the integration of rail and bus stations, high-density multi-story housing, shopping, employment, and parks in urban neighborhoods. The Sacramento Countywide Design Standards (Sacramento County 2017b) include guidelines for using architectural features that incorporate modern design principles while providing linkages to the existing visual character. Also included in the standards document are guidelines for planting shade trees and for incorporating low-impact design (LID) features such as vegetated swales, (which provide increased visual interest), inviting building entryways and outdoor plazas, landscaped sidewalks, and visually appealing building facades.

In addition to the two general plans described above, the Sacramento Area Council of Governments (SACOG) and the San Joaquin Council of Governments (SJCOG) each have a Metropolitan Transportation Plan/Sustainable Communities Strategy (MTP/SCS) containing principles and strategies that are applicable to the proposed project (SACOG 2016; SJCOG 2018). Both the SACOG and the SJCOG documents focus on long-range planning for transportation improvements, including rail service, roadway networks, pedestrian/bicycle connectivity, and walkable communities. Both include goals to provide improved linkages between urban and rural communities while balancing the need to conserve open space and agricultural land.

The proposed project, which would expand service between Stockton and Sacramento, is included as part of the SJCOG MTP/SCS. One of the guiding principles in the MTP/SCS is the concept of “Smart Land Use,” which entails designing a transportation system to support good growth patterns, including increased housing and transportation options, focusing more growth inward, and improving the economic viability of rural areas. SACOG’s Rural-Urban Connections Strategy is specifically intended to provide economic development opportunities and preserve natural resource values in the more rural portions of the region. Both the SACOG and the SJCOG MTP/SCS include principles and strategies that promote high-quality design of new transit features (such as rail stations) that should be designed to be sensitive to the existing visual surroundings and context. MTP/SCS strategies are designed to promote improved transit access via safe and pleasant sidewalks and walkways around transit stops (including rail stations), designated bike routes and directional signage, accessibility for the disabled, onboard bike racks, better signs for transit access, well-designed transit shelters, and improved transfer points.

The Natomas/Sacramento Airport Station would be located in an industrialized urban area. The parcels in this urban area are zoned for heavy industrial use and the County of Sacramento land

use designation is “Intensive Industrial” (Sacramento County 2019). Therefore, the proposed Natomas/Sacramento Airport Station would be consistent with existing zoning and land uses on the parcels where it would be built. Industrial and manufacturing land uses—which include large, tall, metal, grey and white buildings along with large, flat, paved parking areas that dominate the viewshed—are present around most of the project footprint. Rural residences (on land zoned and designated for agricultural-residential) are present on the east side of the UPRR tracks across from and southeast of the existing industrial facilities. These residences are approximately 250 feet east of the proposed parking area for passengers at the Natomas/Sacramento Airport Station. Views of the project facilities from these residences would be visually consistent with the existing surrounding heavy industrial development and would not stand out in the landscape or detract from the existing visual character and quality of this heavy industrial area. Furthermore, views of the Natomas/Sacramento Airport Station would be screened by the existing tall landscape trees and shrubs that are present on all of the residential parcels to the southeast of this facility.

The Natomas/Sacramento Airport Station would be approximately 950 feet east of the north end of the Walter S. Ueda Parkway trail and trailhead parking area. However, views of the project facilities from this area would be visually consistent with the existing surrounding heavy industrial development and would not stand out in the landscape or detract from the existing visual quality and character of views from this part of the trail (which is already low). The Wolf Creek Wildlife Sanctuary is approximately 450 feet and 1,000 feet south, respectively, of proposed new track and parking; however, these two project facilities would be flat and would be consistent with the existing industrial viewshed looking north from the wildlife sanctuary. Thus, from a visual perspective, the proposed Natomas/Sacramento Airport Station and associated track and parking improvements would be visually consistent with the adjacent industrial land uses and would be consistent with existing heavy industrial zoning and land use designations. The proposed facilities would not degrade the existing visual character or quality of the surrounding heavy industrial area, which is already low.

Station platforms would generally not result in a prominent visual feature because (with the exception of 8- to 10-foot-tall shelters) they are flat, at-grade features; in most locations, existing UPRR rail and/or SacRT facilities are existing landscape elements that appear visually similar to the proposed stations. Most proposed stations would be constructed in heavily developed urban areas that already contain similar types of rail facilities (see, for example, KOP 4~~5~~).

In the developed, heavily urbanized areas of Sacramento, proposed rail improvements would be constructed in transit priority areas, where residential and commercial development are designed to be located in close proximity to transportation corridors to promote Smart Growth goals, reduce vehicle miles traveled, and reduce the emissions of greenhouse gases. The proposed project would also require the construction of several bridges and above-grade crossings. These facilities tend to be larger, more massive structures that stand out in the landscape due to their size and elevation above the ground. For example, the railroad bridge that would span Arcade Creek would be located in an area of high visual quality and sensitivity because of the Walter S. Ueda Parkway trail and adjacent residences. Therefore, these facilities could degrade the existing visual character and quality.

~~Pedestrian overcrossings for station platform access would be constructed at the proposed North Elk Grove Station (including all access and platform variants). The pedestrian overcrossings would be constructed of concrete with metal railings and light fixtures, and would extend~~

~~approximately 40 feet above the existing grade. In the vicinity of the North Elk Grove Station, the existing UPRR tracks and Cosumnes River Boulevard are already elevated well above grade in order to ensure protection from Morrison Creek and Unionhouse Creek flood flows. Therefore, construction of the pedestrian overcrossing would be visually consistent both in height and materials with existing elevated rail and roadway facilities in the immediate vicinity.~~

Mitigation Measures. Implementation of Mitigation Measures AE-3.1, AE-3.2, and AE-3.3 (described below) would reduce significant impacts associated with degradation of visual character and quality to a less-than-significant level because trees would be planted in the station parking lots to soften the views and provide a blending effect with the surrounding landscape; pedestrian overcrossings would blend with and complement the surrounding landscape; darker fencing would improve visibility through the barrier compared with standard gray metal surfaces; appropriately colored overhead light standards and pedestrian shelters would recede into the view; and bridges and above-grade crossings would employ the use of colored concrete to better match the existing landscape.

AE-3.1: Landscape all station parking lots.

All station parking lots will be planted with trees and groundcover to improve aesthetics, provide shade, and reduce the urban "heat island" effect. Shrubs may also be used if space allows. Trees will be scattered throughout the parking lot areas, rather than planted all in one location. All landscaping will be designed to ensure passenger safety (e.g., so that security cameras and safety lighting are not obscured). In addition, plant palettes will incorporate drought-tolerant plant species and will have a strong emphasis on California native plant species that are appropriate for a given site. An irrigation and maintenance program will be implemented during the plant establishment period, and will be continued, as needed, to ensure plant survival. The landscaping plan will maximize the use of planting zones that are water-efficient.

AE-3.2: Apply aesthetic design treatments to pedestrian overcrossings, aerial structures, tunnel openings, bridges, and retaining walls.

SJRRC will implement an aesthetic design treatment for pedestrian overcrossings over tracks, aerial structures, railway bridges, and retaining walls with high visibility. Choosing earth-toned colors for the surfaces will be less distracting to viewers than light or brightly colored surfaces. The design motif applied to structures will reflect a combination of naturally colored surfaces as well as surfaces that are textured to appear like natural materials (e.g., rock or cobble). Alternatively, a design theme may be incorporated (e.g., wildlife and plants from local native oak woodlands; traditional architectural elements, such as inset panels; other designs that reflect local heritage or the environment) using form liners. This will reduce visual monotony, soften verticality, reduce glare, and be more visually pleasing to viewers than plain surfaces for retaining walls, exterior-facing barriers, and girders on bridges, elements that will be visible to traffic or recreational viewers at the overcrossings, abutments, side supports, and columns or on the decking. Roughened retaining wall surfaces would soften the verticality of wall faces by providing visual texture and reducing the amount of smooth surface, which can reflect light. The color of the wall will also be carefully considered. Studies have shown that structures that are two to three

degrees darker than the color of the general surrounding area create less of a visual impact than structures with matching or lighter hues (BLM 2008).

AE-3.3: Apply aesthetic surface treatments to fencing, pedestrian bridge safety barriers, light standards, cable railings, pedestrian shelters, and signal houses.

New fencing, pedestrian bridge safety barriers, light standards, cable railings, pedestrian shelters, and signal houses associated with the proposed facilities will be colored or painted a shade that is two to three shades darker than the general surrounding area. Colors will be chosen from U.S. Department of the Interior, Bureau of Land Management, Standard Environmental Colors Chart CC-001, June 2008, which provides suitable colors for a variety of landscape types (BLM 2008). Color selection will be made based on the existing conditions at each location and will be based on the coloring of the most prevalent season. Paints will be a dull, flat, or satin finish to reduce the potential for glare; the use of glossy paints for surfaces will be avoided. Appropriate paint types will be selected that ensure durability for the finished structures.

Impact AE-4: The proposed project could create a source of substantial light or glare that would adversely affect daytime or nighttime views in the area. However, this potentially significant impact would be reduced to a less-than-significant level due to design features and implementation of Mitigation Measure AE-4.1 (Less-than-Significant Impact with Mitigation).

Construction activities would occur primarily during the daytime hours. However, nighttime lighting during the project's construction phase may be required in areas where track improvements are proposed in order to avoid conflicts with rail traffic on existing rail lines. Most residences in the vicinity of the proposed improvements are screened from the existing UPRR tracks and areas of proposed track improvements either by tall concrete block walls or tall trees. However, there are multiple single-family residences along Franklin Road within 300 feet of the proposed Pollock Siding Upgrade that have no visual screening. In addition, multiple residences on the east side of the proposed Midtown track upgrades, between R and P Streets, have no visual screening. Work on the Del Paso Siding Upgrade/Extension would occur on top of the NEMDC east levee, which is approximately 18 to 24 feet above the ground surface as compared to the at-grade residences that back up to the east side of the NEMDC levee. Nighttime lighting would require the use of high-intensity lighting directed at the work area, which could result in light spillover resulting in sleep disruption for nearby residents. Therefore, this short-term, temporary, construction-related impact is considered significant.

Nighttime safety lighting at at-grade train crossings during the project's operational phase would be used only when trains are passing and would not result in a notable increase in lighting in the area of any project facility during the short activation time. The operation of train headlights at night associated with the proposed new service would be similar to the existing conditions along the existing tracks. The proposed additional service would not increase light at any one location for more than a few moments as trains pass. Minor safety lighting at at-grade crossings and train headlights would not result in a notable increase in lighting in the area of any proposed improvement.

New station platforms and parking areas would be constructed in both rural areas (where the existing amount of nighttime lighting is low) and urban areas (where the existing amount of

nighttime lighting is high). All of the stations and parking areas would require nighttime lighting. ~~At the North Elk Grove Station (including all access and platform variants), a new pedestrian overpass would be installed, which would also require nighttime lighting.~~ Nighttime lighting could result in light spillover that causes glare and obscures views of the night sky, and that could introduce a potential source of sleep disruption for nearby residents. Furthermore, daytime glare could be caused by the use of reflective surfaces such as shiny coatings on the tops of pedestrians shelters at the new stations.

However, as described in Chapter 2, *Project Description*, to minimize the creation of new sources of light and glare, all artificial outdoor lighting would be limited to safety and security requirements, would be designed using Illuminating Engineering Society's design guidelines, and would be in compliance with International Dark-Sky Association approved fixtures. All lighting would be designed to have minimum impact on the surrounding environment and would use downcast, cut-off-type fixtures that direct the light only towards objects requiring illumination. Shielding would be used, where needed, to ensure light pollution is minimized. Therefore, lights would be installed at the lowest allowable height and cast low-angle illumination while minimizing incidental light spill onto adjacent properties and open spaces, and minimizing backscatter into the nighttime sky. The lowest allowable illuminance level would be used for all lighted areas, and the amount of nighttime lights needed to light an area would be minimized to the highest degree possible. Light fixtures would have non-glare finishes that would not cause reflective daytime glare. Lighting would be designed for energy efficiency and have daylight sensors or be timed with an on/off program. Parking lot lighting would be designed to meet safety requirements but would use locational, motion-activated sensing to use regular-intensity lighting when a person is near a row of vehicles, which relays to lower-intensity lighting after a period of inactive movement when no one is near the vehicles. Lights would provide good color rendering with natural light qualities, with the minimum intensity feasible for security, safety, and personnel access. Lighting, including light color rendering and fixture types, would be designed to be aesthetically pleasing. Furthermore, anti-reflective coatings would be used on structures, such as the roofs of pedestrian shelters at new stations, to reduce daytime glare. With incorporation of the provisions to reduce light spillover described above, nighttime lighting at the stations would not result in sleep disruption at houses in the vicinity of the proposed stations. Therefore, operation of proposed facilities would not create a source of substantial light or glare that would adversely affect daytime or nighttime views in the area or result in sleep disruption for adjacent residents, and the proposed project's operational impact would be less than significant.

Mitigation Measures. Implementation of Mitigation Measure AE-4.1 (described below) would reduce the project's short-term temporary impacts from nighttime construction lighting to a less-than-significant level because nighttime lighting for construction activities would be screened from affected residences.

AE-4.1: Install screened construction fencing between residents and nighttime work areas where no visual screening is present.

Solid-screened temporary construction fencing at least 6 feet high will be provided along the boundary of the construction site where nighttime lighting would occur, between the construction site and the residences, in the following locations:

- Along Franklin Road for residences within 300 feet of the proposed Pollock Siding Upgrade
- Along the east side of the UPRR tracks for residences between R Street and P Street in the vicinity of the proposed Midtown Sacramento Station and associated track improvements
- Along the NEMDC east levee and UPRR tracks between Arcade Creek and Rio Linda Creek for residences on the east side of the levee in the vicinity of the proposed Del Paso Siding Upgrade/Extension.

A minimum of 200 linear feet of shielded construction fencing will be provided. The shielded fencing will be proximate to the location of the lighting (e.g., if lighting is required on top of the NEMDC east levee, then the fencing will also be placed on top of the levee).

3.2 Agriculture and Forestry

3.2.1 Introduction

This section describes the regulatory and environmental setting for agriculture and forestry resources in the vicinity of the Valley Rail Sacramento Extension Project (proposed project). It also describes the impacts on these resources that would result from implementation of the proposed project and mitigation measures that would reduce significant impacts where feasible and appropriate. Cumulative impacts on agriculture and forestry resources, in combination with planned, approved, and reasonably foreseeable projects, are discussed in Chapter 4, *Other CEQA-Required Analysis*.

During the public scoping comment period, no comments relevant to agriculture and forestry resources were received. The comments received during the scoping period are included in Appendix A, *NOP and Scoping Summary Report.*

3.2.2 Regulatory Setting

This section summarizes the federal, state, regional, and local regulations related to agriculture and forestry resources and applicable to the proposed project.

3.2.2.1 Federal

There are no federal regulations related to agriculture and forestry resources.

3.2.2.2 State

California Important Farmland Inventory System and Farmland Mitigation and Monitoring Program

The Farmland Mapping and Monitoring Program (FMMP) was established by the State of California in 1982 to continue the Important Farmland mapping efforts begun in 1975 by the U.S. Soil Conservation Service (now called the Natural Resources Conservation Service, under the U.S. Department of Agriculture). The intent was to produce agricultural resource maps based on soil quality and land use across the nation. The California Department of Conservation (DOC) sponsors the FMMP and also is responsible for establishing agricultural easements, in accordance with California Public Resources Code Sections 10250 through 10255.

The DOC FMMP maps are updated every 2 years through the use of aerial photographs, a computer mapping system, a public review, and field reconnaissance. The following list provides a comprehensive description of all the categories mapped by the DOC (2015):

- **Prime Farmland**—Land that has the best combination of physical and chemical features able to sustain long-term agricultural production. This land has the soil quality, growing season, and moisture supply needed to produce sustained high yields.
- **Farmland of Statewide Importance**—Land similar to Prime Farmland but with minor shortcomings, such as greater slopes or less ability to store soil moisture.

- **Unique Farmland**—Land of lesser-quality soils used for the production of the state's leading agricultural cash crops. This land is usually irrigated, but may include nonirrigated orchards or vineyards, as found in some climatic zones in California.
- **Farmland of Local Importance**—Land that is of importance to the local agricultural economy, as defined by each county's local advisory committee and adopted by its board of supervisors. The San Joaquin County Board of Supervisors has defined Farmland of Local Importance as consisting of all farmable land not meeting the definitions of Prime Farmland, Farmland of Statewide Importance, and Unique Farmland. This includes land that is or has been used for irrigated pasture, dryland farming, confined livestock or dairy facilities, aquaculture, poultry facilities, and dry grazing. It also includes soils previously designated by soil characteristics as Prime Farmland, Farmland of Statewide Importance, and Unique Farmland that has since become idle. For Sacramento County, Farmland of Local Importance are lands that do not qualify for designation as Prime, Statewide, or Unique but that currently have irrigated crops or pasture or nonirrigated crops; lands that would be designated Prime or Statewide and have been improved for irrigation but are now idle; and lands that currently support confined livestock, poultry operations, and aquaculture.
- **Grazing Land**—Land with existing vegetation that is suitable for grazing.
- **Urban and Built-Up Lands**—Land that is used for residential, industrial, commercial, institutional, and public utility structures and for other developed purposes.
- **Other Land**—Land that does not meet the criteria of any of the previously described categories and generally includes low-density rural developments, vegetative and riparian areas not suitable for livestock grazing, confined-animal agricultural facilities, strip mines, borrow pits, and vacant and nonagricultural land surrounded on all sides by urban development. In San Joaquin County, the Other Land category is further divided into five subcategories: Rural Residential Land, Semi-Agricultural and Rural Commercial, Vacant and Disturbed Land, Defined Animal Agriculture, and Nonagricultural and Natural Vegetation. Sacramento County does not further divide Other Land into subcategories.

Important Farmland is classified by the DOC as Prime Farmland, Farmland of Statewide Importance, Unique Farmland, and Farmland of Local Importance. Under the California Environmental Quality Act (CEQA), the designations for Prime Farmland, Farmland of Statewide Importance, and Unique Farmland are defined as "agricultural land" or "farmland" (Public Resources Code Sections 21060.1 and 21095, and CEQA Guidelines Appendix G).

Williamson Act Contracts

The California Land Conservation Act of 1965, commonly known as the Williamson Act, enables local governments to form contracts with private landowners to promote continued agricultural or related open space uses. In return, landowners receive property tax assessments that are based on farming and open space uses rather than full market value and development potential. Local governments receive an annual subvention (subsidy) of forgone property tax revenues from the state via the Open Space Subvention Act of 1971. The contracts are annually renewable and may restrict the land to agricultural use for at least 10 years.

The landowner may end the contract by submitting a Notice of Nonrenewal, which starts a 9-year nonrenewal period during which the annual tax assessment continually increases until it is equivalent to current tax rates. The contract is then terminated. Contract cancellation involves an extensive review and approval process. In addition, the landowner may be required to pay a fee of up to 12.5 percent of the property value. The local jurisdiction approving the cancellation must find that the cancellation is consistent with the purpose of the California Land Conservation Act or is in the public interest (California Government Code Section 51282).

An expanded version of the Williamson Act, known as the Farmland Security Zone (FSZ) Act, was enacted in 1998. An FSZ contract offers landowners a greater property tax reduction in return for an initial contract term of 20 years, with renewal occurring automatically each year. Land restricted by an FSZ contract is valued for property assessment purposes at 65 percent of its land conservation act valuation or 65 percent of its Proposition 13 valuation, whichever is lower.

California Farmland Conservancy Program Act (California Public Resources Code, Sections 10200–10277)

The California Farmland Conservancy Program (California Public Resources Code [Public Res. Code] § 10200 et seq.) supports the voluntary granting of agricultural conservation easements from landowners to qualified nonprofit organizations, such as land trusts, as well as local governments. Conservation easements are voluntarily established restrictions that are permanently attached to property deeds, and the general purpose is to retain land in its natural, open-space, agricultural, or other condition while preventing uses that are deemed inconsistent with the specific conservation purposes expressed in the easements. Agricultural conservation easements define conservation purposes that are tied to keeping land available for continued use as farmland. Such farmlands remain in private ownership, and the landowner retains all farmland use authority, but the farmland is restricted in its ability to be subdivided or used for nonagricultural purposes, such as urban uses.

3.2.2.3 Regional and Local

The San Joaquin Joint Powers Authority (SJJPA), a state joint powers agency, and the San Joaquin Regional Rail Commission (SJRRC) propose improvements within and outside of the Union Pacific Railroad (UPRR) right-of-way (ROW). The Interstate Commerce Commission Termination Act (ICCTA) affords railroads engaged in interstate commerce considerable flexibility in making necessary improvements and modifications to rail infrastructure, subject to the requirements of the Surface Transportation Board.[1] ICCTA broadly preempts state and local regulation of railroads, and this preemption extends to the construction and operation of rail lines. Therefore, activities in existing UPRR ROW are exempt from local building and zoning codes and other land use ordinances. Project improvements proposed outside of the UPRR ROW, however, would be subject to regional and local plans and regulations. Although ICCTA does broadly preempt state and local regulation of railroads, SJJPA and SJRRC intend to obtain local agency permits for construction of facilities that fall outside of the UPRR ROW, even though SJRRC has not determined that such permits are legally necessary, and such permits may not be required.

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

Appendix E, *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 project improvements are proposed. 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 preparation of this analysis, and reviewed to assess whether the proposed project would be consistent with the plans of relevant jurisdictions.[2] The proposed project would be generally consistent with the applicable goals, policies, and objectives related to agriculture and forestry identified in Appendix E.

3.2.3 Environmental Setting

Project improvements would occur either within the existing UPRR ROW or directly adjacent to the existing UPRR ROW. Improvements located within the existing UPRR ROW would have no impact on agricultural land uses because lands within the ROW are not used for agricultural production or designated as Important Farmland, and are not under Williamson Act contracts. In addition, improvements outside of the ROW in unincorporated Sacramento County and the city of Sacramento would occur in areas that are not used for agricultural purposes or on lands that are designated as Important Farmland or that are under Williamson Act contracts.

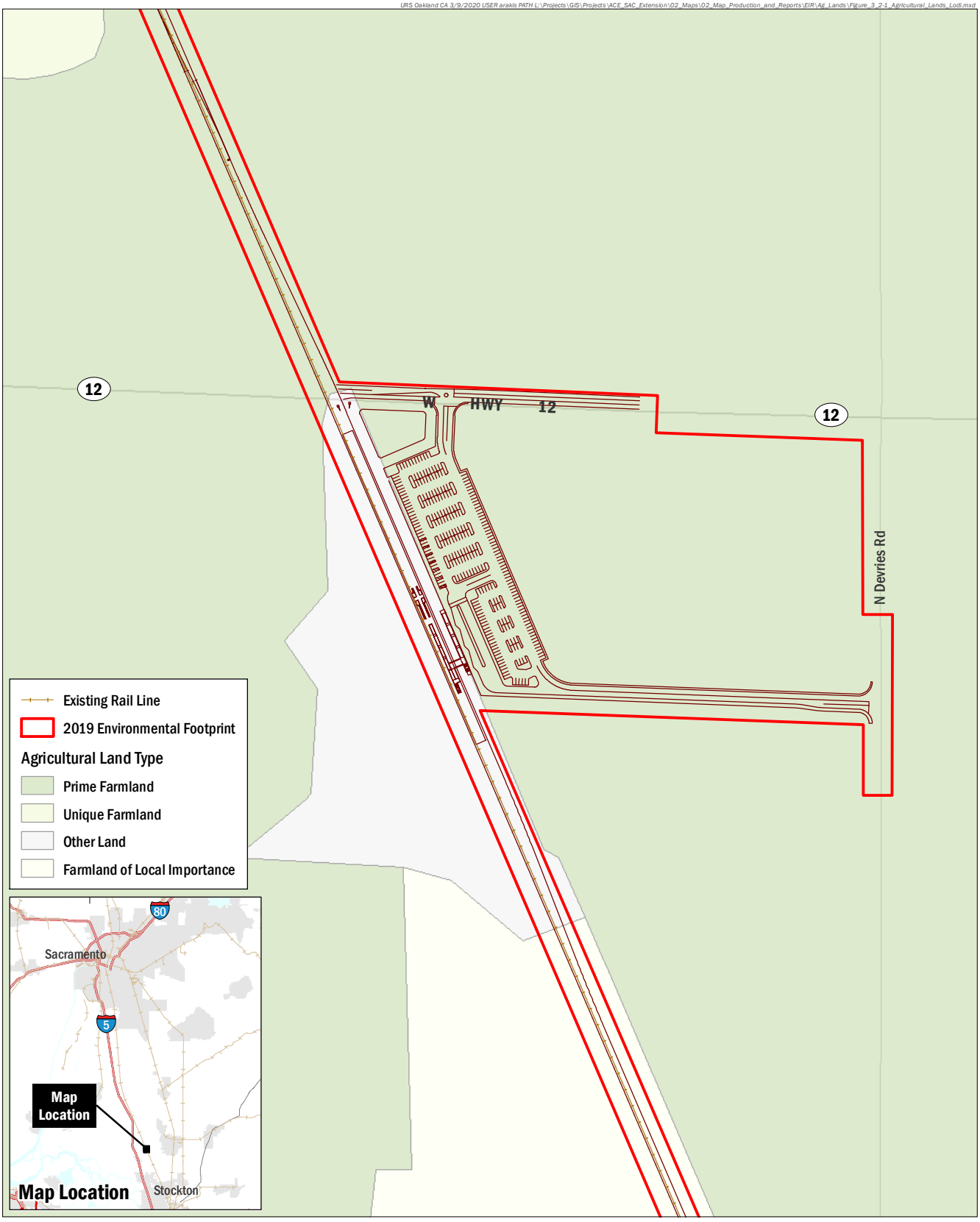
However, the Lodi Station and Lodi Station South Alternative sites in San Joaquin County (Figures 3.2-1 and 3.2-2) would be located in areas used for agricultural purposes (i.e., orchard, row and field crops) and within and adjacent to areas designated as Important Farmland or under Williamson Act contracts. Therefore, this section focuses on agriculture and forestry resources within San Joaquin County. It describes San Joaquin County's agricultural productivity and land uses; describes the significance, quality, and extent of agricultural land within the areas proposed for new stations and track improvements and within the county, including Important Farmland; and describes the factors that could potentially contribute to the conversion of irrigated agricultural land to nonirrigated uses.

3.2.3.1 San Joaquin County Agricultural Uses

Agricultural Productivity

San Joaquin County is California's seventh largest county in terms of agricultural production in the state. According to the 2017 Agricultural Report, the gross valuation for all agricultural commodities produced in San Joaquin County in 2017 was approximately $2.5 billion, which represents an 8.1 percent increase from the adjusted 2016 figure of $2.3 billion, a record high. Wine grapes had the highest crop value ($396 million) in the county. Milk production is the number two commodity, at $387 million, followed by almonds ($363 million), walnuts ($317 million), and cherries ($185 million) (San Joaquin County Agricultural Commissioner 2017).

[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.



Sources: Agricultural Lands: Counties of Sacramento & San Joaquin; Imagery: ESRI, 2017; Rail alignment: AECOM, 2019.

AECOM

San Joaquin Regional Rail Commission

FIGURE 3.2-1

Agricultural Lands Delineation
Lodi Station

Sources: Agricultural Lands: Counties of Sacramento & San Joaquin; Imagery: ESRI, 2017; Rail alignment: AECOM, 2019.

AECOM

San Joaquin Regional Rail Commission

FIGURE 3.2-2

Agricultural Lands Delineation
Lodi Station South Alternative

San Joaquin County Farmland Conversion

The Important Farmland classifications established by the California DOC—Prime Farmland, Farmland of Statewide Importance, Unique Farmland, and Farmland of Local Importance—identify the land's suitability for agricultural production by considering the physical characteristics of the soil, such as soil temperature range, depth of the groundwater table, flooding potential, rock fragment content, and rooting depth. The classifications also consider location, growing season, and the moisture available to sustain high-yield crops. For details on Important Farmland classifications, see the descriptions above.

Table 3.2-1 summarizes the acreages of agricultural land in San Joaquin County between 2006 and 2016 and shows the net change in acreage over that 10-year period. DOC estimated that San Joaquin County included 765,013 acres of agricultural land in 2006, of which 620,080 acres (81.1 percent) were classified as Important Farmland and 144,933 acres (18.9 percent) were classified as Grazing Land (DOC 2008). In 2016, the total acreage of agricultural land decreased to 744,835 acres, of which 615,075 acres (82.6 percent) were classified as Important Farmland and 129,760 acres (17.4 percent) were classified as Grazing Land (DOC 2016a). During the same period, the number of acres of Unique Farmland and Farmland of Local Importance increased by about 28,000 acres, or 42.5 percent, for a total rate of Important Farmland loss of 0.8 percent. The total acreage of grazing land has declined at a greater rate (11.7 percent) compared with the rate of decline of Important Farmland during this period.

Table 3.2-1. Summary of Agricultural Land Conversion in San Joaquin County

Important Farmland Category	Acres		Net Change (2006–2016)
	2006	2016	
Prime Farmland	407,609	381,634	-6.8
Farmland of Statewide Importance	89,274	82,618	-8.1
Unique Farmland	63,232	81,920	29.6
Farmland of Local Importance	59,965	68,903	12.9
Important Farmland Subtotal	**620,080**	**615,075**	**-0.8**
Grazing Land	144,933	129,760	-11.7
Agricultural Land Total	**765,013**	**744,835**	**-2.7**

Source: DOC 2008, 2016a

DOC field reports for San Joaquin County identify the factors contributing to changes in agricultural land uses. According to the most recent 2016 Field Report, conversion of irrigated Important Farmland (i.e., Prime Farmland, Farmland of Statewide Importance, or Unique Farmland) to Other Land resulted from land that was left idle for three or more update cycles, the construction of rural residences and commercial uses, and conversions to nonirrigated grain crops (DOC 2016b). Conversions of Important Farmland to Urban Land resulted mainly from the development of new homes near the city of Manteca and the Legacy Fields sports complex north of the city of Tracy. Conversely, Important Farmland increased mainly from new grapevines, almond orchards, and row crops (DOC 2016b).

Williamson Act

San Joaquin County had approximately 439,398 acres of land under Williamson Act contracts in 2015 (the most recent year for which data are available) (DOC 2016c). San Joaquin County also contains an additional 60,256 acres of land that are designated as Farmland Security Zone (FSZ) lands, which are areas where contracts are of longer duration than regular Williams Act contracts (DOC 2016c).

The nonrenewal process is the most common mechanism for termination of Williamson Act contracts, and most Williamson Act contracts are terminated through this process. In San Joaquin County as of 2015, approximately 2,526 acres were in some stage of the nonrenewal process, and the amount of contract land terminated through nonrenewal expirations totaled approximately 2,222 acres (DOC 2016c).

Urban development of Williamson Act lands before contract expiration requires canceling the contracts pursuant to California Government Code Section 51282 (see the discussion of the regulatory framework below). No Williamson Act contracts in San Joaquin County were canceled in 2015 (DOC 2016c).

Farm Infrastructure and Processes

Farm infrastructure typically includes irrigation and drainage systems, field access roads, power distribution systems, storage structures (e.g., silos and barns), and residences. Many of the croplands in the study area in San Joaquin County rely on the irrigation canals in the area. In the San Joaquin Valley, a grid of roads provides access to parcels throughout the valley. Agricultural productivity relies on each of these infrastructure elements to be able to perform its function reliably. If the irrigation system, for instance, is disrupted, access is cut off; if utilities are interrupted, productivity can fall.

Confined animal agriculture properties, such as dairies and heifer ranches, include areas for forage crop production (e.g., corn). The forage crop areas associated with confined animal agriculture receive dairy waste, in accordance with a nutrient management plan to dispose of solid and liquid waste in a manner that protects water quality. The requirements of the nutrient management plan include nutrient balance and manure containment, with application of the waste at an appropriate agronomic rate and under permit from the Central Valley Water Board. Herd size and the soil type of the receiving area tend to drive the amount of forage area needed to manage the nutrients from a dairy.

3.2.3.2 Existing Agricultural Uses

A range of agricultural uses occur adjacent to the UPRR ROW throughout San Joaquin County. These uses include orchards; seasonal row crops, such as hay, corn, strawberries, and alfalfa; and irrigated pasture (DWR 2015). Other common row and field crops sometimes included in crop rotations in San Joaquin County are rye, barley, oats, beans, broccoli, lettuce, cauliflower, safflower.

Agricultural uses on the Lodi Station site and areas north, south, and east of the site consist of wine grapes. The Lodi Station South Alternative site includes a dairy farm and associated support buildings, and the primary cultivated crop on the project site is corn grown for cattle feed.

Important Farmland

As shown in Table 3.2-1, the Lodi Station site consists of approximately 24.7 acres of land designated as Prime Farmland and 2.1 acres of land designated as Other Land; the Lodi Station South Alternative site consists of approximately 3.3 acres of land designated as Prime Farmland, 7.2 acres of land designated as Unique Farmland, and 1.2 acres of land designated as Other Land. In addition, active agricultural fields adjacent to these sites are designated as Important Farmland (Table 3.2-2).

Table 3.2-2. Important Farmland (acres)

Project Component	Prime Farmland	Unique Farmland	Other Land	Total
Lodi Station	24.7	--	2.1	26.8
Lodi Station South Alternative	3.3	7.2	1.1	11.6

Source: DOC 2016d

Williamson Act

The Lodi Station site (Assessor's Parcel Number [APN] 055-17-026) is under an active Williamson Act contract (Contract Number 710442) (San Joaquin County 2018).

Agricultural Zoning

The Lodi Station and Lodi Station South Alternative sites and adjacent parcels are zoned by San Joaquin County as AG-40 (General Agriculture, 40-acre minimum). The AG-40 zoning designation was established to preserve agricultural lands for the continuation of commercial agricultural enterprises. Permitted uses include single-family dwelling units, animal raising, crop production, grazing, and low-intensity structures associated with farming and agricultural processing and sales (San Joaquin County 2019).

3.2.4 Environmental Analysis

3.2.4.1 Methods for Analysis

The evaluation of the potential impacts of the proposed project on agriculture and forestry resources was based on a review of field conditions, aerial photographs, the California Department of Water Resources (DWR) Land Use Viewer, and DOC Important Farmland and farmland conversion data.

The Important Farmland Map for San Joaquin County, produced by the Department of Conservation Division of Land Resource Protection (DOC 2016d), and Williamson Act Contract Map (DOC 2009) for San Joaquin County were used to evaluate the agricultural significance of the lands in the study area. Geographic information system (GIS) data were used to determine the potential acreage of designated farmland affected by implementation of the proposed project.

Appendix G of the CEQA Guidelines focuses the analysis on conversion of agricultural land, including on Prime Farmland, Farmland of Statewide Importance, or Unique Farmland, to

nonagricultural use; therefore, any conversion of these lands would be considered a significant impact under CEQA. Improvements located within the existing UPRR ROW would have no impact on agricultural land uses. Project improvements proposed outside of the ROW in unincorporated Sacramento County and the city of Sacramento would occur in areas that are not used for agricultural purposes or on lands that are designated as Important Farmland or under Williamson Act contracts. As stated previously, the Lodi Station and Lodi Station South Alternative sites in San Joaquin County would occur in areas used for agricultural purposes (i.e., orchard, row and field crops), and within and adjacent to areas designated as Important Farmland or under Williamson Act contracts. Therefore, this analysis focuses on the impacts of the proposed project associated with these stations and related track improvements.

Noise and vibration impacts on confined animal facilities relied on the construction and operational noise modeling presented in Section 3.12, *Noise and Vibration*.

3.2.4.2 Thresholds of Significance

CEQA Guidelines Appendix G (14 California Code of Regulations, Section 15000 et seq.) has identified significance criteria to be considered for determining whether a project could have significant impacts on agricultural or forestry resources.

The project would result in a significant impact on agricultural and forestry resources if it would:

- Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to nonagricultural use.[3]
- Conflict with existing zoning for agricultural use or a Williamson Act contract.
- Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code Section 12220(g)), timberland (as defined by Public Resources Code Section 4526), or timberland zoned Timberland Production (as defined by Government Code Section 51104(g)).
- Result in the loss of forest land or conversion of forest land to non-forest use.
- Involve other changes in the existing environment, which, due to their location or nature, could result in conversion of Farmland to nonagricultural use or conversion of forest land to non-forest use.[4]

The project area is not zoned as forestland, timberland, or a Timberland Production Zone and does not contain 10 percent native tree cover that would be classified as forestland under Public Resources Code Section 12220(g) (see Section 3.4, *Biological Resources*, for further

[3] Conversion of Important Farmland addresses temporary use, permanent direct conversion, and permanent indirect conversion through parcel severance and creation of remnant parcels of Important Farmland.

[4] Other changes in the existing environment consist of impacts on Important Farmland as a result of (1) temporary and permanent disruption of agricultural infrastructure as a result of proposed project construction and (2) noise and vibration impacts at confined animal facilities as a result of proposed project construction and operation.

discussion).[5] Thus, the proposed project would not conflict with existing zoning for, or cause rezoning of, forestry resources or result in conversion of forest land to non-forest use, and analysis of these resources is not discussed further.

3.2.4.3 Impacts and Mitigation Measures

Impact AG-1: The proposed project would temporarily convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use during construction. However, this potentially-significant impact would be reduced to a less-than-significant level through implementation of Mitigation Measure AG-1.1 (Less-than-Significant Impact with Mitigation).

Construction of the Lodi Station or the Lodi South Alternative Station could temporarily convert Important Farmland to nonagricultural uses where construction access, material laydown, and staging areas are located on Important Farmland.

In addition, preconstruction and construction activities that occur on active farmland (i.e., land currently being prepared or used for agricultural production) could temporarily disrupt existing agricultural operations, remove land from agricultural production, and result in a temporary loss in agricultural productivity. If temporary staging areas are not immediately restored to former agricultural use (preconstruction condition) after construction, disruption in agricultural use may become permanent and result in permanent conversion of Important Farmland to nonagricultural use. Therefore, this impact would be potentially significant.

Mitigation Measure. Mitigation Measure AG-1.1 would reduce impacts from temporary use of Important Farmland during construction to a less-than-significant level by requiring any Important Farmland temporarily used for construction access, mobilization, material laydown, and staging to be returned to a condition equal to the preconstruction condition. The required restoration plan and SJRRC's oversight, ensuring that the restoration plan is properly implemented, would maintain Important Farmland in equal quantities to those at the beginning of construction.

AG-1.1: Restore Important Farmlands used for temporary staging areas.

Prior to any ground-disturbing activities at the site of a temporary construction staging area located on Important Farmland, the Contractor will prepare a restoration plan addressing specific actions, sequence of implementation, parties responsible for implementation and successful achievement of restoration for temporary impacts. Actions will include removing and stockpiling the top 18 inches of soil for replacement on-site during restoration activities. Before beginning construction use of sites on Important Farmland, the Contractor will submit the restoration plan to the SJRRC for review and obtain SJRRC approval (and if applicable, landowner approval). The restoration plan will

[5] Section 12220(g) defines forest land as land that can support 10 percent native tree cover of any species, including riparian woodland and hardwoods, under natural conditions and that allows for management of timber, aesthetics, fish and wildlife, biodiversity, water quality, recreation, and other public benefits.

include time-stamped photo documentation of the preconstruction conditions of all temporary staging areas.

The SJRRC will ensure that the contractor returns all construction access, material laydown, and staging areas on Important Farmlands to a condition equal to the preconstruction staging condition. This requirement is included in the design-build construction contract requirements.

Impact AG-2: The proposed project would permanently convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to nonagricultural use. However, this significant impact would be reduced to a less-than-significant level through implementation of Mitigation Measure AG-2.1 (Less-than-Significant Impact with Mitigation).

Permanent conversion of Important Farmland to nonagricultural uses would occur where the proposed project improvements intersect Important Farmland or, more specifically, where the direct impact area is situated on Important Farmland. Construction of platforms, parking lots, and bus drop-off and pickup areas on the Lodi Station site or on the Lodi Station South Alternative site (Figures 3.2-1 and 3.2-2) would permanently convert Important Farmland to nonagricultural use (Table 3.2-3).

Table 3.2-3. Important Farmland Permanently Converted to Nonagricultural Uses (acres)

Project Component	Prime Farmland	Unique Farmland	Total
Lodi Station	10.9	0	10.9
Lodi Station South Alternative	3.3	7.2	10.5

Source: DOC 2016d

Based on an analysis of the San Joaquin County Important Farmland map (DOC 2016d), construction of the Lodi Station would directly and permanently convert approximately 10.9 acres of Prime Farmland, and construction of the Lodi Station South Alternative would directly and permanently convert 3.3 acres of Prime Farmland and 7.2 acres of Unique Farmland (Table 3.2-3). These conversions would contribute to the incremental decline of Important Farmland in the county, region, and state, and would result in the irreversible conversion of this agricultural land. In 2016, approximately 615,100 acres of Important Farmland existed in San Joaquin County (Table 3.2-1). A permanent conversion of either approximately 10.9 acres of Important Farmland (with implementation of the Lodi Station) or approximately 10.5 acres of Important Farmland (with implementation of the Lodi Station South Alternative) would account for less than 1 percent of this total in San Joaquin County. The total conversion of Important Farmland would be small in the context of the county's entire agricultural land base and would not cause a substantial reduction in the county's total agricultural production. However, Appendix G of the CEQA Guidelines considers the conversion of Prime Farmland, Farmland of Statewide Importance, and Unique Farmland a significant impact under CEQA.

Mitigation Measure. Implementation of Mitigation Measure AG-2.1 would reduce impacts from permanent conversion of Important Farmland to a less-than-significant level by requiring purchase of agricultural conservation easements at a ratio of 1:1 for direct use of Important Farmland. This mitigation measure would be effective in minimizing the overall permanent conversion of Important Farmland to a nonagricultural use because it would preserve Important Farmland in an amount commensurate with the quantity and quality of the converted farmlands and within the same agricultural regions where the impacts would occur.

> **AG-2.1: Conserve Important Farmlands (Prime Farmland, Farmland of Statewide Importance, and Unique Farmland).**
>
> SJRRC will enter into an agreement with the Department of Conservation and its California Farmland Conservancy Program to implement agricultural land mitigation. SJRRC will fund the California Farmland Conservancy Program's work to identify suitable agricultural land for mitigation of impacts and to fund the purchase of agricultural conservation easements from willing sellers.
>
> The performance standards for this measure are to preserve Important Farmland in an amount commensurate with the quantity and quality of the converted farmlands, within the same agricultural regions as the impacts occur, at a replacement ratio of not less than 1:1 for Important Farmlands that are permanently converted to nonagricultural uses.
>
> SJRRC will document implementation of Mitigation Measure AG-2.1 through issuance of a compliance memorandum.

Impact AG-3: The proposed project would conflict with a Williamson Act contract (Less-than-Significant Impact).

The Lodi Station site (Assessor's Parcel Number 055-17-026) is under an active Williamson Act contract (Contract Number 710442) (San Joaquin County 2018). Approximately 13 acres of the 26-acre parcel would be acquired for construction of the Lodi Station. Per General Plan Policy LU -7.16, San Joaquin County requires a minimum parcel size of 20 acres to be eligible for enrollment in a Williamson Act contract (San Joaquin County 2016). Therefore, the remainder of the Lodi Station parcel would be ineligible for continued inclusion in San Joaquin County's Williamson Act program.

However, loss of Williamson Act contract status is not assumed to result in the conversion of agricultural land, including Important Farmland, unless a project otherwise directly or indirectly converts agricultural land to nonagricultural land. This is because parcels can be in agricultural use whether or not they are part of a voluntary Williamson Act contract. The loss of Important Farmland due to the Lodi Station is captured in Impact AG-2. As discussed below in Impact AG-5, no additional loss of farmland acreage would occur due to remaindering the rest of the Williamson Act protected area. Therefore, conflicts with an existing Williamson Act contract would be less than significant.

Impact AG-4: The proposed project would conflict with existing zoning for an agricultural use resulting in a significant impact. However, because implementation of Mitigation

Measure AG-4.1 may not be feasible, this impact would be a significant and unavoidable impact of the proposed project (Significant and Unavoidable Impact).

As noted above, the Lodi Station and Lodi Station South Alternative sites are zoned AG-40. The AG-40 zoning designation is established to preserve agricultural lands for the continuation of commercial agricultural enterprises. Transportation services are not permitted in the AG-40 zone (Table 9-605.2 of Division 6 in the County's Development Title 9) (San Joaquin County 2019). This zoning designation was adopted for the purpose of avoiding a physical environmental effect (see Section 3.11, *Land Use and Planning*, for further discussion of consistency with land use policies). The proposed stations would conflict with existing agricultural zoning by converting land zoned for agricultural uses to transit uses. This impact would be significant.

Mitigation Measures. Mitigation Measure AG-2.1 (described above) would reduce impacts from permanent conversion of agricultural land by requiring purchase of agricultural conservation easements, some of which could be zoned AG-40. However, conversion of agricultural land zoned for the continuation of agricultural uses to transit uses would occur. Implementation of Mitigation Measure AG-4.1 (described below) would mitigate the impact by changing the zoning designation from AG-40 to a designation that allows transit. However, SJRRC cannot guarantee successful implementation of the mitigation measure, since they are not responsible for approval of zoning designations in San Joaquin County. Therefore, the impact would be significant and unavoidable.

> **AG-4.1: Consult with the San Joaquin County Community Development Department and Board of Supervisors on the adoption of a change in zoning designation for the parcels proposed for the Lodi Station or the Lodi Station South Alternative.**
>
> SJRRC will consult and coordinate with the San Joaquin Community Development Department and the San Joaquin Board of Supervisors to change the zoning designation for the parcels proposed for the Lodi Station or Lodi Station South Alternative from the current AG-40 to a designation that allows transit uses.

Impact AG-5: The proposed project would not create unviable remnant or severed Important Farmland parcels (Less-than-Significant Impact).

SJRRC would acquire only the portion of the Lodi Station parcel or Lodi Station South Alternative parcel required for the passenger platforms, parking lots, and bus drop-off and pickup areas. As such, the Lodi Station would require severance of approximately 13 acres along the western boarder of a 26-acre parcel (Assessor's Parcel Number 055-17-026), and the Lodi Station South Alternative would require severance of approximately 12 acres along the western boarder of a 142-acre parcel (Assessor's Parcel Number 055-24-026). The remainder of these parcels would be of sufficient size (assumed to be greater than 20 acres) for the continuation of agricultural operations, and the parcels would not be fragmented or irregularly shaped to such a degree that continuing agricultural land uses would be difficult or infeasible. In addition, no access restrictions would occur. Therefore, neither the Lodi Station nor the Lodi Station South Alternative would result in the creation of unviable remnant farmland parcels. This impact would be less than significant.

Impact AG-6: The proposed project would not result in conversion of Farmland to nonagricultural use through temporary or permanent noise and vibration impacts on confined farm animals (Less-than-Significant Impact).

The Lodi Station South Alternative would be located in the vicinity of dairy operations northeast of the station site. The proposed project would generate noise and vibration from construction equipment and through increased frequency of trains passing by confined animal facilities. Confined animals that are unable to walk away from the noise source would experience increased exposure to noise. Noise and vibration can affect farm animal behavior and productivity and induce behavioral changes.

Cattle on dairies are constantly exposed to a variety of noises from farm equipment, farm machinery, and work activities that may have habituated them to noises at or above the presumed threshold for response (California High-Speed Railway Authority 2012). Background levels in cattle barns range from 61 to 90 decibels (dB); therefore, the noise threshold expected to cause a behavioral response by cattle is 85 to 90 dB (California High-Speed Railway Authority 2012; Brouček 2014). Noises greater than that threshold have provoked retreat, freezing, or strong startle response. Thresholds for discomfort for cattle have been noted at 90 to 100 dB (Brouček 2014). Since background levels can range as high as 90 dB and the threshold for discomfort is 90 dB, then a significant impact is considered possible if the project would result in construction noise or new train operational noise levels greater than 90 dB in areas that do not already experience train operations today.

Cattle in the vicinity of the project site are currently exposed to noise from the operation of freight trains. Freight trains are generally louder than passenger trains because freight trains require larger engines to pull heavier cargo and more cars. Because the proposed project would use an existing railway that currently experiences train trips throughout the day and night, cattle are accustomed to the noise and disruption of passing trains.

Construction of the Lodi Station South Alternative would generate noise and vibration from construction equipment and vehicles. As discussed in Section 3.12, *Noise and Vibration*, construction work would result in equipment noise at 50 feet from the equipment of up to 90 A-weighted decibels (dBA) for rail work and up to 61 dBA for operation. Thus, in order to exceed the threshold of 90 dB, construction work would need to be closer to confined animal facilities than 50 feet. The cattle barn and holding area would be 150 feet or more from staging areas and 350 feet or more from construction activities. Therefore, construction noise is not expected to exceed 90 dB at the barn or holding area.

Implementation of the proposed project would add two San Joaquins round trips and five ACE round trips per day, resulting in an increase in noise exposure through increased frequency of trains passing, brief idling of trains at the station, and the introduction of vehicle noise in the parking lot. The cattle holding areas would be more than 300 feet from the station access road and parking lot and more than 600 feet from the station platform. Therefore, the operation of the Lodi Station South Alternative would not be expected to substantially alter animal health or behavior from increased exposure to noise and vibration, and this impact would be less than significant.

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3.3 Air Quality

3.3.1 Introduction

This section describes the regulatory and environmental setting for air quality in the vicinity of the Valley Rail Sacramento Extension Project (proposed project). This section also describes the impacts on air quality that would result from the implementation of the proposed project, and mitigation measures that would reduce significant impacts, where feasible and appropriate. Appendix B, ~~*Quantification of Criteria Air Pollutant and Greenhouse Gas Emissions, and Energy Use*~~ *Air Quality, Health Risk Assessment, Greenhouse Gas, and Energy*, contains additional technical information and calculations in support of this section's analysis.

This section analyzes air quality impacts of the proposed project due to the proposed extension from Stockton to Natomas. Construction and operational emissions are analyzed for proposed improvements between Stockton and Natomas. Greenhouse gas (GHG) emissions are discussed separately in Section 3.8, *Greenhouse Gas Emissions*. Cumulative impacts on air quality, in combination with planned, approved, and reasonably foreseeable projects, are discussed in Chapter 4, *Other CEQA-Required Analysis*.

During the public scoping comment period, the following comments relevant to air quality were received and have guided the impact analysis herein:

- The Sacramento Metropolitan Air Quality Management District (SMAQMD) requested that the environmental document discuss, quantify, and disclose potential construction and operational emissions of criteria air pollutants, and provide mitigation as appropriate, using the methods identified in chapters 3 and 4 of SMAQMD's *Guide to Air Quality Assessment in Sacramento Count* (Guidance). SMAQMD also requested that potential health impacts from exposure to toxic air contaminants be addressed using chapter 5 of SMAQMD's Guidance and the Mobile Source Air Toxics (MSAT) Protocol to assess exposure in Sacramento County.

- The San Joaquin Valley Unified Air Pollution Control District (SJVAPCD) requested that criteria air pollutant emissions be identified and quantified for construction and operations under the proposed project. Emissions should be compared to the SJVAPCD-recommended thresholds of significance. In addition, construction-related emissions should be minimized through use of the "cleanest reasonably available off-road construction fleets" (i.e., equipment powered by the least-emitting engines, such as those that meet current Tier 4 engine emission standards). SJVAPCD recommended the use of the California Emissions Estimator Model (CalEEMod) to estimate project-related emissions. SJVAPCD also recommended that the proposed project evaluate potential health impacts to surrounding receptors from construction-related and operational emissions. SJVAPCD recommended using a quantification methodology for a screening analysis to support the evaluation of potential health risks and ambient air quality, including a prioritization calculation and air dispersion modeling. SJVAPCD further recommended the consideration of nuisance odors using a qualitative analysis and consideration of proposed project elements and proximity to off-site receptors. Finally, SJVAPCD provided recommended mitigation measures and SJVAPCD rules and

regulations that would reduce emissions found to exceed SJVAPCD-recommended thresholds of significance.

The comments received during the scoping period are included in Appendix A, *NOP and Scoping Summary Report.*

3.3.2 Regulatory Setting

This section summarizes federal, state, regional, and local regulations related to air quality that are applicable to the proposed project. Relevant regulatory agencies for air quality include the U.S. Environmental Protection Agency (EPA), California Air Resources Board (CARB), SJVAPCD, and SMAQMD. EPA has established federal air quality standards for which CARB, SJVAPCD, and SMAQMD have primary implementation responsibility. CARB has established state air quality standards, and CARB, SJVAPCD, and SMAQMD are responsible for ensuring that state air quality standards are met.

3.3.2.1 Federal

Clean Air Act and Ambient Air Quality Standards

The primary legislation that governs federal air quality regulations is the Clean Air Act (CAA), enacted in 1970 and amended by Congress most recently in 1990. The CAA delegates primary responsibility for clean air to EPA. EPA develops rules and regulations to preserve and improve air quality and delegates specific responsibilities to state and local agencies. The CAA directs EPA to establish federal air quality standards, known as national ambient air quality standards (NAAQS) for six criteria air pollutants: ozone, carbon monoxide (CO), particulate matter (PM) of 10 microns in diameter and smaller (PM_{10}) and 2.5 microns in diameter and smaller ($PM_{2.5}$), sulfur dioxide (SO_2), nitrogen dioxide (NO_2) and lead. NAAQS include both primary and secondary standards; the former are set to protect public health with an adequate margin of safety, the latter to prevent degradation to the environment (e.g., impairment of visibility, damage to vegetation).

The CAA also mandates that each state submit and implement an air quality control plan, referred to as a state implementation plan (SIP) for local areas not meeting NAAQS. The SIP must include pollution control measures that demonstrate how the standards will be met by the dates specified in the CAA. EPA is responsible for reviewing all SIPs to determine whether they conform to the mandates of the CAA and its amendments and to determine whether implementing them will achieve ambient air quality standards. If EPA determines a SIP to be inadequate, a federal implementation plan that imposes additional control measures may be prepared for the nonattainment area. Table 3.3-1 summarizes NAAQS currently in effect for each criteria air pollutant.

Table 3.3-1. National and California Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards[a]	National Standards[b]	
		Concentration[c]	Primary[c,d]	Secondary[c,e]
Ozone [f]	1 hour	0.09 ppm (180 µg/m^3)	–	Same as primary standard
	8 hours	0.070 ppm (137 µg/m^3)	0.070 ppm (147 µg/m^3)	
Respirable particulate matter—10 micrometers or less[g]	24 hours	50 µg/m^3	150 µg/m^3	Same as primary standard
	Annual arithmetic mean	20 µg/m^3	–	
Fine particulate matter—2.5 micrometers or less[g]	24 hours	–	35 µg/m^3	Same as primary standard
	Annual arithmetic mean	12 µg/m^3	12 µg/m^3	15 µg/m
Carbon monoxide	8 hours	9.0 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)	None
	1 hour	20 ppm (23 mg/m^3)	35 ppm (40 mg/m^3)	
	8 hours (Lake Tahoe)	6 ppm (7 mg/m^3)	–	–
Nitrogen dioxide[h]	Annual arithmetic mean	0.030 ppm (57 µg/m^3)	0.053 ppm (100 µg/m^3)	Same as primary standard
	1 hour	0.18 ppm (339 µg/m^3)	100 ppb (188 µg/m^3)	None
Sulfur dioxide[i]	Annual arithmetic Mean	–	0.030 ppm (for certain areas) [i]	–
	24 hours	0.04 ppm (105 µg/m^3)	0.14 ppm (for certain areas) [i]	–
	3 hours	–	–	0.5 ppm (1,300 µg/m^3)
	1 hour	0.25 ppm (655 µg/m^3)	75 ppb (196 µg/m^3)	–
Lead[j,k]	30-day average	1.5 µg/m^3	–	–
	Calendar quarter	–	1.5 µg/m^3 (for certain areas) [j]	Same as primary standard
	Rolling 3-month average	–	0.15 µg/m^3	
Visibility-reducing particles[l]	8 hours	See footnote l	No national standards	
Sulfates	24 hours	25 µg/m^3		
Hydrogen sulfide	1 hour	0.03 ppm (42 µg/m^3)		
Vinyl chloride[j]	24 hours	0.01 ppm (26 µg/m^3)		

Notes: µg/m^3 = micrograms per cubic meter; mg/m^3 = milligrams per cubic meter; ppb = parts per billion; ppm = parts per million

[a] California standards for ozone, carbon monoxide (except 8-hour Lake Tahoe), sulfur dioxide (1- and 24-hour), nitrogen dioxide, and particulate matter (PM_{10}, $PM_{2.5}$, and visibility-reducing particles), are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.

[b] National standards (other than ozone, particulate matter, and those based on annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest 8-hour concentration measured at each site in a year, averaged over 3 years, is equal to or less than the standard. For PM_{10}, the 24-hour is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 µg/m^3 is equal to or less than 1. For $PM_{2.5}$, the 24-hour standard is attained when 98% of the daily concentrations, averaged over 3 years, are equal to or less than the standards.

[c] Concentration expressed first in the units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25 degrees Celsius (°C) and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and reference pressure of 760 torr; "ppm" in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

[d] *National Primary Standards:* The levels of air quality necessary, with an adequate margin of safety, to protect the public health.

[e] *National Secondary Standards:* Levels of air quality necessary to protect public welfare from any known or anticipated adverse effects of a pollutant.

[f] On October 1, 2015, the national 8-hour ozone primary and secondary standards were lowered from 0.075 to 0.070 ppm.

[g] On December 14, 2012, the national annual $PM_{2.5}$ primary standard was lowered from 15 µg/m^3 to 12.0 µg/m^3. The existing national 24-hour $PM_{2.5}$ standards (primary and secondary) were retained at 35 µg/m^3, as was the annual secondary standard of 15 µg/m^3. The existing 24-hour PM_{10} standards (primary and secondary) of 150 µg/m^3 also were retained. The form of the annual primary and secondary standards is the annual mean, averaged over 3 years.

[h] To attain the 1-hour national standard, the 3-year average of the annual 98th percentile of the 1-hour daily maximum concentrations at each site must not exceed 100 ppb. California standards are in units of ppm. To directly compare the national 1-hour standard to the California standards, the units can be converted from 100 ppb to 0.100 ppm.

[i] On June 2, 2010, a new 1-hour SO_2 standard was established and the existing 24-hour and annual primary standards were revoked. To attain the 1-hour national standard, the 3-year average of the annual 99th percentile of the 1-hour daily maximum concentrations at each site must not exceed 75 ppb. The 1971 SO_2 national standards (24-hour and annual) remain in effect until 1 year after an area is designated for the 2010 standard, except that in areas designated nonattainment for the 1971 standards, the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standards are approved. To directly compare the 1-hour national standard to the California standard, the units can be converted to ppm. In this case, the national standard of 75 ppb is identical of 0.075 ppm.

[j] CARB has identified lead and vinyl chloride as toxic air contaminants with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

[k] The national standard for lead was revised on October 15, 2008, to a rolling 3-month average. The 1978 lead standard (1.5 µg/m^3 as a quarterly average) remains in effect until 1 year after an area is designated for the 2008 standard, except that in areas designated nonattainment for the 1978 standard, the 1978 standard remains in effect until implementation plans to attain or maintain the 2008 standards are approved.

[l] In 1989, CARB converted both the general statewide 10-mile visibility standard and the Lake Tahoe 30-mile visibility standard to instrumental equivalents, which are "extinction of 0.23 per kilometer" and the "extinction of 0.07 per kilometer" for the statewide and Lake Tahoe Air Basin standards, respectively.

Source: CARB 2019

Corporate Average Fuel Economy Standards and the Safer Affordable Fuel-Efficient Vehicles Rule

EPA and the National Highway Traffic Safety Administration (NHTSA) set Corporate Average Fuel Economy (CAFE) standards for passenger cars and for light trucks (collectively, light-duty vehicles), and separately set fuel efficiency standards for passenger cars and light trucks for model years 2012 through 2025.

The Safer Affordable Fuel Efficient (SAFE) Vehicles Rule, proposed by the United States Department of Transportation and EPA in 2018, would amend the existing CAFE standards and establish new standards for model years 2021 through 2026. The proposed rule would retain the model year 2020 standards through model year 2026. In response to the proposed SAFE Vehicles Rule, on July 25, 2019, automobile manufactures Ford, Volkswagen, Honda, and BMW entered into a voluntary framework agreement with CARB to set fuel economy and carbon dioxide limits at levels between the existing federal standards and the standards proposed by the SAFE Vehicles Rule. Under this framework, the auto companies' party to the voluntary agreement would only sell cars in the United States that meet these levels.

On September 27, 2019, EPA and NHTSA published the "SAFE Vehicles Rule Part One: One National Program." (84 FR 51310, Sept. 27, 2019). The Part One Rule revokes California's authority to set its own GHG emissions standards and set zero-emission vehicle mandates in California. Part 2 of the regulations, which would address fuel efficiency standards for light-duty vehicles, model years 2021 through 2026, are still pending.

Locomotive Emissions Standards

In March 2008, EPA adopted a three-part emissions standard program to reduce emissions from diesel locomotives over time. The regulation tightens emission standards for existing remanufactured locomotives, and sets exhaust emission standards for newly built locomotives of model years 2011-2014 (Tier 3) and 2015 and beyond (Tier 4). The regulation is expected to reduce PM emissions from applicable engines by as much as 90% and oxides of nitrogen (NO_X) emissions by as much as 80% when fully implemented.

3.3.2.2 State

California Clean Air Act and Ambient Air Quality Standards

In 1988, the state legislature adopted the California CAA, which established a statewide air pollution control program. The California CAA required CARB to establish California Ambient Air Quality Standards (CAAQS). The California CAA requires that all air districts in the state endeavor to achieve and maintain the CAAQS by the earliest practicable date. The California CAA establishes increasingly stringent requirements for areas that will require more time to achieve the standards. The act specifies that local air districts should focus their attention on reducing the emissions from transportation and area-wide emission sources and provides districts with the authority to regulate indirect sources. CAAQS are generally more stringent than NAAQS and incorporate additional standards for sulfates, hydrogen sulfide, visibility-reducing particles, and vinyl chloride. Differences in the standards are generally explained by the health effects studies

considered during the standard-setting process and the interpretation of the studies. 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, EPA has delegated authority to CARB to prepare the SIP. Air districts and other agencies prepare air quality attainment plans or air quality management plans, and submit them to CARB for review, approval, and incorporation into the applicable SIP. CARB also maintains air quality monitoring stations throughout the state in conjunction with air districts. CARB uses the data collected at these stations to classify air basins as being in attainment or nonattainment with respect to each pollutant and to monitor progress in attaining air quality standards.

California's adopted 2007 State Strategy for the State Implementation Plan for Federal $PM_{2.5}$ and 8-Hour Ozone Standards (2007 SIP) was submitted to EPA in November 2007 as a revision to the SIP (CARB 2017c). In July 2011, CARB approved revisions to the 2007 SIP that updated the CARB rulemaking calendar, adjusted transportation conformity budgets, revised reasonable further progress tables and made associated reductions for contingency purposes, and updated actions to identify advanced emission control technologies (CARB 2017c). In 2008, EPA strengthened the 8-hour ozone standard to 75 parts per billion (ppb), and again further strengthened this standard in 2015 to 70 ppb. Sixteen areas in California were designated nonattainment in 2012. In 2012, EPA also strengthened the annual $PM_{2.5}$ standard to 12 micrograms per cubic meter (µg/m3) and designated four areas in California as nonattainment for this standard. CARB released the Revised Proposed 2016 State Strategy for the State Implementation Plan, describing the proposed commitment to achieve the reductions necessary from mobile sources, fuels, and consumer products to meet federal ozone and $PM_{2.5}$ standards over the next 15 years (CARB 2017c).

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 proposed 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. In December 2004, CARB adopted a fourth phase of emission standards (Tier 4) in the Clean Air Non-road Diesel Rule that are nearly identical to those finalized by EPA earlier that year. The standards required engine manufacturers to meet after-treatment–based exhaust standards for NO_X and PM, starting in 2011, putting emissions from off-road engines virtually on par with those from on-road, heavy-duty diesel engines. CARB has also adopted control measures for diesel particulate matter (DPM) and more stringent emissions standards for various on-road mobile sources of emissions, including transit buses and off-road diesel equipment (e.g., tractors, generators).

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 they are CARB-certified. Violation of the requirement for certification can subject the vehicle manufacturers and/or selling dealers to enforcement actions, including fines.

Carl Moyer 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, air districts administer the Carl Moyer Program.

Toxic Air Contaminant Regulation

California regulates toxic air contaminants (TACs) primarily through the Toxic Air Contaminant Identification and Control Act (Tanner Act) 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 DPM from diesel-fueled engines as a TAC. Federal and state efforts to reduce diesel PM emissions have focused on the use of improved fuels, adding particulate filters to engines, and requiring the production of new-technology engines that emit fewer exhaust particulates. In September 2000, CARB approved a comprehensive Diesel Risk Reduction Plan to reduce emissions from both new and existing diesel-fueled engines and vehicles. The goal of the plan is to reduce DPM (respirable particulate matter) emissions and the associated health risk by 75% in 2010 and by 85% by 2020. Diesel engines tend to produce a much higher ratio of fine particulates than other types of internal combustion engines. The fine particles that make up diesel PM tend to penetrate deep into the lungs and the rough surfaces of these particles makes it easy for them to bind with other toxins within the exhaust, thus increasing the hazards of particle inhalation. Long-term exposure to diesel PM is known to lead to chronic, serious health problems including cardiovascular disease, cardiopulmonary disease, and lung cancer. ~~The plan identifies 14 measures that CARB will implement over the next several years.~~

3.3.2.3 Regional and Local

The San Joaquin Joint Powers Authority (SJJPA), a state joint powers agency, and the San Joaquin Regional Rail Commission (SJRRC) propose improvements within and outside of the Union Pacific Railroad (UPRR) right-of-way (ROW). The Interstate Commerce Commission Termination Act (ICCTA) affords railroads engaged in interstate commerce considerable flexibility in making necessary improvements and modifications to rail infrastructure, subject to the requirements of the Surface Transportation Board.[1] ICCTA broadly preempts state and local regulation of railroads, and this preemption extends to the construction and operation of rail lines. Therefore, activities in existing UPRR ROW are exempt from local building and zoning codes and other land use ordinances. Project improvements proposed outside of the UPRR ROW, however, would be subject to regional and local plans and regulations. Although ICCTA does broadly preempt state and local regulation of railroads, SJJPA and SJRRC intend to obtain local agency

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

permits for construction of facilities that fall outside of the UPRR ROW, even though SJRRC has not determined that such permits are legally necessary, and such permits may not be required.

Appendix E, *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 project improvements are proposed. 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 preparation of this analysis, and reviewed to assess whether the proposed project would be consistent with the plans of relevant jurisdictions.[2] The proposed project would be generally consistent with the applicable goals, policies, and objectives related to air quality identified in Appendix E.

San Joaquin Valley Air Pollution Control District

SJVAPCD has local air quality jurisdiction in the San Joaquin Valley Air Basin (SJVAB), including San Joaquin County, but does not have land use jurisdiction or jurisdiction over mobile sources. SJVAPCD (2015) prepared the Guide for Assessing and Mitigating Air Quality Impacts (GAMAQI) to assist lead agencies and project applicants in evaluating the potential air quality impacts of projects in the SJVAB. GAMAQI provides SJVAPCD-recommended procedures for evaluating potential air quality impacts during the CEQA environmental review process.

SJVAPCD has adopted several attainment plans to achieve state and federal air quality standards. The 2004 Extreme Ozone Attainment Demonstration Plan for 1-hour Ozone was adopted on October 8, 2004, submitted to EPA on November 15, 2004, and the Clarifications Regarding the 2004 Extreme Ozone Attainment Demonstration Plan for 1-hour Ozone was adopted on August 21, 2008. EPA proposed approval and partial disapproval of the 2004 Extreme Ozone Attainment Demonstration Plan for 1-hour Ozone on June 30, 2009. In September 2013, SJVAPCD adopted the 2013 Plan for the Revoked 1-hour Ozone Standard. The 2007 Ozone Plan for 8-hour ozone was adopted on April 30, 2007. The 2016 Plan for the 2008 8-Hour Ozone Standard addresses the 75 ppb ozone standard and was adopted on June 16, 2016. The 2016 Ozone Plan contains a comprehensive list of regulatory and incentive-based measures to reduce reactive organic gases (ROG) and NO_X emissions. In particular, the plan proposes a 60% reduction in NO_X by 2031.

The 2007 PM_{10} Maintenance Plan and Request for Redesignation was approved by CARB on October 25, 2007; EPA designated the SJVAB as an attainment/maintenance area for PM_{10}. The 2015 Plan for the 1997 $PM_{2.5}$ Standard was adopted on April 16, 2015, and the 2016 Moderate Area Plan for the 2012 $PM_{2.5}$ Standard was adopted on September 15, 2016. SJVAPCD adopted an updated $PM_{2.5}$ plan on November 15, 2018. The 2018 Plan for the 1997, 2006, and 2012 $PM_{2.5}$ Standards addresses the EPA federal 1997 annual $PM_{2.5}$ standard of 15 µg/m³ and 24-hour $PM_{2.5}$ standard of 65 µg/m³; the 2006 24-hour $PM_{2.5}$ standard of 35 µg/m³; and the 2012 annual $PM_{2.5}$ standard of 12 µg/m³. This plan demonstrates attainment of the federal $PM_{2.5}$ standards as expeditiously as practicable.

[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.

District rules that could be applicable to the proposed project may include, but are not limited to, the following:

- Rule 2010 (Permits Required). This rule requires any person constructing, altering, replacing, or operating any source operation which 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 fewer 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 within the district.
- Rule 4601 (Architectural Coatings). This rule limits volatile organic compounds (VOCs) emissions from architectural coatings.
- Rule 4641 (Cutback, Slow Cure, and Emulsified Asphalt, Paving and Maintenance Operations). This rule limits VOC emissions by restricting the application and manufacturing of certain types of asphalt for paving and maintenance operations.
- Rule 8011 (General Requirements—Fugitive Dust Emission Sources). This rule outlines requirements for implementation of control measures for fugitive dust emission sources.
- 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 PM_{10} per year.

San Joaquin Council of Governments

The San Joaquin Council of Governments (SJCOG) is a joint-powers authority composed of the County of San Joaquin and the cities of Stockton, Lodi, Manteca, Tracy, Ripon, Escalon, and Lathrop. SJCOG serves as the regional transportation planning agency, which provides a forum for regional decision-making on issues such as growth, transportation, environmental management, housing, open space, air quality, fiscal management, and economic development. SJCOG also analyzes population statistics, airport land use, habitat and open space planning, and other regional issues.

Sacramento Metropolitan Air Quality Management District

SMAQMD has local jurisdiction in the Sacramento County portion of the Sacramento Valley Air Basin (SVAB), with responsibility over a comprehensive program of planning, regulation, enforcement, technical innovation, and promotion of the understanding of air quality issues. SMAQMD inspects stationary sources of air pollution, responds to citizen complaints, monitors

ambient air quality and meteorological conditions, and implements programs and regulations required by the CAA, Clean Air Act Amendments (CAAA), and the California CAA. The clean-air strategy of SMAQMD includes the preparation of plans and programs for the attainment of ambient air-quality standards, adoption and enforcement of rules and regulations concerning sources of air pollution, and issuance of permits for stationary sources of air pollution.

The following outlines several attainment plans adopted by SMAQMD to achieve and maintain state and federal air quality standards.

- Redesignation Substitution (RS) for the 1979 1-hour Ozone NAAQS for the Sacramento Federal Ozone Nonattainment Area (SFNA): The RS demonstrates that the SFNA met EPA's requirements to be redesignated as attainment for the revoked 1979 1-hour NAAQS. The RS request has been forwarded to EPA by CARB. Once approved by EPA, this RS request will redesignate the SFNA to attainment and remove the previous CAA obligations associated with that standard.
- Attainment Plan for the 2008 Ozone NAAQS: This attainment plan demonstrates attainment within the SFNA for the 2008 8-hour NAAQS by an attainment year of 2024. This plan was approved by CARB on November 16, 2017 and forwarded on to EPA.
- $PM_{2.5}$ Maintenance Plan and Redesignation Request: This plan addresses how the region attained and would continue to attain the 24-hour $PM_{2.5}$ standard. On May 10, 2017, EPA found that the area attained the 2006 24-hour $PM_{2.5}$ NAAQS by the attainment date of December 31, 2015 (82 FR 21711).
- PM_{10} Implementation/Maintenance Plan and Redesignation Request for Sacramento County: This Maintenance Plan showed maintenance from 2012 through 2022. EPA approved the PM_{10} Plan, which allowed EPA to proceed with the redesignation of Sacramento County as attainment for the PM_{10} NAAQS. SMAQMD will prepare and submit a second maintenance plan in 2020 to demonstrate maintenance of the PM_{10} standard through 2032.
- 1991 Air Quality attainment Plan (and subsequent Triennial Assessments): This attainment plan addresses Sacramento County's nonattainment status for the ozone, CO, and PM_{10} CAAQS.

The rules and regulations include procedures and requirements to control the emission of pollutants and to prevent adverse impacts. All projects within SMAQMD's jurisdictional area are subject to SMAQMD rules and regulations in effect at the time of construction. Specific SMAQMD rules that could be applicable to the proposed project may include, but are not limited to, the following:

- Rule 201: General Permit Requirements. Any project that includes the use of equipment capable of releasing emissions to the atmosphere may be required to obtain permit(s) from SMAQMD before equipment operation. The applicant, developer, or operator of a project that includes an emergency generator, boiler, or heater should contact SMAQMD early to determine whether a permit is required and to begin the permit application process. Portable construction equipment (e.g., generators, compressors, pile drivers,

lighting equipment) with an internal combustion engine greater than 50 horsepower must have a SMAQMD permit or CARB portable-equipment registration.

- Rule 402: Nuisance. A developer and proposed project cannot emit any quantities of air contaminants or other materials that would cause injury, detriment, nuisance, or annoyance to any considerable number of persons or the public; or that would endanger the comfort, repose, health, or safety of any persons or the public; or that would cause or have natural tendency to cause injury or damage to business or property.
- Rule 403: Fugitive Dust. The developer or contractor is required to control dust emissions from earthmoving activities or any other construction activity to prevent airborne dust from leaving the project site.
- Rule 442: Architectural Coatings. The developer or contractor is required to use coatings that comply with the content limits for VOCs specified in the rule.
- Rule 453: Cutback and Emulsified Asphalt Paving Materials. The developer or contractor is required to use asphalt paving materials that comply with the VOC content limits specified in the rule.

In addition, SMAQMD recommends that all construction projects include Basic Construction Emission Control Practices, as outlined in the SMAQMD CEQA Guide (SMAQMD 2017c), and that any projects with construction mitigation requirements must reduce emissions from off-road equipment. If modeled construction-generated emissions for a project are not reduced to SMAQMD's threshold of significance by application of these standard construction mitigation measures, then a mitigation fee may be assessed to achieve the necessary mitigation.

Sacramento Area Council of Governments

The Sacramento Area Council of Governments (SACOG) serves as the metropolitan planning organization (MPO) for the Sacramento region, developing a regional Metropolitan Transportation Plan (MTP) and Sustainable Communities Strategy (SCS) in coordination with each of the local 28 member cities and counties. SACOG plays a central role in transportation infrastructure planning for the region, while also serving as a forum for the study, planning, and resolution of other planning issues facing the local member governments. The most recent 2020 MTP/SCS for the SACOG region was adopted in November 2019. The 2020 MTP/SCS lays out a plan that links land use, air quality, and transportation needs.

Local General Plans

State law requires each city and county to adopt a general plan "for the physical development of the county or city, and any land outside its boundaries which bears relation to its planning" (§65300). In addition, the cities and counties within the jurisdiction of SJVAPCD must also address air quality in their general plans.

Appendix E, *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 project improvements are proposed. Section 15125(d) of the California Environmental Quality Act (CEQA) Guidelines requires an environmental impact report (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 reviewed to assess whether the proposed project would be consistent with the plans of relevant jurisdictions.[3] The proposed project would be generally consistent with the applicable goals, policies, and objectives related to air quality resources identified in Appendix E.

Table 3.3-2 provides a summary of the county and city general plans that have been identified, reviewed, and considered during the preparation of this analysis.

Table 3.3-2. Local General Plans Regarding Air Quality

Title	Summary
County	
San Joaquin County	
San Joaquin County General Plan 2035 (2016)	The General Plan includes an Air Quality section in the Public Health and Safety Element, which outlines existing air quality conditions and local air quality planning, as well as federal and state ambient air quality standards that the County must comply with. The Plan includes policies to protect human health, such as meeting all state and federal standards, minimizing motor vehicle emissions through land use and transportation strategies, coordinating with the SJVAPCD and supporting its efforts, and minimizing hazards from toxic air contaminants. It also includes goals within the Transportation and Mobility section of the General Plan that aim to improve the transportation system in ways that would ultimately reduce vehicle miles traveled, conserve energy resources, minimize air pollution, and reduce greenhouse gas emissions.
Sacramento County	
Sacramento County General Plan of 2005–2030 (2011, Air Quality and Circulation elements amended 2017)	The Sacramento County General Plan contains a set of goals, policies, and programs that address important community issues and is the basis for land use and public policy decisions made by the Board of Supervisors and other policy makers. The Plan includes an Air Quality Element that contains several goals and policies specifically aimed at improving air quality in the region. The Element includes policies that promote alternatives to automobile-oriented development, thereby reducing motor vehicle emissions; require construction and new development compliance with thresholds of significance adopted by the SMAQMD; require all feasible reductions in emissions for the operation of construction vehicles and equipment; and limit idling of on- and off-road engines. The Plan also includes goals within the Circulation Element to provide an interconnected transportation system that includes all modes of travel—automobile, transit, pedestrian, and biking, as well as to specifically promote the maintenance and improvement of rail transportation.

[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.

Title	Summary
City	
Lodi	
	The Lodi General Plan is a comprehensive policy document that expresses the community's long-term vision to promote continued compact form and emphasizes the preservation of surrounding agricultural and viticulture lands. Policies that either directly or indirectly address air quality are included in several elements of the General Plan, including Community Design and Livability, Transportation, and Conservation; within the Conservation element, the sub-sections of Energy and Climate Change and Air Quality directly address air quality issues. Each of these elements contain policies relevant to the project, including those that encourage continued commuter rail service and ridership on public transit systems, as well as an overall reduction of vehicle miles traveled (VMT), and require the construction and operation of new development to implement best management practices for reducing air pollutant emissions.
Elk Grove	
	The General Plan includes a Conservation and Air Quality Element that details policies aimed at minimizing air pollutant emissions and improving the City's air quality. The policies state that the City shall monitor the air quality and consider implementing a population cap if it declines; support and encourage alternative modes of transportation; and reduce commuting rates. Policies in the Circulation Element of the General Plan also seek to improve air quality by encouraging the use of transport modes other than single-occupant vehicles and by making the flow of vehicles on the city's roadways as smooth as possible.
Sacramento	
	The 2035 General Plan defines a roadmap to achieving the City's vision to be "the most livable city in America." It serves as a legal document with which many City actions and programs are required to be consistent. The Environmental Resources element contains an air quality section that includes goals and policies to reduce air pollutant emissions from new development and mobile sources. In addition, the Mobility element contains policies to create a well-connected transportation system. The vision of the City is one that fosters increased transit use through an enhanced multimodal system and multi-jurisdictional transportation planning. Policies M 3.2.1 and M 3.2.3 specifically speaks to the intent to enhance passenger rail service to and through the Sacramento area, such as the service that would be achieved from the proposed project; these improved multimodal transportation systems are recognized as providing a regional benefit to air quality and reducing greenhouse gas emissions.

Although the proposed project would increase emissions from diesel multiple units in the jurisdictions the alignment traverses, it is expected to result in a transportation mode shift (i.e., attract passengers who otherwise would have driven cars). This shift would reduce travel by highway vehicles, reducing mobile source emissions and congestion. Accordingly, emissions associated with operation of the proposed project would not be inconsistent with regional and local air quality plans.

3.3.3 Environmental Setting

Air quality is defined by the concentration of pollutants in relation to their impact on human health. Ambient concentrations of air pollutants are determined by the amount of emissions released by pollutant sources and the ability of the atmosphere to transport and dilute such emissions. Terrain, wind, atmospheric stability, and the presence of sunlight all affect transport and dilution. California is divided into 15 air basins based on geographic features that create distinctive regional climates.

Existing ambient air quality in each air basin is affected by these climatological conditions as well as topography and the types and amounts of air pollutants emitted. The project elements are located within the SJVAB and the SVAB. The following sections discuss climate and meteorological information specific to these air basins, followed by a summary of air pollutants.

3.3.3.1 Local Climate and Meteorological Conditions

San Joaquin Valley Air Basin

Approximately 250 miles long and averaging 35 miles wide, the SJVAB is the second largest air basin in the state. The SJVAB is defined by the Sierra Nevada mountains in the east (8,000 to 14,000 feet in elevation), the Coast Ranges in the west (averaging 3,000 feet in elevation), and the Tehachapi mountains in the south (6,000 to 8,000 feet in elevation). The San Joaquin Valley is basically flat with a slight downward gradient to the northwest. The valley opens to the sea at the Carquinez Strait where the San Joaquin-Sacramento Delta (Delta) empties into San Francisco Bay. The San Joaquin Valley, thus, could be considered a "bowl" that is open only to the north.

The SJVAB has an inland Mediterranean climate averaging more than 260 sunny days per year. The valley floor experiences warm, dry summers and cool, wet winters. Summer high temperatures often exceed 100° F, averaging in the low 90s in the northern valley and high 90s in the south. In the entire SJVAB, high daily temperature readings in summer average 95° F. Over the last 30 years, the SJVAB averaged 106 days a year 90° F or hotter, and 40 days a year 100° F or hotter. The daily summer temperature variation can be as much as 30° F.

In winter, as the cyclonic storm track moves southward, the storm systems moving in from the Pacific Ocean bring a maritime influence on the SJVAB. The high mountains to the east prevent the cold, continental air masses of the interior from influencing the San Joaquin Valley. Winters are mild and humid. Temperatures below freezing are unusual. Average high temperatures in the winter are in the 50s, but highs in the 30s and 40s can occur on days with persistent fog and low cloudiness. The average daily low temperature is 45° F.

Although marine air generally flows into the basin from the Delta, the region's topographic features restrict air movement through and out of the basin. The Coast Ranges hinder wind access into the SJVAB from the west, the Tehachapi Mountains prevent the southerly passage of air flow, and the high Sierra Nevada range is a significant barrier to the east. These topographic features result in weak air flow, which becomes blocked vertically by high barometric pressure over the SJVAB. As a result, the SJVAB is highly susceptible to pollutant accumulation over time. Most of the surrounding mountains are above the normal height of summer inversion layers (1,500 to 3,000 feet) (SJVAPCD 2015).

Sacramento Valley Air Basin

In general, the SVAB has many similar characteristics to the SJVAB. The SVAB is relatively flat and bounded by the north Coast Ranges to the west and the northern Sierra Nevada to the east; the SJVAB is to the south of the SVAB. Air also flows into the SVAB through the Carquinez Strait, the only breach in the western mountain barrier, and moves across the Delta from the San Francisco Bay.

The mountain ranges surrounding the SVAB create a physical barrier to airflow, which leads to the entrapment of locally generated air pollutants when meteorological conditions are unfavorable for transport and dilution, as well as pollution that might otherwise be transported northward on prevailing winds from the Sacramento metropolitan area. Although a significant portion of the SVAB is located at an elevation of more than 1,000 feet above sea level, most of its populace lives and works below that elevation. The Sacramento Valley is often subjected to inversion layers that, coupled with geographic barriers and high summer temperatures, create a high potential for air pollution problems.

The Mediterranean climate of the region is characterized by hot, dry summers and cool, rainy winters. The local meteorology of the project area is represented by measurements recorded at the Sacramento Executive Airport weather station (Station 047630). The normal annual precipitation is approximately 17 inches, more than half of which falls during the winter rainy season (November–February) (Western Regional Climate Center 2016), typically from air masses that move in from the Pacific Ocean and travel across California from west to the east. The inland location and surrounding mountains typically confine the area from much of the ocean breezes that keep the coastal regions moderate in temperature. July temperatures range from an average minimum of 58°F to an average maximum of 93°F (WRCC 2016a). January temperatures range from an average minimum of 38°F to an average maximum of 54°F (WRCC 2016a). Characteristic of SVAB winter months are periods of dense and persistent low-level fog, which are most prevalent between storms.

Poor air movement occurs most frequently in fall and winter when high-pressure cells are present over the project area and meteorological conditions are stable. The lack of surface winds during these periods, combined with the reduced vertical flow caused by less surface heating, reduces the influx of air and results in the concentration of pollutants. Surface concentrations of air pollutant emissions are highest when these conditions occur in combination with agricultural burning activities or temperature inversions, which hamper dispersion by creating a ceiling over the area and trapping air pollutants near the ground. The winds and unstable atmospheric conditions associated with the passage of winter storms result in periods of low air pollution and excellent visibility. Precipitation and fog also tend to reduce or limit some pollutant concentrations. However, between winter storms, high pressure and light winds contribute to low-level temperature inversions and stable atmospheric conditions, resulting in the concentration of air pollutants.

May through October is ozone season in the SVAB and is characterized by poor air movement in the mornings and the arrival of the Delta sea breeze from the southwest in the afternoons. In addition, longer daylight hours provide a plentiful amount of sunlight to fuel photochemical reactions between VOC and NO_X, which in turn result in ozone formation. Typically, the Delta breeze transports air pollutants northward out of the SVAB; however, during approximately half of the time from July to September, a phenomenon known as the Schultz Eddy prevents this from occurring. The Schultz Eddy phenomenon causes the wind pattern to shift southward, blowing air pollutants back into the SVAB. This phenomenon exacerbates the concentration of air pollutant emissions in the SVAB and contributes to violations of the ambient air quality standards.

3.3.3.2 Pollutants of Concern

Criteria Air Pollutants

As described above, EPA and CARB have identified six air pollutants as being indicators of ambient air quality: ozone, CO, NO_2, SO_2, PM (both PM_{10} and $PM_{2.5}$), and lead. The following section provides a brief description of criteria air pollutants, including its source types and health effects, along with the most current attainment designations for the project area.

Ozone. Ozone is a colorless gas that is odorless at ambient levels. It exists primarily as a beneficial component of the ozone layer in the upper atmosphere (stratosphere), shielding the earth from harmful ultraviolet radiation emitted by the sun, and as a pollutant in the lower atmosphere (troposphere).

Ozone is the primary component of urban smog. It is not emitted directly into the air but is formed through a series of reactions involving VOC and NO_X in the presence of sunlight. VOC emissions result primarily from incomplete combustion and the evaporation of chemical solvents and fuels. NO_X includes various combinations of nitrogen and oxygen, including nitric oxide (NO), NO_2, and others, typically resulting from the combustion of fuels.

VOC and NO_X emissions are both considered critical to ozone formation. Therefore, the rate of ozone production can be limited by either VOC or NO_X. When there is a lower production rate of NO_X, indicating that NO_X is scarce, the rate of ozone production is NO_X-limited. Under these circumstances, ozone could be most effectively reduced by lowering current and future NO_X emissions, rather than by lowering VOC. Rural areas tend to be NO_X-limited, while areas with a dense urban population tend to be VOC-limited. Both VOC and NO_X reductions provide ozone benefits in region, but the SFNA exhibits a NO_X-limited regime and therefore NO_X reductions are more effective than VOC reductions on a tonnage basis (SMAQMD 2017a). Meteorology and terrain play a major role in ozone formation. Generally, low wind speeds or stagnant air coupled with warm temperatures and clear skies provide the optimum conditions for formation. As a result, summer is generally the peak ozone season. Because of the reaction time involved, peak ozone concentrations often occur far downwind of the precursor emissions. Therefore, ozone is a regional pollutant that often affects large areas. In general, ozone concentrations over or near urban and rural areas reflect an interplay of emissions of ozone precursors, transport, meteorology, and atmospheric chemistry.

Individuals exercising outdoors, children, and people with preexisting lung disease, such as asthma and chronic pulmonary lung disease, are considered the most susceptible sub-groups for ozone effects. Short-term exposure (lasting for a few hours) to ozone can result in breathing pattern changes, reduction of breathing capacity, increased susceptibility to infections, inflammation of the lung tissue, and some immunological changes. In recent years, a correlation between elevated ambient ozone levels and increases in daily hospital admission rates, as well as mortality, has also been reported. An increased risk for asthma has been found in children who participate in multiple sports and live in communities with high ozone levels.

Emissions of the ozone precursors VOC and NO_X have decreased over the past several years. According to the most recently published California Air Resources Board Almanac, emission levels of NO_X and VOC in the SJVAB are projected to decrease through 2020, largely due to more stringent motor vehicle standards and cleaner burning fuels, as well as due to rules for the control

of VOC from various industrial coating and solvent operations; while NO_X continues to decline after 2020, VOC is projected to increase slightly. Levels of NO_X and VOC within the Sacramento metropolitan area (inclusive of the southern portion of the SVAB, as well as the western portions of El Dorado and Placer Counties), are projected to continue to decrease through 2035 (CARB 2013).

Carbon Monoxide. CO is a colorless and odorless gas that, in the urban environment, is primarily produced by the incomplete burning of carbon in fuels, primarily from mobile (transportation) sources. In fact, 77% of the nationwide CO emissions are from mobile sources. The other 23% consists of CO emissions from wood-burning stoves, incinerators, and industrial sources. Relatively high concentrations are typically found near crowded intersections and along heavily used roadways carrying slow-moving traffic. Even under the most severe meteorological and traffic conditions, high concentrations of CO are limited to locations within a relatively short distance (300 to 600 feet) of heavily traveled roadways. Vehicle traffic emissions can cause localized CO impacts, and severe vehicle congestion at major signalized intersections can generate elevated CO levels, called “hot spots,” which can be hazardous to human receptors adjacent to the intersections.

CO enters the bloodstream through the lungs by combining with hemoglobin, which normally supplies oxygen to the cells. However, CO combines with hemoglobin much more readily than oxygen does, drastically reducing the amount of oxygen available to the cells. Adverse health effects associated with exposure to high CO concentrations, typically only attainable indoors or within similarly enclosed spaces, include dizziness, headaches, and fatigue. CO exposure is especially harmful to individuals who suffer from cardiovascular and respiratory diseases (EPA 2016b).

Nitrogen Dioxide. NO_2 is one of a group of highly reactive gases known as oxides of nitrogen, or NO_X. NO_2 is formed when ozone reacts with NO in the atmosphere and is listed as a criteria pollutant because NO_2 is the more toxic than NO. The major human-made sources of NO_2 are combustion devices, such as boilers, gas turbines, and mobile and stationary reciprocating internal combustion engines. The combined emissions of NO and NO_2 are referred to as NO_X and reported as equivalent NO_2. Because NO_2 is formed and depleted by reactions associated with photochemical smog (ozone), the NO_2 concentration in a particular geographical area may not be representative of the local NO_X emission sources. NO_X also react with water, oxygen, and other chemicals to form nitric acids, contributing to the formation of acid rain.

Inhalation is the most common route of exposure to NO_2. Breathing air with a high concentration of NO_2 can lead to respiratory illness. Short-term exposure can aggravate respiratory diseases, particularly asthma, leading to respiratory symptoms (such as coughing, wheezing, or difficulty breathing), hospital admissions, and visits to emergency rooms. Longer exposures to elevated concentrations of NO_2 may contribute to the development of asthma and potentially increase susceptibility to respiratory infections. Larger decreases in lung functions are observed in individuals with asthma or chronic obstructive pulmonary disease (e.g., chronic bronchitis, emphysema) than in healthy individuals, indicating a greater susceptibility of these sub-groups (EPA 2016c).

Sulfur Dioxide. SO_2 is one component of the larger group of gaseous sulfur oxides (SO_X). SO_2 is used as the indicator of the larger group of SO_X, as it is the component of greatest concern and

found in the atmosphere at much higher concentrations than other gaseous SO_X. SO_2 is typically produced by such stationary sources as coal and oil combustion facilities, steel mills, refineries, and pulp and paper mills. The major adverse health effects associated with SO_2 exposure pertain to the upper respiratory tract. On contact with the moist mucous membranes, SO_2 produces sulfurous acid, which is a direct irritant. Concentration rather than duration of exposure is an important determinant of respiratory effects. Children, the elderly, and those who suffer from asthma are particularly sensitive to the effects of SO_2 (EPA 2016d).

SO_2 also reacts with water, oxygen, and other chemicals to form sulfuric acids, contributing to the formation of acid rain. SO_2 emissions that lead to high concentrations of SO_2 in the air generally also lead to the formation of other SO_X, which can react with other compounds in the atmosphere to form small particles, contributing to particulate matter pollution, which can have health effects of its own.

Particulate Matter. PM is a complex mixture of extremely small particles and liquid droplets. PM is made up of several components, including acids (such as nitrates and sulfates), organic chemicals, metals, and soil or dust particles. The major area-wide sources of $PM_{2.5}$ and PM_{10} are fugitive dust, especially from roadways, agricultural operations, and construction and demolition. Sources of PM_{10} also include crushing or grinding operations. Sources of $PM_{2.5}$ also include all types of combustion, including motor vehicles, power plants, residential wood burning, forest fires, agricultural burning, and some industrial processes. While exhaust emissions from mobile sources contribute only a very small portion of directly emitted $PM_{2.5}$ and PM_{10} emissions, they are a major source of VOC and NO_X, which undergo reactions in the atmosphere to form PM, known as secondary particles. These secondary particles make up the majority of PM pollution.

The size of PM is directly linked to the potential for causing health problems. EPA is concerned about particles that are 10 micrometers in diameter or smaller, because these particles generally pass through the throat and nose and enter the lungs. Once inhaled, these particles can affect the heart and lungs and cause serious health effects and even death. The adverse health effects associated with PM_{10} depend on the specific composition of the PM. For example, health effects may be associated with metals, polycyclic aromatic hydrocarbons (PAH), and other toxic substances adsorbed onto fine particulate matter (referred to as the “piggybacking effect”), or with fine dust particles of silica or asbestos. Effects related to short- and long-term exposure to elevated concentrations of PM_{10} include respiratory symptoms, aggravation of respiratory and cardiovascular diseases, a weakened immune system, and cancer (World Health Organization 2016). $PM_{2.5}$ poses an increased health risk because these very small particles can be inhaled deep in the lungs and may contain substances that are particularly harmful to human health. Direct emissions of $PM_{2.5}$ decreased in the SJVAB and Sacramento Metropolitan Area between 2000 and 2010 but are projected to remain flat after 2015 in the SJVAB and increase very slightly through 2035 in the Sacramento metropolitan area. Similarly, emissions of DPM decreased from 2000 through 2010 due to reduced exhaust emissions from diesel mobile sources; these emissions are anticipated to continue to decline in both the SVAB and Sacramento metropolitan area through 2035 (CARB 2013).

Lead. Lead is a highly toxic metal that may cause a range of human health effects. Lead is found naturally in the environment and is used in manufactured products. Previously, the lead used in gasoline anti-knock additives represented a major source of lead emissions to the atmosphere. EPA began working to reduce lead emissions soon after its inception, issuing the first reduction

standards in 1973. Lead emissions have significantly decreased due to the near elimination of leaded gasoline use. Metal processing is currently the primary source of lead emissions. The highest levels of lead in air are generally found near lead smelters. Other stationary sources are waste incinerators, utilities, and lead-acid battery manufacturers. Although the ambient lead standards are no longer violated, lead emissions from stationary sources still pose "hot spot" problems in some areas. As a result, CARB has identified lead as a TAC.

Fetuses, infants, and children are more sensitive than others to the adverse effects of lead exposure. Exposure to low levels of lead can adversely affect the development and function of the central nervous system, leading to learning disorders, distractibility, the inability to follow simple commands, and a lower intelligence quotient. In adults, increased lead levels are associated with increased blood pressure. Lead poisoning can cause anemia, lethargy, seizures, and death, although it appears that there are no direct effects of lead on the respiratory system.

Toxic Air Contaminants (Hazardous Air Pollutants)

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 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 the California Office of Environmental Health Hazard Assessment (OEHHA).

Air toxics are generated by several sources, including *stationary sources*, such as dry cleaners, gas stations, auto body shops, and combustion sources; *mobile sources*, such as motor vehicles, diesel trucks, ships, and trains; and *area sources*, such as farms, landfills, and construction sites. The negative health effects of TACs can be carcinogenic (cancer-causing), short-term (acute) noncarcinogenic, and long-term (chronic) noncarcinogenic. Direct exposure to these pollutants has been shown to cause cancer, birth defects, damage to the brain and nervous system, and respiratory disorders.

The primary TACs of concern associated with the proposed project are fine particulate matter ($PM_{2.5}$) and DPM, asbestos, and the fungus spores that cause Valley Fever. Principal characteristics surrounding these pollutants are discussed below.

Fine particulate matter ($PM_{2.5}$) and **diesel particulate matter** exposure is strongly associated with mortality, respiratory diseases, and lung development in children, and other endpoints such as hospitalization for cardiopulmonary disease. CARB identified DPM as a TAC in 1998 based on data developed and reviewed by the State of California Office of Environmental Health Hazard Assessment (OEHHA) and CARB in the scientific risk assessment on exposure to diesel exhaust and its health effects (CARB 1998). Other agencies, such as the National Toxicology Program, the EPA and the National Institute of Occupational Safety and Health, concluded that exposure to diesel exhaust likely causes cancer. More recently, the World Health Organization's International Agency for Research on Cancer classified diesel engine exhaust as carcinogenic to humans (Group 1), an increase from the prior 1998 classification by the International Agency for

Research on Cancer (IARC) as probably carcinogenic to humans (Group 2A) (IARC 2012). ~~evidence demonstrating cancer effects in humans.~~

Asbestos is the name given to several naturally occurring fibrous silicate minerals. Asbestos has been mined for applications requiring thermal insulation, chemical and thermal stability, and high tensile strength. Asbestos is also found in its natural state in rock or soil (known as naturally occurring asbestos [NOA]). Mapping published by the United States Geological Survey and California Geological Survey indicate that the project is not located within an area known to contain NOA. However, asbestos may have been used during the construction of the existing structures, and these structures would be demolished by the proposed project.

Valley Fever is not an air pollutant, but is 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% of Valley Fever cases are mild and display flu-like symptoms or no symptoms at all. Of those who are exposed and seek medical treatment, the most common symptoms are fatigue, cough, chest pain, fever, rash, headache, and joint aches. While Valley Fever is endemic to the Central Valley, counties south of Sacramento with greater agricultural acreage (e.g., San Luis Obispo, Kings and Kern counties) have the most cases, though some cases are reported each year in Sacramento County (estimated at fewer than 5 per year) and San Joaquin County (estimated at 10 to 39 cases per year) (California Department of Public Health 2019).

3.3.3.3 Existing Air Quality Conditions

Local Attainment Designations

Several ambient air quality monitoring stations in the SJVAB and the SVAB measure concentrations of air pollutants to support the monitoring of progress toward attainment of NAAQS and CAAQS (Table 3.3 1). CARB, SJVAPCD, and SMAQMD maintain these stations. Both EPA and CARB use this type of monitoring data to designate areas according to attainment status for NAAQS and CAAQS. The purpose of these designations is to identify areas with air quality problems and thereby initiate planning efforts for improvement.

The four designations are defined as:

- Nonattainment – Assigned to areas where monitored pollutant concentrations 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 of time.
- Unclassified – Assigned to areas where data are insufficient to determine whether a pollutant is violating the standard in question.

Table 3.3-3 summarizes the attainment status of San Joaquin and Sacramento counties for NAAQS and CAAQS.

Table 3.3-3. Attainment Status of the SJVAB and SVAB

Pollutant	SJVAB		SVAB	
	Federal	State	Federal	State
Ozone (O_3)	Nonattainment (extreme)	Nonattainment	Nonattainment (extreme)	Nonattainment
Particulate Matter (PM_{10})	Maintenance (serious)	Nonattainment	Attainment	Nonattainment
Particulate Matter ($PM_{2.5}$)	Nonattainment (serious/moderate)	Nonattainment	Nonattainment (serious/moderate)	Nonattainment
Carbon Monoxide (CO)	Attainment	Unclassified	Attainment	Attainment
Nitrogen Dioxide (NO_2)	Attainment/ Unclassified	Attainment	Attainment/ Unclassified	Attainment
Sulfur Dioxide (SO_2)	Attainment/ Unclassified	Attainment	Attainment	Attainment

Sources: California Air Resources Board 2018b; U.S. Environmental Protection Agency 2019.
SO_2 = sulfur dioxide
O_3 = ozone
CO = carbon monoxide
NO_2 = nitrogen dioxide
$PM_{2.5}$ = particulate matter 2.5 microns or less in diameter
PM_{10} = particulate matter 10 microns or less in diameter

Sensitive Receptors

SJVAPCD and SMAQMD generally define a sensitive receptor as a facility or land use that houses or attracts members of the population who are particularly sensitive to the effects of air pollutants, such as children, the elderly, and people with illnesses. Examples of sensitive receptors include residential areas, schools, and hospitals. The project alignment is surrounded by a mix of industrial, commercial, residential, and recreational land uses. The closest sensitive receptors (residences) are located immediately adjacent to the UPRR ROW, with various other receptor locations scattered along the corridor.

3.3.4 Environmental Analysis

3.3.4.1 Methodology

The discussion below presents the methods used for the air quality analysis and how the significance of the proposed project's air quality impacts was determined. Potential air quality impacts associated with short-term construction and long-term operations were evaluated according to guidance and methods from CARB, as well as SJVAPCD and SMAQMD for the project improvements occurring within each air district, respectively.

Project improvements and operations would take place along the project alignment, which is within the jurisdiction of two air districts: SJVAPCD and SMAQMD. Both air districts have adopted distinct recommended thresholds of significance. To compare project emissions appropriately to

each air district's recommended thresholds of significance, construction and operational activities occurring within the boundaries of each air district were quantified and analyzed separately.[4]

Mass Emissions Modeling

Emissions estimates for each project improvement in both air districts were based on a combination of project-specific data inputs and model defaults. A summary of the data inputs, emissions factors, and calculation methodologies used are provided below for both the construction and operational elements of the project. Detailed project inputs, assumptions, and calculations are provided in Appendix B-1, *Quantification of Criteria Air Pollutant and Greenhouse Gas Emissions, and Energy Use.*

Construction

The construction the proposed project would generate emissions of criteria air pollutants, precursors, and TACs (i.e., DPM) from a variety of sources, including off-road construction equipment, on-road vehicles, earthmoving activities, and off-gas from paving activities and architectural coating. Construction would occur throughout the project alignment but would be phased over approximately three years. The construction of each project element would include site work, rail work, and structural work. It is assumed that certain elements of each of these activities could overlap in time. Thus, maximum daily emissions were estimated assuming the maximum potential overlap of supporting construction activities (i.e., assuming that the maximum use of equipment, on-road vehicles, earthwork, demolition, and paving would occur in a single day). To conservatively estimate maximum daily emissions, calculations accounted for the potential overlap of maximum daily emissions from concurrent construction phases for individual project elements, as well as the potential for concurrent construction of project elements throughout the project alignment that are anticipated to be constructed within the same year. Total annual emissions were based on actual annual use of equipment and on-road vehicles, as well as total earthwork, demolition, paving, and architectural coating that could take place in a given year, and was not always a multiplication of maximum daily emissions by total days of work per year.

In cases for which a project improvement includes both a proposed and alternative improvement and/or variant, emissions were estimated for all alternatives/variants. To calculate the maximum daily and maximum annual emissions scenarios in either air district, the greater of the emissions estimates from a proposed versus alternative/variant improvement were used.

The following details the methodology for estimating emissions from each construction-related emissions source.

- **Off-road equipment:** Emission factors from off-road construction equipment were obtained from the California Air Pollution Control Officers Association's (CAPCOA)

[4] CARB acknowledges that air basins, in particular SJVAB, are both contributors and receptors of pollutant transport throughout the state (California Air Resources Board 2009). While technical documents have been published analyzing the transport relationship among California air basins, quantifying the effects of pollutant transport as a result of project implementation would require detailed projections of future climatic and meteorological conditions. Air districts in the project area have adopted thresholds and mitigation requirements that are commensurate with expected criteria air pollutant contributions from downwind air basins (California Air Resources Board 2011).

California Emissions Estimator Model (CalEEMod) (version 2016.3.2) User Guide, which provides values per unit of activity by calendar year for each pollutant for each equipment type. Maximum daily emissions of criteria pollutant emissions from each construction activity were estimated by multiplying the emission factors by the equipment inventory (number of pieces, hours per day of use, and horsepower and load factor for each equipment type). The equipment inventory was developed with consideration for project-specific elements; where project-specific details were not available, CalEEMod default data was used.

- **Locomotives:** Emissions from diesel-powered locomotives used to transport rail materials during construction were quantified using EPA's 2009 locomotive engine emission standards and project-specific activity data. These locomotives were assumed to utilize a 1,500 horsepower, Tier 1 engine.

- **On-road vehicles:** On-road construction would include construction-worker vehicles, haul trucks, material delivery trucks, and onsite work trucks. Exhaust emission factors from on-road vehicles were obtained from the CARB Emission FACtor (EMFAC) model, EMFAC2017. Emission factors for on-site on-road vehicle use were based on 5 miles per hour (mph) emission rates. Emission factors for off-site on-road vehicle use were based on emission rates for the fleet aggregate speed. The estimated maximum daily number and activity (hours on-site and distances travelled off-site) of on-road vehicles to be used during each construction activity phase was a project-specific data input. Maximum daily on-site and off-site exhaust emissions from on-road motor vehicles were estimated by multiplying the appropriate emission factors by the project-specific on-road vehicle inventory. Emission factors for gasoline-powered light duty vehicles within the vehicle fleet mix were adjusted using CARB's Off-model Adjustment Factors to account for the Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule Par One: One National Program, adopted by the EPA and the National Highway Traffic Safety Administration in 2019.

- Fugitive dust emissions from on-road vehicles were also estimated for on-site and off-site vehicle use. Emissions factors from EMFAC2017 were used to estimate fugitive dust associated with brake wear and tire wear by multiplying the respective emission factors by estimated total vehicle miles traveled (VMT) per day for each on-road vehicle. Re-entrained dust emissions were calculated for the on-road vehicle use using the EPA *Compilation of Air Pollutant Emission Factors* (AP-42) methodology for both paved and unpaved roads (AP-42 sections 13.2.1 and 13.2.2, respectively).

- **Earthwork:** Fugitive dust emissions from earthwork (i.e., grading, bulldozing, and truck loading) were estimated using emission factors developed using CalEEMod and AP-42 methodology. Acreages of clearing and grubbing and quantities of cut and fill for each project improvement were project-specific data inputs. The emission factors for PM_{10} and $PM_{2.5}$ were multiplied by the total acreage of clearing and grubbing, and by the total cut and fill quantity to estimate total emissions from earthwork for each project improvement. The total emissions were then divided by a minimum activity duration to estimate maximum daily emissions.

- **Demolition:** Fugitive dust emissions from demolition were estimated using emission factors developed using CalEEMod and AP-42 methodology; these emissions accounted

for both the physical demolition of existing structures and the truck loading of the demolished material. Quantities of square footage for demolition was a project-specific data input. The emission factors for PM_{10} and $PM_{2.5}$ were multiplied by the total square footage of demolition to estimate the total emissions resulting from demolition. The total emissions were divided by a minimum activity duration to estimate maximum daily emissions.

- **Paving and Architectural Coatings:** Fugitive ROG emissions associated with paving were estimated using the CalEEMod default emission factor of 2.62 pounds of ROG per acre paved. Fugitive ROG emissions associated with architectural coatings of parking areas were estimated using CalEEMod methodology, which is based upon AP-42. Acreages of paved areas for each project improvement were based upon the project design and multiplied by the respective emission factors to estimate total fugitive ROG emissions. Total emissions were divided by the activity duration to estimate maximum daily emissions.

Operations

Operational emissions sources from the proposed project would include locomotive emissions from passenger rail service from the existing Stockton Downtown/ACE Station to the proposed Natomas/Sacramento Airport Station, inclusive of stops at the proposed new stations along the route; on-road vehicle emissions from the proposed shuttle bus between the proposed Natomas/Sacramento Airport Station and the Sacramento Airport; and indirect emissions from electricity use and waste generation.

Although the proposed project would increase the operational emission sources within the air districts the alignment traverses, the proposed project is expected to result in a transportation mode shift (i.e., attract passengers who otherwise would have driven cars). As discussed in the analysis of Impact TRA-2 of Section 3.16, *Transportation,* this shift would reduce travel by personal (household) automobiles, reducing mobile source emissions and congestion.

The following details the methodology for estimating emissions from each ~~construction-related~~ operational emissions source.

- **Passenger Train Operations:** The proposed new passenger rail service would result in diesel fuel combustion and associated criteria pollutant emissions from train activity. Daily one-way trips are anticipated to include the extension of existing train lines that currently go to Stockton, as well as the initiation of new trips between Stockton and Natomas, for a total of 14 one-way trips between the existing Stockton Downtown/ACE Station and the proposed Natomas/Sacramento Airport station.

  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. Emission factors for calculations were based on EPA’s 2009 Emission Factors for Locomotives Technical Highlights (EPA-240-F-09-025) and the conversion factors for methane (CH_4) and N_2O from EPA’s 2018 Emission Factors for Greenhouse Gas Inventories guide. Emission standards are defined per unit of activity (in grams per horsepower-hour) for Tier 4 engines. Emissions were

estimated using operational hours estimates for the new passenger train operations that would result from the proposed project, inclusive of idling time at each station. Daily criteria pollutant emissions were annualized conservatively assuming 365 operating days per year. Emissions were apportioned to SJVAPCD and SMAQMD based on the number of track miles within each air district.

- **Shuttle Bus Operations:** The proposed shuttle bus from the Natomas/Sacramento Airport Station to the Sacramento Airport would generate emissions from on-road travel. Exhaust emission factors from on-road vehicles were obtained from the EMFAC2017. Emission factors were based on emission rates for aggregate speed and model year for the Urban Bus vehicle category. Emission factors used were inclusive of PM emissions from brake wear and tire wear. Maximum daily exhaust emissions were estimated by multiplying the emission factors by the anticipated daily VMT (daily trips x trip distance).

- **Electricity Usage and Waste Disposal:** Indirect emissions associate with electricity generation and waste disposal were calculated from GHG emissions. The GHG impact analysis is provided in Section 3.8, *Greenhouse Gas Emissions,* but the summary of these indirect emissions calculations is provided here for completeness of the emissions estimation methodology.

  Emission factors for electricity use were unique to each local electricity provider (assumed to be Pacific Gas & Electric [PG&E] within SJVAPCD and Sacramento Municipal Utility District [SMUD] within SMAQMD). Emission factors were from the PG&E 2018 Corporate Responsibility and Sustainability Report and EPA eGrid data. Monthly forecasted electricity use for each station was based upon historical information from electricity use by existing stations and adjusted for the size of the proposed stations.

  Emission factors for waste disposal were based upon CalEEMod. Monthly forecasted waste generation for each station was based upon historical information from existing stations and adjusted for the size of the proposed stations.

- **Displaced Vehicle Miles:** The proposed service would cause some commuters to mode-shift from personal (household) automobile use to rail use. This would cause a reduction in VMT associated with on-road travel. Passenger vehicle emissions reductions were estimated for the reduced VMT based on emission factors from EMFAC2017 for light-duty and medium-duty vehicles for aggregate model year and speed values. Emissions reduction estimates were then apportioned to the SJVAPCD and SMAQMD air districts based on the project alignment length within each air district.

Health Risk Analysis for Toxic Air Contaminants (TACs)

A Health Risk Assessment (HRA) was performed to assess the potential increase in health risks that could result from construction and operational TAC emissions associated with the proposed project. The analysis was conducted consistent with guidance and methodologies from local, regional, state and federal agencies, including the Bay Area Air Quality Management District (BAAQMD), CAPCOA, CARB, OEHHA, SMAQMD MSAT Protocol, SJVAPCD, and EPA. The HRA evaluated health risk and hazard impacts of short-term construction and long-term operational emissions from the proposed project on existing offsite sensitive receptors within 500 feet of the proposed project emissions sources. Exposure to project-related DPM was assessed

by predicting the health risks in terms of excess cancer and non-cancer hazard impacts. EPA's AERMOD dispersion model was used to predict DPM concentrations at sensitive receptors based on the maximum daily PM_{10} exhaust emissions, with exhaust emissions of PM_{10} used as a surrogate for DPM. Project-level cancer risk and non-cancer hazard index were estimated based on annual concentrations from AERMOD using CARB's Hot Spots Analysis and Reporting Program Version 2 (HARP 2), which incorporates OEHHA's age-specific factors to account for the increased sensitivity to carcinogens during early-in-life exposure. The HRA methodology for construction and operational impacts is summarized below; additional details on the model inputs and parameters are provided in Appendix B-2.

Construction

Construction of the proposed project would generate DPM from diesel-powered off-road equipment, locomotives, and haul trucks. For construction, the project sources would exist within the proposed footprint of the proposed rail stations and along the track improvement sections (where applicable). There are discrete sites where construction would occur and, in many cases, there are existing residential areas or other sensitive land uses for which sensitive receptors were evaluated for potential health risk impacts from the proposed project. Where construction of project elements is anticipated to result in the same maximum potential emissions of exhaust PM_{10}, and that were also similar in geographical and meteorological conditions and along similar track orientation, a single representative modeling scenario was run. For proposed rail stations that have alternatives (Lodi Station), only one of the options were modeled. The driving factors for only modeling one scenario of each of these stations included: (1) construction emissions and duration were the same; and (2) the track alignment did not change between the alternatives. Modeling scenarios also combined emissions from station construction and track improvements that would occur adjacent to or nearby each other and are scheduled to occur in the same construction year, into a single model run, thereby presenting the maximum potential construction-related emissions that would be generated by the proposed project in those given locations.

Operation

Operation of the proposed project would increase DPM emissions along the alignment corridor due to new passenger train service, and between the proposed Natomas/Sacramento Airport Station and the Sacramento International Airport due to new connecting shuttle services. Operational emissions were modeled as adjacent line volume sources along 1.24-mile (2-kilometer) segments at key locations selected along the track alignment to characterize the emissions over the rail line; key location selection was based on the inclusion of construction activity at a location prior to operations, meteorological conditions, and track alignment. The selected areas modeled serve as representative of other areas along the rail line that are similar in their track orientation and meteorological conditions. Because construction of the proposed project would occur throughout the approximately 52-mile length of railway alignment between the existing Stockton Downtown/ACE Station and the proposed Natomas/Sacramento Airport Station, and given the large number of construction sites and the various track alignments at each one, modeling all of them for operation would generally account for the majority of track alignments throughout the 52-mile line. As a result, every receptor used in the operational modeling runs were treated as sensitive.

During operation, throughout an operational passenger train trip, the speed of the train would vary (i.e. travel faster between stations and travel slow or idle at or in the vicinity of stations). As part of a supplemental analysis of TAC impacts from Caltrain sources prepared by Illingworth and Rodkin, Inc. (Illingworth & Rodkin, 2017) for a Health Risk Assessment in Redwood City, CA, train speed was factored into the emission calculation. Similarly, the consideration of train speed was applied for this proposed project. PM_{10} emissions associated with train operations were further broken down into those emissions associated with the longer duration of time spent travelling at slower speeds and the time spent travelling at higher speeds within the 2-kilometer segment as a train approaches and departs a station; within approximately 0.75 kilometer (0.47-mile) of any station in each direction, train speed was assumed to be slower and would be assigned the low-speed train emission rate. For the 0.25-kilometer (km) (0.16-mile) track segments beyond the 0.75-mile segment in each direction, train speed was assumed to be higher and assigned the high-speed train emission rate. This was used to weight the distribution of emissions throughout the 2-km segment and present the maximum potential impact, taking into consideration the potential for areas in which a higher proportion of operational emissions would occur, as opposed to an even distribution throughout the representative 2-km segments.

The only non-locomotive exhaust emission source for operations are the shuttle buses that would connect travelers between the Natomas/Sacramento Airport Station and the airport. This source was represented as an adjacent line volume source in the model with a total length of approximately 3.2 miles (5.1 km). The route modeled from the rail station access road, located off West Elkhorn Boulevard, then west along West Elkhorn Boulevard to State Route 99.

3.3.4.2 Thresholds of Significance

Air quality impacts would be considered significant if they would exceed the following thresholds of significance, which are based on Appendix G of the CEQA Guidelines and the SJVAPCD and SMAQMD CEQA guidelines for the respective air quality districts. According to Appendix G of the CEQA Guidelines, the proposed project could have a significant impact on air quality if it would:

- Conflict with or obstruct implementation of the applicable air quality plan.
- For the purposes of this analysis, “conflict with or obstruct implementation of” is defined as circumstances in which a project would worsen existing air quality violations or exceed the growth assumptions utilized by SJCOG or SACOG.
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is designated a nonattainment area under an applicable federal or state ambient air quality standard (including releasing emissions that exceed quantitative thresholds for ozone precursors).
- For the purposes of this analysis, a “cumulatively considerable net increase” is defined as circumstances in which total direct emissions exceed the pertinent air quality thresholds of significance, as presented below in Table 3.3-4.
- Expose sensitive receptors to substantial pollutant concentrations.

Table 3.3-4. SJVAPCD and SMAQMD Mass Emission Thresholds

	SJVAPCD	SMAQMD
Temporary Construction	ROG: 10 tons/year or 100 lbs/day[a] NO_X: 10 tons/year or 100 lbs/day[a] PM_{10}: 15 tons/year or 100 lbs/day[a] $PM_{2.5}$: 15 tons/year or 100 lbs/day[a] CO: 100 tons/year or 100 lbs/day[a] SO_X: 27 tons/year or 100 lbs/day[a]	NO_X: 85 lbs/day PM_{10}: 80 lbs/day or 14.6 tons/year $PM_{2.5}$: 82 lbs/day or 15 tons/year
Long-term Operations	Same as construction	NO_X or VOC: 65 lbs/day PM_{10}: 80 lbs/day or 14.6 tons/year $PM_{2.5}$: 82 lbs/day or 15 tons/year

Sources: San Joaquin Valley Air Pollution Control District 2015; Sacramento Metropolitan Air Quality Management District 2015.

[a] The 100-pound-per-day threshold is a screening-level threshold that helps determine whether increased emissions from a proposed project will cause or contribute to a violation of CAAQS or NAAQS. Projects with emissions below the threshold will not be in violation of CAAQS or NAAQS. Projects with emissions above the threshold would require an Ambient Air Quality Analysis to confirm this conclusion (San Joaquin Valley Air Pollution Control District 2015a).

Notes: ROG = reactive organic gases; lbs = pounds; NO_X = nitrogen oxide; PM_{10} = particulate matter that is 10 microns in diameter and smaller $PM_{2.5}$ = particulate matter that is 2.5 microns in diameter and smaller; CO = carbon monoxide; SO_X = sulfur oxide; CAAQS = California ambient air quality standards; NAAQS = National ambient air quality standards

- For this analysis, schools, daycare facilities, places of assembly, 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 as described below.

  - As discussed above, all criteria pollutants that would be generated by the proposed project are associated with some form of health risk (e.g., asthma). Criteria pollutants can be classified as either regional or localized pollutants. Regional pollutants can be transported over long distances and affect ambient air quality far from the emissions source. Localized pollutants affect ambient air quality near the emissions source. Ozone is considered a regional criteria pollutant, whereas CO, NO_2, SO_2, and lead are localized pollutants. PM can be both a local and a regional pollutant, depending on its composition. The primary criteria pollutants of concern generated by the project are ozone precursors (ROG and NO_X), CO, and PM (including DPM).

  - Adverse health effects induced by regional criteria pollutant emissions generated by the proposed project (ozone precursors and PM) are highly dependent on a multitude of interconnected variables (e.g., cumulative concentrations, local meteorology and atmospheric conditions, the number and character of exposed individuals [e.g., age, gender]). For these reasons, ozone precursors (ROG and NO_X) contribute to the formation of ground-borne ozone on a regional scale, where emissions of ROG and NO_X generated in one area may not equate to a specific ozone concentration in that same area. Similarly, some types of particulate pollutant may be transported over long-distances or formed through atmospheric reactions. As such, the magnitude and locations of specific health effects from exposure to increased ozone or regional PM concentrations are the product of emissions generated by numerous sources throughout a region, as opposed to a single individual project.

- Existing models have limited sensitivity to small changes in regional criteria pollutant concentrations, and as such, translating project-generated regional criteria pollutants to specific health effects would not produce meaningful results. In other words, minor increases in regional air pollution from project-generated ROG and NO_X would have nominal or negligible impacts on human health. The technical limitations of existing models to correlate project-level regional emissions with specific health consequences are recognized by air quality management districts throughout the state, including SJVAPCD and SMAQMD. As discussed above, air districts develop region-specific CEQA thresholds of significance in consideration of existing air quality concentrations and attainment or nonattainment designations under the NAAQS and CAAQS. The NAAQS and CAAQS are informed by a wide range of scientific evidence that demonstrates that there are known safe concentrations of criteria pollutants; the standards were established using health-based criteria to protect the public health, including protecting the health of "sensitive" populations such as asthmatics, children, and the elderly, with a margin of safety from adverse health impacts due to exposure to air pollution. While recognizing that air quality is cumulative problem, air districts typically consider projects that generate criteria pollutant and ozone precursor emissions below these thresholds to be minor in nature and would not adversely affect air quality such that the NAAQS or CAAQS would be exceeded. Emissions generated by the proposed project could increase photochemical reactions and the formation of tropospheric ozone and secondary PM, which at certain concentrations, could lead to an increased incidence of specific health consequences. Although these health effects are associated with ozone and particulate pollution, the effects are a result of cumulative and regional emissions. As such, a project's incremental contribution cannot be traced to specific health outcomes on a regional scale, and a quantitative correlation of project-generated regional criteria pollutant emissions to specific human health impacts is not included in this analysis. It is foreseeable that unmitigated construction- and operational-generated emissions of ozone precursors and PM in excess of air district thresholds could contribute to cumulative and regional health impacts. In such cases, all feasible mitigation is applied, and emissions are reduced to the extent possible. Please refer to Impact AQ-2 for a discussion of project-generated emissions and a description of feasible mitigation.

- Because localized pollutants generated by a project can directly affect adjacent sensitive receptors, the analysis of project-related impacts on human health focuses only on those localized pollutants with the greatest potential to result in a significant, material impact on human health. This analysis is consistent with the current state-of-practice and published guidance by SJVAPCD (2015), SMAQMD (2019), CAPCOA (2009), OEHHA (2015), and CARB (2000). The pollutants of concern include (1) DPM and localized PM, (2) localized CO, (3) asbestos, and (4) C. immitis (Valley Fever). Locally adopted thresholds of significance for each pollutant are identified below.

- *Diesel Particulate Matter (DPM):* SJVAPCD outlined their health risk assessment thresholds in APR-1906 Framework for Performing Health Risk Assessments (SJVAPCD, 2018). For projects that fall under CEQA, such as the proposed project, the cancer risk threshold is less than or equal to 20 in a million and the chronic non-cancer Hazard Index threshold is less than 1.0. SMAQMD does not recommend any

particular health risk or concentration-based thresholds and instead defers to the local jurisdiction to determine appropriate risk levels. However, the neighboring air district, (BAAQMD), does recommend project-specific and cumulative cancer risk thresholds of 10 and 100 in a million, respectively. A chronic non-cancer Hazard Index of less than 1.0 is also recommended. Therefore, the health risks for excess cancer and chronic non-cancer associated with construction and operation of the proposed project that would take place within the SMAQMD jurisdictional boundary were compared against the BAAQMD thresholds for construction and operation phases. ~~SJVAPCD and SMAQMD adopted quantitative thresholds for evaluating receptor exposure to the identified TAC DPM. The SJVAPCD threshold is applicable to both permitted and non-permitted sources, whereas the SMAQMD threshold was developed for permitted stationary sources, but is often considered when quantitatively modeling potential health risks associated with proposed projects. Using these thresholds, impacts are considered significant if the probability of contracting cancer for the maximum exposed individual (MEI) equals or exceeds 10 in 1 million, or if the hazard index (HI) (the ratio of expected exposure levels to health-acceptable exposure levels) equals or exceeds 1 for the MEI.~~

- *Localized Carbon Monoxide Concentrations:* SJVAPCD and SMAQMD have each adopted screening criteria that provide a conservative indication of whether project-generated traffic would cause a potential CO hot spot. The screening criteria adopted by SJVAPCD and SMAQMD are similar, both providing a tiered screening level procedure.

- The **first tier** states that the proposed project's CO impact would be less than significant if the following criteria are met:

- SJVAPCD

- Traffic generated by the proposed project would not result in a deterioration of level of service (LOS) on one or more streets or at one or more intersections to LOS E or F;[5] and

- The project would not worsen a street or an intersection that already operates at LOS of F.

- SMAQMD

- Traffic generated by the proposed project would not result in deterioration of intersection level of service (LOS) to LOS E or F; and

- The project would not contribute additional traffic to an intersection that already operates at LOS of E or F.

- If the first tier of screening criteria is not met, each air district provides a **second tier** analysis step. Under this step, the project's CO impacts would be less than significant if:

[5] **Level of service (LOS)** is a qualitative measure used to relate the quality of motor vehicle traffic service using letters A through F, with A being the best and F being the worst.

    - SJVAPCD

- An analysis is run using the Transportation Project-Level Carbon Monoxide Protocol (University of California, Davis) and results demonstrate that the project would not potentially have a significant effect on any intersection.

- SMAQMD

- The project would not result in an affected intersection experiencing more than 31,600 vehicles per hour.

- The project would not contribute traffic to a tunnel, parking garage, bridge underpass, urban street canyon, below-grade roadway, or other locations where horizontal or vertical mixing of air would be substantially limited.

- The mix of vehicle types at the intersection is not anticipated to be substantially different from the County average.

- Per Section 15064.3 of the CEQA Guidelines adopted in 2018, a LOS analysis was not performed in support of this EIR; therefore, the second-tier screening criteria were used for analysis. The SMAQMD criteria were used to analyze potential impacts along the entire project alignment. These criteria provide for a semi-quantitative level of analysis and addresses the root concerns associated with localized CO concentrations applicable to the proposed project, in particular the potential for an increase in congestion at high-volume roadways or within locations prone to limit the natural dispersion of ambient CO concentrations.

- *Asbestos:* There are no quantitative thresholds related to receptor exposure to asbestos. However, SJVAPCD and SMAQMD both require the demolition or renovation of asbestos-containing building materials to comply with the limitations of the National Emissions Standards for Hazardous Air Pollutants (NESHAP) regulations as listed in the Code of Federal Regulations.

- *Valley Fever Exposure:* Valley Fever can develop after receptor exposure to C. immitis. While flu-like symptoms develop in less than 40% of individuals exposed to the fungal spores, those presenting symptoms may experience fatigue, cough, chest pain, fever, rash, headache, and joint aches. Neither the state nor the project area air districts have adopted thresholds to evaluate receptor exposure to increased Valley Fever risk. The potential for the proposed project to expose receptors to Valley Fever is highest in areas known to contain C. immitis and during earthmoving activities that generate fugitive dust. Accordingly, uncontrolled construction dust emissions in endemic regions of C. immitis could result in increased health impacts from the exposure of receptors to C. immitis spores.

- Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people.

    - For the purposes of this analysis, the construction of an odor-producing facility, as defined by the study area air quality management districts, 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.

3.3.4.3 Impacts and Mitigation Measures

Impact AQ-1: Implementation of the proposed project could conflict with or obstruct implementation of applicable air quality plans. However, implementation of Mitigation Measures AQ-2.1, AQ-2.2, AQ-2.3, and AQ-2.4 would reduce this potentially-significant impact to a less than significant level (Less-than-Significant Impact with Mitigation).

Air quality plans describe air pollution control strategies to be implemented by a city, county, or region. The primary purpose of an air quality plan is to bring an area that does not attain federal or state air quality standards into compliance, as well as to ensure that an area that is in attainment is able to maintain compliance with the requirements of the CAA and California CAA requirements. SJVAPCD and SMAQMD prepare plans to attain and maintain compliance with state and national ambient air quality standards. Current air quality plans are listed above.

Overall, the implementation of the proposed project would result in several benefits, including reduced VMT and traffic congestion relief throughout the project alignment and region, consistent with the objectives and policies of both the SJVAPCD and SMAQMD air quality plans. The goal of the air quality plans, however, is to reduce criteria air pollutant emissions for which the SJVAB and SVAB are considered nonattainment in order to achieve NAAQS and CAAQS by the earliest practicable date. The SJVAPCD GAMAQI is intended to provide technical guidance for the review of air quality impacts from proposed projects within the boundaries of the SJVAPCD. Similarly, the SMAQMD *Guide to Air Quality Assessment in Sacramento County* (Guide) is intended to provide a tool for identifying proposed projects that may have a significant adverse effect on air quality. According to both the SJVAPCD GAMAQI and the SMAQMD Guide, projects whose emissions are expected to meet or exceed the recommended thresholds of significance for criteria air pollutants would have a potentially significant adverse impact on air quality and potentially conflict with or obstruct the implementation of applicable air quality plans; projects whose emissions do not meet or exceed these thresholds would not impact the respective air district's ability to reach or maintain attainment and would be consistent with applicable air quality plans.

As detailed in the below analysis of Impact AQ-2, emissions that would be generated by operation of the proposed project within the respective jurisdictions of SJVAPCD and SMAQMD would not exceed the recommended thresholds of significance of the respective air districts. However, the construction of project improvements within the SJVAPCD jurisdiction would exceed SJVAPCD-recommended significance thresholds for maximum daily and annual emissions of NO_X. In addition, although emissions estimates do not exceed SJVAPCD-recommended thresholds for PM_{10} or $PM_{2.5}$, SJVAPCD requires the implementation of fugitive dust control measures, as detailed in SJVAPCD Regulation VIII, on construction sites of 1 acre or greater (SJVAPCD 2015). Construction of the proposed project within the SMAQMD jurisdiction would exceed SMAQMD-recommended significance thresholds for maximum daily emissions of NO_X, PM_{10}, and $PM_{2.5}$. Similar to SJVAPCD, SMAQMD recommends that all construction projects implement SMAQMD's Basic Construction Emission Control Practices (SMAQMD 2010). SJVAPCD's and SMAQMD's thresholds were established to help prevent emissions from new projects from contributing to regional violations of the ambient air quality standards. Without incorporation of SJVAPCD's Regulation VIII fugitive dust control measures and SMAQMD's Basic Construction Emission Control Practices,

and because NO_X emissions would exceed the SJVAPCD and SMAQMD thresholds and PM_{10} and $PM_{2.5}$ emissions would exceed the SMAQMD threshold, project construction could conflight with the applicable air quality plans. This impact would be potentially significant.

In addition, because the proposed project could promote indirect regional growth as a result of improved and expanded access to transit services, this analysis also considers whether the proposed project would result in unanticipated growth in the region that could result in increased indirect criteria air pollutant emissions not considered in the drafting of the applicable air quality plans, regional transportation plans, and sustainable communities strategies.

As detailed in Section 3.13, *Population and Housing*, the proposed expansion of service and new station (Lodi Station or Lodi Station South Alternative) within the SJVAPCD jurisdiction would serve the anticipated growth planned for by the City of Lodi through its General Plan, and development of the area surrounding the station alternatives would be limited through San Joaquin County's land use designation and zoning and infrastructure constraints identified in the San Joaquin County General Plan and the San Joaquin County Development Title. Therefore, operations of the proposed project within SJVAPCD's jurisdiction would not induce new or unplanned growth inconsistent with the City of Lodi or San Joaquin County. Within Sacramento County, the proposed project would support future population and housing growth as identified in the 2020 MTP/SCS. ~~The proposed North Elk Grove Station would be located adjacent to the existing SacRT Franklin light rail station and would provide a connection between the Franklin light rail station and the proposed project.~~ The areas adjacent to the proposed City College Station, Midtown Sacramento Station, and Old North Sacramento Station are within a Transit Priority Area, which is defined as an area of the region within 0.5 mile of a major transit stop (existing or planned light rail, street car, or train station) or an existing or planned high-quality transit corridor included in the 2020 MTP/SCS. Development surrounding the proposed Natomas/Sacramento Airport Station is limited through the County's land use designations and Urban Policy Area/Urban Services Boundary, and therefore the proposed station would not result in new land uses or cause the redistribution or intensification of planned land uses that could induce unplanned growth.

Mitigation Measures: Mitigation Measures AQ-2.1 through AQ-2.4, described below under Impact AQ-2, would reduce construction-related NO_X, PM_{10}, and $PM_{2.5}$ emissions to a less-than-significant level in both the SJVAPCD and SMAQMD respective jurisdictions and ensure the implementation of fugitive dust control measures at construction and staging areas. Therefore, the construction of the proposed project would not conflict with applicable air quality plans and the impacts would be less than significant with the implementation of mitigation.

AQ-2.1: Implement advanced emissions controls for off-road equipment.

Refer to measure description under discussion of Impact AQ-2 below.

AQ-2.2: Implement advanced emissions controls for locomotives used for construction.

Refer to measure description under discussion of Impact AQ-2 below.

AQ-2.3: Implement fugitive dust control measures at all construction and staging areas to reduce construction-related fugitive dust, consistent with SJVAPCD Regulation VIII and SMAQMD Basic Emission Control Practices.

Refer to measure description under discussion of Impact AQ-2 below.

AQ-2.4: Offset construction NO_X emissions.

Refer to measure description under discussion of Impact AQ-2 below.

Impact AQ-2: Implementation of the proposed project could result in a cumulatively considerable net increase of criteria pollutants for which the project region is nonattainment under an applicable federal or state ambient air quality standard. However, implementation of Mitigation Measures AQ-2.1, AQ-2.2, AQ-2.3, and AQ-2.4 would reduce this potentially-significant impact to a less than significant level (Less-than-Significant Impact with Mitigation).

Construction

Construction emissions are described as short-term or temporary in duration but have the potential to adversely affect air quality. Construction-related activities would result in temporary emissions of criteria air pollutants (e.g., PM_{10}, $PM_{2.5}$, CO) and ozone precursors (e.g., VOC and NO_x) from ground disturbing activities (e.g., excavation, grading, and clearing); exhaust emissions from the use of off-road equipment, material delivery, and construction worker commutes; building construction; asphalt paving; and the application of architectural coatings.

Criteria pollutant emissions generated by these sources were quantified using emission factors and methodologies described above. As noted in the methodology description, the construction-related emissions estimates use conservative assumptions based on a construction scenario of maximum overlap of the most intensive days of equipment use of each construction phase (site work, rail work, and structures work) and concurrent construction of project elements along the project alignment. Because of these conservative assumptions, actual emissions could be less than those estimated. If construction is delayed or occurs over a longer period, emissions could be reduced because of a more modern and cleaner burning (less emitting) construction equipment fleet mix and a less intensive and overlapping construction schedule.

Tables 3.3-5 and 3.3-6 summarize the maximum daily and maximum annual emissions of ROG, CO, NO_X, SO_2, PM_{10}, and $PM_{2.5}$ associated with the construction of each project element within the jurisdiction of SJVAPCD and SMAQMD, respectively. Each table also presents the maximum daily and annual construction scenarios of the proposed project elements being constructed concurrently within each air district jurisdiction. Note that, while emissions are shown for alternatives and/or variants, the maximum daily and annual emissions scenarios account only for the higher emissions of the alternative/variant improvements, thereby presenting a maximum possible construction emissions scenario regardless of which alternative/variant is ultimately constructed. Refer to Appendix B-1, *Quantification of Criteria Air Pollutant and Greenhouse Gas Emissions, and Energy Use,* for detailed model inputs, assumptions, and calculations.

Table 3.3-5. Estimated Unmitigated Air Pollutant Emissions from Proposed Project Construction Within the SJVAPCD Jurisdiction

Project Element	Construction Year	Maximum Daily Emissions (pounds per day)						Maximum Annual Emissions (tons per year)					
		ROG	CO	NO_X	SO_2	PM_{10}	$PM_{2.5}$	ROG	CO	NO_X	SO_2	PM_{10}	$PM_{2.5}$
Lodi Station	2021	9.94 ~~8.50~~	44.58 ~~43.57~~	103.76 ~~107.50~~	0.12	32.16 ~~32.15~~	14.62 ~~14.61~~	0.60 ~~0.55~~	3.19 ~~3.13~~	5.82 ~~5.84~~	0.01	1.18	0.52
Lodi Station South Alternative	2021	10.16 ~~8.53~~	44.58 ~~43.57~~	103.76 ~~107.50~~	0.12	32.35 ~~32.24~~	14.63 ~~14.62~~	0.60 ~~0.55~~	3.19 ~~3.13~~	5.82 ~~5.84~~	0.01	1.18	0.52
Track Curve Reconstruction East March Lane to East Swain Road	2022	5.86 ~~5.78~~	24.49 ~~23.92~~	80.30 ~~84.40~~	0.07	28.03 ~~28.02~~	13.38 ~~13.37~~	0.06	0.25	0.70 ~~0.72~~	0.00	0.07	0.04
Track Curve Reconstruction North of North New Hope Road	2022	5.86 ~~5.78~~	24.49 ~~23.92~~	80.30 ~~84.40~~	0.07	28.03 ~~28.02~~	13.38 ~~13.37~~	0.06	0.25	0.70 ~~0.72~~	0.00	0.07	0.04
Hammer Lane Siding Upgrade	2023	5.86 ~~5.78~~	24.49 ~~23.92~~	80.30 ~~84.40~~	0.07	28.03	13.38 ~~13.37~~	0.11	0.50 ~~0.49~~	1.40 ~~1.45~~	0.00	0.15	0.07
Thornton Siding Upgrade & Extension	2023	5.89 ~~5.78~~	24.49 ~~23.92~~	80.30 ~~84.40~~	0.07	28.87 ~~28.86~~	13.48 ~~13.47~~	0.22	1.00 ~~0.98~~	2.80 ~~2.89~~	0.00	0.30	0.14
Lodi Siding	2021	5.98 ~~5.80~~	24.49 ~~23.92~~	80.30 ~~84.40~~	0.07	29.10 ~~29.09~~	13.51 ~~13.50~~	0.45	1.99 ~~1.97~~	5.60 ~~5.78~~	0.01	0.60 ~~0.59~~	0.29
Maximum Daily / Annual Emissions During Each Construction Year[1]	***2021***	***16.44*** ***~~14.33~~***	***69.07*** ***~~67.49~~***	***184.06**** ***~~191.90~~***	***0.19***	***61.35*** ***~~61.33~~***	***28.14*** ***~~28.12~~***	***1.05*** ***~~0.99~~***	***5.18*** ***~~5.10~~***	***11.42**** ***~~11.62~~***	***0.01***	***1.77***	***0.81***
	2022	***11.73*** ***~~11.57~~***	***48.98*** ***~~47.84~~***	***160.60**** ***~~168.80~~***	***0.15*** ***~~0.14~~***	***56.05***	***26.76*** ***~~26.74~~***	***0.11***	***0.50*** ***~~0.49~~***	***1.40*** ***~~1.45~~***	***0.00***	***0.15***	***0.07***
	2023	***11.76*** ***~~11.57~~***	***49.98*** ***~~47.84~~***	***160.60**** ***~~168.80~~***	***0.15*** ***~~0.14~~***	***56.90*** ***~~56.89~~***	***26.86*** ***~~26.85~~***	***0.34*** ***~~0.33~~***	***1.50*** ***~~1.48~~***	***4.20*** ***~~4.34~~***	***0.00***	***0.44***	***0.22***
SJVAPCD Thresholds		*100*	*100*	*100*	*100*	*100*	*100*	*10*	*100*	*10*	*27*	*15*	*15*
Emissions Exceed Thresholds?		*No*	*No*	*Yes*	*No*	*No*	*No*	*No*	*No*	*Yes*	*No*	*No*	*No*

Potential Exceedances of SJVAPCD-recommended thresholds of significance are with an asterisk (*) ~~in underline~~.

Notes: ROG = reactive organic compounds; NO_x = oxides of nitrogen; PM_{10} = respirable particulate matter with an aerodynamic diameter of 10 micrometers or less; $PM_{2.5}$ = respirable particulate matter with an aerodynamic diameter of 2.5 micrometers or less; SJVAPCD = San Joaquin Valley Air Pollution Control District.

[1] Totals do not all add exactly as a result of rounding.

Source: Modeled by AECOM in 2020~~19~~. See Appendix B-1, *Quantification of Criteria Air Pollutant and Greenhouse Gas Emissions, and Energy Use*, for complete modeling inputs, assumptions, and calculations.

Table 3.3-6. Estimated Unmitigated Air Pollutant Emissions from Proposed Project Construction Within the SMAQMD Jurisdiction

Project Element	Construction Year	Maximum Daily Emissions (pounds per day)						Maximum Annual Emissions (tons per year)					
		ROG	CO	NO_X	SO_2	PM_{10}	$PM_{2.5}$	ROG	CO	NO_X	SO_2	PM_{10}	$PM_{2.5}$
~~North Elk Grove Station Access Variant 2 *Inclusive of Elk Grove platform improvements*[1]~~	~~2021~~	~~3.98~~	~~20.81~~	~~36.52~~	~~0.05~~	~~26.86~~	~~12.66~~	~~0.49~~	~~2.83~~	~~4.79~~	~~0.01~~	~~1.11~~	~~0.48~~
~~North Elk Grove Station Access Variant 1 *Inclusive of Elk Grove platform improvements*[1]~~	~~2021~~	~~3.90~~	~~20.81~~	~~36.52~~	~~0.05~~	~~26.82~~	~~12.66~~	~~0.48~~	~~2.83~~	~~4.79~~	~~0.01~~	~~1.11~~	~~0.48~~
City College Station	2023	8.46 ~~8.29~~	44.58 ~~43.66~~	103.76 ~~106.97~~	0.112 ~~0.25~~	25.51 ~~25.43~~	13.92 ~~13.91~~	0.53	2.65 ~~2.61~~	6.36 ~~6.53~~	0.01	0.72	0.33
Midtown Sacramento Station	2021	10.68 ~~8.60~~	44.58 ~~43.57~~	103.76 ~~107.50~~	0.12	32.14 ~~32.13~~	14.62 ~~14.61~~	0.72 ~~0.68~~	3.43 ~~3.38~~	8.01 ~~8.17~~	0.01	1.14	0.53
Old North Sacramento Station	2023	10.01 ~~8.51~~	4.458 ~~43.57~~	103.76 ~~107.50~~	0.12	32.21 ~~32.20~~	14.64 ~~14.62~~	0.82 ~~0.77~~	4.09 ~~4.02~~	8.77 ~~8.93~~	0.01	1.27	0.58 ~~0.57~~
Natomas / Sacramento Airport Station	2021	11.98 ~~8.76~~	44.58 ~~43.57~~	103.76 ~~107.50~~	0.12	32.38	14.66 ~~14.64~~	0.73 ~~0.68~~	3.36 ~~3.33~~	7.94 ~~8.11~~	0.01	1.01	0.48
Track Curve Reconstruction South of Desmond Road	2022	5.86 ~~5.78~~	24.49 ~~23.92~~	80.30 ~~84.40~~	0.07	28.03	13.38 ~~13.37~~	0.06	0.25	0.70 ~~0.72~~	0.00	0.07	0.04
Track Curve Reconstruction North of ~~North~~ Elk Grove ~~Station~~	2022	5.86 ~~5.78~~	24.49 ~~23.92~~	80.30 ~~84.40~~	0.07	28.03 ~~28.02~~	13.38 ~~13.37~~	0.06	0.25	0.70 ~~0.72~~	0.00	0.07	0.04
Philips Siding Upgrade and Extension	2021	5.93 ~~5.79~~	24.49 ~~23.92~~	80.30 ~~84.40~~	0.07	29.15 ~~29.14~~	13.52 ~~13.51~~	0.11	0.50 ~~0.49~~	1.40 ~~1.45~~	0.00	0.15	0.07
Pollock Siding Upgrade	2023	5.86 ~~5.78~~	24.49 ~~23.92~~	80.30 ~~84.40~~	0.07	28.03	13.38 ~~13.37~~	0.11	0.50 ~~0.49~~	1.40 ~~1.45~~	0.00	0.15	0.07
South Sacramento Siding Upgrade	2023	5.86 ~~5.78~~	24.49 ~~23.92~~	8030 ~~84.40~~	0.07	28.02 ~~28.01~~	13.38 ~~13.37~~	0.26	1.12 ~~1.10~~	3.41 ~~3.54~~	0.00	0.29	0.14
Del Paso Siding Upgrade and Extension	2021	8.53 ~~8.32~~	44.58 ~~43.57~~	103.76 ~~107.50~~	0.12	32.83 ~~32.82~~	14.71 ~~14.70~~	0.84 ~~0.83~~	4.30 ~~4.23~~	9.93 ~~10.17~~	0.01	1.15	0.52
~~Elk Grove Siding~~	~~2021~~	~~8.32~~	~~43.57~~	~~107.50~~	~~0.12~~	~~32.81~~	~~14.69~~	~~0.44~~	~~2.33~~	~~5.34~~	~~0.01~~	~~0.62~~	~~0.28~~
New Crossover	2023	5.86 ~~5.78~~	24.49 ~~23.92~~	80.30 ~~84.40~~	0.07	28.03	13.38 ~~13.37~~	0.11	0.50 ~~0.49~~	1.40 ~~1.45~~	0.00	0.15	0.07
	2021	***37.11***	***158.22***	***391.57****	***0.43***	***126.50****	***57.52***	***2.41***	***11.59***	***27.28***	***0.03***	***3.45***	***1.61***

Project Element	Construction Year	Maximum Daily Emissions (pounds per day)						Maximum Annual Emissions (tons per year)					
		ROG	CO	NO_X	SO_2	PM_{10}	$PM_{2.5}$	ROG	CO	NO_X	SO_2	PM_{10}	$PM_{2.5}$
Maximum Daily / Annual Emissions During Each Construction Year[2]		~~***43.77***~~	~~***219.02***~~	~~***550.92***~~	~~***0.60***~~	~~***186.15***~~	~~***84.82***~~	~~***3.24***~~	~~***16.60***~~	~~***38.03***~~	~~***0.04***~~	~~***5.17***~~	~~***2.36***~~
	2022	***11.73*** ~~***11.5***~~	***48.98*** ~~***47.84***~~	***160.60**** ~~***68.80***~~	***0.15*** ~~***0.14***~~	***56.06*** ~~***56.05***~~	***26.76*** ~~***26.74***~~	***0.11***	***0.50*** ~~***0.49***~~	***1.40*** ~~***1.45***~~	***0.00***	***0.15***	***0.07***
	2023	***36.06*** ~~***34.16***~~	***162.62*** ~~***159.00***~~	***448.41**** ~~***467.67***~~	***0.46*** ~~***0.59***~~	***141.79**** ~~***141.70***~~	***68.69*** ~~***68.65***~~	***1.84*** ~~***1.78***~~	***8.85*** ~~***8.72***~~	***21.35*** ~~***21.89***~~	***0.02***	***2.58*** ~~***2.57***~~	***1.19***
SMAQMD Thresholds		-	-	85	-	80	82	-	-	-	-	14.60	15.00
Emissions Exceed Thresholds?		-	-	Yes	-	Yes	No ~~Yes~~	-	-	-	-	No	No

Potential Exceedances of SMAQMD-recommended thresholds of significance are shown with an asterisk (*)~~in underline~~.

Notes: ROG = reactive organic compounds; NO_X = oxides of nitrogen; PM_{10} = respirable particulate matter with an aerodynamic diameter of 10 micrometers or less; $PM_{2.5}$ = respirable particulate matter with an aerodynamic diameter of 2.5 micrometers or less; SMAQMD = Sacramento Metropolitan Air Quality Management District.

~~[1] While North Elk Grove platform improvement variants would differ in location, they are equivalent in emissions-generating construction activity.~~

[2] Totals do not all add exactly as a result of rounding.

Source: Modeled by AECOM 2020~~19~~. See Appendix B-1, *Quantification of Criteria Air Pollutant and Greenhouse Gas Emissions, and Energy Use*, for complete modeling inputs, assumptions, and calculations.

While Tables 3.3-5 and 3.3-6 identify construction-related emissions from each project improvement and associated alternative/variant (as applicable), the impact determination is based on total maximum emissions from the construction of all improvements within both air districts to provide a complete assessment of potential air quality emissions and enable a comparison against adopted air district thresholds. The construction of project improvements within San Joaquin County would exceed SJVAPCD-recommended significance thresholds for maximum daily and annual emissions of NO_X. In addition, although emissions estimates do not exceed SJVAPCD-recommended thresholds for PM_{10} or $PM_{2.5}$, SJVAPCD requires the implementation of fugitive dust control measures, as detailed in SJVAPCD Regulation VIII, on construction sites of 1 acre or greater (SJVAPCD 2015). The construction of proposed project elements within Sacramento County would exceed SMAQMD-recommended significance thresholds for maximum daily emissions of NO_X, PM_{10}, and $PM_{2.5}$. Similar to SJVAPCD, SMAQMD ~~recommends~~ requires that all construction projects implement SMAQMD's Basic Construction Emission Control Practices (SMAQMD 2019~~10~~). Without incorporation of SJVAPCD's Regulation VIII fugitive dust control measures and SMAQMD's Basic Construction Emission Control Practices, and because NO_X emissions would exceed the SJVAPCD and SMAQMD thresholds and PM_{10} and $PM_{2.5}$ emissions would exceed the SMAQMD threshold, the impact of short-term construction-related activities would be potentially significant.

Mitigation Measures: The following mitigation measures would reduce on-site construction-related air quality emissions to a less-than-significant level, as shown in Tables 3.3-7 and 3.3-8.

Mitigation measures AQ-2.1 through AQ-2.3 would reduce the potential emissions of NO_X, ROG, and PM generated from on-site use of construction equipment and use of locomotives for construction-support and on-site earthwork. The implementation of Mitigation Measures AQ-2.1 and AQ-2.2 would reduce emissions of NO_X, as well as ROG and exhaust PM, from on-site equipment use; these reductions would reduce construction-related emissions in both air districts to a level that would not exceed the respective air district-recommended thresholds of significance for NO_X. Mitigation measure AQ-2.3 would reduce PM_{10} and $PM_{2.5}$ emissions associated with fugitive dust to a level that would not exceed the air district-recommended thresholds of significance for PM and would ensure compliance with the SJVAPCD and SMAQMD requirements for the implementation of fugitive dust management measures at construction sites.

Although Mitigation Measure AQ-2.1 would reduce the potential impact to a less-than-significant level, the implementation of Mitigation Measure AQ-2.1 is dependent upon the availability of specific equipment through a third party and is not entirely within the control of SJRRC. Mitigation Measure AQ-2.4 is included as a contingency in the case that Tier 4 construction equipment cannot be obtained and that construction-related emissions would otherwise exceed SJVAPCD- or SMAQMD-recommended thresholds. Therefore, if after application of Mitigation Measure AQ-2.1, emissions would still exceed the SJVAPCD- or SMAQMD-recommended threshold for NO_X during construction, SJRRC shall implement Mitigation Measure AQ-2.4 to offset NO_X emissions and would ensure the reduction of the project's impacts related to construction-generated emissions of NO_X to a less-than-significant level.

Overall, the implementation of Mitigation Measures AQ-2.1 through AQ-2.4 would reduce construction-related emissions due to construction of the proposed project to a less-than-significant level in both the SJVAPCD and SMAQMD jurisdictions. Estimated emissions with the

implementation of mitigation measures are shown for project improvements within SJVAPCD and SMAQMD jurisdictions in Tables 3.3-7 and 3.3-8, respectively.

AQ-2.1: Implement advanced emissions controls for off-road equipment.

SJRRC shall require that the construction contractor for all off-road equipment greater than 25 horsepower have engines that meet or exceed Tier 4 Final off-road emission standards, if commercially available. The Community Development Department for San Joaquin and Sacramento County will verify compliance with this measures prior to the issuance of a grading permit for construction activities within the respective jurisdictions.

AQ-2.2: Implement advanced emissions controls for locomotives used for construction.

SJRRC will require all diesel-powered locomotives used for construction to have engines that meet or exceed Tier 4 locomotive emission standards. The local community development or community works department, dependent upon the location of construction, will verify compliance with this measures prior to the issuance of a grading permit for construction activities within the respective jurisdictions.

AQ-2.3: Implement fugitive dust control measures at all construction and staging areas to reduce construction-related fugitive dust, consistent with SJVAPCD Regulation VIII and SMAQMD Basic Emission Control Practices.

SJRRC shall require that the construction contractor comply with fugitive dust control measures listed below or as they may be updated in the future by the SJVAPCD or SMAQMD. These measures reflect the SJVAPCD's Regulation VIII and the Basic Construction Emission Control Practices identified by the SMAQMD. The local community development or community works department, dependent upon the location of construction, will verify compliance with this measures prior to the issuance of a grading permit for construction activities within the respective jurisdictions.

- Water all exposed active construction area surfaces two times daily. Stabilize all on-site unpaved roads using water or chemical stabilizer/suppressant. Exposed surfaces include, but are not limited to, soil piles, graded areas, unpaved parking areas, staging areas, and access roads. All disturbed areas, including storage piles, that are not being actively utilized for construction purposes, shall be effectively stabilized to prevent dust emissions by being sprayed with water or chemical stabilizer/suppressant, or by being covered with a tarp or other suitable cover or vegetative ground cover.
- Install wind barriers at the windward sides of construction areas. Suspend excavation and grading activity when winds exceed 20 miles per hour.
- Cover or maintain at least 2 feet of free board space on haul trucks transporting soil, sand, or other loose material on the site. Any haul trucks that would be traveling along freeways or major roadways should be covered. Clean the interior of cargo compartments on emptied haul trucks prior to leaving a site.

Table 3.3-7. Estimated Mitigated Air Pollutant Emissions from Proposed Project Construction Within the SJVAPCD Jurisdiction

Project Element	Construction Year	Maximum Daily Emissions (puonds per day)						Maximum Annual Emissions (tons per year)					
		ROG	CO	NO_X	SO_2	PM_{10}	$PM_{2.5}$	ROG	CO	NO_X	SO_2	PM_{10}	$PM_{2.5}$
Lodi Station	2021	3.21 ~~1.78~~	49.09 ~~48.09~~	16.90 ~~16.01~~	0.12	13.29 ~~13.28~~	4.79 ~~4.78~~	1.16 ~~0.11~~	3.22 ~~3.17~~	0.85 ~~0.82~~	0.01	0.52 ~~0.51~~	0.17 ~~0.16~~
Lodi Station South Alternative	2021	3.43 ~~1.81~~	48.09	16.90 ~~16.01~~	0.12	13.38 ~~13.37~~	4.80 ~~4.79~~	0.17 ~~0.11~~	3.22 ~~3.17~~	0.85 ~~0.82~~	0.01	0.52	0.17
Track Curve Reconstruction East March Lane to East Swain Road	2022	1.15 ~~1.07~~	25.25 ~~24.68~~	13.21 ~~12.68~~	0.07	11.48 ~~11.47~~	4.61 ~~4.60~~	0.01	0.25 ~~0.24~~	0.08	0.00	0.03	0.01
Track Curve Reconstruction North of North New Hope Road	2022	1.15 ~~1.07~~	25.25 ~~24.68~~	13.21 ~~12.68~~	0.07	11.48 ~~11.47~~	4.60	0.01	0.25 ~~0.24~~	0.08	0.00	0.03	0.01
Hammer Lane Siding Upgrade	2023	1.15 ~~1.07~~	25.25 ~~24.68~~	13.21 ~~12.68~~	0.07	11.48	4.61 ~~4.60~~	0.02	0.49	0.17 ~~0.16~~	0.00	0.06	0.02
Thornton Siding Upgrade & Extension	2023	1.18 ~~1.08~~	25.25 ~~24.68~~	13.21 ~~12.68~~	0.07	12.32	4.71 ~~4.70~~	0.04	0.99 ~~0.97~~	0.34 ~~0.33~~	0.00	0.11	0.03
Lodi Siding	2021	1.26 ~~1.09~~	25.25 ~~24.68~~	13.21 ~~12.68~~	0.07	12.55 ~~12.54~~	4.74 ~~4.73~~	0.08 ~~0.07~~	1.97 ~~1.95~~	0.68 ~~0.65~~	0.01	0.23	0.07
Maximum Daily / Annual Emissions During Each Construction Year[1]	***2021***	**4.70** **~~2.89~~**	**74.34** **~~72.77~~**	**30.11** **~~28.69~~**	**0.19**	**25.93** **~~25.92~~**	**9.54** **~~9.52~~**	**0.24** **~~0.18~~**	**5.19** **~~5.12~~**	**1.53** **~~1.47~~**	**0.01**	**0.75** **~~0.74~~**	**0.23**
	2022	**2.31** **~~2.14~~**	**50.49** **~~49.35~~**	**26.42** **~~25.36~~**	**0.15** **~~0.14~~**	**22.96** **~~22.95~~**	**9.21** **~~9.19~~**	**0.02**	**0.49**	**0.17** **~~0.16~~**	**0.00**	**0.06**	**0.02**
	2023	**2.34** **~~2.15~~**	**50.49** **~~49.35~~**	**26.42** **~~25.36~~**	**0.15** **~~0.14~~**	**23.80** **~~23.79~~**	**9.31** **~~9.30~~**	**0.06** **~~0.05~~**	**1.48** **~~1.46~~**	**0.51** **~~0.49~~**	**0.00**	**0.17**	**0.05**
SJVAPCD Thresholds		*100*	*100*	*100*	*100*	*100*	*100*	*10*	*100*	*10*	*27*	*15*	*15*
Emissions Exceed Thresholds?		*No*	*No*	*No*	*No*	*No*	*No*	*No*	*No*	*No*	*No*	*No*	*No*

Notes: ROG = reactive organic compounds; CO = Carbon Monoxide; NO_X = oxides of nitrogen; PM_{10} = respirable particulate matter with an aerodynamic diameter of 10 micrometers or less; $PM_{2.5}$ = respirable particulate matter with an aerodynamic diameter of 2.5 micrometers or less; SJVAPCD = San Joaquin Valley Air Pollution Control District.

[1] Totals do not all add exactly as a result of rounding.

Source: Modeled by AECOM in 20<u>20</u>~~19~~. See Appendix B<u>-1</u>, *Quantification of Criteria Air Pollutant and Greenhouse Gas Emissions, and Energy Use*, for complete modeling inputs, assumptions, and calculations.

Table 3.3-8. Estimated Mitigated Air Pollutant Emissions from Proposed Project Construction Within the SMAQMD Jurisdiction

Project Element	Construction Year	Maximum Daily Emissions (pounds per day)						Maximum Annual Emissions (tons per year)					
		ROG	CO	NO_X	SO_2	PM_{10}	$PM_{2.5}$	ROG	CO	NO_X	SO_2	PM_{10}	$PM_{2.5}$
~~North Elk Grove Station Access Variant 2 *Inclusive of North Elk Grove platform improvements*[1]~~	~~2021~~	~~1.35~~	~~24.57~~	~~6.02~~	~~0.05~~	~~11.31~~	~~4.54~~	~~0.11~~	~~2.84~~	~~0.70~~	~~0.01~~	~~0.49~~	~~0.16~~
~~North Elk Grove Station Access Variant I *Inclusive of North Elk Grove platform improvements*[1]~~	~~2021~~	~~1.28~~	~~24.57~~	~~6.02~~	~~0.05~~	~~11.27~~	~~4.53~~	~~0.11~~	~~2.84~~	~~0.70~~	~~0.01~~	~~0.49~~	~~0.16~~
City College Station	2023	1.73 ~~1.59~~	49.09 ~~48.09~~	16.90 ~~16.01~~	0.12	13.19 ~~13.18~~	4.78 ~~4.77~~	0.09	2.75 ~~2.71~~	0.80 ~~0.76~~	0.01	0.28	0.08
Midtown Sacramento Station	2021	3.95 ~~1.87~~	49.09 ~~48.09~~	16.09 ~~16.01~~	0.12	13.27 ~~13.26~~	4.79 ~~4.78~~	0.16 ~~0.12~~	3.42 ~~3.37~~	1.04 ~~1.01~~	0.01	0.47	0.15
Old North Sacramento Station	2023	3.29 ~~1.79~~	49.09 ~~48.09~~	16.90 ~~16.01~~	0.12	13.34 ~~13.33~~	4.80 ~~4.79~~	0.19 ~~0.14~~	4.19 ~~4.13~~	1.16 ~~1.11~~	0.01	0.52	0.16
Natomas / Sacramento Airport Station	2021	5.26 ~~2.04~~	49.09 ~~48.09~~	16.90 ~~16.01~~	0.12	13.52 ~~13.51~~	4.83 ~~4.81~~	0.17 ~~0.12~~	3.35 ~~3.31~~	0.97 ~~0.94~~	0.01	0.39	0.12
Track Curve Reconstruction South of Desmond Road	2022	1.15 ~~1.07~~	25.25 ~~24.68~~	13.21 ~~12.68~~	0.07	11.48	4.61 ~~4.60~~	0.01	0.25 ~~0.24~~	0.08	0.00	0.03	0.01
Track Curve Reconstruction North of ~~North~~ Elk Grove ~~Station~~	2022	1.15 ~~1.07~~	25.25 ~~24.68~~	13.21 ~~12.68~~	0.07	11.48 ~~11.47~~	4.61 ~~4.60~~	0.01	0.25 ~~0.24~~	0.08	0.00	0.03	0.01
Philips Siding Upgrade and Extension	2021	1.21 ~~1.08~~	25.25 ~~24.68~~	13.21 ~~12.68~~	0.07	12.60	4.75 ~~4.74~~	0.02	0.49	0.17 ~~0.16~~	0.00	0.06	0.02
Pollock Siding Upgrade	2023	1.15 ~~1.07~~	25.25 ~~24.68~~	13.21 ~~12.68~~	0.07	11.48	4.61 ~~4.60~~	0.02	0.49	0.17 ~~0.16~~	0.00	0.06	0.02
South Sacramento Siding Upgrade	2023	1.15 ~~1.07~~	25.25 ~~24.68~~	13.21 ~~12.68~~	0.07	11.47	4.61 ~~4.60~~	0.04	1.16 1.15	0.41 0.40	0.00	0.10	0.03
Del Paso Siding Upgrade and Extension	2021	1.80 1.60	49.09 48.09	16.90 16.01	0.12	13.96 13.95	4.88 4.87	0.15 0.14	4.51 4.45	1.25 1.20	0.01	0.45	0.12
~~Elk Grove Siding~~	~~2021~~	~~1.59~~	~~48.09~~	~~16.01~~	~~0.12~~	~~13.94~~	~~4.86~~	~~0.08~~	~~2.48~~	~~0.63~~	~~0.01~~	~~0.24~~	~~0.06~~
New Crossover	2023	1.15 ~~1.07~~	25.25 ~~24.68~~	13.21 ~~12.68~~	0.07	11.48	4.61 ~~4.60~~	0.02	0.49	0.17 ~~0.16~~	0.00	0.06	0.02
Maximum Daily / Annual Emissions During Each Construction Year[1]	***2021***	**12.22 ~~9.53~~**	**172.53 ~~241.61~~**	**63.91 ~~82.76~~**	**0.43 ~~0.60~~**	**53.34 ~~78.57~~**	**19.25 ~~28.60~~**	**0.50 ~~0.59~~**	**11.77 ~~16.93~~**	**3.44 ~~4.65~~**	**0.03 ~~0.04~~**	**1.37 ~~2.10~~**	**0.41 ~~0.63~~**
	2022	**2.31 ~~2.14~~**	**50.49 ~~49.35~~**	**26.42 ~~25.36~~**	**0.15 ~~0.14~~**	**22.96 ~~22.95~~**	**9.21 ~~9.20~~**	**0.02**	**0.49**	**0.17 ~~0.16~~**	**0.00**	**0.06**	**0.02**
	2023	**8.48 ~~6.59~~**	**173.93 ~~170.21~~**	**73.43 ~~70.07~~**	**0.46 ~~0.45~~**	**60.96 ~~60.94~~**	**23.40 ~~23.35~~**	**0.37 ~~0.30~~**	**9.09 ~~8.96~~**	**2.71 ~~2.60~~**	**0.02**	**1.01**	**0.30 ~~0.29~~**
SMAQMD Thresholds		-	-	85	-	80	82	-	-	-	-	14.60	15.00
Emissions Exceed Thresholds?		-	-	No	-	No	No	-	-	-	-	No	No

Notes: ROG = reactive organic compounds; CO = Carbon Monoxide; NO_X = oxides of nitrogen; PM_{10} = respirable particulate matter with an aerodynamic diameter of 10 micrometers or less; $PM_{2.5}$ = respirable particulate matter with an aerodynamic diameter of 2.5 micrometers or less; SMAQMD = Sacramento Metropolitan Air Quality Management District.

[1] ~~While North Elk Grove platform improvement variants would differ in location, they are equivalent in emissions-generating construction activity.~~

[2] Totals do not all add exactly as a result of rounding.

Source: Modeled by AECOM in 2020~~19~~. See Appendix B-1, *Quantification of Criteria Air Pollutant and Greenhouse Gas Emissions, and Energy Use*, for complete modeling inputs, assumptions, and calculations.

- Prevent track out by installing track out control device. Use wet power vacuum street sweepers to remove any visible track of mud or dirt onto adjacent public roads at least once a day. The use of dry powered sweeping is prohibited.
- Limit vehicle speeds on unpaved roads to 15 miles per hour (mph).
- All roadways, driveways, sidewalks, and parking lots to be paved should be completed as soon as possible. In addition, building pads should be laid as soon as possible after grading unless seeding or soil binders are used.
- Minimize idling time by either shutting equipment off when not in use or reducing idling time to 5 minutes (as required by California Code of Regulations, Title 13, sections 2449(d) and 2485). Post this requirement prominently at the entrances to the site, where workers will see it.
- Provide current certificate(s) of compliance for CARB's In-Use Off-Road Diesel-Fueled Fleets Regulation (California Code of Regulations, Title 13, Sections 2449 and 2449.1). For more information, contact CARB at 877-593-6677, doors@arb.ca.gov, or www.arb.ca.gov/doors/compliance_cert1.html.
- Maintain all construction equipment in proper working condition according to the manufacturer's specifications. The equipment must be checked by a certified mechanic and determined to be in proper condition before it is operated.

AQ-2.4: Offset construction NO_X emissions.

If construction equipment and locomotives with Tier 4 or equivalent engines are unavailable to support construction activities, as required by Mitigation Measure AQ-2.1 and Mitigation Measure AQ-2.2, SJRRC shall participate in the off-site mitigation fee program by each air district, as appropriate. The mitigation fee, if needed, will be set at a level that would bring NO_X emissions to a less-than-significant level (i.e., less than 100 pounds per day or 10 tons per year from construction activities within the SJVAPCD and less than 85 pounds per day from construction activities within the SMAQMD). The off-site mitigation fee may be needed if there is limited availability of equipment that meets or exceeds Tier 4 Final off-road emission standards for heavy-duty diesel engine use, and if the application of other mitigation measures would not bring NO_X emissions below the SJVAPCD or SMAQMD threshold during construction. The calculation of fees, if needed, shall occur in consultation with SJVAPCD and SMAQMD, respectively, prior to initiating construction in each air district. The mitigation and administrative fees shall be paid in full by the Project Applicant, or its designee, prior to the local community development or public works department issuing a grading permit that would allow activity that would exceed the respective air district's thresholds. The Project Applicant, or its designee, may negotiate an alternate payment plan based on the timing of construction phases that are expected to exceed the respective air district's thresholds of significance, and would be required to be accepted by and agreed upon in writing with the respective air district prior to the issuance of a grading permit. In coordination with the respective air districts, the Project Applicant, or its designee, may reanalyze the project's construction-related emissions prior to starting construction to update the required mitigation and administrative fees. If an updated analysis is performed, it must be submitted to and approved by the respective air district and local development jurisdiction.

Operations

Operations of the proposed project have the potential to create air quality impacts through new and extended ACE and San Joaquin rail service and implementation of new shuttle service between the proposed Natomas/Sacramento Airport Station and the Sacramento Airport. However, operations would also improve existing passenger rail opportunities, which would reduce on-road VMT in the transportation network. Criteria pollutant emissions and reductions that would be generated by these sources were quantified using emission factors and methodologies described above.

Tables 3.3-9 and 3.3-10 summarize the maximum daily and maximum annual emissions of ROG, CO, NO_X, SO_2, PM_{10}, and $PM_{2.5}$ associated with operation of the proposed project within the jurisdiction of the SJVAPCD and SMAQMD, respectively. Note that, while emissions are shown for both the proposed project element and associated alternatives/variants, the maximum daily and annual emissions scenarios account only for the higher emissions of the alternative/variant, thereby presenting a maximum possible operational emissions scenario regardless of which alternative/variant is ultimately constructed. Refer to Appendix B-1, Quantification of Criteria Air Pollutant and Greenhouse Gas Emissions, and Energy Use, for detailed model inputs, assumptions, and calculations.

Table 3.3-9. Estimated Criteria Air Pollutant Emissions from Operations Within the SJVAPCD Jurisdiction

Operational Emissions Source	Maximum Daily Emissions (pounds per day)						Maximum Annual Emissions (tons per year)					
	ROG	CO	NO_X	SO_2	PM_{10}	$PM_{2.5}$	ROG	CO	NO_X	SO_2	PM_{10}	$PM_{2.5}$
Locomotive Operations	1.40 ~~0.74~~	42.60 ~~22.58~~	33.28 ~~17.64~~	0.15 ~~0.08~~	0.50 ~~0.26~~	0.48 ~~0.26~~	0.25 ~~0.09~~	7.67 ~~2.86~~	5.59 ~~2.23~~	0.03 ~~0.01~~	0.09 ~~0.03~~	0.09 ~~0.03~~
Displaced VMT from On-Road to Rail	(1.50)	(111.01) ~~(110.29)~~	(6.97) ~~(6.96)~~	(0.45)	(57.12) ~~(7.85)~~	(15.33) ~~(3.23)~~	(0.27) ~~(0.19)~~	(19.98) ~~(13.95)~~	(1.25) ~~(0.88)~~	(0.08) ~~(0.06)~~	(10.28) ~~(0.99)~~	(2.76) (0.41)
Net Emissions Change[1]	**(0.10)** **~~(0.76)~~**	**(68.41)** **~~(87.71)~~**	**26.31** **~~10.68~~**	**(0.30)** **~~(0.37)~~**	**(56.62)** **~~(7.59)~~**	**(14.48)** **~~(2.98)~~**	**(0.02)** **~~(0.10)~~**	**(12.31)** **~~(11.10)~~**	**4.74** **~~1.35~~**	**(0.05)**	**(0.19)** **~~(0.96)~~**	**(2.67)** **~~(0.38)~~**
Air District Threshold	100	100	100	100	100	100	10	100	10	27	15	15
Exceed Threshold?	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**

Notes: ROG = reactive organic compounds; CO = Carbon Monoxide; NO_X = oxides of nitrogen; PM_{10} = respirable particulate matter with an aerodynamic diameter of 10 micrometers or less; $PM_{2.5}$ = respirable particulate matter with an aerodynamic diameter of 2.5 micrometers or less; SJVAPCD = San Joaquin Valley Air Pollution Control District.

[1] Totals do not all add exactly as a result of rounding.

Source: Modeled by AECOM in 2020~~19~~. See *Appendix B-1*, Quantification of Criteria Air Pollutant and Greenhouse Gas Emissions, and Energy Use, for complete modeling inputs, assumptions, and calculations.

As shown in Tables 3.3-9 and 3.3-10, the operation of the proposed project would not generate emissions in excess of SJVAPCD- or SMAQMD-recommended thresholds of significance, irrespective of potential emissions reductions from a shift in transportation mode from on-road vehicles to rail. When considering the displaced VMT that would result from increased rail use and reduced on-road travel, the proposed project would result in a net reduction in emissions of most pollutants. This transportation mode shift would be a regional air quality benefit and the generation of operational emissions from the proposed project would be a less-than-significant impact and no mitigation is required.

Table 3.3-10. Estimated Criteria Air Pollutant Emissions from Operations Within the SMAQMD Jurisdiction

Operational Emissions Source	Maximum Daily Emissions (pounds per day)						Maximum Annual Emissions (tons per year)					
	ROG	CO	NO_X	SO_2	PM_{10}	$PM_{2.5}$	ROG	CO	NO_X	SO_2	PM_{10}	$PM_{2.5}$
Locomotive Operations	1.84 ~~0.98~~	55.95 ~~29.66~~	43.71 ~~23.17~~	0.20 ~~0.11~~	0.66 ~~0.35~~	0.64 ~~0.34~~	0.33 ~~0.12~~	10.07 ~~3.75~~	7.87 ~~2.93~~	0.04 ~~0.01~~	0.12 ~~0.04~~	0.11 ~~0.04~~
Airport Shuttle Service	0.00	0.01 ~~0.03~~	0.12 ~~0.24~~	0.00 ~~0.01~~	0.11 ~~0.07~~	0.03	0.00	0.00	0.02 ~~0.03~~	0.00	0.02 ~~0.01~~	0.01 ~~0.00~~
Sub-total[1]	**1.84 ~~0.98~~**	**55.96 ~~29.69~~**	**43.83 ~~23.41~~**	**0.20 ~~0.11~~**	**0.76 ~~0.42~~**	**0.67 ~~0.37~~**	**0.33 ~~0.12~~**	**10.07 ~~3.76~~**	**7.89 ~~2.96~~**	**0.04 ~~0.01~~**	**0.14 ~~0.05~~**	**0.12 ~~0.05~~**
Displaced VMT from On-Road to Rail	(1.97)	(145.79) ~~(144.85)~~	(9.15) ~~(9.14)~~	(0.60) ~~(0.59)~~	(75.01) ~~(10.31)~~	(20.13) ~~(4.25)~~	(0.36) ~~(0.25)~~	(26.24) ~~(18.32)~~	(1.65) ~~(1.16)~~	(0.11) ~~(0.08)~~	(13.5) ~~(1.30)~~	(3.62) ~~(0.54)~~
Net Emissions Change[1]	**(0.13) ~~(1.00)~~**	**(86.83) ~~(115.17)~~**	**34.68 ~~14.27~~**	**(0.39) ~~(0.48)~~**	**(74.25) ~~(9.89)~~**	**(19.46) ~~(3.88)~~**	**(0.02) ~~(0.13)~~**	**(16.17) ~~(14.57)~~**	**6.24 ~~1.81~~**	**(0.07) ~~(0.06)~~**	**(13.36) ~~(1.25)~~**	**(3.50) ~~(0.49)~~**
Air District Threshold	65	-	65	-	80	82	-	-	-	-	14.60	15
Exceed Threshold?	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**

Notes: ROG = reactive organic compounds; CO = Carbon Monoxide; NO_X = oxides of nitrogen; PM_{10} = respirable particulate matter with an aerodynamic diameter of 10 micrometers or less; $PM_{2.5}$ = respirable particulate matter with an aerodynamic diameter of 2.5 micrometers or less; SMAQMD = Sacramento Metropolitan Air Quality Management District.

[1] Totals do not all add correctly as a result of rounding.

Source: Modeled by AECOM in 202019. See Appendix B-1, Quantification of Criteria Air Pollutant and Greenhouse Gas Emissions, and Energy Use for complete modeling inputs, assumptions, and calculations.

Impact AQ-3: Implementation of the proposed project would not expose sensitive receptors to substantial pollutant concentrations (Less-than-Significant Impact with Mitigation).

Some land uses are considered more sensitive to air pollution than others, due to the types of population groups or activities involved. Children, pregnant women, the elderly, those with existing health conditions, and athletes or others who engage in frequent exercise are especially vulnerable to the effects of air pollution. Accordingly, land uses that are typically considered sensitive receptors include schools, daycare centers, parks and playgrounds, and medical facilities.

Residential areas are considered to be sensitive to air pollution because residents (including children and the elderly) tend to be at home for extended periods of time, resulting in sustained exposure to any pollutants present. Recreational land uses are considered moderately sensitive to air pollution. Exercise places a high demand on respiratory functions, which can be impaired by air pollution, even though exposure periods during exercise are generally short. In addition, noticeable air pollution can detract from the enjoyment of recreation. Industrial and commercial areas are considered the least sensitive to air pollution. Exposure periods are relatively short and intermittent as the majority of the workers tend to stay indoors most of the time.

Short-Term Construction Emissions and Exposure to TACs at Surrounding Land Uses

The construction would generate DPM emissions from the use of off-road diesel-powered equipment required for site work, rail work, and structural work. These activities may expose

nearby receptors to TACs, including residents in adjacent areas; the nearest residences are as close as 50 feet (15 meters) to some of the proposed station construction locations. For example, there are a few residences adjacent to the existing tracks along which improvements are proposed for the proposed Midtown Sacramento Station, west of and across the existing tracks from the proposed Lodi Station~~, as well as a residential neighborhood north of and across Strawberry Creek from the proposed North Elk Grove station~~. A Health Risk Assessment was performed in support of this EIR to evaluate the potential for exposure by sensitive receptors to project-generated TACs. Emissions estimates for the proposed project, as described in Section 3.3.4.1, Methodology, and further detailed included in Appendices B-1 and B-2, were used to determine concentrations of each pollutant at sensitive receptor locations resulting from construction of the proposed project in order to evaluate the excess cancer risk a receptor is exposed to as a result of the proposed project. On-site construction-related emissions were represented by adjacent volume sources covering the footprint of the project site. For this analysis, DPM is considered to be less than or equal to 10 micrometers in diameter. Therefore, PM_{10} represents the upper limit for DPM emissions associated with the construction of proposed project improvements. As detailed above in the discussion of Impact AQ-1, construction activities would be required to implement Mitigation Measures AQ-2.1 and AQ-2.2, which would require the use of engines on heavy-duty off-road construction equipment and supporting locomotives that meet Tier 4 emissions standards. This would also reduce the DPM emissions associated with on-site construction activities throughout the proposed project alignment. As such, and in order to ensure that excess health risks associated with implementation of the proposed project would be minimized to the greatest extent possible, the Health Risk Assessment modeled the excess health risk associated with mitigated PM_{10} emissions. Table 3.3-11 summarizes the construction emissions inputs used to inform the Health Risk Assessment.

Table 3.3-11. Construction-related Emissions Inputs to Health Risk Assessment

Project Element	Construction Start Year	Construction Duration (months)	Total PM_{10} Exhaust (pounds)
Lodi Station	2021	14	29.59
Thornton Siding Upgrade & Extension	2023	4	9.63
Lodi Siding	2021	8	19.25
City College Station	2-23	8	23.38
Midtown Sacramento Station	2021	12	30.28
Old North Sacramento Station	2023	14	40.14
Natomas/Sacramento Airport Station	2021	12	29.39
Track Curve Reconstruction North of Elk Grove	2022	1	2.42
South Sacramento Siding	2023	4	11.44
Del Paso Siding Upgrade & Extension	2021	12	37.13

Notes: PM_{10} = respirable particulate matter with an aerodynamic diameter of 10 micrometers or less
Source: Modeled by AECOM in 2020. See Appendix B-1, Quantification of Criteria Air Pollutant and Greenhouse Gas Emissions, and Energy Use, and Appendix B-2, Health Risk Assessment, for complete modeling inputs, assumptions, and calculations.

Excess cancer and chronic non-cancer health risks were evaluated for each modeled site for the duration of construction and then a 30-year (sites within SMAQMD) or 70-year (sites within SJVAPCD) exposure period for operations. Given the differences in risk thresholds between the two air districts, results that are presented below are grouped by district. The excess cancer risk attributed to construction sources from the Lodi Station and track improvements and Thornton track improvements are listed in Table 3.3-12. The excess cancer risk associated with

construction of these project elements would result in maximum excess cancer risk of 2.63 and 0.15 in a million, respectively. Both are below the threshold of 20 in a million. Table 3.3-13 provides the chronic non-cancer risk results for the Lodi Station and track improvements and the Thornton track improvements during construction. The maximum chronic non-cancer Hazard Index values would be 0.003 and 0.0003, respectively, both of which fall well below the threshold of 1.0.

Table 3.3-12. Maximum Excess Cancer Risk at Off-Site Sensitive Receptors for Construction Sites within SJVAPCD

Site	Year	Years of Age	Maximum Excess Cancer Risk (in a million)[1]	Significance Threshold (in a million)[2]	Exceeds Threshold?
Lodi Station/Track Improvements	2021	Third Trimester to 1	2.63	20	No
Thornton Siding Upgrade & Extension	2021	Third Trimester to 1	0.15	20	No

[1] Values rounded to the nearest hundredth.

[2] APR-1906 Framework for Performing Health Risk Assessments (SJVAPCD, 2018).

Source: Modeled by AECOM in 2020. See Appendix B-2, Health Risk Assessment, for complete modeling inputs, parameters, and outputs.

Table 3.3-13. Maximum Chronic Non-Cancer Hazard Index at Off-Site Sensitive Receptors for Construction Sites within SJVAPCD

Site	Maximum Chronic Non-Cancer Hazard Index[1]	Significance Threshold[2]	Exceeds Threshold?
Lodi Station/Track Improvements	0.0030	1.0	No
Thornton Siding Upgrade & Extension	0.0003	1.0	No

[1] Values rounded to the nearest thousandth.

[2] APR-1906 Framework for Performing Health Risk Assessments (SJVAPCD, 2018).

Source: Modeled by AECOM in 2020. See Appendix B-2, Health Risk Assessment, for complete modeling inputs, parameters, and outputs.

The excess cancer risk attributed to construction sources from the North Elk Grove, City College, Midtown, Old North, Del Paso, and Natomas modeling locations are listed in Table 3.3-14. All sites were found to have excess cancer risk well below the project-specific threshold of 10 in a million, with the highest cancer risk from any of the sites at 3.21 in a million from City College. Table 3.3-15 provides the chronic non-cancer risk results for the above listed sites during construction. The maximum chronic non-cancer Hazard Index values across all sites was 0.004 at City College and Natomas. Therefore, all sites fall well below the chronic non-cancer threshold of 1.0.

Table 3.3-14. Maximum Excess Cancer Risk at Off-Site Sensitive Receptors for Construction Sites within SMAQMD

Site	Year	Years of Age	Maximum Excess Cancer Risk (in a million)[1]	Significance Threshold[2]	Exceeds Threshold?
Track Curve Reconstruction North of Elk Grove	2021	Third Trimester to 1	0.95	10	No
City College and South Sacramento Track Improvements	2023	Third Trimester to 1	3.21	10	No
Midtown Station	2021	Third Trimester to 1	2.50	10	No
Old North Sacramento Station	2021	Third Trimester to 1	2.46	10	No
Del Paso Track Improvements	2023	Third Trimester to 1	0.37	10	No
Natomas/Sacramento Airport Station	2021	Third Trimester to 1	3.13	10	No

[1] Values rounded to the nearest hundredth.

[2] BAAQMD, 2017.

Source: Modeled by AECOM in 2020. See Appendix B-2, Health Risk Assessment, for complete modeling inputs, parameters, and outputs.

Table 3.3-15. Maximum Chronic Non-Cancer Risk at Off-Site Sensitive Receptors for Construction Sites within SJVAPCD

Site	Maximum Chronic Non-Cancer Hazard Index[1]	Significance Threshold[2]	Exceeds Threshold?
Track Curve Reconstruction North of Elk Grove	0.001	1.0	No
City College and South Sacramento Track Improvements	0.004	1.0	No
Midtown Station	0.003	1.0	No
Old North Sacramento Station	0.003	1.0	No
Del Paso Track Improvements	< 0.001	1.0	No
Natomas/Sacramento Airport Station	0.004	1.0	No

[1] Values rounded to the nearest hundredth.

[2] BAAQMD, 2017.

Source: Modeled by AECOM in 2020. See Appendix B-2, Health Risk Assessment, for complete modeling inputs, parameters, and outputs.

Construction-related emissions estimates are intentionally conservative to assume the worse-case scenario with regard to the exact duration of construction, intensity of equipment use, and potential overlap of construction phases at a given location. For example, in many cases, the locomotive support would only occur on a few days and not throughout the entire construction phase. Therefore, it is likely the emissions and related health risks would be less than modeled. However, based on the conservative estimates, without use of Tier 4 engines, DPM emissions associated with operation of the off-road equipment and supporting locomotives for construction would result in emissions of DPM that would range from about 15 to 20 times greater than with

use of Tier 4 engines. As shown in Table 3.3-15, the maximum chronic non-cancer Hazard Index at off-site sensitive receptors for all locations is orders of magnitude less than the recommended threshold. An increase in emissions without use of Tier 4 engines would not result in a maximum chronic non-cancer Hazard Index that would exceed the recommended threshold of significance. However, the level of unmitigated DPM emissions from construction of the proposed project could result in an exceedance of the significance thresholds for maximum excess cancer risk at off-site sensitive receptors.

As shown in Tables 3.3-12 through 3.3-15, short-term construction with use of Tier 4 engines would not expose sensitive receptors to DPM emission levels that would result in a health hazard. Therefore, with implementation of the above-required Mitigation Measures AQ-2.1 and AQ-2.2, the potential health risks from implementation of the proposed project would be less than significant.

Mitigation Measures: Mitigation Measures AQ-2.1 and AQ-2.2, described above under Impact AQ-2 to reduce construction-related emissions to a level that would not exceed SMAQMD mass emissions thresholds, would reduce construction-related DPM. These reductions would minimize exces health risks associated with short-term construction activities for the proposed project. Therefore, construction of the proposed project would not expose sensitive receptors to substantial pollutant concentrations and the impact would be less than significant with the implementation of mitigation.

AQ-2.1: Implement advanced emissions controls for off-road equipment.

Refer to measure description under discussion of Impact AQ-2 above.

AQ-2.2: Implement advanced emissions controls for locomotives used for construction.

Refer to measure description under discussion of Impact AQ-2 above.

~~Health risk is a function of the concentration of contaminants in the environment and the duration of exposure to those contaminants. Concentrations of mobile-source DPM emissions are typically reduced by approximately 60% at a distance of around 300 feet (100 meters) (Zhu and Hinds 2002). While there are residences within 50 feet of specific Phase I improvements, construction activities would be dispersed throughout the entirety of the project sites, which ranges from 2 to 16 acres in size for the proposed Midtown Sacramento, Lodi (or Lodi Station South Alternative), and North Elk Grove stations and alternatives, so a portion of the construction activities would take place farther than 300 feet from the nearest residences. In addition, as described in Impact AQ-2, PM_{10} emissions during construction would not exceed the SJVAPCD or SMAQMD threshold of significance for the construction of any individual Phase I improvement (Tables 3.3-6 and 3.3-7).~~

~~The risks estimated for an exposed individual are higher if a fixed exposure occurs over a longer period of time. Health effects from TACs are often described in terms of individual cancer risk, which is based on a 30-year lifetime exposure to TACs (OEHHA 2015). Construction activities at any one location would last between 1 and 14 months, depending on the specific Phase I improvement (for example, track improvements are typically shorter in duration and station construction is typically longer). If the duration of construction activities near a sensitive receptor was for the entirety of a 14-month construction duration (e.g., for construction of the propose Lodi or North Elk Grove stations or respective variants), which is not anticipated, then the exposure would be less than 4% of the total exposure period used for typical health risk calculations (i.e.,~~

~~30 years). In addition, construction phases would vary in activity and equipment intensity, and would take place throughout the entirety of each improvement site, thereby limiting the amount of time that emitting equipment would be within a distance that would expose sensitive receptors to substantial concentrations.~~

~~Although maximum daily and annual PM_{10} emissions were found to exceed SMAQMD thresholds in the analysis of Impact AQ-2, these PM_{10} emissions were inclusive of both fugitive dust and exhaust emissions and are the additive emissions from the construction of multiple Phase I improvements along the alignment could potentially be constructed concurrently. As noted above, concentrations of DPM decrease rapidly over short distances. Therefore, the emissions considered for this analysis are the individual emissions that would occur at and around a specific Phase I improvement construction location and not the sum total of all construction activities along the project alignment. The maximum PM_{10} emissions that would be generated by the construction of any Phase I improvement would be approximately 33 pounds per day and 1.25 ton per year; when considering only the particulate matter generated from exhaust (not inclusive of fugitive dust) for this analysis of DPM, the maximum emissions from the construction of any given Phase I improvement would be approximately 10 pounds per day and 1 ton per year, well below air district thresholds.~~

~~If the duration of construction activities near a sensitive receptor was for 14 months, which is the maximum construction duration of any Phase I improvement, then the exposure would be 4.7% of the total exposure period used for typical health risk calculations (i.e., 30 years). Due to the intermittent and temporary nature of construction activities, and the dispersive properties of TACs, as well as the fact that PM emissions would be far less than the SJVAPCD- or SMAQMD-recommended PM_{10} thresholds for an individual Phase I improvement, short-term construction would not expose sensitive receptors to DPM emission levels that would result in a health hazard. As a result, this impact would be less than significant, and no mitigation is required.~~

~~It should also be noted that, while not required to ensure a less-than-significant impact associated with construction emissions and exposure to TACs, implementation of Mitigation Measures AQ-2.1 and AQ-2.2, described above, would further reduce potential DPM emissions from construction-related activities, correlating to a reduction in the potential exposure of sensitive receptors to TAC emissions during construction.~~

Long-Term Operational Emissions and Exposure to TACs at Surrounding Land Uses

Operation of the locomotive engines associated with the proposed project would generate exhaust emissions along the project alignment, including ~~and~~ at stations during brief idling for passenger on- and off-loading. These emissions would be intermittent at any given location along the alignment. A Health Risk Assessment was performed in support of this EIR to evaluate the potential for exposure to sensitive receptors by project-generated TACs. Emissions estimates for the proposed project, as described in Section 3.3.4.1, Methodology, and further detailed included in Appendices B-1 and B-2, were used to determine concentrations of each pollutant at sensitive receptor locations resulting from operations of the proposed project in order to evaluate the excess cancer risk a receptor is exposed to as a result of the proposed project. For this analysis, DPM is considered to be less than or equal to 10 micrometers in diameter. Therefore, PM_{10} represents the upper limit for DPM emissions associated with the operations of the proposed project.

The excess cancer risk attributed to railway operational sources (i.e. locomotives) within 1 km north and south of Lodi Station, Thornton, and Stockton Downtown/ACE Station are provided in Table 3.3-16. The excess cancer risk associated with operations for a 70-year period at each of these sites would result in maximum excess cancer risk of 3.63 (Lodi), 3.30 (Thornton), and 3.37 (Stockton). All three sites are below the threshold of 20 in a million. Table 3.3-17 provides the chronic non-cancer risk results for these three sites during operations. The maximum chronic non-cancer Hazard Index values at Lodi Station, Thornton and Stockton would be all be 0.001 and well below the threshold of 1.0.

Table 3.3-16. Maximum Excess Cancer Risk at Off-Site Sensitive Receptors for Operations within SJVAPCD

Site	Years of Age	Maximum Excess Cancer Risk (in a million)[1]	Significance Threshold (in a million)[2]	Exceeds Threshold?
Lodi Station	Third Trimester to 70 (70 years)	3.62	20	No
Thornton	Third Trimester to 70 (70 years)	3.37	20	No
Stockton Downtown/ ACE Station	Third Trimester to 70 (70 years)	3.27	20	No

[1] Values rounded to the nearest hundredth.

[2] APR-1906 Framework for Performing Health Risk Assessments (SJVAPCD, 2018).

Source: Modeled by AECOM in 2020. See Appendix B-2, Health Risk Assessment, for complete modeling inputs, parameters, and outputs.

Table 3.3-17. Maximum Chronic Non-Cancer Hazard Index at Off-Site Sensitive Receptors for Operations within SJVAPCD

Site	Maximum Chronic Non-Cancer Hazard Index[1]	Significance Threshold[2]	Exceeds Threshold?
Lodi Station	0.001	1.0	No
Thornton	0.001	1.0	No
Stockton Downtown/ACE Station	0.001	1.0	No

[1] Values rounded to the nearest thousandth.

[2] APR-1906 Framework for Performing Health Risk Assessments (SJVAPCD, 2018).

Source: Modeled by AECOM in 2020. See Appendix B-2, Health Risk Assessment, for complete modeling inputs, parameters, and outputs.

The excess cancer risk attributed to railway operational sources (i.e. locomotives) within 1 km of the sites of the proposed project within SMAQMD are provided in Table 3.3-18**.** The excess cancer risk associated with operations for a 30-year period at each of these sites would result in highest maximum excess cancer risk for any of the sites to be 6.94 in a million (near the Existing Railroad Realignment track improvement). All sites are below the project-specific threshold of 10 in a million. Table 3.3-19 provides the chronic non-cancer risk results for these same sites during operations. The maximum chronic non-cancer risk value would all be 0.002 or less, and well below the threshold of 1.0.

Table 3.3-18. Maximum Excess Cancer Risk at Off-Site Sensitive Receptors for Operations within SMAQMD

Site	Years of Age	Maximum Excess Cancer Risk (in a million)[1]	Significance Threshold[2]	Exceeds Threshold?
Track Curve Reconstruction North of Elk Grove	Third Trimester to 30 (30 years)	5.77	10	No
City College and South Sacramento Track Improvements	Third Trimester to 30 (30 years)	4.63	10	No
Existing Railroad Realignment	Third Trimester to 30 (30 years)	6.94	10	No
Midtown Station	Third Trimester to 30 (30 years)	4.48	10	No
Old North Sacramento Station[3]	Third Trimester to 30 (30 years)	5.18	10	No
Natomas/Sacramento Airport Station	Third Trimester to 30 (30 years)	4.76	10	No

[1] Values rounded to the nearest hundredth.

[2] BAAQMD, 2017.

[3] Includes track segments associated with Del Paso track improvements.

Source: Modeled by AECOM in 2020. See Appendix B-2, Health Risk Assessment, for complete modeling inputs, parameters, and outputs.

Table 3.3-19. Maximum Chronic Non-Cancer Hazard Index at Off-Site Sensitive Receptors for Operations within SMAQMD

Site	Maximum Chronic Non-Cancer Hazard Index[1]	Significance Threshold[2]	Exceeds Threshold?
Track Curve Reconstruction North of Elk Grove	0.001	1.0	No
City College and South Sacramento Track Improvements	0.001	1.0	No
Existing Railroad Realignment	0.002	1.0	No
Midtown Station	0.001	1.0	No
Old North Sacramento Station[3]	0.001	1.0	No
Natomas/Sacramento Airport Station	0.001	1.0	No

[1] Values rounded to the nearest thousandth.

[2] BAAQMD, 2017.

[3] Includes track segments associated with Del Paso track improvements.

Source: Modeled by AECOM in 2020. See Appendix B-2, Health Risk Assessment, for complete modeling inputs, parameters, and outputs.

In conjunction with the MSAT Protocol, SMAQMD developed an internet-based mapping tool that discloses localized cancer risk and $PM_{2.5}$ levels in proximity to high-volume roadways and rail within Sacramento County. This mapping data has been used to inform this analysis of the potential existing health risks in the vicinity of the proposed project and consider the proposed project's relative contribution to excess health risks at sensitive receptors. The sum of the project-specific (Table 3.3-18) and existing potential cancer risk values at the receptor of maximum project-specific concentrations, at each modeling site within Sacramento County are summarized in Table 3.3-20.

Table 3.3-20. Maximum Excess Cancer Risk at Off-Site Sensitive Receptors for Operations within SMAQMD

Modeling Scenario	Years of Age	Existing Potential Cancer Risk (in a million)[1,2]	Maximum Project Excess Cancer Risk (in a million)[1,3]	Maximum Cumulative Excess Cancer Risk (in a million)[1]	Significance Threshold[3]	Exceeds Threshold?
Track Curve Reconstruction North of Elk Grove	Third Trimester to 30 (30 years)	2.1	5.77	7.87	100	No
City College and South Sacramento Track Improvements	Third Trimester to 30 (30 years)	31	4.63	35.63	100	No
Existing Railroad Realignment	Third Trimester to 30 (30 years)	64	6.94	71.94	100	No
Midtown Station	Third Trimester to 30 (30 years)	47	4.48	51.48	100	No
Old North Sacramento Station	Third Trimester to 30 (30 years)	8.6	5.18	13.78	100	No
Natomas/Sacramento Airport Station	Third Trimester to 30 (30 years)	7.3	4.76	12.06	100	No

[1] Values rounded to the nearest hundredth.

[2] Values equal to the existing potential cancer risk at the maximum receptor location of the project-only maximum excess cancer risk obtained by using the SMAQMD MSAT Air Toxics Protocol tool.

[3] BAAQMD, 2017.

Source: Modeled by AECOM in 2020. See Appendix B-2, Health Risk Assessment, for complete modeling inputs, parameters, and outputs.

As shown in Table 3.3-20, for modeled locations at which the proposed project would generate the highest potential concentrations, the existing health risk is less than 100 in a million. Existing conditions in areas of the project alignment near the Existing Railroad Realignment track improvement and Midtown Sacramento stations may already exceed the 100 in a million risk level recommended threshold of the neighboring BAAQMD prior to the addition of the proposed project; these locations, while within the project vicinity, are adjacent to higher-volume roadways (i.e., the intersection of V Street and 20th Street). In addition, these locations do not coincide with the anticipated highest project-generated emissions concentrations, but instead are where project-generated concentrations would contribute less than 1 in a million excess health risk. While contributing sources of DPM and Total Organic Gasses (TOG) at these locations include the existing rail activity, mobile-source emissions from vehicles along the nearby roadways are also a substantial contributing source. Operation of the proposed project would use engines that meet or exceed Tier 4 emissions standards, the most stringent standards under current regulations. In addition, it is expected to result in a transportation mode shift (i.e., attract passengers who otherwise would have driven cars) that would reduce travel by highway vehicles, reducing mobile source emissions and congestion. Reduced congestion would also serve to reduce the emissions associated with on-road trucks that emit DPM and contribute to the existing health risks. Due to the proposed project's use of Tier 4 engines as the most stringent standard under current regulations, overall consistency with regional planning efforts to increase multi-modal transportation opportunities and thereby reduce on-road traffic and related emissions, and the fact that project-level emissions do not exceed the recommended thresholds of significance, the proposed project would not contribute substantially to an increase of these existing conditions. Therefore, ~~Recent analysis in the EIR for the ACE Extension Lathrop to Ceres/Merced Project included modeling to determine the potential health risks associated with increased rail service along that project's alignment and locomotive idling at proposed new stations (SJRRC 2018).~~

~~As shown in Tables 3.3-9 and 3.3-10, locomotive operational emissions, which are inclusive of in-transit and idling activities along the alignment, would not exceed SJVAPCD- or SMAQMD-recommended thresholds of significance. These thresholds were developed to reduce emissions within the respective air districts to levels that will not interfere with the region's ability to attain the health-based NAAQS and CAAQS, and thereby, protect public health in the overall region.~~

~~Not only would the operational emissions of the Phase I improvements not exceed thresholds, but the total operational PM emissions for all locomotive operational activity within both air districts would come to less than one-quarter of one percent of the PM threshold for either air district. Nevertheless, a comparison to a quantitative model performed for a similar project is also included here to further support the analysis of potential health effects associated with proposed locomotive operations. The ACE Extension Lathrop to Ceres/Merced Project included a track alignment within the SJVAB in urban areas likely to have higher ambient CO concentrations than in the more rural vicinity of the proposed project's alignment in the northern portion of San Joaquin County and similar to those within the Sacramento Metropolitan portion of the proposed project's alignment. In addition, the ACE Extension Lathrop to Ceres/Merced Project included new stations (including the proposed North Lathrop Station) with residential receptors as close as 180 feet (55 meters). The proposed North Lathrop Station would receive up to 16 train visits per day, slightly more than the 14 train visits estimated at each station as part of the proposed project. Therefore, the conditions of the ACE Extension Lathrop to Ceres/Merced Project are representative of the~~

~~conditions of the Phase I improvements and were used to evaluate the potential health risks associated with in-transit and at-station locomotive operations.~~

~~Potential health impacts associated with increased exposure to DPM under the ACE Extension Lathrop to Ceres/Merced Project were evaluated at the North Lathrop Station because idling and operational emissions would be highest at that location. As noted above, that location was also reasonably representative of conditions under the proposed project with the highest potential emissions and nearest receptors. Per the ACE Extension Lathrop to Ceres/Merced Project analysis, locomotive idling at the North Lathrop Station and in-transit operations would result in a cancer risk of three cases per million and a chronic HI of less than 0.1 (shown in Table 4.3-23 of the ACE Extension Lathrop to Ceres/Merced Draft EIR). These results are well below the district thresholds of a cancer risk of 10 cases per million for cancer risk and an HI of 1. As these results are considered representative of worst-case conditions associated with Phase I improvements, and potential health risk does not exceed the air district thresholds of significance,~~ long-term operational emissions and exposure to TACs at surrounding land uses associated with proposed project operations would be less than significant and no mitigation is required.

Localized CO Concentrations

Continuous engine exhaust may elevate localized CO concentrations, or “hot spots.” CO concentration is a direct function of vehicle idling time and, therefore, traffic flow conditions. Under stagnant meteorological conditions, CO concentrations near congested roadways and/or intersections may reach unhealthy levels that adversely affect nearby sensitive land uses. 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.

However, emissions and ambient concentrations of CO have decreased substantially throughout California in the past three decades. The national statewide CO standard is attained statewide in California, and an exceedance of NAAQS or CAAQS in the region was last recorded in 1993. This is primarily attributable to requirements for cleaner vehicle emissions. The Federal Motor Vehicle Control Program has mandated increasingly lower emission levels for vehicles manufactured since 1973. Between 2000 and 2016, national average CO concentrations decreased by approximately 61% and regional average CO concentrations in the California and Nevada region decreased by approximately 60% (EPA 2018b).

Tables 3.3-5 and 3.3-6 indicate that CO emissions are not anticipated to exceed the SJVAPCD or SMAQMD thresholds, even when summing emissions from all proposed project elements within a given air district and, for construction, consideration of maximum overlap of construction phases at any given construction site, and concurrent construction of multiple project improvements. The air district thresholds are set with the purposes of meeting the NAAQS and CAAQS air quality standards, which are set to protect public health with an adequate margin of safety.

While ambient CO concentrations in the region have not exceeded NAAQS or CAAQS in many years and the proposed project would not generate a substantial level of CO emissions, localized CO concentrations could still occur, particularly at intersections of high-volume roadways. As described in the methodology section above, the SMAQMD second-tier screening criteria are

used to evaluate potential CO hot spot impacts, as this criteria provide for a semi-quantitative level of analysis in the absence of a LOS analysis and address the root concerns associated with localized CO concentrations applicable to the proposed project, in particular the potential for an increase in congestion at high-volume roadways or within locations prone to limit the natural dispersion of ambient CO concentrations.

The proposed Lodi station is in a rural area surrounded by arterial roadways that do not experience traffic levels near 31,600 vehicles per hour; for example, even at the more heavily travelled intersection of Interstate 5 (I-5) and State Route 12 (SR 12), the peak hour vehicle count on I-5 is 6,700 and on SR 12 is 2,000 (Caltrans 2017). Based on a review of the Sacramento County Traffic Counts Database, intersections in the vicinity of the proposed stations carry well below the SMAQMD second-tier screening criteria of 31,600 vehicles per hour; the data provides daily traffic counts and, assuming that peak hour traffic would be approximately 10% of the daily totals, peak hour volumes range between several hundred to fewer than 4,000. Overall, the proposed project would induce a mode shift from personal automobiles to passenger rail and not generate a net increase in vehicles on the roadway. While there may be a shift in the location of on-road travel by rail passengers to be more centralized around the proposed stations, this change in travel patterns would not contribute additional vehicles to an intersection in the vicinity of the proposed project stations such that an affected intersection would experience more than 31,600 vehicles per hour. In addition, proposed project operations would not contribute to a tunnel, parking garage, bridge underpass, urban street canyon, or other locations where the horizontal or vertical mixing of air would be substantially limited, and the mix of vehicle types at the intersections is not anticipated to be substantially different from the fleet average in the region. Therefore, the proposed project would meet SMAQMD's CO hot spot second-tier screening criteria.

Because the proposed project would generate CO emissions well below the air district thresholds, and because the proposed project would meet the SMAQMD CO hot spot second tier screening criteria, this impact would be less than significant, and no mitigation is required.

Valley Fever

Disturbance of soil containing C. *immitis* could expose the receptors adjacent to the proposed project construction sites to spores known to cause Valley Fever. Areas with 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. While the presence is greater within San Joaquin County, there have been cases reported within Sacramento County.

The potential presence of C. *immitis* in the project area is not the sole indicator of whether construction activities would result in an increased incidence rate of Valley Fever. Propagation of C. *immitis* is dependent on climatic conditions, with the potential for growth and surface exposure being the highest following early seasonal rains and long dry spells. C. *immitis* spores can be released when filaments are disturbed by earthmoving activities. Receptors adjacent to the construction area, therefore, may be at increased risk of inhaling *C. immitis* spores and subsequently developing Valley Fever. However, receptors must be exposed to and inhale the spores to be at an increased risk of developing Valley Fever. Moreover, not everyone who is exposed to C. *immitis* becomes 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).

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 and SMAQMD Basic Emission Control Practices would minimize fugitive dust through routine watering and other controls and reduce the risk of nearby receptors contracting Valley Fever. In addition, implementation of Mitigation Measure AQ-2.3, as required to reduce potential construction-related emissions to a less-than-significant level, would require the implementation of dust control measures consistent with SJVAPCD Regulation VIII and SMAQMD Basic Emission Control Practices. Therefore, the impact of exposure of sensitive receptors to increased Valley Fever risk during construction of the proposed project would be less than significant and no mitigation is required.

Asbestos

As described above, the proposed project is not located within an area known to contain NOA. However, asbestos may have been used during the construction of existing structures, and these structures could be disturbed or demolished during the construction of the proposed project. The handling and disposal of these materials is regulated by the federal and state Occupational Safety and Health Administration (OSHA and Cal/OSHA), and the National Emissions Standards for Hazardous Air Pollutants (NESHAP) regulations as listed in the Code of Federal Regulations requiring notification and inspection. Because the SJRRC and its construction contractors are required to comply with these materials handling regulations, and because the project-related construction area would be fenced to exclude the presence of non-authorized personnel, project-related impacts related to asbestos would be less than significant and no mitigation is required.

Impact AQ-4: Implementation of the proposed project would not result in other emissions (such as those leading to odors) adversely affecting a substantial number of people (Less-than-Significant Impact).

The generation and severity of odors is dependent on several 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).

Odor Emissions Related to Short-Term Construction Activities

The predominant source of power for construction equipment is diesel engines. Exhaust odors from diesel engines and emissions associated with asphalt paving and the application of architectural coatings may be considered offensive to some individuals. The construction of all proposed project elements would take place in a typical construction site and be temporary in nature. These odors would be generally localized to the immediate area surrounding the construction site. Because odors would be temporary, disperse rapidly with distance from the source, and cease once construction activities had been complete, construction-generated odors would not result in the exposure of a substantial number of people to objectionable odor emissions. Furthermore, construction activities would be conducted in compliance with SJVAPCD Rule 4641 and SMAQMD rules 402, 441, and 442 (described above), which would limit ROG emissions from asphalt and architectural coatings and other air pollutants that could result in a

nuisance to the public, thereby ensuring that odors generated by short-term construction would not affect a substantial number of people. Therefore, this impact would be less than significant, and no mitigation is required.

Odor Emissions Related to Long-Term Operations

Proposed project operations would not include any land uses identified by the CARB as being associated with the generation of objectionable odors. The new stations themselves would not represent a source of odor emissions. However, the increased passenger rail operations on the tracks that access the stations may increase the potential for generation of odors from locomotive diesel fuel combustion. These odors would be intermittent and of short-duration during the loading and unloading of passengers. In addition, this would be consistent with existing land uses and rail operation along the alignment. Any odors resulting from diesel fuel combustion along rail alignment would be intermittent and short-term, occurring as trains pass by, and not considered a significant odor-generating source (CARB 2005). As a result, this impact would be less than significant, and no mitigation is required

3.4 Biological Resources

3.4.1 Introduction

This section describes the regulatory and environmental setting for biological resources, including wetlands, in and directly adjacent to the proposed Valley Rail Sacramento Extension Project (proposed project). It also describes the impacts on biological resources, including wetlands, and mitigation measures that would reduce significant impacts, where feasible and appropriate. Cumulative impacts, in combination with planned, approved, and reasonably foreseeable projects, are discussed in Chapter 4, Other CEQA-Required Analysis.

The study area for biological resources includes all proposed permanent and temporary impact areas plus a 500-foot buffer. The methods for determining existing and potential biological resources in the study area and buffer are described in this section.

During the public scoping comment period, the following comment topics relevant to biological resources were received:

- Construction of project-related improvements in the Legal Delta and evaluation of impacts and mitigation measures in relation to the Delta Plan Mitigation Monitoring and Reporting Program, as well as recommendations to avoid or mitigate for conditions that would introduce or improve habitat for nonnative invasive species as related to policies in the Delta Plan.
- Compliance with Endangered Species Act Section 7/Magnuson-Stevens Fishery Conservation and Management Act, Essential Fish Habitat (EFH), consultation with the National Oceanic and Atmospheric Administration (NOAA) Fisheries National Marine Fisheries Service (NMFS).
- Coverage under the San Joaquin County Multi-Species Habitat Conservation Plan (SJMSCP) due to required U.S. Army Corps of Engineers (USACE) permitting and Section 7 consultation.
- Potential impacts on Swainson's hawk (*Buteo swainsoni*) near the proposed Lodi Station.
- Avoidance of impacts on Steelhead Creek and associated biological resources near the proposed Natomas/Sacramento Airport Station footprint.

This section addresses these concerns. The comments received during the scoping period are included in Appendix A, *NOP and Scoping Summary Report.*

3.4.2 Regulatory Setting

This section summarizes federal, state, regional, and local regulations related to biological resources and wetlands that are applicable to the proposed project.

3.4.2.1 Federal

Endangered Species Act of 1973, U.S. Code, Title 16, Sections 1531 through 1543

The federal Endangered Species Act (ESA) and its subsequent amendments protect plants and wildlife (and their habitats) listed as endangered or threatened by the U.S. Fish and Wildlife Service (USFWS) and NMFS. Section 9 of the ESA specifically prohibits the taking of ESA-protected wildlife, and lists prohibited actions. The ESA defines take as "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in such conduct" (50 Code of Federal Regulations [CFR] Part 17.3). The ESA also governs the removal, possession, malicious damage, or destruction of endangered plants on federal land. Taking is allowed only when incidental to an otherwise legal activity through the ESA Section 7 process for federal agencies, and through the ESA Section 10 habitat conservation plan process for private entities.

Migratory Bird Treaty Act, U.S. Code, Title 16, Sections 703 through 711

The Migratory Bird Treaty Act (MBTA) implements international treaties between the United States and other nations to protect migratory birds and their parts, eggs, and nests from activities such as hunting, pursuing, capturing, killing, selling, and shipping, unless expressly authorized by regulation or permit. Examples of authorized activities include USFWS-issued permits to qualified applicants for falconry, raptor propagation, scientific collecting, special purposes (rehabilitation, education, migratory game bird propagation, and salvage); take of depredating birds; taxidermy; and waterfowl sale and disposal. Regulations governing migratory bird permits are found in 50 CFR Part 13 – General Permit Procedures, and 50 CFR Part 21 – Migratory Bird Permits.

Invasive Species, Executive Order 13112 (February 3, 1999)

Executive Order (EO) 13112 directs federal agencies to prevent and control the spread of invasive plants and animals, and avoid direct or indirect impacts whenever there is a practicable alternative.

Bald and Golden Eagle Protection Act of 1940

The Bald Eagle Protection Act of 1940 (16 United States Code [USC] 668, enacted by 54 Stat. 250) protects bald and golden eagles by prohibiting the taking, possession, and commerce of such birds, and establishes civil penalties for violation of this Act.

National Marine Fisheries Service Magnuson-Stevens Fishery Conservation and Management Act

The Magnuson-Stevens Act 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 permitted, funded, or undertaken that may adversely affect EFH, defined as "waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity," including migratory routes to and from anadromous fish spawning grounds. Habitat Areas of Particular Concern (HAPC) are a subset of EFH, and are considered high-priority areas for conservation, management, or research because they are rare, sensitive, stressed by development, or important to ecosystem function. The San Francisco Bay is designated as HAPC for estuarine habitat.

Clean Water Act

The Clean Water Act (CWA) (33 USC 1251 et seq.) establishes legal requirements for the restoration and maintenance of the chemical, physical, and biological integrity of the nation's waters.

Section 401: Section 401 requires that an applicant for a federal license or permit that allows activities resulting in a discharge to waters of the United States must obtain a state certification that the discharge complies with other provisions of the CWA. The Regional Water Quality Control Boards (RWQCBs) administer the certification program in California.

Section 402: Section 402 regulates construction-related stormwater discharges to surface waters through the National Pollutant Discharge Elimination System (NPDES) program, administered by the United States Environmental Protection Agency (EPA).

Section 404: Section 404 establishes a permit program administered by the USACE regulating the discharge of dredged or fill material into waters of the United States, including wetlands. Implementing regulations by USACE are found at 33 CFR Parts 320-330. Guidelines for implementation are referred to as the Section 404(b)(1) Guidelines, and were developed by the EPA in conjunction with USACE (40 CFR Part 230). The Guidelines allow the discharge of dredged or fill material into the aquatic system only if there is no practicable alternative that would have less adverse impacts.

Rivers and Harbors Act, Section 10 (33 USC Section 401 et seq.)

The Rivers and Harbor Act is administered by USACE. Section 10 requires permits for all structures (such as bridge footings) in navigable waters of the United States and for activities such as dredging. Navigable waters are defined as those that are subject to the ebb and flow of the tide and susceptible to use in their natural condition or by reasonable improvements as means to transport interstate or foreign commerce. USACE grants or denies permits based on the effects on navigation. Most activities covered under this act are also covered under CWA Section 404.

General Bridge Act of 1946

Any individual, partnership, corporation, or local, state, or federal legislative body, agency, or authority planning to construct or modify a bridge or causeway across a navigable waterway of the United States must apply for a U.S. Coast Guard (USCG) bridge permit. This includes all temporary bridges used for construction access or traffic detour.

Plant Protection Act of 2000

The Plant Protection Act of 2000 prevents importation, exportation, and spread of pests that are injurious to plants, and provides for the certification of plants and the control and eradication of plant pests. The Act consolidates requirements previously contained in multiple federal regulations, including the Federal Noxious Weed Act, the Plant Quarantine Act, and the Federal Plant Pest Act.

Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon

The Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon (USFWS 2005) was released by USFWS on December 15, 2005. This plan focuses on 33 species of plants and animals that occur exclusively or primarily in vernal pool ecosystems, including the federally listed vernal pool fairy shrimp and vernal pool tadpole shrimp.

The plan outlines recovery priorities and provides goals, objectives, strategies, and criteria for recovery. One of the overall objectives of the recovery plan is to promote natural ecosystem processes and functions by protecting and conserving intact vernal pools and vernal pool complexes. Habitat protection under the recovery plan includes the protection of the topographic, geographic, and soil features that support hydrologically interconnected systems of vernal pools, swales, and other seasonal wetlands in an upland matrix that together form hydrologically and ecologically functional vernal pool complexes.

Although not regulatory in nature, the Recovery Plan should be taken into consideration when analyzing potential impacts on vernal pools and associated biota to ensure that projects do not prevent or impair the plan's future long-term implementation success. It is also used by USFWS to determine recommendations and requirements during endangered species consultation for vernal pool–dependent species.

~~The USFWS Vernal Pool Recovery Plan Stone Lakes Core Area overlaps with the south-central portion of the North Elk Grove Siding Variants. Core Areas are the specific sites that USFWS has deemed necessary to recover federally endangered and threatened vernal pool species. The Stone Lakes Core Area is ranked in Zone 2. Protection of Zone 2 core areas is important for recovery of some species that are rare and localized, but have significant populations in Zone 2. Protection of Zone 2 core areas is a lower priority than protection of Zone 1 core areas because USFWS believes that in each Zone 1 core area, species occurrences and suitable vernal pool habitat must be protected to prevent extinction or irreversible decline of at least one species covered in the recovery plan. The recovery criteria generally recommend protection of 95 percent of suitable habitat in Zone 1 core areas, and 85 percent of suitable habitat in Zone 2 core areas. Species covered in the Recovery Plan that may occur in the project area consist of Boggs Lake hedge-hyssop, legenere, Ahart's dwarf rush, vernal pool fairy shrimp, and vernal pool tadpole shrimp.~~

3.4.2.2 State

California Endangered Species Act, California Fish and Game Code Section 2050 et seq

The California Endangered Species Act (CESA) provides that certain species of fish, wildlife, and plants that are of ecological, educational, historical, recreational, aesthetic, economic, and scientific value to the people of California are of statewide concern, and should be conserved, protected, and enhanced along with their habitats. The CESA establishes that it is the policy of the state that state agencies should not approve projects as proposed that would jeopardize the continued existence of any endangered species or threatened species, or result in the destruction or adverse modification of habitat essential to the continued existence of those species, if there

are reasonable and prudent alternatives available consistent with conserving the species or its habitat that would prevent jeopardy.

Furthermore, the CESA provides that reasonable and prudent alternatives shall be developed by the California Department of Fish and Wildlife (CDFW) with the project proponent and the state lead agency that are consistent with conserving the species, while at the same time maintaining the project purpose to the greatest extent possible.

A "take" of a species under the CESA is defined as an activity that would directly or indirectly kill an individual of a species. The CESA definition of take does not include "harm" or "harass," as is included in the federal act. As a result, the threshold for a take under the CESA may be higher than under the ESA because habitat modification is not necessarily considered take under the CESA. The take of state-listed species incidental to otherwise lawful activities requires a permit, pursuant to Section 2081(b) of the CESA. The state has the authority to issue an incidental take permit under California Fish and Game Code Section 2081, or to coordinate with USFWS during the Section 10(a) process to make the federal permit consistent with the CESA.

Fully Protected Designations – California Fish and Game Code Sections 3511, 4700, 5515, and 5050

Prior to enactment of the CESA and the federal ESA, California enacted laws to "fully protect" designated wildlife species from take, including hunting, harvesting, and other activities. Unlike the subsequent CESA and ESA, there was no provision for authorized take of designated fully protected species. Currently, 36 fish and wildlife species are designated as fully protected in California, including golden eagle.

California Senate Bill (SB) 618 (signed by Governor Brown in October 2011) authorizes take of fully protected species, where pursuant to a Natural Conservation Community Plan, approved by CDFW. The legislation gives fully protected species the same level of protection as is provided under the Natural Community Conservation Planning Act for endangered and threatened species.

California Native Plant Protection Act, California Fish and Game Code Sections 1900 – 1913

The California Native Plant Protection Act of 1977 (California Fish and Game Code Sections 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 CDFW before removing the plants. This act has mostly been superseded by the CESA.

Raptors, California Fish and Game Code Section 3503.5.

Section 3503.5 of the California Fish and Game Code states that it is "unlawful to take, possess, or destroy any birds in the order Falconiformes or Strigiformes or to take, possess, or destroy the nest or eggs of any such bird except as otherwise provided by this code or any regulation adopted pursuant thereto." Disturbance during the raptor breeding season could result in the incidental

loss of fertile eggs or nestlings, or lead to nest abandonment. Although no permits are issued for species protected under this code, coordination with CDFW is required.

Non-game and Migratory Birds, California Fish and Game Code Sections 3513 and 3800

Sections 3513 and 3800 of the California Fish and Game Code regulate unlawful take of non-game or migratory bird species. Disturbance during the breeding season could cause the incidental loss of fertile eggs or nestlings, or lead to nest abandonment. Although no permits are issued for species protected under these code sections, coordination with CDFW is required.

Lake and Streambed Alteration Agreements – California Fish and Game Code Sections 1600-1616

Under these sections of the California Fish and Game Code, an applicant is required to notify CDFW prior to constructing a project that would divert, obstruct, or change the natural flow, bed, channel, or bank of a river, stream, or lake. Preliminary notification and project review generally occur during the environmental review process. When a fish or wildlife resource may be substantially adversely affected, CDFW is required to propose reasonable project changes to protect the resource. These modifications are formalized in a Lake and Streambed Alteration Agreement (LSAA) that becomes part of the plans, specifications, and bid documents for the proposed project. CDFW jurisdiction is determined to occur in the water body of any natural river, stream, or lake. The term “stream,” which includes creeks and rivers, is defined in Title 14, California Code of Regulations (CCR), Section 1.72.

California Porter-Cologne Water Quality Control Act

Pursuant to the California Porter-Cologne Water Quality Control Act, the State Water Resources Control Board (SWRCB) and the nine RWQCBs may require permits (“waste discharge requirements”) for the fill or alteration of “Waters of the State.” The term “Waters of the State” is defined as “any surface water or groundwater, including saline waters, within the boundaries of the state” (California Water Code, Section 13050[e]). Although “waste” is partially defined as any waste substance associated with human habitation, SWRCB interprets this to include fill discharge into water bodies. SWRCB and RWQCB have interpreted their authority to require waste discharge requirements to extend to any proposal to fill or alter “Waters of the State,” even if those same waters are not under the jurisdiction of USACE. Mitigation requiring no net loss of wetlands functions and values of waters of the state is typically required by RWQCB.

Pursuant to this authority, SWRCB and RWQCB may require the submission of a “report of waste discharge” under California Water Code Section 13260, which is treated as an application for a waste discharge requirement.

3.4.2.3 Regional and Local

The San Joaquin Joint Powers Authority (SJJPA), a state joint powers agency, and the San Joaquin Regional Rail Commission (SJRRC) propose improvements within and outside of the Union Pacific Railroad (UPRR) right-of-way (ROW). The Interstate Commerce Commission Termination Act (ICCTA) affords railroads engaged in interstate commerce considerable flexibility in making necessary improvements and modifications to rail infrastructure, subject to the

requirements of the Surface Transportation Board.[1] ICCTA broadly preempts state and local regulation of railroads, and this preemption extends to the construction and operation of rail lines. Therefore, activities in existing UPRR ROW are exempt from local building and zoning codes and other land use ordinances. Project improvements proposed outside of the UPRR ROW, however, would be subject to regional and local plans and regulations. Although ICCTA does broadly preempt state and local regulation of railroads, SJJPA and SJRRC intend to obtain local agency permits for construction of facilities that fall outside of the UPRR ROW, even though SJRRC has not determined that such permits are legally necessary, and such permits may not be required.

Appendix E, *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 project improvements are proposed. 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 preparation of this analysis, and reviewed to assess whether the proposed project would be consistent with the plans of relevant jurisdictions.[2] The proposed project would be generally consistent with the applicable goals, policies, and objectives related to biological resources identified in Appendix E.

The Delta Reform Act and the Delta Plan

The following improvements are proposed are within the boundaries of the Legal Delta as delineated by the Delta Protection Act (Section 12220 of the California Water Code) passed in 1959:

- Thornton Siding Upgrade/Extension
- Track Curve Reconstruction North of North New Hope Road
- Track Curve Reconstruction South of Desmond Road
- Phillips Siding Upgrade/Extension

The Sacramento-San Joaquin Delta Reform Act of 2009 is codified in Division 35 of the California Water Code, Sections 85000-85350 (Delta Reform Act). Pursuant to the Delta Reform Act, the Delta Stewardship Council (Council) has adopted the Delta Plan, a legally enforceable management framework for the Delta and Suisun Marsh for achieving the coequal goals. The Delta Reform Act grants the Council specific regulatory and appellate authority over certain actions that take place in whole or in part in the Delta and Suisun Marsh, referred to as "covered actions" (California Water Code Sections 85022(a) and 85057.5). The Council exercises that authority through its regulatory policies (set forth in CCR Title 23, Sections 5001 through 5016) and recommendations incorporated into the Delta Plan. State and local agencies are required to demonstrate consistency with the Delta Plan when carrying out, approving, or funding a covered action (California Water Code Sections 85057.5 and 85225).

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

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

According to the Delta Plan (Delta Stewardship Council 2019), only certain activities qualify as covered actions. To be considered a covered action, a project must meet all the following criteria:

- Will occur, in whole or in part, within the boundaries of the Delta or Suisun Marsh;
- Will be carried out, approved, or funded by the state or a local public agency;
- Is covered by one or more provisions of the Delta Plan;
- Will have a significant impact on the achievement of one or both of the coequal goals or the implementation of government-sponsored flood control programs to reduce risks to people, property, and state interests in the Delta.

According to California Water Code Section 85054, "coequal goals" means the two goals of (1) providing a more reliable water supply for California; and (2) protecting, restoring, and enhancing the Delta ecosystem. The following Delta Plan regulatory policies may apply to the proposed project:

- Delta Plan Policy G P1(b)(2) (23 CCR Section 5002(b)(2)) requires that actions not exempt from CEQA and subject to Delta Plan regulations must include all applicable feasible mitigation measures in the Delta Plan as amended April 26, 2018, or substitute mitigation measures that are equally or more effective.
- Delta Plan Policy ER P5 (23 CCR Section 5009) requires that covered actions fully consider and avoid or mitigate the potential for new introductions of, or improved habitat conditions for, invasive, nonnative species in a way that appropriately protects the ecosystem.

San Joaquin County

The following proposed project impact areas are in San Joaquin County:

- Hammer Lane Siding Upgrade
- Track Curve Reconstruction between East March Lane and East Swain Road
- Lodi Station/Lodi Station South Alternative
- Lodi Siding Variants
- Thornton Siding Upgrade/Extension
- Track Curve Reconstruction North of North New Hope Road

The Lodi Station and Lodi Station South Alternative are the only project components in San Joaquin County that are proposed to be constructed outside of the existing UPRR ROW, and would therefore be subject to the following regional plans, policies, and ordinances.

San Joaquin County Multi-Species Habitat Conservation and Open Space Plan

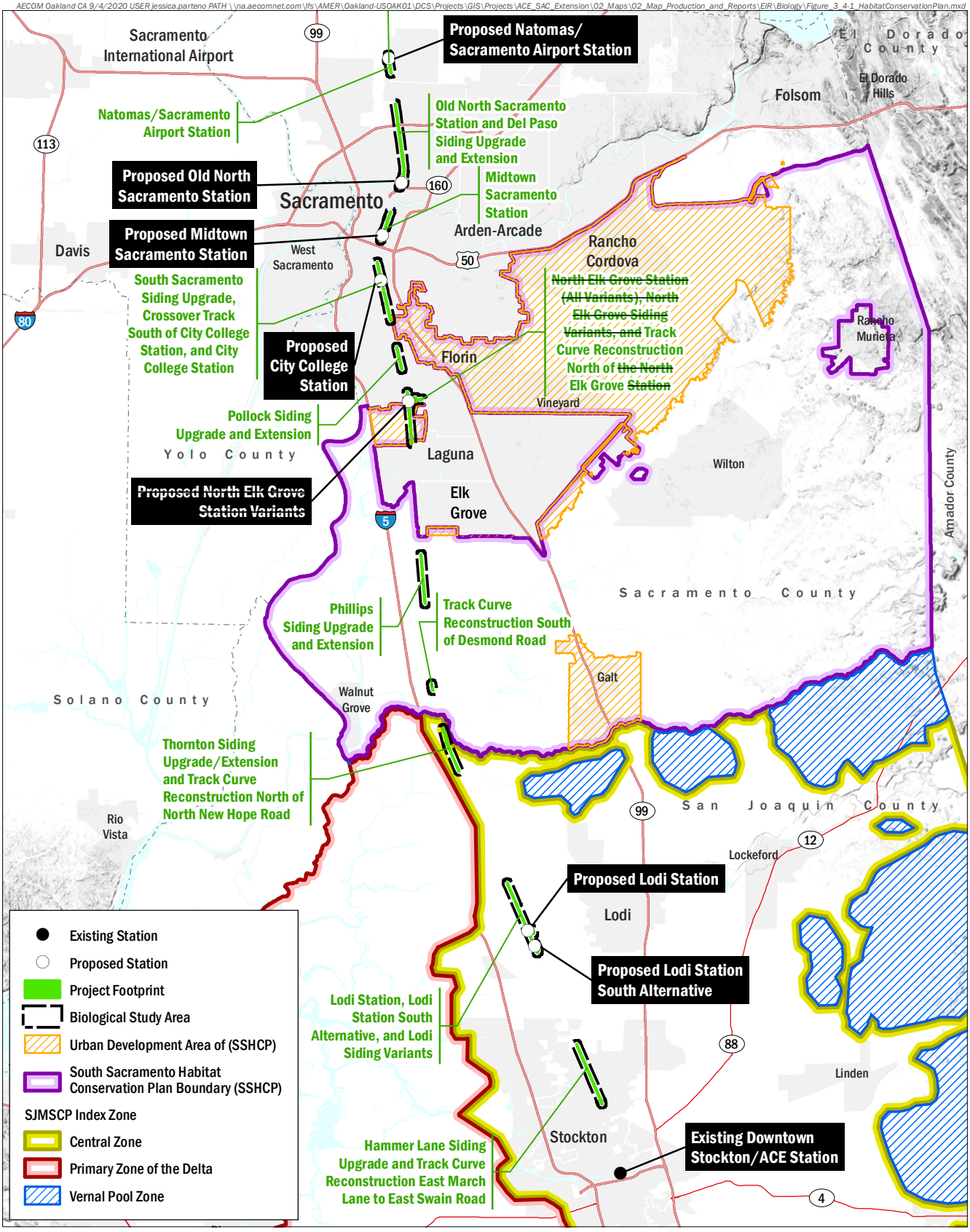
The SJMSCP was approved and adopted in 2000 (County of San Joaquin 2000) (Figure 3.4-1). The SJMSCP covers all of San Joaquin County except for federally owned lands (e.g., the Lawrence Livermore National Lab Site 300). The 97 species covered by the SJMSCP (Covered Species) include species listed under the CESA and/or ESA as threatened or endangered (or rare, in accordance with the CESA); federal candidate species; species proposed for listing as threatened or endangered; birds covered by the MBTA (where they are also included on another state or federal list); species protected by the Bald and Golden Eagle Protection Act (the golden eagle, but not the bald eagle, is an SJMSCP Covered Species); and species that may be of concern pursuant to CEQA and NEPA, including California Rare Plant Ranked (CRPR) list 1A, 1B, 2A, and 2B plants; state-listed species of special concern; state-listed special animals and special plants; state-designated fully protected species; and federal species of concern. Covered Species include 27 plants (6 listed), 4 fish (2 listed), 4 amphibians (1 listed), 4 reptiles (1 listed), 33 birds (7 listed), 15 mammals (3 listed), and 10 invertebrates (5 listed).

Covered activities include public and private activities such as new commercial, residential, and industrial construction; agricultural activities requiring a discretionary permit pursuant to CEQA; aggregate mining; new schools; transportation projects; and public infrastructure projects. The SJMSCP, in accordance with ESA Section 10(a)(1)(B) and CESA Section 2081(b) Incidental Take Permits, provides compensation for the conversion of open space to non-open space uses that affect the plant, fish, and wildlife species covered by the Plan. The SJMSCP is a voluntary plan for both local jurisdictions and for project proponents.

San Joaquin County General Plan

The San Joaquin County General Plan (Mintier-Harnish Planning Consultants 2016) includes goals and policies to conserve open space and protect natural resources, including wildlife habitat and water resources. The following goals and policies of the San Joaquin General Plan are relevant to the proposed project:

- Open Space Goal NCR-1: To conserve and enhance the County's open space resources.
    - Policy NCR 1.1 emphasizes protection of important natural resource habitat, biological diversity, and the ecological integrity of natural systems in the County.
- Wildlife Habitat Goal NCR-2: To preserve and protect wildlife habitat areas for the maintenance and enhancement of biological diversity and ecological integrity.
    - Project-relevant policies include NCR-2.1, 2.3 through 2.7, and 2.9 related to the protection of significant biological and ecological resources, including wetlands, riparian areas, significant oak woodlands and heritage trees, special-status species and their habitats, waterfowl, and fisheries.
- Water Resources and Water Quality Goal NCR-3: To ensure the quality of water for municipal and industrial uses, agriculture, recreation, and fish and wildlife.
    - Specifically, Policy NCR-3.4 identifies County support for eliminating sources of pollution to County waterways and groundwater.



Data Source: AECOM, 2019; SSHP, 2019; ESRI, 2019; San Joaquin County Multi-Species Habitat Conservation and Open Space Plan, 2018.

AECOM

San Joaquin Regional Rail Commission

FIGURE 3.4-1

Habitat Conservation Plans

Note: The North Elk Grove Station, including all access and siding variants, is no longer under consideration. Therefore, the footprint shown above would be reduced to only the portion of the proposed project that includes the Track Curve Reconstruction North of Elk Grove.

San Joaquin County Code of Regulation – Natural Resources

Division 15 of the San Joaquin County Code (County of San Joaquin n.d.) prescribes regulations for the protection, conservation, and/or managed use of the following specified natural resources that are relevant to the proposed project: trees, riparian habitat, wetlands, and waterways.

Chapter 9-1505 Trees

According to Chapter 9-1505 of San Joaquin County Municipal Code, the removal of a native oak tree, heritage oak tree, or historical tree requires an approved Improvement Plan Application. Each heritage oak or historical tree that has been removed shall be replaced with five trees or acorns or combination thereof. Each native oak tree shall be replaced with three trees and/or acorns. The Review Authority may require the replanting of any replacement tree not found alive at the end of the 3-year maintenance period. To protect and preserve heritage oak trees, historical oak trees, and native oak trees, development standards are outlined, including avoidance and minimization measures.

Chapter 9-1510 Riparian Habitat

According to Chapter 9-1510 of San Joaquin County municipal code, an action that in the opinion of the Review Authority has the potential to destroy, eliminate, or degrade riparian habitats shall not be permitted, unless the Review Authority determines that all of the following are true: (a) the potential loss is in the public interest; and (b) potential destruction, elimination, or degradation of the riparian habitat would be mitigated through a Riparian Habitat Mitigation Plan that shall be part of the conditions of approval. The Riparian Habitat Mitigation Plan shall include a plan to protect existing riparian habitat or a plan to replace, preserve, or develop new habitat, or a combination thereof.

Sacramento County

The following proposed project components are in unincorporated Sacramento County:

- Track Curve Reconstruction South of Desmond Road
- Phillips Siding Upgrade/Extension
- ~~North Elk Grove Station (including all access and platform variants)~~
- ~~Elk Grove Siding Variants~~
- Track Curve Reconstruction North of ~~North~~ Elk Grove ~~Station~~
- Natomas/Sacramento Airport Station

Although Track Curve Reconstruction South of Desmond Road, Phillips Siding Upgrade/Extension, ~~Elk Grove Siding Variants,~~ and Track Curve Reconstruction North of ~~North~~ Elk Grove ~~Station~~ are in Sacramento County, there are no project components in these footprints proposed outside of existing UPRR ROW; these project components would be generally consistent with the applicable goals, policies, and objectives related to biological resources and wetlands identified below, but are not subject to their requirements.

Development of the ~~North Elk Grove Station (including all access and platform variants), the~~ Natomas/Sacramento Airport Station would require construction activities outside of existing UPRR ROW, and would therefore be subject to the following regional plans, policies, and ordinances.

South Sacramento Habitat Conservation Plan

The South Sacramento Habitat Conservation Plan (SSHCP) was approved by local agencies in fall 2018 (County of Sacramento et al. 2018a) (Figure 3.4-1). The SSHCP encompasses a 317,000-acre area in south Sacramento County, divided into two components: inside and outside the Urban Development Area (UDA). ~~The North Elk Grove Station (including all access and platform variants) is in the UDA of the SSHCP. Urban development and transportation projects in the UDA, which include development of parking lots like those proposed for the North Elk Grove Station (including all access and platform variants), are Covered Activities under the SSHCP (County of Sacramento et al. 2018a)~~.

The South Sacramento Conservation Agency is the implementing agency and is responsible for preserve management oversight. Covered activities are subject to compliance with SSHCP, and the SSHCP applies to ministerial and discretionary projects. Covered activities and projects include the following: 1) Private Projects (projects inside the SSHCP UDA, preserves inside and outside the UDA); and 2) Public Projects (projects inside the SSHCP UDA, rural road projects outside the UDA, rural water projects outside the UDA, and preserves inside and outside the UDA).

The SSHCP is a habitat-based plan; therefore, compliance with the SSHCP is required when projects would result in a change of natural land covers even if there is not incidental take of species. The SJMSCP provides coverage for 5 invertebrate, 2 amphibian, 2 reptile, 9 bird, 2 mammal, and 8 plant species through the establishment of preserve areas in the Habitat Conservation Plan (HCP). Land use authority permittees include Sacramento County, the City of Rancho Cordova, and the City of Galt. Other permittees include the Sacramento County Water Agency and the Southeast Connector Joint Powers Authority.

The SSHCP Aquatic Resources Program (County of Sacramento et al. 2018b) was developed in conjunction with the SSHCP to develop avoidance and minimization measures (AMMs) and compensatory mitigation requirements that meet or exceed the CWA and State LSAA Program mandates, and implement these standards in a local aquatic resource permit program.

Sacramento County General Plan

The Sacramento County General Plan of 2005-2030 includes several goals to protect biological resources in Sacramento County, including preservation and management of natural habitats, and the preservation, protection, and management of aquatic resources. Specific policies relevant to the proposed project include:

- Habitat mitigation, preservation and management, protection, and project review are outlined in Policies CO-58 through CO-74.
- Protection of special-status species and their habitat, and land management for special-status species is included in policies CO-75 through CO-82.

- Protection of vernal pools, rivers and streams, riparian habitat, and floodplains is included under Policies CO-83 through CO-95 and CO-102 through CO-104.
- Bank stabilization policies to "maintain levee protection, riparian vegetation, function and topographic diversity by stream channel and bank stabilization projects" are included under Policies CO-96 through CO-101.
- Policies related to channel maintenance and restoration of rivers and streams, including tree removal, are included under Policies CO-120 through CO-125.
- Fish species protection is addressed through habitat preservation to increase the population of threatened and endangered species by preserving and increasing available habitat for these species. Policy CO-127 to protect, preserve, and restore migratory routes for anadromous species would apply to any project-related impacts on the Natomas East Main Drainage Canal.

Sacramento County Tree Preservation and Protection Ordinance

Chapter 19.12 of the Sacramento County Municipal Code, Tree Preservation and Protection (Sacramento County 2019a) contains guidelines for construction around and landscaping below native oaks. The ordinance states that other trees species may also be protected at the discretion of County officials. The code also describes tree permit requirements, and avoidance and minimization measures. The ~~North Elk Grove Station (including all access and platform variants), and the~~ Natomas/Sacramento Airport Station <u>is</u> ~~are~~ proposed in portions of unincorporated Sacramento County that are outside existing UPRR ROW, the development of which may be subject to the Sacramento County Tree Preservation and Protection Ordinance.

Sacramento County Swainson's Hawk Ordinance

Chapter 16.130 of Title 16 of the Sacramento County Code addresses the reduction in Swainson's hawk foraging habitat in unincorporated Sacramento County. Participating in the County's Swainson's Hawk Mitigation Program, which is voluntary, is one option for mitigating the loss of foraging habitat in unincorporated areas of the County. Under this program, mitigation for impacts less than 40 acres can be achieved by paying a mitigation fee or providing replacement habitat (title or easement to suitable Swainson's hawk mitigation lands on a per-acre basis); mitigation for impacts of 40 acres or greater can be achieved only by providing replacement habitat under this program. ~~The North Elk Grove Station (including all access and platform variants) would be constructed in Sacramento County and would overlap with grassland habitat that is suitable foraging habitat for Swainson's hawk, and could therefore qualify for mitigation requirements under the Sacramento County Swainson's Hawk Ordinance.~~

Sacramento County Aquatic Resources Protection Ordinance

According to Section 16.135.030 (Applicability) of the Sacramento County Aquatic Resources Protection Ordinance (Chapter 16.135 of Sacramento County Code) (Sacramento County 2019d), all proposed projects in the SSHCP Plan Area that permanently and/or temporarily impact an aquatic resource shall require an Aquatic Resources Impact Permit from the County. Although both the Track Curve Reconstruction South of Desmond Road and Phillips Siding Upgrade/Extension improvements are in the SSHCP Plan Area, no project activities are proposed

outside of existing UPRR ROW at these project footprints, and therefore, they would not require an Aquatic Resources Impact Permit. The ~~North Elk Grove Station (including all access and platform variants), North Elk Grove Siding Variants, and~~ Track Curve Reconstruction North of ~~North~~ Elk Grove ~~Station are~~ is proposed in the UDA of the SSHCP (i.e., are outside the Plan Area) and also would not require an Aquatic Resources Impact Permit.

Sacramento Regional County Sanitation District (Regional San) Bufferlands Master Plan

The proposed Track Curve Reconstruction North of Elk Grove ~~North Elk Grove Station (including all access and platform variants) and North Elk Grove Siding Variants overlap with the Regional San Bufferlands Master Plan (Regional San 2000). Although the North Elk Grove Siding Variants~~ would be confined to the existing UPRR ROW~~, the North Elk Grove Station (including all access and platform variants) is proposed outside of existing UPRR ROW,~~ and ~~may~~ would therefore not conflict with the Bufferlands' current land use (Regional San 2000). The purpose of the Bufferlands Master Plan is to establish a long-term, cost-effective management direction for the Bufferlands that will maintain the existing buffer zone, provide for future expansion and changes in operation of the Sacramento Regional Wastewater Treatment Plant (SRWTP), and protect and enhance the area's environmental resources. Chapter 4 of the Master Plan includes direction and policies of the plan, and Chapter 5 presents the preferred management alternative in detail. ~~The North Elk Grove Station (including all access and platform variants) footprint overlaps with Bufferlands areas designated as Open Space.~~ The Bufferlands' Open Space Areas are actively managed to provide an open-space buffer between the Regional San water treatment plant process area and adjacent landowners, and passively managed for wildlife habitat. The Bufferlands management policies for open space areas emphasize the protection of public health and safety and the preservation of sensitive biological and cultural resources.

Cosumnes River Preserve Management Plan

The Cosumnes River Preserve Management Plan's purpose is the permanent protection of a continuous riparian corridor, including adjacent floodplain, wetland habitats, and a vernal pool grassland complex supporting endangered species. The Track Curve Reconstruction South of Desmond Road portion of the proposed project overlaps with the Cosumnes River Preserve Management Plan (Kleinschmidt Associates 2008), and the adjacent properties are owned by the Bureau of Land Management. All project activities related to Track Curve Reconstruction South of Desmond Road would be confined to the existing UPRR ROW, and no impacts on the Cosumnes River Preserve Management Plan are expected.

American River Parkway Plan Area

The American River Parkway Plan Area is outside of proposed project improvements within 500 feet of the Old North Sacramento Station. The purpose of the American River Parkway Plan (County of Sacramento 2008) is to provide a guide for land use decisions affecting the Parkway, and the plan specifically addresses the preservation, use, development, and administration of the Parkway. Policies of the American River Parkway Plan that may be relevant to the proposed project include those related to terrestrial resources, aquatic communities, and water quality. Policy 3.1 of the American River Parkway Plan states that development of non-Parkway facilities must have a compelling regional need; meet all applicable statutory requirements; and provide mitigation and enhancements to the Parkway's natural, recreational, or interpretive resources.

Local Plans and Policies

City of Stockton

The southern portion of the Hammer Lane Siding Upgrade and the Track Curve Reconstruction between East March Lane and East Swain Road project footprints (i.e., the portion that extends south of Bear Creek) are in the City of Stockton. However, there are no project components proposed outside of existing UPRR ROW in this area. The proposed project would therefore be generally consistent with the applicable goals, policies, and objectives related to biological resources and wetlands identified below, but is not subject to their requirements.

The Natural and Cultural Resources chapter of the City of Stockton General Plan 2035 (City of Stockton 2007b) includes several goals to protect biological resources in the city, including preservation and management of sensitive habitats and open space areas, including the Sacramento-San Joaquin Delta; preservation and protection of sensitive species; and enhancement of the urban forest canopy. Specific policies relevant to the proposed project include:

- Policy NCR-1.1. The City shall strive to protect natural resource areas, fish and wildlife habitat, scenic areas, open space areas, agricultural lands, parks, and other cultural/historic resources (including Oak trees) from encroachment or destruction by incompatible development.
- Policy NCR-2.1. The City shall support preservation, restoration, and enhancement of habitats of State or Federally-listed rare, threatened, endangered and/or other sensitive and special-status species.
- Policy NCR-2.4. The City shall consider the loss of sensitive habitats due to development to be a significant environmental impact. All development that is proposed to disturb or remove sensitive habitat shall demonstrate mitigation for this loss.
- Policy NCR-2.13. The City shall encourage the planting of native trees, shrubs, and grasslands in order to preserve the visual integrity of the landscape, provide habitat conditions suitable for native vegetation, and ensure a maximum number and variety of well-adapted plants are maintained.

City of Elk Grove

~~The North Elk Grove Station (including all access and platform variants) does not lie within the limits of the City of Elk Grove, but it does overlap with the City of Elk Grove General Plan planning area, and would therefore be subject to the following City of Elk Grove General Plan policies.~~

~~The southern portion of the Hammer Lane Siding Upgrade and the Track Curve Reconstruction between East March Lane and East Swain Road project footprints (i.e., the portion that extends south of Bear Creek) are in the City of Stockton. However, there are no project components proposed outside of existing UPRR ROW in this area. The proposed project would therefore be generally consistent with the applicable goals, policies, and objectives related to biological resources and wetlands identified below, but is not subject to their requirements.~~

While outside the city limits, the proposed improvement closest to the City of Elk Grove is the Phillips Siding Upgrade/Extension. However, there are no project components proposed outside of existing UPRR ROW in this area. The proposed project would therefore be generally consistent with the applicable goals, policies, and objectives related to biological resources and wetlands identified below, but is not subject to their requirements.

Chapter 7 Community and Resource Protection of the Elk Grove General Plan (City of Elk Grove 2019) includes goals and policies for the protection of natural resources, including protection of open space lands for recreation and habitat for native species; preservation of trees and urban forest canopy; and water quality.

Policies and Standards of the Elk Grove General Plan that are relevant to the proposed project include:

- Policy NR-1-2: Preserve and enhance natural areas that serve, or may potentially serve, as habitat for special-status species. Where preservation is not possible, require that appropriate mitigation be included in the proposed project.
    - Standard NR-1.2a: Require a biological resources evaluation for private and public development projects in areas identified to contain or possibly contain special-status plant and animal species.
    - Standard NR-1.2b: Require development projects to retain movement corridor(s) adequate (both in size and in habitat quality) to allow for the continued wildlife use based on the species anticipated in the corridor.
    - Standard NR-1.2c: Development adjacent to a natural stream(s) shall provide a "stream buffer zone" along the stream. "Natural streams" shall be generally considered to consist of the following, subject to site-specific review by the City: Deer Creek, Elk Grove Creek, Laguna Creek and its tributaries, Morrison Creek, Union House Creek (a.k.a. Strawberry Creek), and White House Creek. The following are examples of desired features for this transition zone; the specific design for each transition zone shall be approved on a case-by-case basis by the City. Stream buffer zones shall measure at least 50 feet from the stream centerline (total width of 100 feet or more), depending on the characteristics of the stream, and shall include: 1. Sufficient width for a mowed fire-break (where necessary), access for channel maintenance and flood control, and for planned passive recreation uses. 2. Sufficient width to provide for: a. Quality and quantity of existing and created habitat; b. Presence of species, as well as species sensitivity to human disturbance; c. Areas for regeneration of vegetation; d. Vegetative filtration for water quality; e. Corridor for wildlife habitat linkage, and f. Protection from runoff and other impacts of urban uses adjacent to the corridor.
- Policy NR-1-4: Avoid impacts to wetlands, vernal pools, marshland, and riparian (streamside) areas unless shown to be technically infeasible. Ensure that no net loss of wetland areas occurs, which may be accomplished by avoidance, revegetation, restoration on-site or through creation of riparian habitat corridors, or purchase of credits from a qualified mitigation bank.

- Policy NR-1-6: Encourage the retention of natural stream corridors, and the creation of natural stream channels where improvements to drainage capacity are required.
    - Standard NR 1-6a: Stream crossings shall be minimized and be aesthetically compatible with the natural appearance of the stream channel. The use of bridges and other stream crossings with natural (unpaved) bottoms shall be encouraged to minimize impacts to natural habitat.
    - Standard NR 1-6b: Uses in the stream corridors shall be limited to recreation and agricultural uses compatible with resource protection and flood control measures. Roads, parking, and associated fill slopes shall be located outside of the stream corridor, except at stream crossings.
    - Standard NR 1-6c: Open space lands within a stream corridor shall be required to be retained as open space as a condition of development approval for projects that include a stream corridor. Unencumbered maintenance access to the stream shall be provided.
    - Standard NR 1-6d: To the extent possible, retain natural drainage courses in all cases where preservation of natural drainage is physically feasible and consistent with the need to provide flood protection. Where a stream channel is to be created, such human-made channels shall be designed and maintained such that they attain functional and aesthetic attributes comparable to natural channels.
- Policy NR-2-1: Preserve large native oak and other native tree species as well as large nonnative tree species that are an important part of the City's historic and aesthetic character.
- Policy NR-3-1: Ensure that the quality of water resources (e.g., groundwater, surface water) is protected to the extent possible.
- Policy NR-3-2: Integrate sustainable stormwater management techniques in site design to reduce stormwater runoff and control erosion.
    - Standard NR-3-2.a: Where feasible, employ on-site natural systems such as vegetated bioswales, living roofs, and rain gardens in the treatment of stormwater to encourage infiltration, detention, retention, groundwater recharge, and/or on-site water reuse.
    - Standard NR-3-2.b: Roads and structures shall be designed, built, and landscaped so as to minimize erosion during and after construction.
    - Standard NR-3-2.c: Post-development peak storm water run-off discharge rates and velocities shall be designed to prevent or reduce downstream erosion, and to protect stream habitat.
- Policy NR-3-3: Implement the City's National Pollutant Discharge Elimination System permit through the review and approval of development projects and other activities regulated by the permit.

City of Sacramento

The following proposed project components are within the limits of the City of Sacramento:

- South Sacramento Siding Upgrade
- Crossover Track South of City College Station
- City College Station
- Pollock Siding Upgrade
- Midtown Sacramento Station
- Old North Sacramento Station
- Del Paso Siding Upgrade/Extension

Although the above-listed track improvements are in the City of Sacramento, there are no project components in these footprints proposed outside of existing UPRR ROW; therefore, these project components would be generally consistent with the applicable goals, policies, and objectives related to biological resources and wetlands identified below but are not subject to their requirements. However, development of the City College Station, Midtown Sacramento Station, and Old North Sacramento Station would require construction activities outside of existing UPRR ROW, and would therefore be subject to the following plans, policies, and ordinances.

City of Sacramento General Plan

The City of Sacramento 2030 General Plan (City of Sacramento 2015) establishes policies that regulate new development projects within City limits: both directly and indirectly. The City's Environmental Resources policies include water quality protection (Goal E.R. 1.1) and conservation of natural and open space (Goal 2.1). The following policies from the City of Sacramento 2030 are relevant to the proposed project:

- L.U. 9.1.1. Open Space Preservation. The City shall place a high priority on acquiring and preserving open space lands for recreation, habitat protection and enhancement, flood hazard management, public safety, water and agricultural resources protection, and overall community benefit.
- L.U. 2.2.2. Waterway Conservation. The City shall encourage the conservation and restoration of rivers and creeks within the urbanized area as multi-functional open space corridors that complement adjoining development and connect the city's parks and recreation system to the Sacramento and American rivers.
- E.R. 2.1.2. Conservation of Open Space. The City shall continue to preserve, protect, and provide access to designated open space areas along the American and Sacramento rivers, floodways, and undevelopable floodplains.
- E.R. 2.1.4. Retain Habitat Areas. The City shall retain plant and wildlife habitat areas where there are known sensitive resources (e.g., sensitive habitats, special-status, threatened, endangered, candidate species, and species of concern). Particular attention

shall be focused on retaining habitat areas that are contiguous with other existing natural areas and/or wildlife movement corridors.

- E.R. 2.1.5. Riparian Habitat Integrity. The City shall preserve the ecological integrity of creek corridors, canals, and drainage ditches that support riparian resources by preserving native plants and, to the extent feasible, removing invasive nonnative plants. If not feasible, adverse impacts on riparian habitat shall be mitigated by the preservation and/or restoration of this habitat at a 1:1 ratio, in perpetuity.
- E.R. 2.1.6. Wetland Protection. The City shall preserve and protect wetland resources including creeks, rivers, ponds, marshes, vernal pools, and other seasonal wetlands, to the extent feasible. If not feasible, the mitigation of all adverse impacts on wetland resources shall be required in compliance with State and Federal regulations protecting wetland resources, and if applicable, threatened or endangered species. Additionally, the City shall require either on- or off-site permanent preservation of an equivalent amount of wetland habitat to ensure no-net loss of value and/or function.

City of Sacramento Tree Ordinance

The City of Sacramento Municipal Code (Chapter 12.56 Tree Planting, Maintenance, and Conservation) requires a permit for impacts to "City Trees" or "Private Protected Trees" (includes trees formerly referred to as "Heritage Trees"). A "City tree" means any tree the trunk of which, when measured four and one-half feet above ground, is partially or completely located in a city park, on real property the city owns in fee, or on a public right-of-way, including any street, road, sidewalk, park strip, mow strip, or alley. A "Private protected tree" means one of the following:

- A tree that is designated by city council resolution to have special historical value, special environmental value, or significant community benefit, and is located on private property;
- Any native Valley Oak (*Quercus lobata*), Blue Oak *(Quercus douglasii*), Interior Live Oak (*Quercus wislizenii*), Coast Live Oak (*Quercus agrifolia*), California Buckeye (*Aesculus californica*), or California Sycamore (*Platanus racemosa*), that has a DSH of twelve (12) inches or more, and is located on private property;
- A tree that has a diameter at standard height (DSH) of twenty-four (24) inches or more located on private property.

City of Sacramento Landscape Requirements

The City of Sacramento Municipal Code (Chapter 12.92 Water Efficient Landscape Requirements) establishes a structure for planning, designing, installing, maintaining, and managing water-efficient landscapes in new construction and rehabilitated landscape projects.

According to Section 15.92.080, a project applicant shall complete the Water Efficient Landscape Worksheet that contains information on the plant factor, irrigation method, irrigation efficiency, and area associated with each hydrozone. Calculations are then made to show that the Evapotranspiration Adjustment Factor (ETAF) for the landscape project does not exceed a factor of 0.55 for residential areas and 0.45 for nonresidential areas, exclusive of special landscape areas.

3.4.3 Environmental Setting

This section discusses the environmental setting related to biological resources and wetlands by geographic segment for proposed project improvements.

Field reconnaissance, database searches, and background literature review were conducted to characterize biological resources known to be present or with the potential to occur in the study area. No protocol-level wildlife or botanical surveys have been conducted for the proposed project to date. A wetland delineation survey was completed in portions of the study area on various dates in 2017 and 2018. A description of the wetland delineation survey is provided in "*Wetlands and Waters of the United States and States*," below. Table 3.4-1 summarizes site reconnaissance and field delineation surveys conducted to date to characterize biological resources in the study area.

Table 3.4-1. Site Reconnaissance and Delineation Surveys—Biological Resources

Survey Type	Date	Objective	Personnel (AECOM)
Site Reconnaissance	September 12, 2017	Identify biological resource constraints at the project site.	Julie Roth Stuart Griffin
Habitat Mapping and Wetland Delineation	October 26 and 27, 2017; November 8, 9 and 10, 2017	Map habitat/land cover and conduct a wetland delineation in existing UPRR ROW portions of the project footprint.	Pamela Brillante Owen Routt
Supplemental Habitat Mapping and Wetland Delineation	October 23 and 25, 2018 (North Elk Grove Station [including all access and platform variants])[1]	Map habitat/land cover in additional areas of the study area and conduct a wetland delineation in additional areas of the project footprint.	Charles Battaglia Jasmine Wurlitzer Stuart Griffin
Habitat Mapping for Revised Project Footprint	December 9, 2019 (Midtown Sacramento Station, Pollock Siding Upgrade, Sacramento City College Station, South Sacramento Siding Upgrade, North Elk Grove Siding Variants); December 10, 2019 (Phillips Siding Upgrade/Extension and Thornton Siding Upgrade/ Extension); December 11, 2019 (Lodi Station, Lodi Station South Alternative, Lodi Siding Variants); December 12, 2019 (Hammer Lane Siding Upgrade); December 19, 2019 (Old North Sacramento Station and Del Paso Siding Upgrade/Extension); December 20, 2019 (Natomas/ Sacramento Airport Station)	Map habitat/land cover in additional areas of the study area.	Jasmine Wurlitzer Vanessa Tucker

Source: data compiled by AECOM in 2019

1: The North Elk Grove Station, including all access and siding variants, is no longer under consideration.

Prior to site visits, records searches of the following databases were performed to identify special-status species and any wetlands or waters known to occur or with potential to occur in the study area:

- The CDFW California Natural Diversity Database (CNDDB) for the seven U.S. Geological Survey (USGS) quadrangles in which the project area occurs: Lodi South, Lodi North, Thornton, Bruceville, Florin, Sacramento East, and Rio Linda; as well as the surrounding 20 USGS quadrangles: Waterloo, Stockton East, Stockton West, Holt, Terminous, Lockeford, Bouldin Island, Galt, Clay, Isleton, Courtland, Clarksburg, Elk Grove, Sacramento West, Carmichael, Taylor Monument, Citrus Heights, Verona, Pleasant Grove, and Roseville (USGS 2018a-aa) (CDFW 2019a);
- California Native Plant Society (CNPS) Rare Plant Inventory for the USGS quadrangles listed above;
- USFWS' Information for Planning and Consultation database identifying federally-regulated sensitive resources with potential to occur in the project impact areas (USFWS 2019a);
- USFWS's online Critical Habitat Mapper (USFWS 2019b);
- Soil Web soil survey data (NRCS 2020); and
- National Wetland Inventory Wetlands Mapper (USFWS 2020a).

Other literature and environmental documentation reviewed includes:

- Lower Cosumnes River Watershed Assessment (Robertson-Bryan, Inc. 2006).
- Interstate 5/Cosumnes River Boulevard Interchange Project Final Environmental Impact Statement/Environmental Impact Report and Biological Assessment (City of Sacramento and FHWA 2006; Jones & Stokes 2003).
- The Bufferlands Master Plan (Regional San 2000).

During field reconnaissance, vegetation and land cover types were mapped in the project study area. Figures 3.4-2A through 3.4-2C depicts the study area for biological resources. Because most of the study area is developed or disturbed from past and current land uses (e.g. railroad, agriculture), land cover was classified initially according California Department of Water Resources (DWR) Land Use Data (DWR 2014, 2015). Areas of natural land cover were further categorized by the dominant species in the dominant vegetation strata, and were generally classified according to the *Manual of California Vegetation* (Sawyer et al. 2009; Sawyer and Keeler-Wolf 1995) and the *Preliminary Descriptions of the Terrestrial Natural Communities of California* (Holland 1986), and modified as needed based on site conditions.

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Miles

Data Source: AECOM, 2019; CPAD, 2019; CCED, 2018; ESRI, 2016

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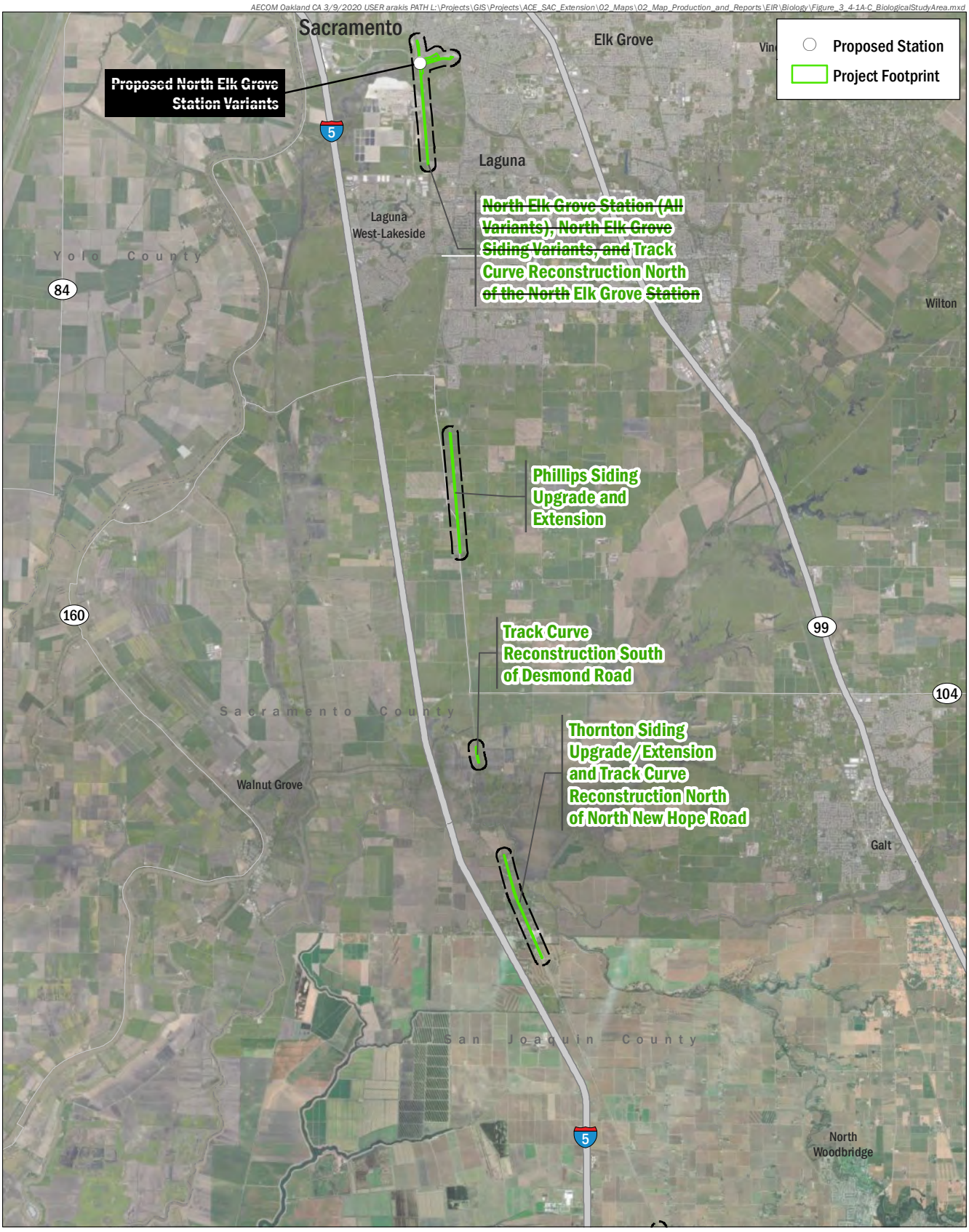
FIGURE 3.4-2A

Biological Study Area
Stockton to Lodi



AECOM

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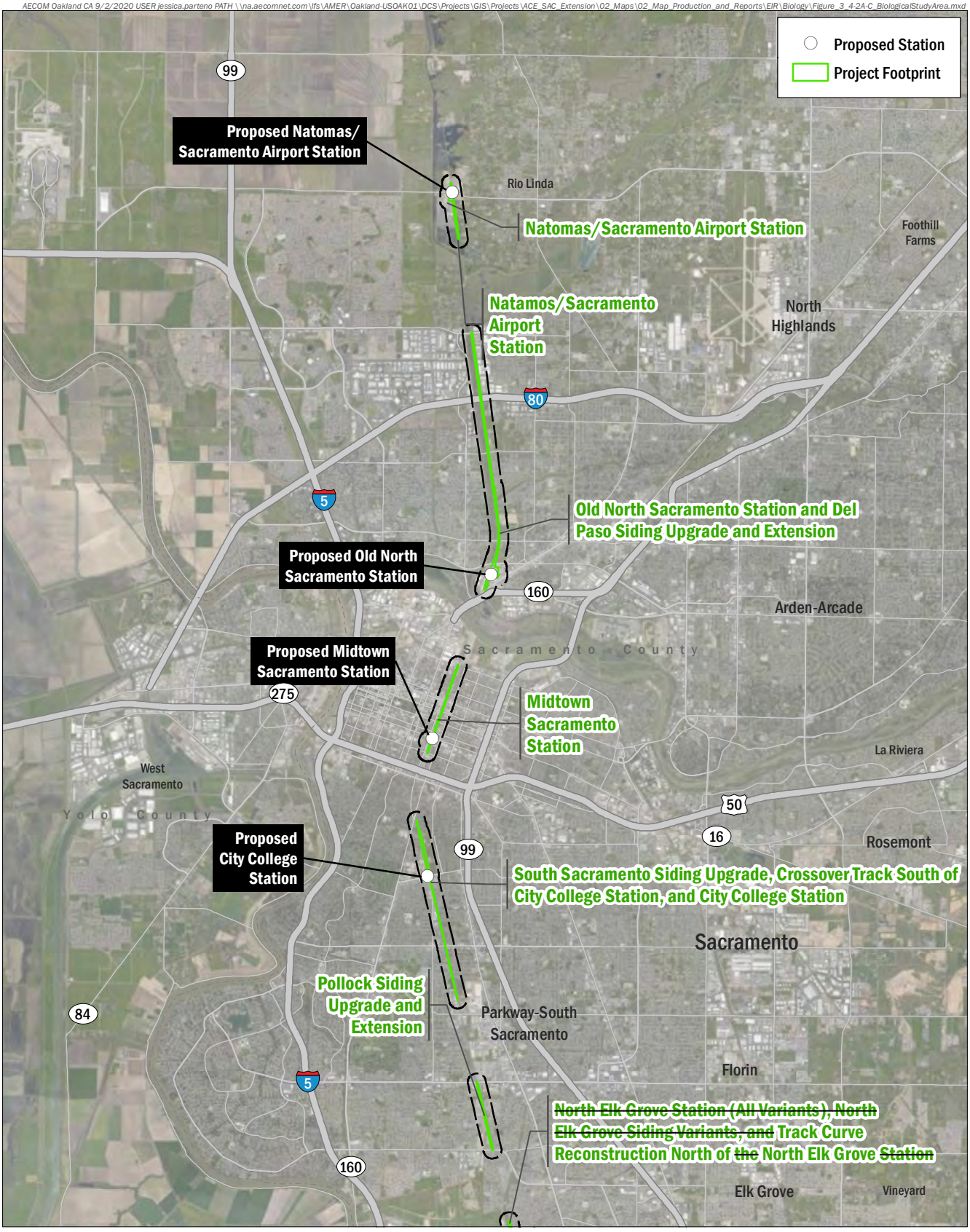
Note: The North Elk Grove Station, including all access and siding variants, is no longer under consideration. Therefore, the footprint shown above would be reduced to only the portion of the proposed project that includes the Track Curve Reconstruction North of Elk Grove.

FIGURE 3.4-2B

Biological Study Area
Lodi to Elk Grove



Data Source: AECOM, 2019; CPAD, 2019; CCED, 2018; ESRI, 2016

AECOM

San Joaquin Regional Rail Commission

FIGURE 3.4-2C

Biological Study Area
Elk Grove to Natomas

3.4.3.1 Project Setting and Regional Context

The project impact area encompasses a total of approximately 338 acres at 11 separate locations along the UPRR Sacramento Subdivision between Stockton and the Natomas area of Sacramento, in San Joaquin and Sacramento Counties. The project footprint consists of the existing railroad and associated ROW, and adjacent areas to support additional improvements (e.g., proposed stations).

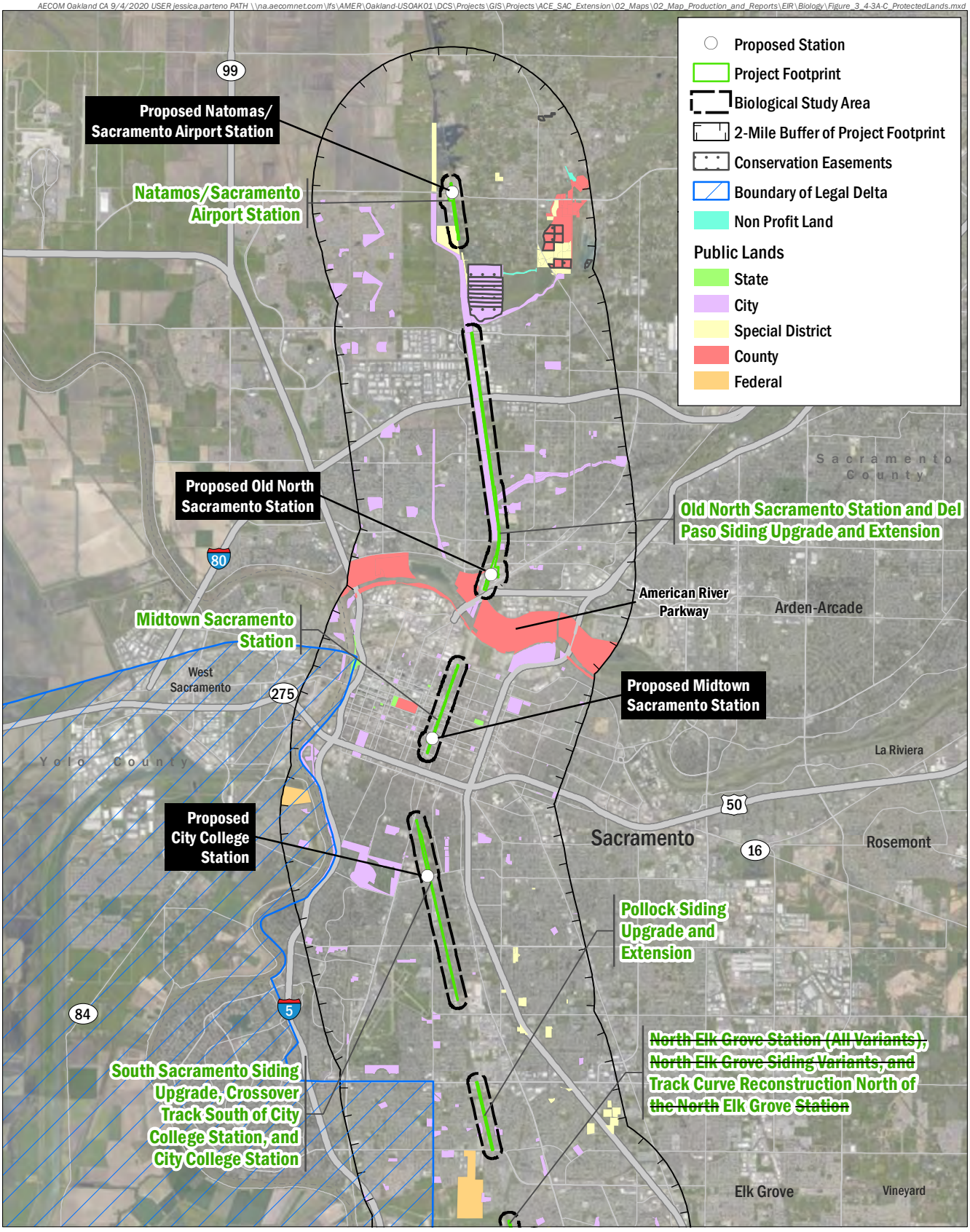
Areas surrounding the study area are composed primarily of either urban developments (e.g., in the cities of Sacramento and Stockton), active agriculture (e.g., locations in southern Sacramento County and northern San Joaquin County), or disturbed grasslands and rural residential developments. One location (Track Curve Reconstruction South of Desmond Road) is surrounded by managed wetlands of the Cosumnes River Preserve that are known as Lost Slough, Lost Slough East, and the Barn Ponds (Robertson-Bryan 2006). Additional conservation areas in proximity to the project footprint include the Stone Lakes National Wildlife Refuge, Sacramento Regional Sanitation District Bufferlands (Bufferlands), and White Slough Wildlife Area (Figures 3.4-3A through 3.4-3C).

The project corridor is in the Central California Valley ecoregion of California, defined by an underlying geomorphology of alluvial fans and terraces (Griffith et al. 2016). The region features flat, intensively farmed plains and large areas of urban development. The topography of the project area is generally flat, with elevations ranging from approximately 5 feet above mean sea level (amsl) to approximately 132 feet amsl.

The Sacramento River Basin and San Joaquin River Basin watersheds overlap the project area. Small portions of the project area (i.e., the Track Curve Reconstruction North of North New Hop Road, Track Curve Reconstruction South of Desmond Road, the southern section of the Phillips Siding Upgrade/Extension, and the northern section of the Thornton Siding Upgrade/Extension) are in the boundaries of the Legal Delta. Natural hydrology in the region is primarily driven by direct precipitation and associated runoff into streams and channels. Irrigation and drainage canals are also prevalent in the vicinity, primarily in proximity to the northernmost (Natomas) and southernmost (San Joaquin County) project locations. Major hydrologic features present along the project corridor, from south to north, include:

- Lower Cosumnes River and Lower Mokelumne River watersheds;
- Laguna Creek, Morrison Creek, and Union House Creek east of the connection with the Sacramento River; and
- Natomas East Main Drainage Canal/Steelhead Creek, just above the confluence with the American River.

Soils in the project impact areas are characterized primarily as loams, clays, or urban land complexes, with mildly to moderately alkaline soil types present in some areas (NRCS 2020). A total of 17 soil series is mapped in the project site. These soils types are listed in Appendix C, *Supporting Biological Resources Information*.



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Data Source: AECOM, 2019; CPAD, 2019; CCED, 2018; ESRI, 2019; DWR Atlas, 2019; Vernal Pool Recovery Plan, U.S. FWS, 2005

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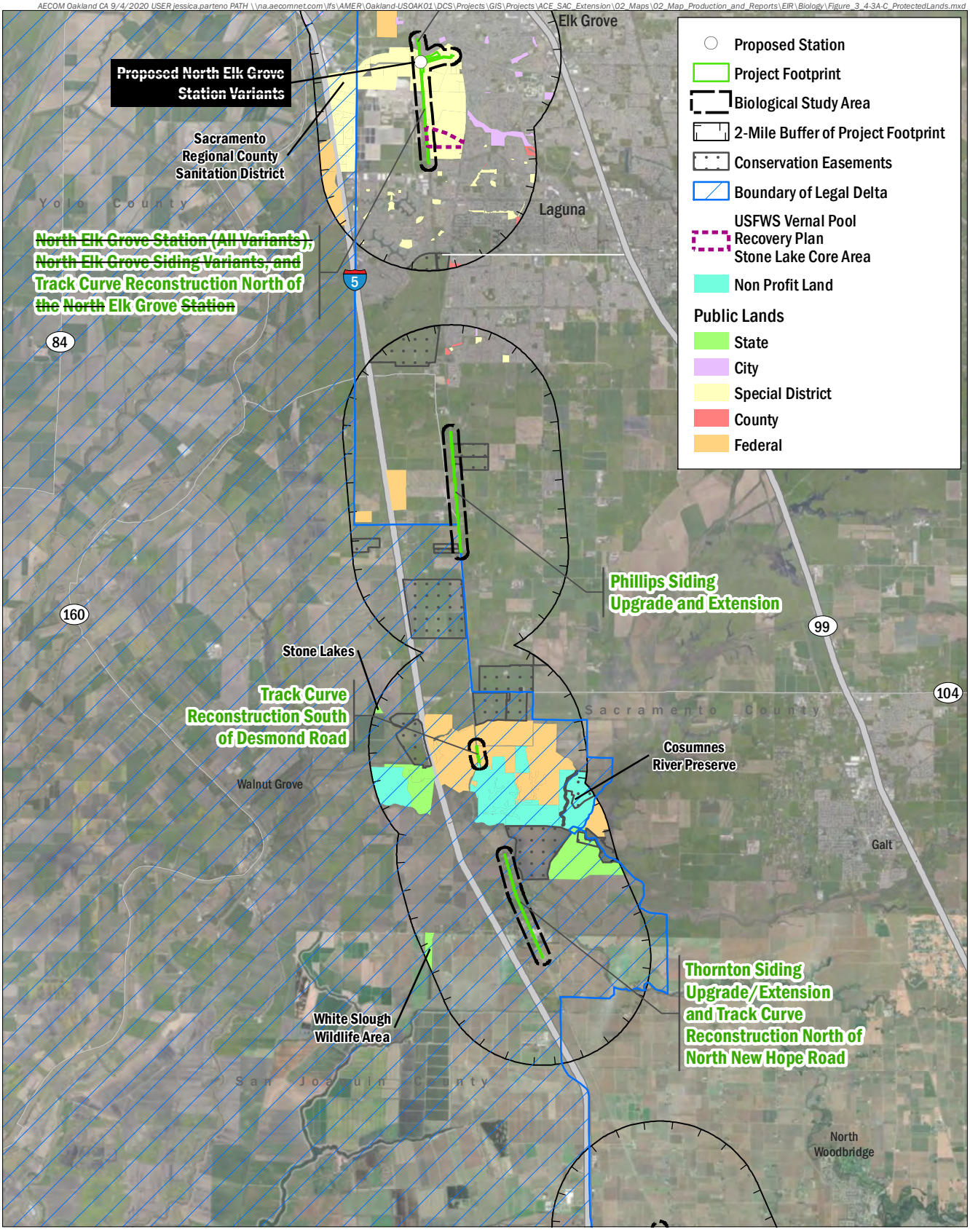
FIGURE 3.4-3A

Protected Lands
Elk Grove to Natomas



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Data Source: AECOM, 2019; CPAD, 2019; CCED, 2018; ESRI, 2019; DWR Atlas, 2019; Vernal Pool Recovery Plan, U.S. FWS, 2005

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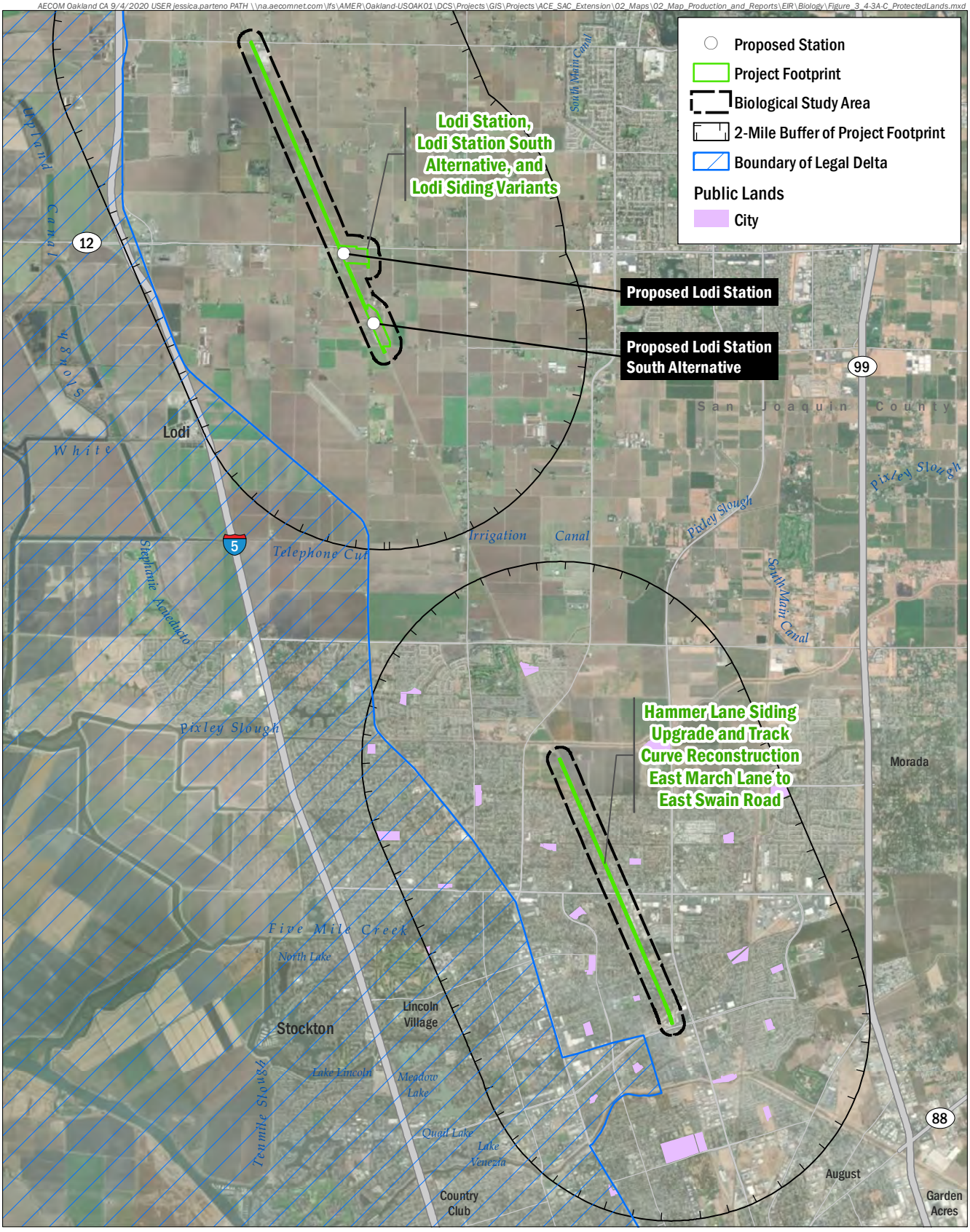
Note: The North Elk Grove Station, including all access and siding variants, is no longer under consideration. Therefore, the footprint shown above would be reduced to only the portion of the proposed project that includes the Track Curve Reconstruction North of Elk Grove.

FIGURE 3.4-3B

Protected Lands
Lodi to Elk Grove



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Data Source: AECOM, 2019; CPAD, 2019; CCED, 2018; ESRI, 2019; DWR Atlas, 2019; Vernal Pool Recovery Plan, U.S. FWS, 2005

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FIGURE 3.4-3C

Protected Lands
Stockton to Lodi

3.4.3.2 Vegetation and Land Cover

A description of each vegetation and land cover type present in the study area is provided below.

Land cover type acreages for each project improvement area are summarized in Table 3.4-2, and depicted by the specific improvement footprint in Figures 3.4-4A through 3.4-4K. These land cover types are described below.

Developed/Landscaped

Developed/landscaped areas occur throughout the project area in the form of highly disturbed, barren, and unvegetated or sparsely vegetated access roads, farm edges, canal levees, railroad ballast, and the toe of the ballast slope. In urban settings, developed/landscaped areas consist of industrial, commercial, and residential developments characterized primarily by impervious surfaces (e.g., buildings, paved roadways, and parking lots) that are often interspersed with patches of ornamental landscaping. Common ornamental landscape species include Mexican fan palm (*Washingtonia robusta*), eucalyptus trees (*Eucalyptus* sp.), white mulberry (*Morus alba*), oleander (*Nerium oleander*), native oak trees (*Quercus lobata* and *Q. wislizenii*), cork oak (*Quercus suber*), various escaped cultivars of fruit and nut trees, and managed turf.

Rural Residential

Rural residential land cover occurs adjacent to project footprints in rural and agricultural settings and is characterized by 1- to 2-acre parcels, typically with one main structure and several outbuildings, often surrounded by agricultural land uses. It includes areas of barren ground for property access and is highly disturbed by human and domestic animal use. Vegetation is generally ruderal, with pockets of ornamental shrubs and trees typically occurring around structures and the parcel perimeter. Managed turf is integrated with this land cover type in some areas such as in the vicinity of the Thornton Siding Upgrade/Extension, Track Curve Reconstruction North of North New Hope Road, Lodi Station, Lodi Station South Alternative, and Lodi Siding Variants.

Occasional native tree and shrub species occur in isolated areas within rural residential areas, including interior live oak, valley oak (*Quercus lobata*), Goodding's black willow (*Salix gooddingii*), and Fremont cottonwood (*Populus fremontii*).

Ruderal

This land cover type occurs throughout the project area adjacent to the UPRR ROW, in fallow agricultural fields, and along the perimeters of active agricultural fields, rural residences, access roads, and canals. It is dominated by a variety of nonnative broadleaf weeds characteristic of 3disturbed places. Ruderal vegetation in the project area is like that described as the Upland Mustards and Other Ruderal Forbs Herbaceous Semi-Natural Alliance in the Manual of California Vegetation (CNPS 2019b). Dominant species are field mustard (*Hirschfeldia incana*), yellow star thistle (*Centaurea solstitialis*), perennial pepperweed (*Lepidium latifolium*), stinkwort (*Dittrichia graveolens*), Russian thistle (*Salsola tragus*), prickly lettuce (*Lactuca serriola*), milk thistle (*Silybum marianum*), poison hemlock (*Conium maculatum*), toothpickweed (*Ammi visnaga*), fennel (*Foeniculum vulgare*), European heliotrope (*Heliotropium europaeum*), and English plantain (*Plantago lanceolata*). Grasses are also common and include several nonnative species,

such as Bermuda grass (*Cynodon dactylon*), Italian rye grass (*Festuca perennis*), and wild oats (*Avena* sp.), as well as patches of native saltgrass (*Distichlis spicata*), particularly along the railroad ballast. Other native species adapted to disturbance and often found in ruderal areas along railroad tracks include doveweed (*Croton setiger*) and hairy leaved sunflower (*Helianthus annuus*).

Occasionally, Himalayan blackberry (*Rubus armeniacus*) or native shrub and tree species, such as valley oak, sandbar willow (*Salix exigua*), and blue elderberry (*Sambucus nigra* ssp*. caerulea*), were observed interspersed in ruderal areas along the UPRR ROW, such as at the sites of the proposed Old North Sacramento Station and Track Curve Reconstruction North of Elk Grove.~~, North Elk Grove Station (including all access and platform variants) and North Elk Grove Siding Variants.~~

Nonnative Annual Grassland

Nonnative annual grasslands were observed adjacent to the proposed Lodi Siding Variants, Thornton Siding Upgrade/Extension, Phillips Siding Upgrade/Extension, Track Curve Reconstruction North of Elk Grove ~~North Elk Grove Station (including all access and platform variants), North Elk Grove Siding Variants~~, and Natomas/Sacramento Airport Station footprints. All mapped grasslands were either grazed by livestock (e.g., cattle, sheep, goats, horses) or were otherwise maintained (e.g., mowed, disked).

Vegetation in this land cover type is most like the Wild Oats and Annual Brome Grasslands Herbaceous Semi-Natural Alliance described by the Manual of California Vegetation (CNPS 2019c). Dominant species consist of nonnative annual grasses, including wild oats, soft chess brome (*Bromus hordeaceus*), medusahead (*Elymus caput-medusae*), and Mediterranean barley (*Hordeum marinum* ssp. *gussoneanum*). Perennial nonnative grasses and herbaceous species are scattered throughout this vegetation community at low cover, and include Bermuda grass, Italian rye grass, filaree (*Erodium* sp.), and winter vetch (*Vicia villosa*). Native herbs, including spikeweed (*Centromadia* sp.), California poppy (*Eschscholzia californica*), and common gumplant (*Grindelia camporum*) were also observed in this vegetation type at the proposed Lodi Station and Lodi Station South Alternative. Native doveweed and narrow tarweed (*Holocarpha virgata*) were common in the grassland habitat adjacent to the western boundary of the proposed Natomas/Sacramento Airport Station footprint.

Grasslands in the vicinity of ~~adjacent to~~ the Track Curve Reconstruction North of Elk Grove ~~Station (including all access and platform variants) and North Elk Grove Siding Variants~~ are in the Regional San Bufferlands area, which is managed for the preservation and restoration of wildlife habitat values. As a result of restoration efforts in the Bufferlands, grassland vegetation in this area also consists of native perennial grasses and forbs, including blue wildrye (*Elymus glaucus*), purple needlegrass (*Stipa pulchra*), and narrow tarweed intermixed with naturalized nonnative species.

Oak Tree Canopy

Patches of scattered valley oak and/or interior live oak trees with either a ruderal, nonnative annual grassland, or barren understory are common throughout the project area. Oaks with an

Table 3.4-2. Land Cover Type by Project Site

Project Site Footprints	Land Cover Types															TOTAL
	Agricultural Ditch/Ditch	Blackberry Scrub	Canal	Cattail Marsh	Developed/ Landscaped	Ephemeral Drainage	Nonnative Annual Grassland	Oak Tree Canopy	Open Water	Row & Field Crops	Ruderal	Rural Residential	Seasonal Wetland	Vineyard/ Orchard	Willow Scrub	
Hammer Lane Siding Upgrade and Track Curve Reconstruction between East March Lane and East Swain Road	0.09	0.06	0.03	0.01	26.86	-	-	0.72	-	0.01	7.49	-	-	-	-	**35.26**
Lodi Station, Lodi Station South Alternative, and Lodi Siding Variants	0.41	0.01	0.02	-	22.88	0.73	-	0.27	-	22.38	16.85	0.36	-	26.21	0.04	**90.19**
Thornton Siding Upgrade/Extension and Track Curve Reconstruction North of North New Hope Road	0.31	3.63	-	-	15.64	-	0.01	2.58	-	0.58	1.19	0.21	-	0.34	0.49	**24.98**
Track Curve Reconstruction South of Desmond Road	0.13	0.11	-	-	1.86	-	-	-	-	-	0.20	-	1.39	-		**3.70**
Phillips Siding Upgrade/Extension	0.12	1.06	-	0.30	15.07	1.32	-	-	-	0.25	8.12	-	0.07	-	0.82	**27.13**
~~North Elk Grove Station (including all access and platform variants), North Elk Grove Siding Variants, and~~ Track Curve Reconstruction North of ~~North~~ Elk Grove[1] ~~Station~~	-	0.84	-	0.37	15.18	0.02	-	-	0.34	-	37.96	-	0.38	-	0.40	**55.50**
Pollock Siding Upgrade	-	-	-	-	10.51	-	-	-	-	-	1.92	-	-	-	-	**12.43**
City College Station, South Sacramento Siding Upgrade, and Crossover Track South of City College Station	0.02	-	-	-	24.63	-	-	-	-	-	0.10	-	-	-	-	**24.76**
Midtown Sacramento Station	-	-	-	-	14.08	-	-	-	-	-	0.10	-	-	-	-	**14.18**
Old North Sacramento Station and Del Paso Siding Upgrade/Extension	0.15	-	-	-	47.41	0.16	0.37	2.61	0.17	-	11.09	-	-	-	-	**61.95**
Natomas/Sacramento Airport Station	-	-	-	-	6.62	-	-	0.08			2.44	-	0.54	-	-	**9.69**
TOTAL	**1.24**	**5.72**	**0.06**	**0.68**	**200.75**	**2.24**	**0.38**	**6.25**	**0.51**	**23.22**	**87.46**	**0.57**	**2.39**	**26.56**	**1.75**	**359.76**

1. Totals include the original footprint of the now deleted North Elk Grove Station (including all access and siding variants). As such, actual totals related only to the Track Curve Reconstruction North of Elk Grove would be much less.

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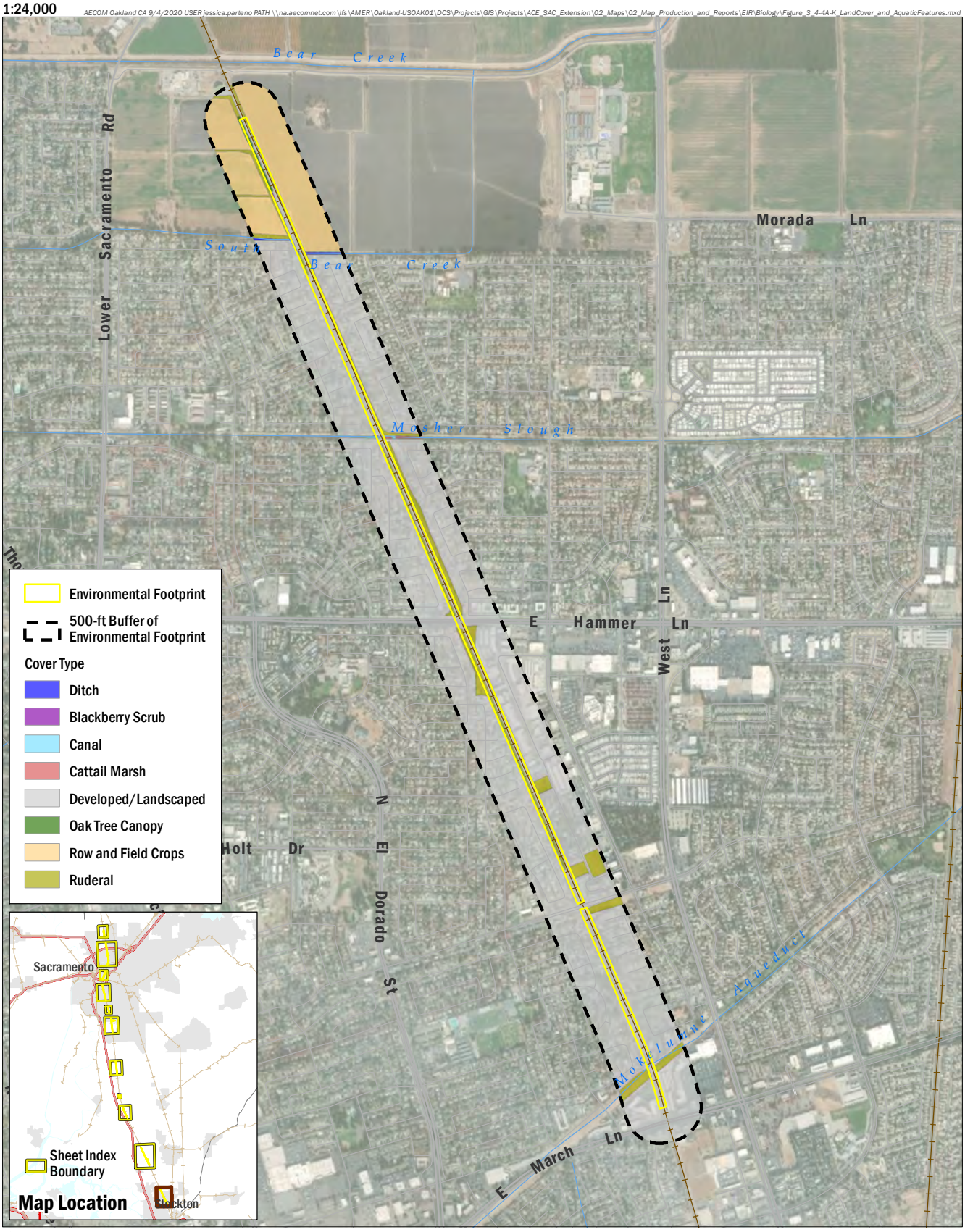

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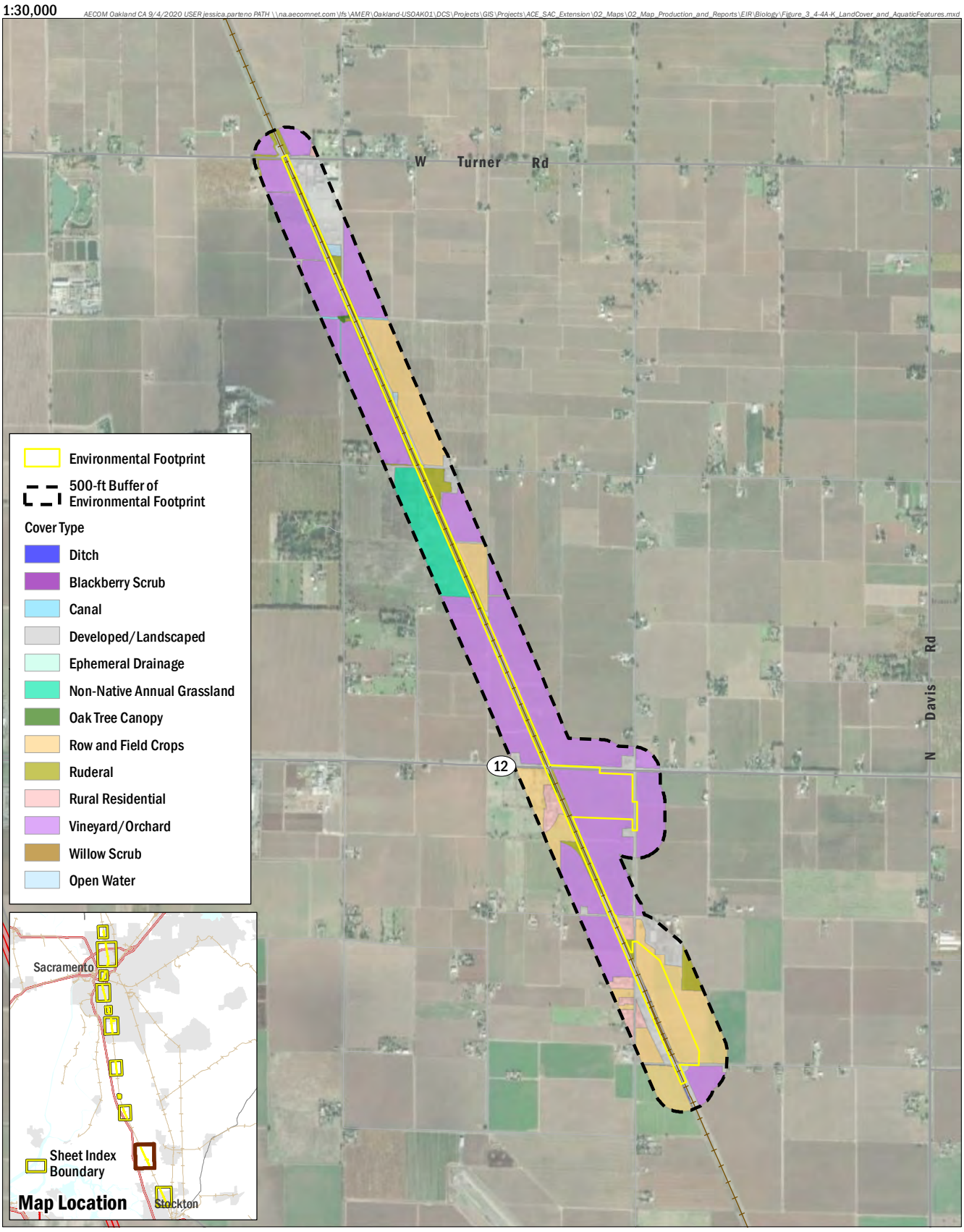
FIGURE 3.4-4A

Hammer Lane Siding Upgrade and Track Curve Reconstruction East March Lane to East Swain Road
Land Cover and Aquatic Features



AECOM

San Joaquin Regional Rail Commission

FIGURE 3.4-4B

Lodi Station, Lodi Station South Alternative, and Lodi Siding Variants Land Cover and Aquatic Features

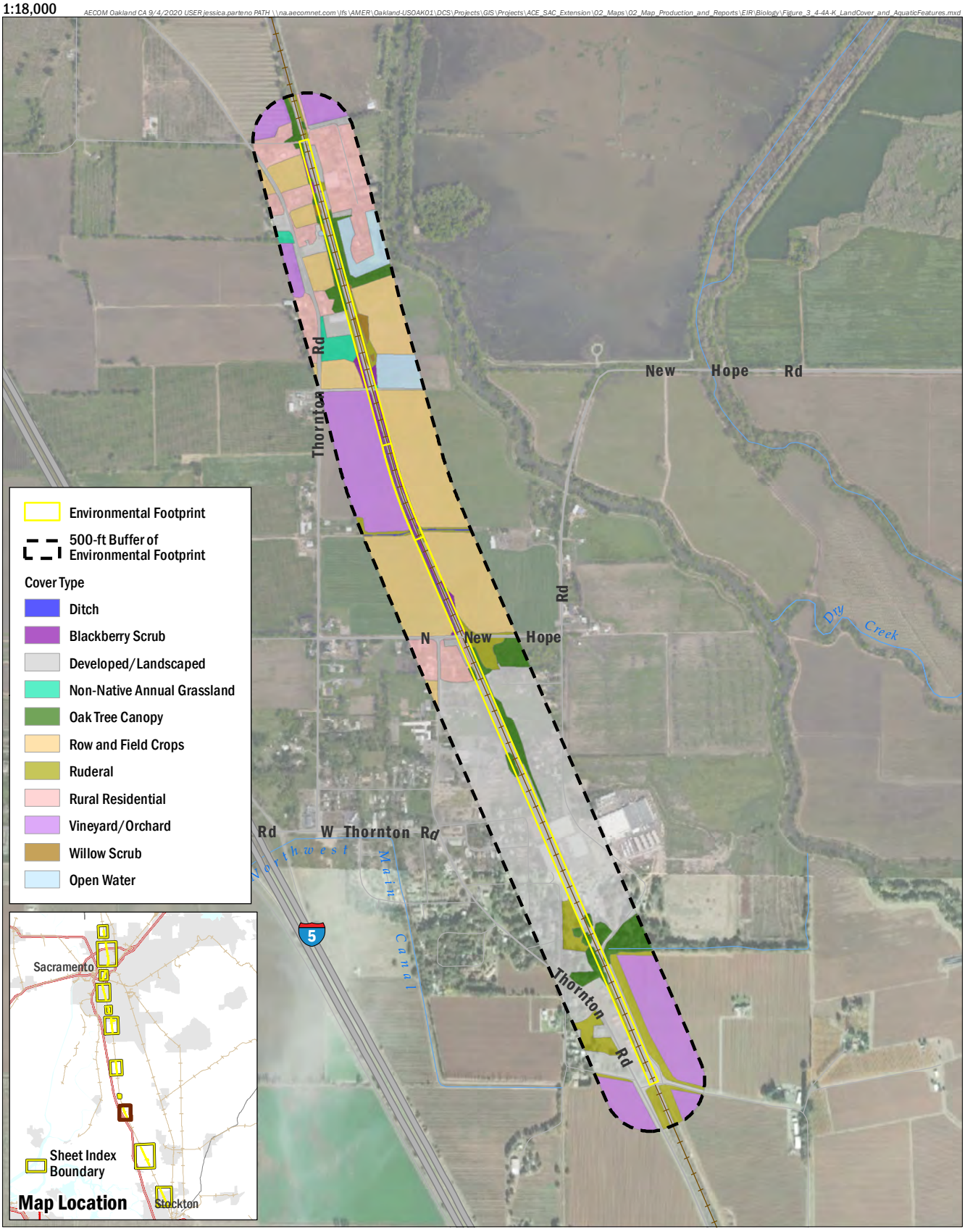


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FIGURE 3.4-4C

Thornton Siding Upgrade/Extension and Track Curve Reconstruction North of North New Hope Road Land Land Cover and Aquatic Features

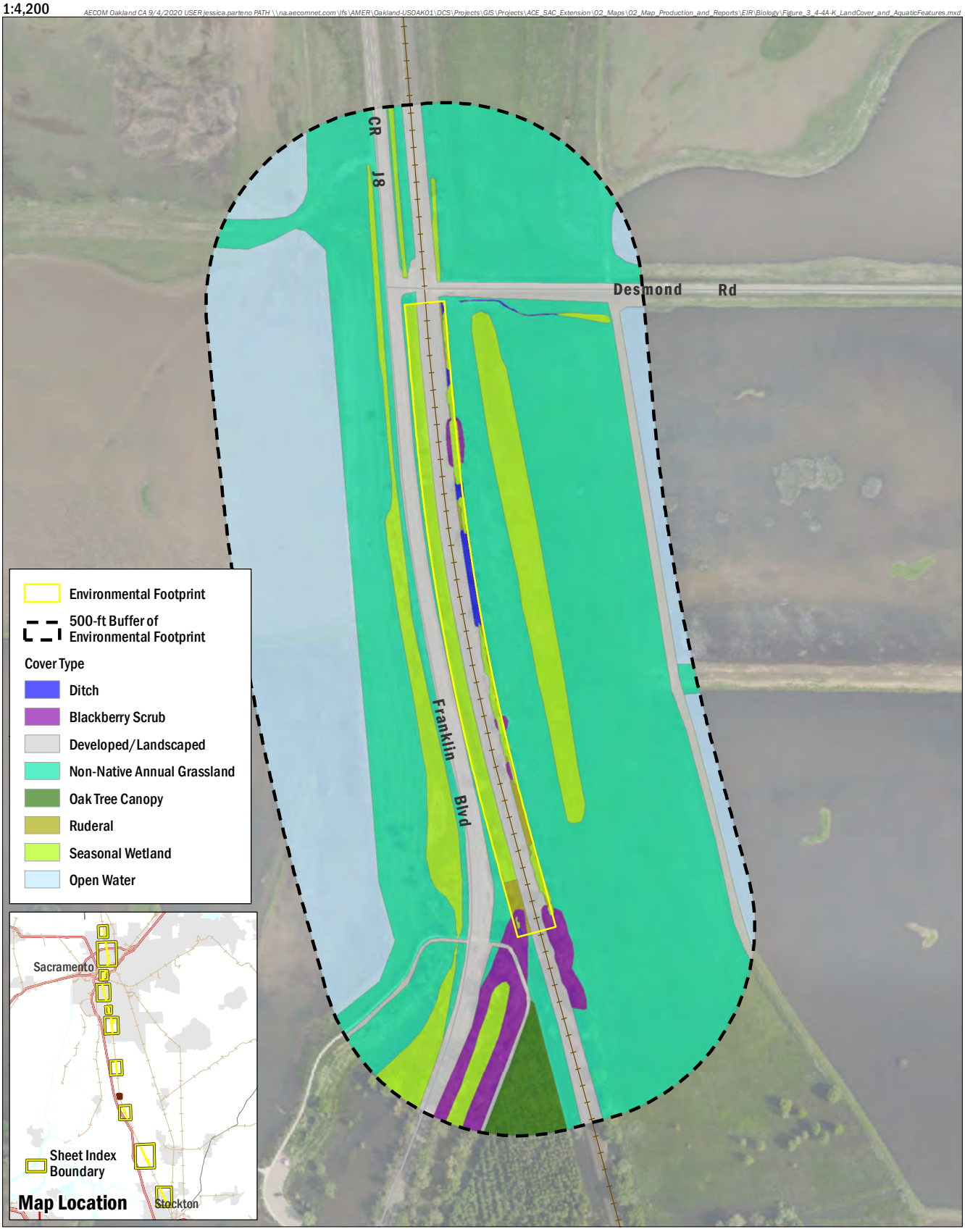

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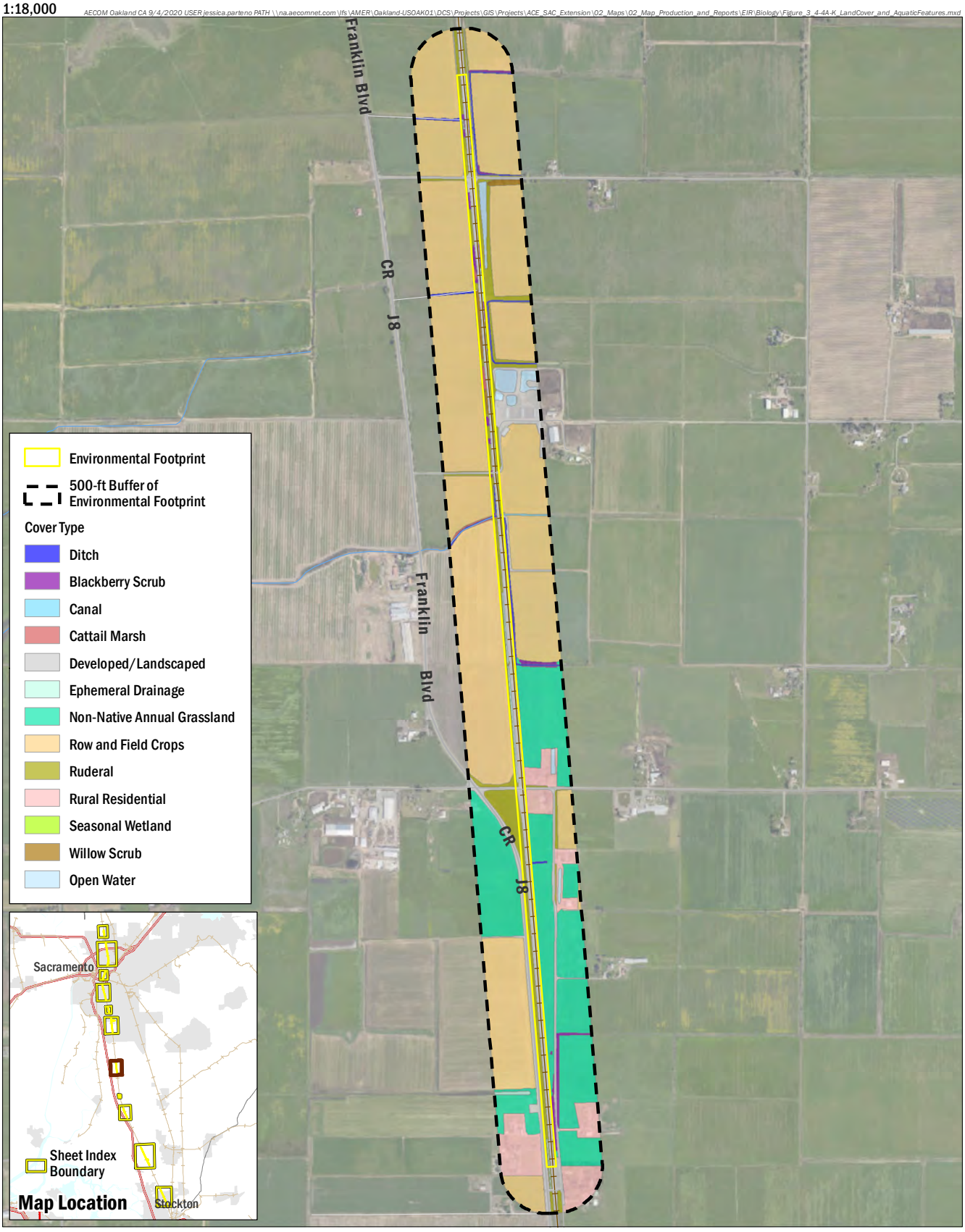
FIGURE 3.4-4D

Track Curve Reconstruction South of Desmond Road
Land Cover and Aquatic Features

1:18,000

AECOM Oakland CA 9/4/2020 USER jessica.parteno PATH \\na.aecomnet.com\fs\AMER\Oakland-USOAK01\DCS\Projects\GIS\Projects\ACE_SAC_Extension\02_Maps\02_Map_Production_and_Reports\EIR\Biology\Figure_3_4-4A-K_LandCover_and_AquaticFeatures.mxd



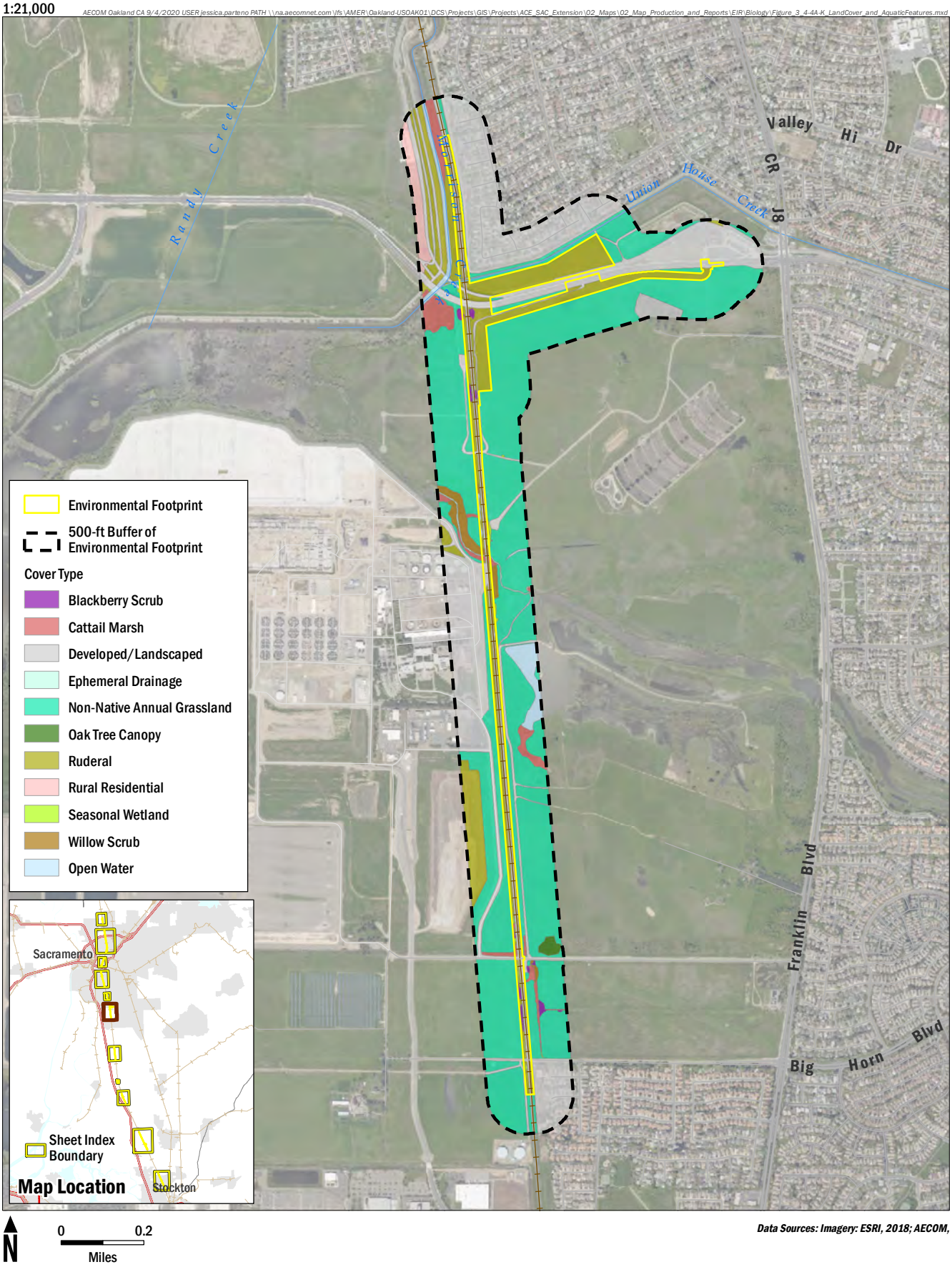
Data Sources: Imagery: ESRI, 2018; AECOM,

AECOM

San Joaquin Regional Rail Commission

FIGURE 3.4-4E

Phillips Siding Upgrade and Extension
Land Cover and Aquatic Features



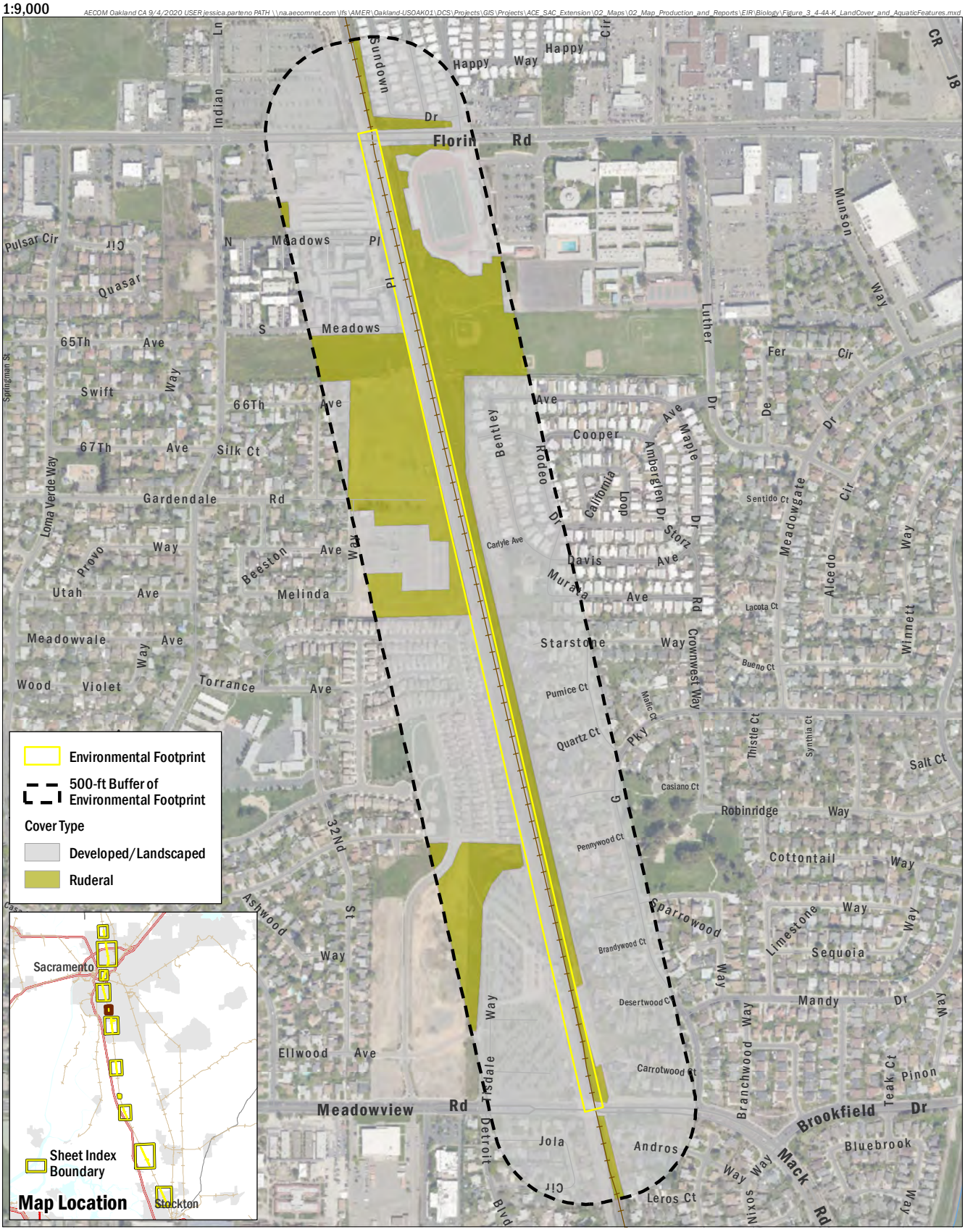
AECOM

San Joaquin Regional Rail Commission

Note: The North Elk Grove Station, including all access and siding variants, is no longer under consideration. Therefore, the footprint shown above would be reduced to only the portion of the proposed project that includes the Track Curve Reconstruction North of Elk Grove.

FIGURE 3.4-4F

~~North Elk Grove Station (All Variants), North Elk Grove Siding Variants, and~~ Track Curve Reconstruction North of ~~the North~~ Elk Grove ~~Station~~ - Land Cover and Aquatic Features



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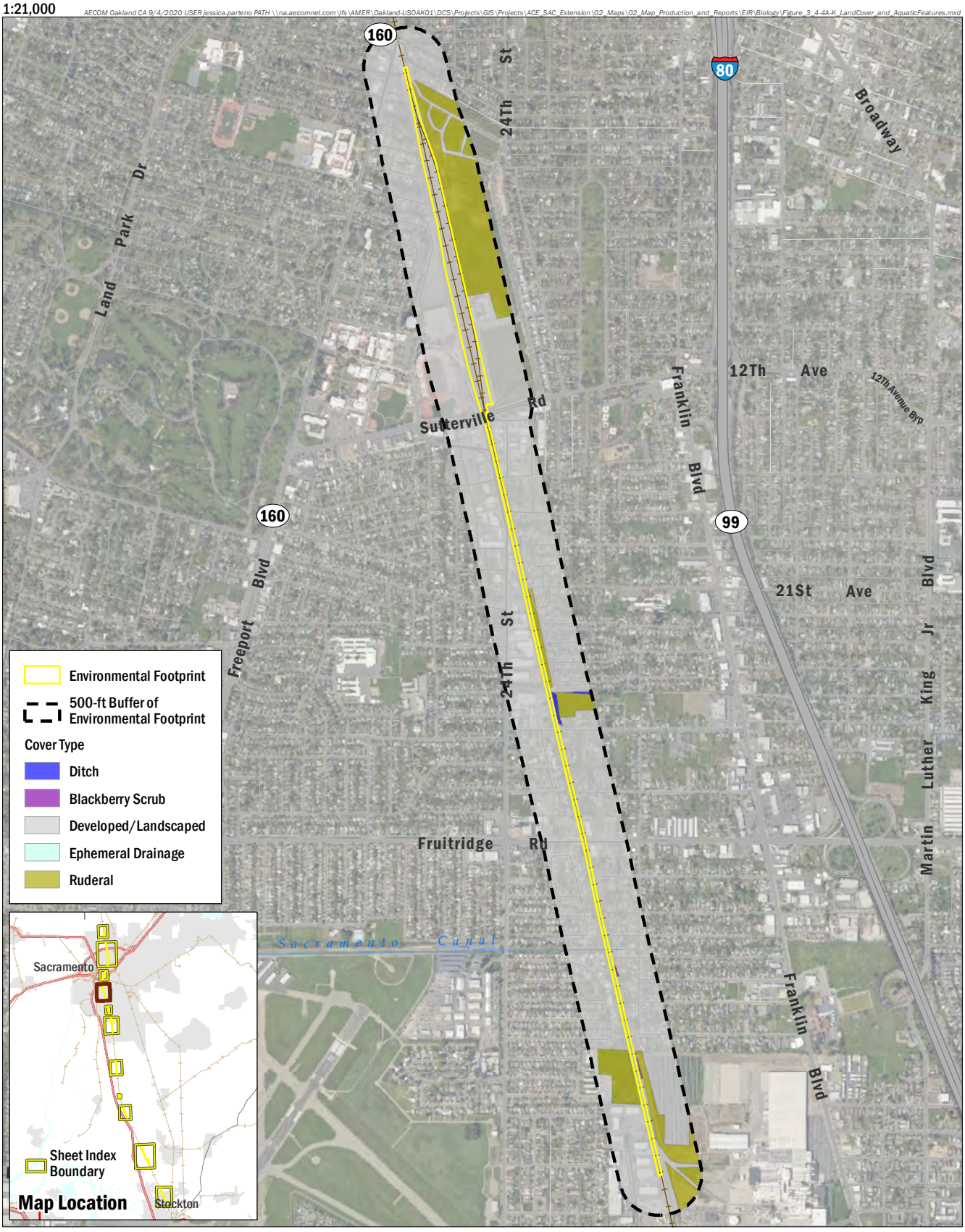
San Joaquin Regional Rail Commission

FIGURE 3.4-4G

Pollock Siding Upgrade
Land Cover and Aquatic Features

1:21,000



Data Sources: Imagery: ESRI, 2018; AECOM,

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FIGURE 3.4-4H

South Sacramento Siding Upgrade, Crossover Track South of City College Station, and City College Station Land Cover and Aquatic Features

AECOM

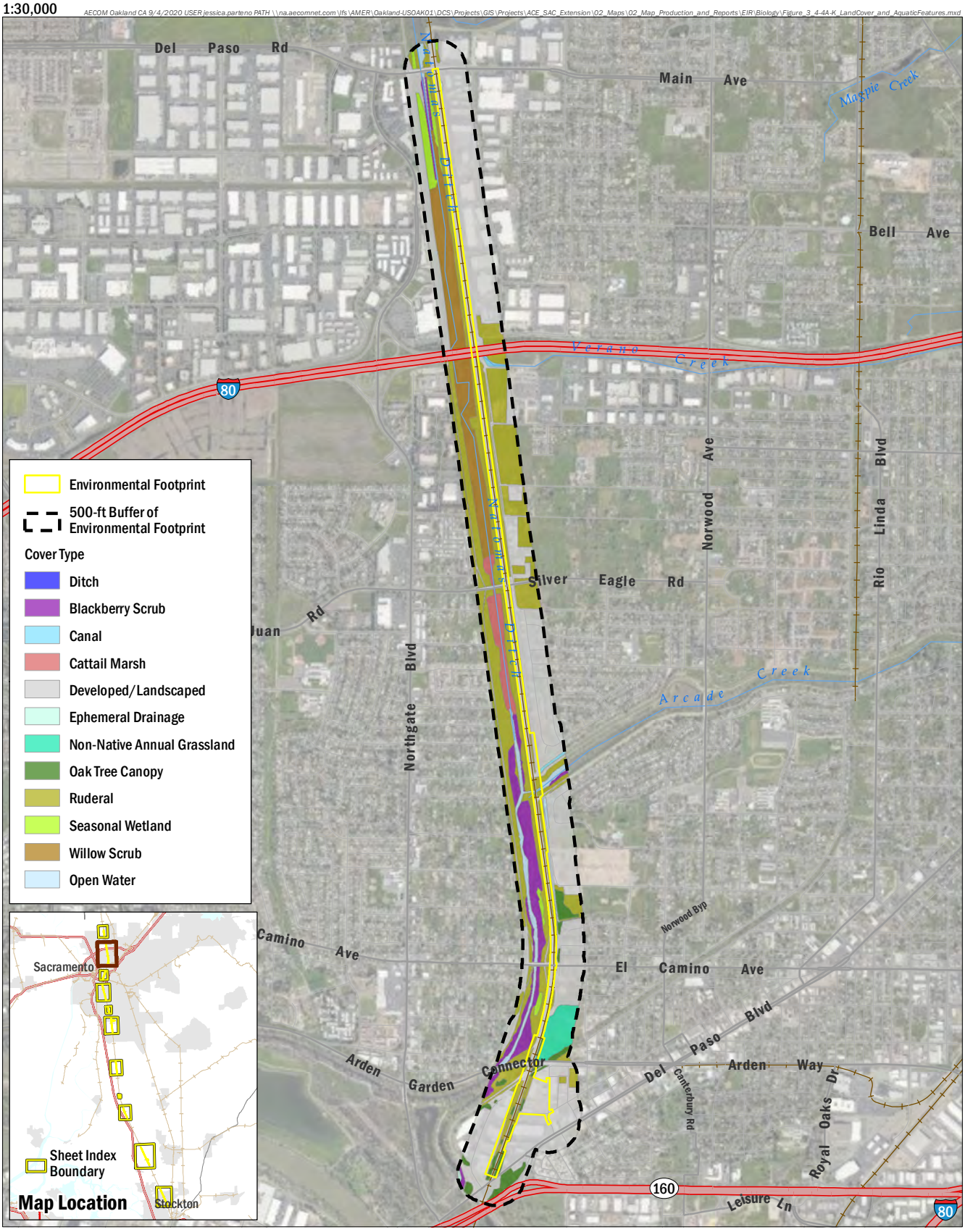
San Joaquin Regional Rail Commission

FIGURE 3.4-4I

Midtown Sacramento Station
Land Cover and Aquatic Features

1:30,000

AECOM Oakland CA 9/4/2020 USER:jessica.parteno PATH:\\na.aecomnet.com\fs\AMER\Oakland-USOAK01\DCS\Projects\GIS\Projects\ACE_SAC_Extension\02_Maps\02_Map_Production_and_Reports\EIR\Biology\Figure_3_4-4A-K_LandCover_and_AquaticFeatures.mxd



Data Sources: Imagery: ESRI, 2018; AECOM,

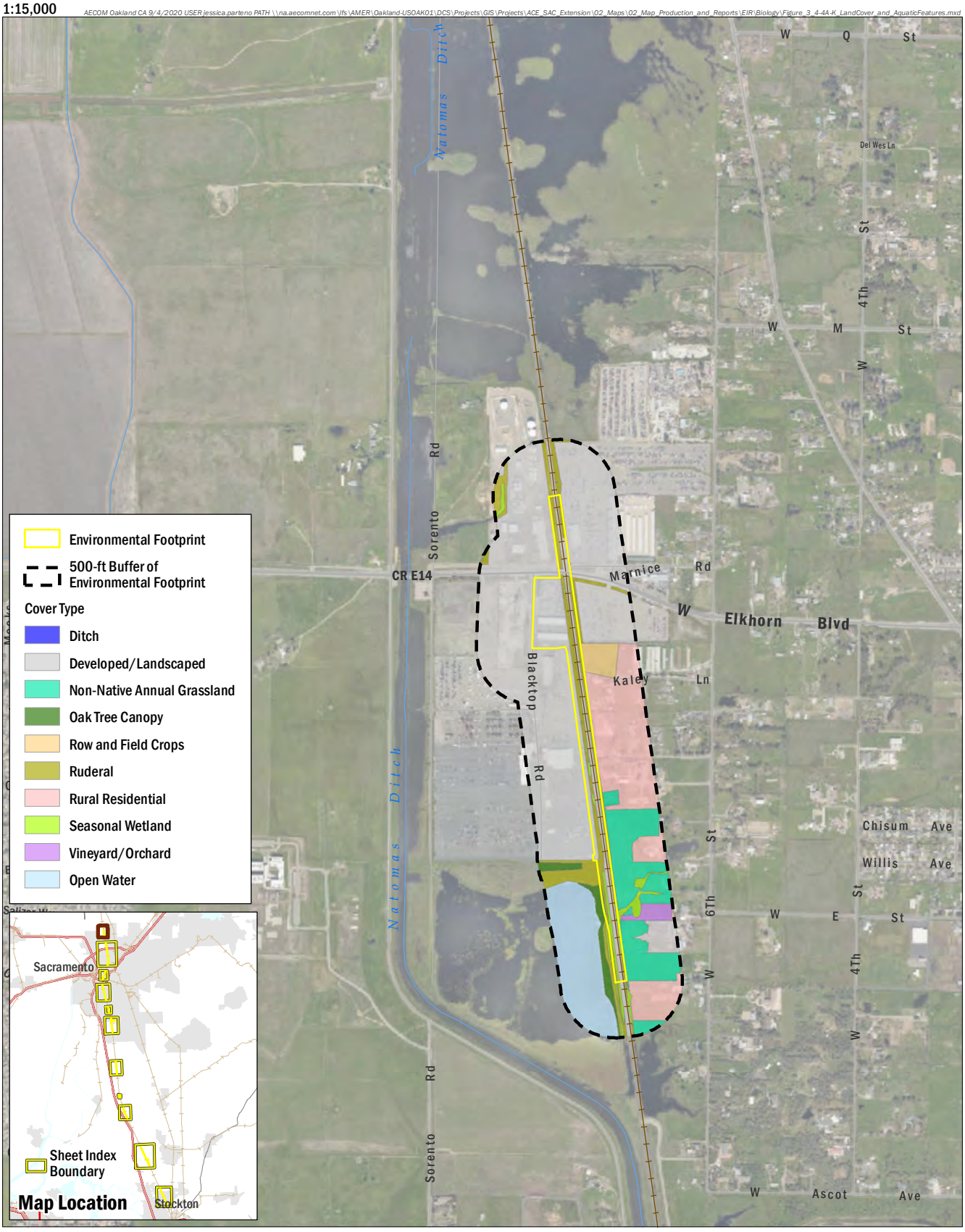
AECOM

San Joaquin Regional Rail Commission

FIGURE 3.4-4J

Old North Sacramento Station and Del Paso Siding Upgrade and Extension Land Cover and Aquatic Features

1:15,000



Data Sources: Imagery: ESRI, 2018; AECOM,

AECOM

San Joaquin Regional Rail Commission

FIGURE 3.4-4K

Natomas/Sacramento Airport Station
Land Cover and Aquatic Features

understory interspersed with elderberry shrubs was observed at the proposed Old North Sacramento Station and Track Curve Reconstruction South of Desmond Road footprints. Isolated valley oak trees are interspersed with ornamental tree and shrub species at the proposed Lodi Station and Lodi Station South Alternative, and in ruderal areas along the Hammer Lane Siding Upgrade. In the project area, this habitat type does not likely provide the typical functions of native woodland habitat for several reasons, including extremely small patch size; isolation by surrounding agricultural, urban, and other land uses; and generally high levels of disturbance. Recently replanted oak woodlands with limited oak canopy are present in lands north of the Lodi Station~~,~~ and to the south of Track Curve Reconstruction South of Desmond Road~~, and east of the North Elk Grove Siding Variants~~.

Riparian

Mature oak riparian habitat dominated by large valley oak trees is present outside of the project area along the banks of major creeks and waterways in the vicinity of the proposed project, including the Cosumnes River, Morrison Creek, American River, Steelhead Creek, and Arcade Creek. This vegetation community is most like Holland's Great Valley Oak Riparian community type, organized under the Valley Oak Woodland Alliance in the Manual of California Vegetation (CNPS 2019d).

Thickets of riparian vegetation dominated by the invasive nonnative rattlebox shrub (*Sesbania punicea*) are present along the entire Natomas East Main Drainage Canal (NEMDC/Steelhead Creek), and are particularly dense and widespread north of the Natomas/Sacramento Airport Station footprint. Rattlebox forms a monoculture along the banks of Steelhead Creek in these areas and along the perimeters of wide, shallow ponds that are connected to the creek. Floating water primrose (*Lugwigia peploides*) is also present as a floating mat of vegetation that spreads out from beneath the rattlebox to cover the shallow, open areas along the creek and associated ponds.

Willow Scrub

Thickets of sandbar willow scrub are common throughout the project area along ephemeral drainages that parallel the base of railroad ballast. This habitat type is best described as the *Salix exigua* Shrubland Alliance, where sandbar willow is dominant or co-dominant in the shrub canopy with Himalayan blackberry (CNPS 2019e). Emergent trees, including Goodding's black willow, valley oak, interior live oak, and Fremont cottonwood, are also present at low relative cover.

Blackberry Scrub

This vegetation community often occurs as a narrow, approximately 20-foot-wide, dense strip of Himalayan blackberry brambles along the toe of the ballast slope. Poison hemlock, briar rose, stinging nettle (*Urtica dioica*), and California blackberry (*Rubus ursinus*) are common associates. This vegetation community is most like the Himalayan blackberry-rattle box-edible fig riparian scrub vegetation alliance (CNPS 2019f).

Agricultural Land Cover Types

Row and Field Crops

Row and field crops are common throughout the Central Valley, with this agricultural type surrounding several of the proposed project footprints (i.e., northern portions of the Hammer Lane Siding Upgrade; Lodi Station, Lodi Station South Alternative, and Lodi Siding Variants; Thornton Siding Upgrade/Extension; Track Curve Reconstruction North of North New Hope Road; and Phillips Siding Upgrade/Extension). During field surveys, areas with row and field crops included hay, corn, strawberries, and alfalfa. This land cover type also includes occasional fallow fields. Other common row and field crops sometimes included in crop rotations in the Central Valley, and that may be a temporal component of the agriculture areas mapped as row/field crops in the project area, include rye, barley, oats, beans, broccoli, lettuce, cauliflower, and safflower. In addition to crop plants, ruderal vegetation typically borders agricultural fields along perimeter access roads.

Vineyard/Orchard

Vineyards and orchards are common landscape features in the areas surrounding the proposed Lodi Station, Lodi Station South Alternative, and Lodi Siding Variants; and the Thornton Siding Upgrade/Extension and Track Curve Reconstruction North of North New Hope Road. These areas are composed of monocultures of evenly spaced, similar-sized grapevines or commercial crop trees (e.g., walnut, almond, peach). The understory is typically barren, or consists of patches of mowed or otherwise managed ruderal vegetation between rows. Ruderal areas are also often present along perimeter access roads and ditches.

Aquatic and Wetland Habitats

Three watersheds overlap the project area: San Joaquin Delta Watershed (Stockton to Lodi); Lower Mokelumne Watershed (Lodi to Thornton); and Lower Sacramento Watershed (Thornton to Natomas). In addition, the proposed Old North Sacramento Station would be constructed at the northwestern boundary of the Lower American River Watershed. Section 3.10, *Hydrology and Water Quality*, provides detailed descriptions of each watershed and associated sub-watersheds.

The proposed Thornton Siding Upgrade/Extension, Track Curve Reconstruction North of North New Hope Road, Track Curve Reconstruction South of Desmond Road, and the southern portion of the Phillips Siding Upgrade/Extension are within the boundaries of the Legal Delta (DWR 2019a). The proposed Track Curve Reconstruction between East March Lane and East Swain Road in the City of Stockton is approximately 0.3 mile east of the boundaries of the Legal Delta.

Major rivers in proximity to the proposed project include the Calaveras River, located approximately 0.5 mile south of the proposed Hammer Lane Siding Upgrade and Track Curve Reconstruction between East March Lane and East Swain Road; the Cosumnes River and Mokelumne River, whose confluence is between the Thornton Siding Upgrade/Extension, Track Curve Reconstruction North of North New Hope Road, and Track Curve Reconstruction South of Desmond Road; and the American River, approximately 0.5 mile north and south of the Midtown Sacramento Station and Old North Sacramento Station footprints, respectively. Although none of these rivers overlap with the proposed project, several tributary creeks and drainages intersect

the project footprint. Other wetland features in the project area include agricultural ditches, ephemeral drainages, seasonal wetlands, cattail marsh, and open water ponds.

Creeks and Waterways

Creeks and waterways in the project vicinity flow from east to west toward the Sacramento River or Sacramento/San Joaquin Delta. Creek channels and associated vegetation, particularly riparian scrub and forest habitats, provide important movement corridors for wildlife in urban and agricultural settings. Special-status wildlife that may use these habitats include Swainson's hawk, western pond turtle (*Emys marmorata*), giant garter snake (*Thamnophis gigas*), and numerous species of migratory birds. Named waterways that intersect the project footprint include Mosher Slough, South Bear Creek, ~~Laguna Creek, Union House Creek,~~ and Arcade Creek. Other creeks and waterways in the project vicinity, but that do not cross the project footprint, include Verano Creek, Morrison Creek, Dry Creek, Rio Linda Creek, and Steelhead Creek (NEMDC). Each of these creeks and waterways is described briefly below.

Mosher Slough crosses the proposed Hammer Lane Siding Upgrade footprint from east to west underneath an existing raised track bridge. In the project area, Mosher Slough is a channelized, earth-lined linear canal feature surrounded by development. Where it crosses the project footprint, vegetation in the slough is dense and dominated by Himalayan blackberry and field mustard, with small patches of cattail marsh (*Typha* spp.) in the channel center. Mosher Slough is a channelized drainage conveyance and freshwater tidal tributary traversing from east to west across agricultural and developed lands in and near the City of Stockton, and discharges to the San Joaquin River Deep Water Ship Channel (Lee & Jones-Lee 2002). It receives stormwater runoff and irrigation tailwater releases upstream of the City; and in the City, it receives stormwater runoff from residential and commercial areas. Mosher Slough is listed on the Federal CWA's 303(d) list as impaired for diazinon and chlorpyrifos, with high enough concentrations to cause aquatic life toxicity (Lee & Jones-Lee 2002).

South Bear Creek crosses under the northern section of the proposed Hammer Lane Siding Upgrade footprint via a corrugated culvert pipe, where it borders the surrounding crop fields and appears to function as an agricultural ditch. This small creek originates 0.5 mile to the northeast at the confluence of Bear Creek and Pixley Slough, and terminates 1.7 miles to the southwest in Mosher Slough. It is a channelized and highly disturbed perennial stream feature surrounded by agricultural fields to the north and a housing development to the south. Bank vegetation is dominated by ruderal species tolerant of disturbance and flooding, including field mustard, Himalayan blackberry, and johnsongrass (*Sorghum halepense*), interspersed with occasional valley oak trees. At the time of the survey in December 2019, the portion of South Bear Creek adjacent to the study area exhibited ponding, but was not fully inundated.

Laguna Creek crosses beneath ~~the central portion of the proposed North Elk Grove Siding Variants under~~ an existing raised track bridge. Laguna Creek originates in the foothills approximately 12 miles to the east, and flows westward through the City of Elk Grove, eventually draining west of the proposed project to the Stone Lakes National Wildlife Refuge and Sacramento River. It is a relatively natural, unlined feature with perennial hydrology. At the time of the biological survey in December 2019, the portion of the creek in the study area had deep flowing water and creek banks that were densely populated with willow scrub and cattail marsh vegetation.

Union House Creek crosses ~~beneath the northern section of the proposed North Elk Grove Station (including all access and platform variants) footprint~~ under an existing raised track bridge, then terminates at its confluence with Morrison Creek approximately 200 feet to the west of the railroad tracks. Like Laguna Creek, Union House Creek originates in the foothills southeast of Sacramento, and flows from east to west through Elk Grove. However, it is channelized for its entire length, with little to no bank vegetation. This creek appears to exhibit seasonal or intermittent hydrology, because it was dry at the time of biological surveys in October 2018. Creek banks near the proposed project consist of annual grassland vegetation, which had been recently mowed at the time of biological survey.

Arcade Creek originates approximately 13 miles northeast of Sacramento and flows westward, draining to the NEMDC. Before it reaches its terminus, Arcade Creek passes under the south-central portion of the Old North Sacramento Station footprint, beneath an existing raised track bridge. It has been channelized through the North Sacramento area, where it flows in an approximately 250-foot-wide flood-control canal bounded by steep engineered levees. Creek bank vegetation consists of oak riparian forest, while the remainder of the canal is dominated by highly disturbed ruderal vegetation. Levees are vegetated by mowed annual grasses and herbs; interior lower slopes nearer to the creek are highly disturbed, and obscured by large piles of garbage.

Verano Creek originates a few miles east of the proposed project in the North Highlands area and terminates approximately 200 feet to the east of the proposed Del Paso Siding Upgrade/Extension near the Interstate 80 (I-80) overpass. Where it crosses the project footprint, Verano creek is a narrow, 8-foot-wide channelized ditch vegetated by ruderal herbaceous species. Scattered valley oak trees are also present along the channel banks. The creek was fully inundated during the biological survey in December 2019, and likely exhibits seasonal hydrology.

Morrison Creek originates approximately 18 miles east of Sacramento near Mather Field. It has been significantly altered, and channelized for most of its length. Near the proposed project, it flows from north to south approximately 200 feet to the west of the Track Curve Reconstruction North of Elk Grove ~~northern extent of the North Elk Grove Station~~ footprint ~~(including all access and platform variants)~~, near the Cosumnes River Boulevard overpass. Creek banks in this area are vegetated by willow scrub and emergent marsh vegetation, with patches of oak riparian forest to the southwest.

The Natomas East Main Drainage Canal (NEMDC) is an approximately 300-foot-wide channelized feature that is bounded by large engineered levees. It flows from north to south west of the proposed Old North Sacramento Station, Del Paso Siding Upgrade/Extension, and the Natomas/Sacramento Airport Station footprints. The center of the NEMDC contains the Steelhead Creek channel. For most of its reach near the proposed project, Steelhead Creek is approximately 25 feet wide, and bordered with either oak riparian forest or willow scrub vegetation that extends for 50 to 200 feet beyond the channel banks in the central portion of the NEMDC. The remainder of the NEMDC is dominated by ruderal vegetation consisting of annual grasses and herbs.

The confluence of **Dry Creek** and **Rio Linda Creek** with the NEMDC is situated approximately halfway between the Old North Sacramento and Natomas/Sacramento Airport Station footprints, but does not overlap with either. Rio Linda Creek is considered potential salmonid habitat, while

the main stem of Dry Creek is considered a migratory passage for steelhead salmon. These streams support mature riparian forest habitat along stream banks.

Agricultural Ditches

Agricultural ditches are humanmade linear water conveyance structures that are designed to provide an irrigation source for agricultural crops. Several unnamed agricultural ditches cross the project area, flowing beneath the railroad easement through large concrete or corrugated metal culverts, or under raised track bridges. Vegetation in ditches varies from none (barren) in concrete-lined conveyances, to dense willow scrub, riparian trees, blackberry scrub, and cattail marshes along and in earth-lined canals. Ditches with deep, perennial hydrology or that receive regular maintenance (i.e., are mucked out) tend to be sparsely vegetated with emergent and wetland species along canal edges, including cattails (*Typha* spp.), tall flatsedge (*Cyperus eragrostis*), and smartweeds (*Persicaria* spp.). Ruderal vegetation is common along the tops of canal banks.

Seasonal Wetlands and Vernal Pools

Seasonal wetlands support annual and perennial native and nonnative wetland plant species. This habitat type typically resembles a wetland community during the wet season and for a few weeks following the end of the wet season, drying up rapidly with the onset of summer. Seasonal wetlands form in seasonally flooded or saturated soils in depressions in ruderal or grassland areas, at the edges of creeks and ponds, and in ditches and canals that occur throughout the project area. Dominant plant species found in seasonal wetlands in the project area include salt grass, Italian ryegrass, hairy hawkbit (*Leontodon saxatilis*), Mediterranean barley (*Hordeum marinum*), Mediterranean beard grass (*Polypogon maritimus*), tall flatsedge (*Cyperus eragrostis*), willow herb (*Epilobium brachycarpum* and/or *E. ciliatum*), and hyssop loosestrife (*Lythrum hyssopifolia*). In some areas, particularly at the Track Curve Reconstruction South of Desmond Road and the Track Curve Reconstruction North of Elk Grove ~~Station (including all access and platform variants)~~, Goodding's black willow, sandbar willow, and blackberry are also associated with some seasonal wetlands, creating riparian forest- or scrub-wetlands.

Vernal pools are a type of seasonal wetland that form in shallow depressions underlain by an impervious or restrictive soil layer near the surface that hinders the percolation of water. These wetland types support low-growing, herbaceous plant communities dominated by annual plants, and are typically characterized by a high percentage of native plant species, many of which may be endemic (restricted) to vernal pools. ~~Coyote thistle (*Eryngium vaseyi*), a plant species commonly associated with vernal pools, was observed in seasonal wetlands within the 200-foot buffer of the project footprint at the North Elk Grove Station (including all access and platform variants) in the Regional San Bufferlands.~~ According to the Bufferlands Master Plan, natural vernal pools are found in the annual grassland habitats between the UPRR and Franklin Boulevard, north of Dwight Road and south of the Wetlands Preserve (Regional San 2000). In addition, many of the seasonal wetlands and ephemeral drainages mapped in and adjacent to the project footprint could contain vernal pool plant and/or wildlife species, many of which are protected.

Managed Wetlands

Managed wetlands are in survey buffer areas surrounding the proposed Track Curve Reconstruction South of Desmond Road and the Track Curve Reconstruction North of Elk Grove ~~Station (including all access and platform variants)~~ in mitigation restoration lands operated by the Cosumnes River Preserve and Regional San, respectively. The Lost Slough, Lost Slough East, and Barn Ponds wetland management units are near the Track Curve Reconstruction South of Desmond Road, and consist of intensively managed shallow permanent and seasonal wetlands and adjacent uplands, primarily for the benefit of wintering sandhill cranes, northern pintail ducks, and giant garter snake (Robertson-Bryan 2006). Most of these wetlands function as seasonal ponds that are dry in summer and flooded in fall; while approximately 10 percent of ponds retain water throughout the dry season. Ponds are rotated between permanent and seasonal every 3 to 5 years, and are regularly disked to limit extent of cattails, which, along with bulrush, is the dominant vegetation in these permanent and seasonal wetlands.

~~Several permanent surface waters in the Regional San Bufferlands surrounding the proposed North Elk Grove Station (including all access and platform variants) footprint are managed for flood control, mitigation, cogeneration, and agricultural irrigation purposes (Regional San 2000).~~

Ephemeral Drainage

Ephemeral drainages of various lengths and widths occur throughout the project area in constructed toe ditches and low spots with compacted soils at the toe of railroad ballast. Substrates in the ephemeral drainages are generally barren, or dominated by ruderal vegetation. These areas appear to gather rainwater and runoff from adjacent railroad ballast, agricultural fields, and urban areas intermittently throughout the year, but generally do not remain saturated for long periods of time. Scattered valley oak trees, elderberry shrubs, and patches of blackberry and briar rose brambles are common throughout ephemeral drainages.

Cattail Marsh

Small patches of freshwater emergent marsh vegetation dominated by cattails occur in low spots where water collects parallel to the railroad ballast, as well as in canals, creeks, and ditches that intersect the project footprint. This vegetation community fits the cattail marsh *Typha (angustifolia, domingensis, latifolia*) Herbaceous Alliance as described in the Manual of California Vegetation (CNPS 2019g). It is dominated or co-dominated by narrow leaf cattail (*Typha angustifolia*), southern cattail (*T. domingensis*), and/or broadleaf cattail (*T. latifolia*). Common associates are tall flatsedge, salt grass, perennial pepperweed, redtop (*Agrostis stolonifera*), common knotweed (*Persicaria lapathifolia*), dotted smartweed (*Persicaria punctata*), chairmaker's bulrush (*Shoenoplectus americanus*), California bulrush (*Shoenoplectus californicus*), and cocklebur (*Xanthium strumarium*). Emergent sandbar willow and black willow are also present at low cover.

3.4.3.3 Special-Status Species

For this document, special-status species are defined as follows:

- Species listed by the State of California or the federal government as endangered, threatened, or rare;
- Candidates for state or federal listing as endangered or threatened;

- Taxa (i.e., taxonomic categories or groups) that meet the criteria for listing, even if not currently included on any list, as described in CCR Section 15380 of the CEQA Guidelines;
- Species identified by CDFW as species of special concern;
- Species listed as fully protected under the California Fish and Game Code;
- Species afforded protection under local or regional planning documents; and
- Taxa considered by CDFW to be "rare, threatened, or endangered in California" and assigned a CRPR of 1A, 1B, 2A, or 2B.
- Species listed as sensitive by the U.S. Department of Interior Bureau of Land Management

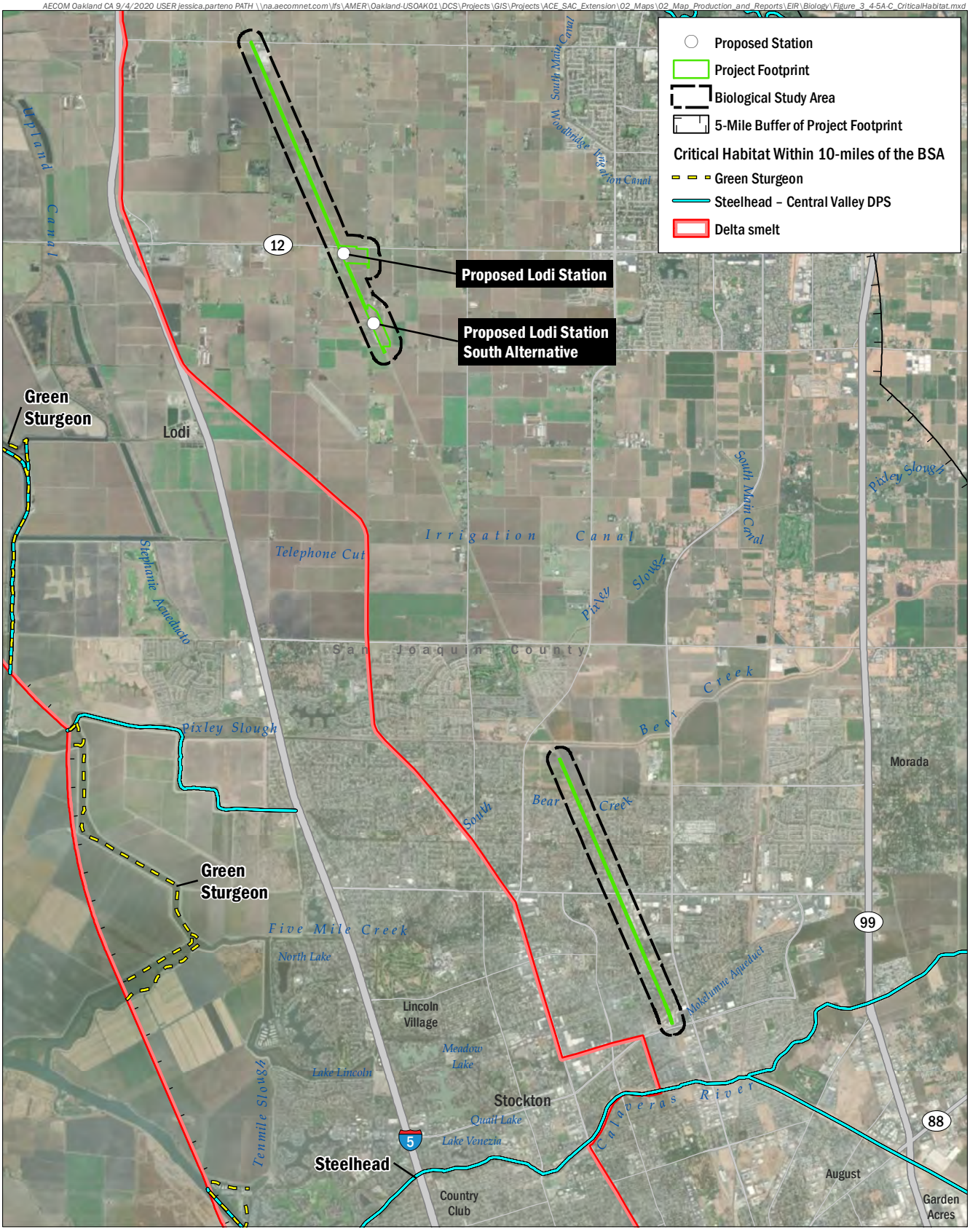
Seventy-five special-status species (34 plants and 41 wildlife) were evaluated for their potential to occur based on database search results (CDFW 2019a; CNPS 2019; USFWS 2019a) and review of other literature and environmental documentation. The species evaluated, their current status, associated habitat requirements, and potential for occurrence in the project site are listed in Appendix C, *Supporting Biological Resources Information*. Species known to occur on the project site or in the vicinity of the proposed project are described below.

Critical Habitat and Essential Fish Habitat

Designated critical habitats for green sturgeon, Steelhead-Central Valley Distinct Population Segment (DPS), Delta smelt, Chinook Salmon-Central Valley Spring-Run Evolutionary Significant Unit (ESU), and the valley elderberry longhorn beetle (VELB) are within 5 miles of the proposed project (USFWS 2019b) (Figures 3.4-5A through 3.4-5C). Of these, only two critical habitats overlap with the study area: (1) aquatic habitat for Steelhead-Central Valley DPS in Steelhead Creek, which flows from north to south approximately 200 feet west of the western boundary of the Del Paso Siding Upgrade/Extension and Old North Sacramento Station footprints; and (2) elderberry savannah habitat for valley elderberry longhorn beetle within 500 feet to the southeast of the proposed Old North Sacramento Station (USFWS 2019b). Essential fish habitat for Chinook salmon is designated for the Sacramento and San Joaquin watersheds that overlap the proposed project (Pacific Fishery Management Council 2014).

Special-Status Plants

The database searches and literature review resulted in a total of 34 species of special-status plants evaluated for their potential to occur on the project site or in the vicinity (see Appendix C, *Supporting Biological Resources Information)*. Of these 34 species, the following 15 species were excluded from further analysis because of a lack of suitable habitat; the species' known range is outside the study area; or other factors (e.g., microhabitat suitability) that make the species unlikely to occur: Ferris' milk-vetch, alkali milk-vetch, heartscale, big-scale balsamroot, big tarplant, succulent owl's clover, hispid salty bird's-beak, palmate-bracted bird's-beak, recurved larkspur, San Joaquin spearscale, Red Bluff dwarf rush, Delta tule pea, Mason's lilaeopsis, Delta mudwort, and eel-grass pondweed.



N

0 5

Miles

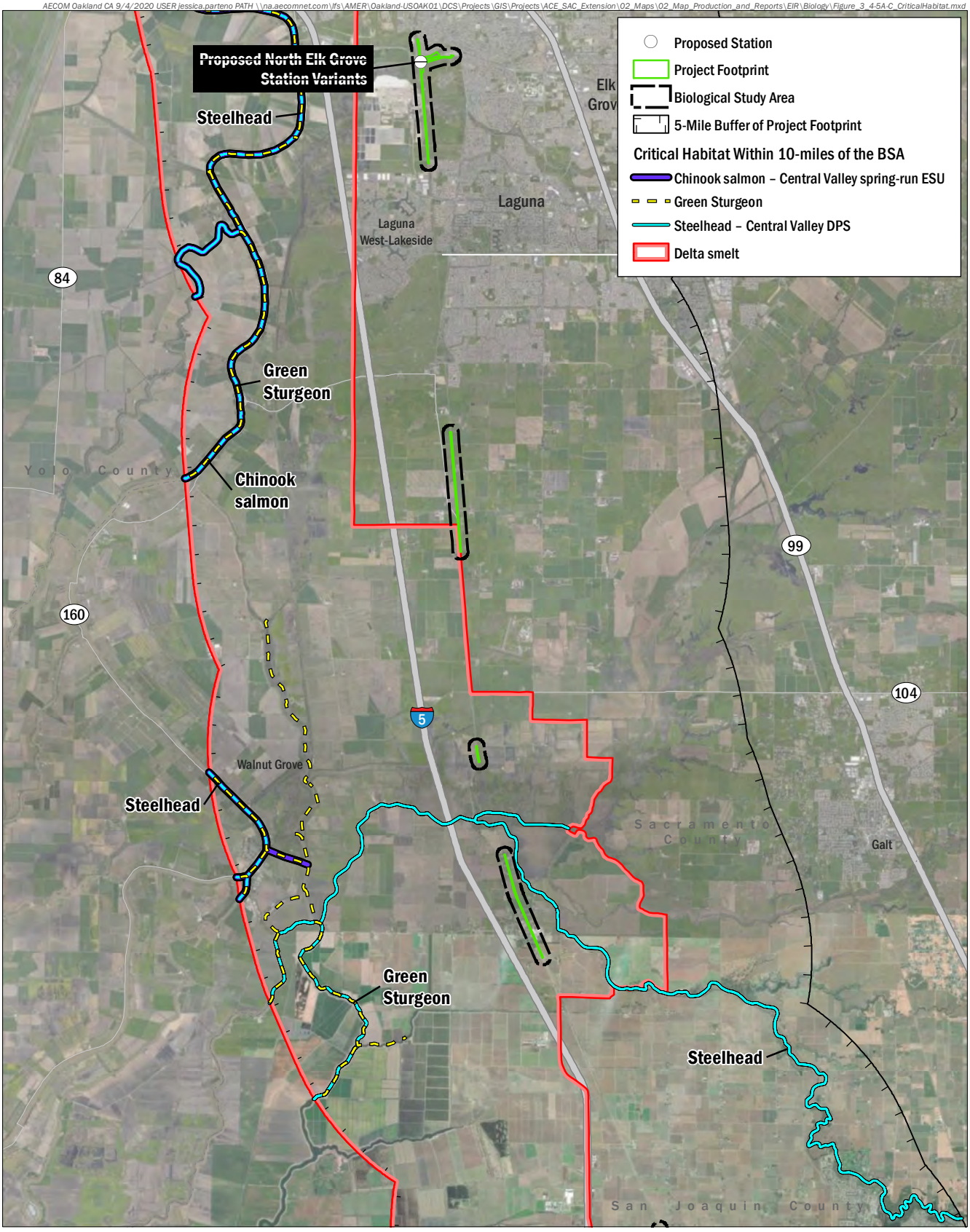
Data Source: AECOM, 2019; CPAD, 2019; CCED, 2018; ESRI, 2016

AECOM

San Joaquin Regional Rail Commission

FIGURE 3.4-5A

Critical Habitat
Stockton to Lodi



Data Source: AECOM, 2019; CPAD, 2019; CCED, 2018; ESRI, 2016

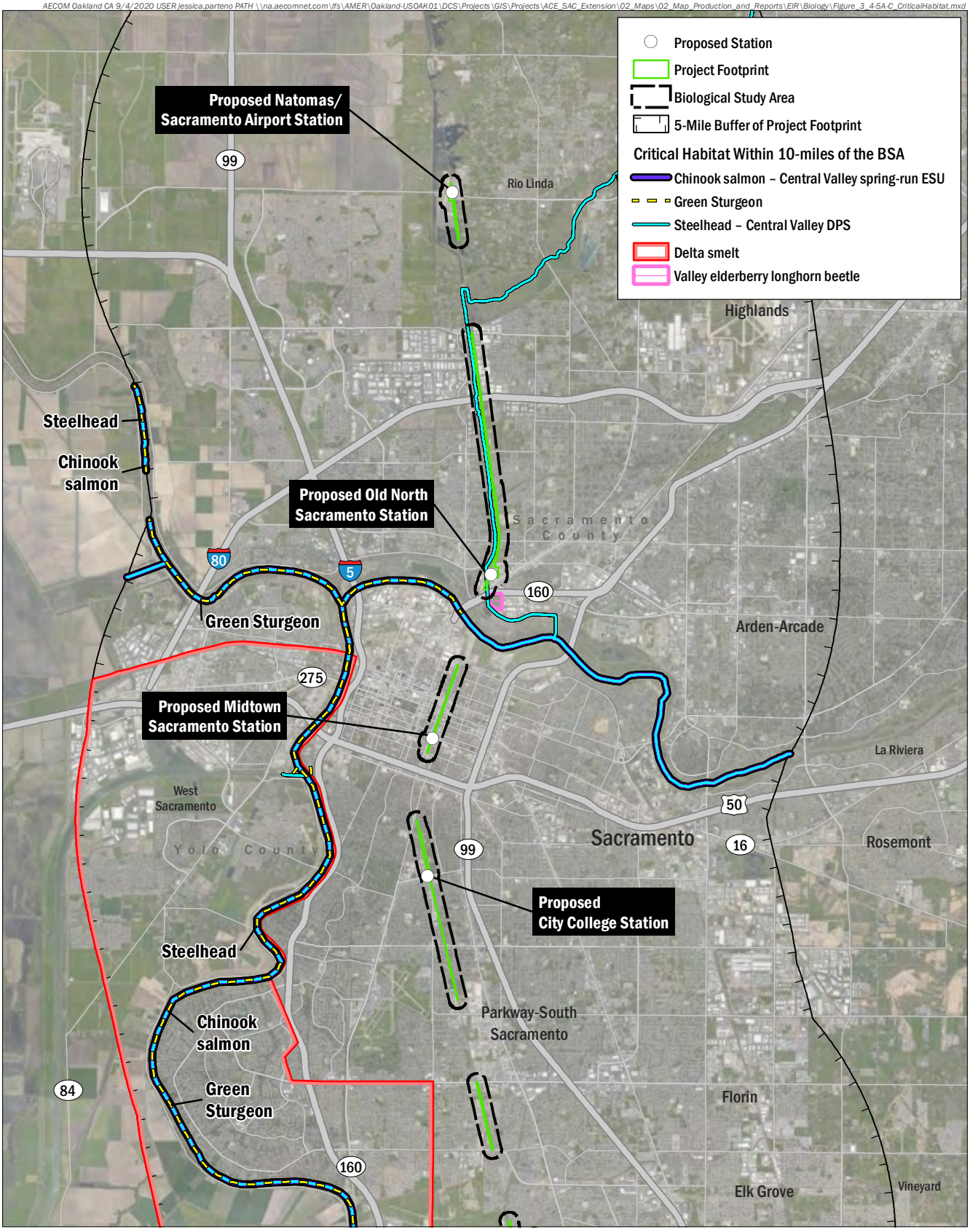
AECOM

San Joaquin Regional Rail Commission

Note: The North Elk Grove Station, including all access and siding variants, is no longer under consideration. Therefore, the footprint shown above would be reduced to only the portion of the proposed project that includes the Track Curve Reconstruction North of Elk Grove.

FIGURE 3.4-5B

Critical Habitat
Lodi to Elk Grove



N

0 5

Miles

Data Source: AECOM, 2019; CPAD, 2019; CCED, 2018; ESRI, 2016

AECOM

San Joaquin Regional Rail Commission

FIGURE 3.4-5C

Critical Habitat

Elk Grove to Natomas

Based on database search results, there are 19 special-status plant species that have potential to occur in or adjacent to the project area, of which 12 species are covered by regional conservation plans. Of the 19 species with potential to occur, only one (Sanford's arrowhead) is known to occur in the project footprint. The life history and ecology of the 19 special-status plant species that are known to occur or have potential to occur in the project area are discussed further below.

Sanford's Arrowhead

Sanford's arrowhead (*Sagittaria sanfordii*) is designated as a CRPR 1B.2 species; however, it is not listed under the ESA or the CESA. This species is a rhizomatous herbaceous perennial that occurs in shallow marshes and freshwater swamps. Sanford's arrowhead blooms from May through October, and is known to occur at elevations ranging from sea level to 2,133 feet amsl. Sanford's arrowhead is endemic to California; the current range of this species includes Butte, Del Norte, El Dorado, Fresno, Merced, Mariposa, Marin, Napa, Orange, Placer, Sacramento, San Bernardino, Shasta, San Joaquin, Solano, Tehama, Tulare, Ventura, and Yuba counties (CNPS 2019a).

There are 38 records of this species in various aquatic habitats within 5 miles of the proposed project (CDFW 2019a). One population is documented in the portion of Arcade Creek that runs from the Norwood Avenue bridge west to the UPRR crossing at the NEMDC, and overlaps with the north-central portion of the proposed Del Paso Siding Upgrade/Extension (CDFW 2019a). Sanford's arrowhead is also documented within 0.5 mile southeast of the Natomas/Sacramento Airport Station footprint in a large vernal pool (CDFW 2019a). Another population is documented in a roadside ditch near the Sac Executive Airport, approximately 1 mile west of the proposed City College Station footprint (CDFW 2019a). Several records of the species are from ditches and canals within 2 miles of the Pollock Siding Upgrade and Track Curve Reconstruction North Elk Grove ~~Siding Variants~~ (CDFW 2019a). The species is also recorded in Morrison Creek within 2 miles of the Track Curve Reconstruction North of Elk Grove ~~Station (including all access and platform variants)~~, and from cattail marsh habitat in a drainage channel in the Stone Lakes complex, approximately 2.5 miles southwest and northeast of the Track Curve Reconstruction North of Elk Grove ~~Siding Variants~~ and Phillips Siding Upgrade/Extension footprints, respectively (CDFW 2019a). Sanford's arrowhead is also recorded in the Cosumnes River and Snodgrass Slough, within 2 miles of the Thornton Siding Upgrade/Extension footprint (CDFW 2019a).

Sanford's arrowhead is a Covered Species under the SSHCP and SJMSCP (County of Sacramento et al. 2018; County of San Joaquin 2000).

Watershield

Watershield (*Brasenia schreberi*) is designated as a CRPR 2B.3 species; however, it is not listed under the ESA or the CESA. This species is an aquatic, perennial rhizomatous herb that occurs in freshwater marshes and swamps. Watershield blooms from June through September, and is known to occur at elevations ranging from 98 to 7,220 feet amsl. Watershield is widespread in California and found in many other states (CNPS 2019a). There are two records of this species within 5 miles of the proposed project (CDFW 2019a). One record is from Stone Lake in warm, still water, approximately 2 miles west of the proposed Phillips Siding Upgrade/Extension footprint

(CDFW 2019a). Another historic record of the species exists from near the City of Stockton (CDFW 2019a).

Bristly Sedge

Bristly sedge (*Carex comosa*) is designated as a CRPR 2B.1 species; however, it is not listed under the ESA or the CESA. This species is a perennial rhizomatous herb that occurs in marshes and swamps in coastal prairie and valley and foothill grassland habitats. Bristly sedge blooms from May through September, and is known to occur at elevations ranging from sea level to 2,050 feet amsl. Bristly sedge is widespread in California and found in many other states (CNPS 2019a). There are 16 records of this species within 5 miles of the proposed project from riparian and marsh habitats concentrated in the northern end of the Delta near the Thornton Siding Upgrade/Extension and the Phillips Siding Upgrade/Extension footprints (CDFW 2019a).

Bristly sedge is a Covered Species under the SJMSCP (County of San Joaquin 2000).

Pappose Tarplant

Pappose tarplant (*Centromadia parryi* ssp. *parryi*) is designated as a CRPR 1B.2 species; however, it is not listed under the ESA or the CESA. This species is an annual herb that often occurs in alkaline soils in chaparral, coastal prairie, coastal salt marsh, meadows, seeps, and vernally mesic sites in valley and foothill grassland. Pappose tarplant blooms from May through November, and is known to occur at elevations ranging from sea level to 1,400 feet amsl. Pappose tarplant is endemic to California; the current range of this species includes Butte, Colusa, Glenn, Lake, Napa, San Mateo, Solano, Sonoma, and Yolo Counties (CNPS 2019a). There is one record of this species within 5 miles of the proposed project, in the Delta's Merritt Island approximately 5 miles southwest of the Track Curve Reconstruction North of Elk Grove ~~North Elk Grove Station (including all access and platform variants)~~; however, this record is considered extirpated due to agricultural disturbance (CDFW 2019a).

Bolander's Water-hemlock

Bolander's water-hemlock (*Cicuta maculata*) is designated as a CRPR 2B.1 species; however, it is not listed under the ESA or the CESA. This species is a perennial herb that occurs in coastal, brackish, or freshwater marshes and swamps. Bolander's water-hemlock blooms from July through September, and is known to occur at elevations ranging from sea level to 6,560 feet amsl. Bolander's water-hemlock is found in California, Arizona, New Mexico, and Washington states; the current range of this species in California includes Contra Costa, Marin, Sacramento, Santa Barbara, and Solano Counties (CNPS 2019a). Only one record of this species in the project vicinity, documented within 2 miles west of the Thornton Siding Upgrade/Extension footprint in Delta Meadows River Park (CDFW 2019a).

Peruvian Dodder

Peruvian dodder (*Cuscuta obtusiflora* var. *glandulosa)* is designated as a CRPR 2B.2 species; however, it is not listed under the ESA or the CESA. This species is a parasitic annual vine that occurs in freshwater marshes and swamps. Peruvian dodder blooms from July through October, and is known to occur at elevations ranging from 50 to 920 feet amsl. Peruvian dodder is widely distributed in California, and is also found outside California in several southern and eastern

states (CNPS 2019a). There is one record of this species in the project vicinity from Laguna Lake in Elk Grove, approximately 2 miles southeast of the Track Curve Reconstruction North of Elk Grove ~~North Elk Grove Station (including all access and platform variants)~~ footprint (CDFW 2019a).

Dwarf Downingia

Dwarf downingia (*Downingia pusilla*) is designated as a CRPR 2B.2 species; however, it is not listed under the ESA or the CESA. This species is a small herbaceous annual that occurs in vernal pools and mesic areas in valley and foothill grasslands. This species blooms from March through May, and is known to occur at elevations ranging from 3 to 1,460 feet amsl. The current range of this species in California includes Amador, Fresno, Merced, Napa, Placer, Sacramento, San Joaquin, Solano, Sonoma, Stanislaus, Tehama, and Yuba counties (CNPS 2019a).

There are seven records of dwarf downingia within 5 miles of the proposed project (CDFW 2019a). Three records of the species are within 1 mile north of the Natomas/Sacramento Airport Station in vernal pool habitats, and several records are from vernal pool habitat surrounding the Stone Lakes complex, approximately 2.5 miles southwest and northwest of the Track Curve Reconstruction North of Elk Grove ~~Elk Grove Siding Upgrade/Extension~~ and Phillips Siding Upgrade/Extension footprints, respectively (CDFW 2019a).

Dwarf downingis is a Covered Species under the SSHCP (County of Sacramento et al. 2018).

Bogg's Lake Hedge-hyssop

Boggs Lake hedge-hyssop (*Gratiola heterosepala*) is designated as a CRPR 1B.2 species and listed as endangered pursuant to the CESA; however, it is not listed under the ESA. This species is a small herbaceous, semi-aquatic annual that occurs on clay soils in vernal pools, and marshes and swamps of lake margins. Boggs Lake hedge-hyssop blooms from April through August, and is known to occur at elevations ranging from 33 to 7,792 feet amsl. The current range of this species in California includes Fresno, Lake, Lassen, Madera, Mendocino, Merced, Modoc, Placer, Sacramento, Shasta, Siskiyou, San Joaquin, Solano, and Tehama counties (CNPS 2019a).

Suitable habitats (marshes and seasonal wetlands) for Boggs Lake hedge-hyssop are present in the project area, and there are two records of this species within 5 miles of the proposed project: one record is approximately 2 miles northeast of the proposed Natomas/Sacramento Airport Station footprint, in shallow vernal pools; and the other is from a large vernal pool in the Elliott Conservancy preserve approximately 5 miles east of the proposed Track Curve Reconstruction North of Elk Grove ~~North Elk Grove Station (including all access and platform variants)~~ footprint (CDFW 2019a).

Bogg's Lake hedge-hyssop is a Covered Species under the SSHCP and SJMCSP, and under the USFWS Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon (County of Sacramento et al. 2018; County of San Joaquin 2000; USFWS 2005).

Woolly Rose-mallow

Woolly rose-mallow (*Hibiscus lasiocarpos* var. *occidentalis*) is designated as a CRPR 1B.2 species; however, it is not listed under the ESA or the CESA. This species is an emergent perennial rhizomatous herb that occurs in freshwater marshes and swamps, as well as in riprap

on sides of levees. Woolly rose-mallow blooms from June through September, and is known to occur at elevations ranging from sea level to 395 feet amsl. Woolly rose-mallow is endemic to California; the current range of this species includes Butte, Contra Costa, Colusa, Glenn, Sacramento, San Joaquin, Solano, Sutter, and Yolo Counties (CNPS 2019a).

There are 29 records of this species within 5 miles of the proposed project, most of which are along slough and river bank habitats throughout the Delta (CDFW 2019a). Other documented habitats include a drainage ditch approximately 3.75 miles west of the proposed Old North Sacramento Station footprint, and a berm along an artificial pond in agricultural habitat approximately 3.5 miles northwest of the Lodi Station footprint (CDFW 2019a).

Woolly rose-mallow is a Covered Species under the SJMCSP (County of San Joaquin 2000).

Ahart's Dwarf Rush

Ahart's dwarf rush (*Juncus leiospermus* var. *ahartii*) is designated as a CRPR 1B.1; however, it is not listed under the ESA or the CESA. This species is an herbaceous annual that occurs in vernally mesic sites in valley and foothill grassland, vernal pools, meadows and seeps, cismontane woodland, and chaparral. Ahart's dwarf rush blooms from March through June, and is known to occur at elevations ranging from 95 to 750 feet amsl. This species is endemic to California; its range includes Butte, Calaveras, Placer, Sacramento, Tehama, and Yuba Counties (CNPS 2019a). There is only one record of this species within a 27-quadrangle search area, from vernal pools south of the City of Rancho Cordova (CDFW 2019a).

Ahart's dwarf-rush is a Covered Species under the SSHCP and SJMCSP, and under the USFWS Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon (County of Sacramento et al. 2018; County of San Joaquin 2000; USFWS 2005).

Legenere

Legenere (*Legenere limosa*) is designated as a CRPR 1B.1 species; however, it is not listed under the ESA or the CESA. This species is an herbaceous annual that occurs in vernal pools, seasonal wetlands, wetland swales, marshes, artificial ponds, and floodplains of intermittent drainages. Legenere blooms from April through June, and is known to occur at elevations ranging from 3 to 2,887 feet amsl. Legenere is endemic to California; the current range of this species includes Alameda, Lake, Monterey, Napa, Placer, Sacramento, Santa Clara, Shasta, San Joaquin, San Mateo, Solano, Sonoma, Stanislaus, Tehama, and Yuba counties (CNPS 2019a).

There are 11 records of legenere within 5 miles of the proposed project (CDFW 2019). The nearest record of the species is within ~~0.3~~ 1.7 miles southeast of the proposed Track Curve Reconstruction North of Elk Grove ~~North Elk Grove Siding Variants~~, near Sims Road, in a vernal pool complex in the Regional San Bufferlands preserve (CDFW 2019). Several records are also present in other vernal pool complexes approximately 3 miles ~~south and~~ north of the proposed ~~North Elk Grove Siding Variants and~~ the Phillips Siding Upgrade/Extension footprints~~, respectively~~ (CDFW 2019a).

Legenere is a Covered Species under the SSHCP and SJMCSP, and under the USFWS Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon (County of Sacramento et al. 2018; County of San Joaquin 2000; USFWS 2005).

Pincushion Navarretia

Pincushion navarretia (*Navarretia myersii*) is designated as a CRPR 1B.1 species; however, it is not listed under the ESA or the CESA. This species is an herbaceous annual herb that occurs in vernal pools, often in acidic soils. Pincushion navarretia blooms from April to May, and is known to occur at elevations ranging from 65 to 1,085 feet amsl. Pincushion navarretia is endemic to California; the current range of this species includes Amador, Calaveras, Merced, Placer, and Sacramento counties (CNPS 2019a).

There are no records of pincushion navarretia within 5 miles of the proposed project (CDFW 2019). However, Regional San considers this species to have potential to occur in its Bufferlands conservation area, where suitable habitat (vernal pools) are known to occur (Regional San 2000).

Pincushion navarretia is a Covered Species under the SSHCP (County of Sacramento et al. 2018).

Slender Orcutt Grass

Slender Orcutt grass (*Orcuttia tenuis*) is designated as a CRPR 1B.1 species, and is listed as threatened under the ESA and endangered under the CESA. This species is an herbaceous annual herb that occurs in vernal pools, often with gravelly soils. Slender Orcutt grass blooms from May through October, and is known to occur at elevations ranging from 114 to 5,775 feet amsl. Slender Orcutt grass is endemic to California; the current range of this species includes Butte, Lake, Lassen, Modoc, Plumas, Sacramento, Shasta, Siskiyou, and Tehama counties (CNPS 2019a).

There are no records of slender Orcutt grass within 5 miles of the proposed project (CDFW 2019). However, Regional San considers this species to have potential to occur in its Bufferlands conservation area, where suitable habitat (vernal pools) is known to occur (Regional San 2000).

Slender Orcutt grass is a Covered Species under the SSHCP (County of Sacramento et al. 2018).

Sacramento Orcutt Grass

Sacramento Orcutt grass (*Orcuttia viscida*) is designated as a CRPR 1B.1 species and it is also listed as endangered under both the ESA and the CESA. This species is an herbaceous annual herb that occurs in vernal pools. Sacramento Orcutt grass blooms from April through September and is known to occur at elevations ranging from 98 to 330 feet amsl. Sacramento Orcutt grass is endemic to California and its range is limited to Sacramento County (CNPS 2019a).

There are no records of Sacramento Orcutt grass within 5 miles of the proposed project (CDFW 2019). However, Regional San considers this species to have potential to occur in its Bufferlands conservation area, where suitable habitat (vernal pools) are known to occur (Regional San 2000).

Sacramento Orcutt grass is a Covered Species under the SSHCP (County of Sacramento et al. 2018).

Heckard's Pepper-grass

Heckard's pepper-grass (*Lepidium latipes* var. *heckardii*) is designated as a CRPR 1B.2 species; however, it is not listed under the ESA or the CESA. This species is an annual herb that occurs

in alkaline areas in valley and foothill grassland habitat. Heckard's pepper-grass blooms from March through May, and is known to occur at elevations ranging from 5 to 660 feet amsl. Heckard's pepper-grass is endemic to California; the current range of this species includes Glenn, Merced, Sacramento, Solano, and Yolo Counties (CNPS 2019a). There are two records of this species in the vicinity of the proposed project, both from along the edges of vernal pools in the Stone Lakes Wildlife Refuge approximately ~~3~~ 4.5 miles southwest and 3 miles northwest of the proposed Track Curve Reconstruction North of Elk Grove ~~Siding Variants~~ and the Phillips Siding Upgrade/Extension footprints, respectively (CDFW 2019a).

Marsh Skullcap

Marsh skullcap (*Scutellaria galericulata*) is designated as a CRPR 2B.2 species; however, it is not listed under the ESA or the CESA. This species is a perennial rhizomatous herb that occurs in lower montane coniferous forest, meadows, seeps, marshes, and swamps. Marsh skullcap blooms from June through September, and is known to occur at elevations ranging from sea level to 7,000 feet amsl. The current range of this species in California includes El Dorado, Lassen, Modoc, Nevada, Placer, Plumas, Sacramento, Shasta, Siskiyou, and San Joaquin counties (CNPS 2019a). There are two records of this species within 5 miles of the proposed project in tidal marsh habitat in Snodgrass Slough, where plants were found growing on partially submerged logs, approximately 3.5 miles west of the proposed Thornton Siding Upgrade/Extension footprint (CDFW 2019a).

Side-flowering Skullcap

Side-flowering skullcap (*Scutellaria laterifolia*) is designated as a CRPR 2B.2 species; however, it is not listed under the ESA or the CESA. This species is a perennial rhizomatous herb that occurs in meadows, seeps, marshes, and swamps. Side-flowering skullcap blooms from July through September, and is known to occur at elevations ranging from sea level to 1,640 feet amsl. The current range of this species in California includes Inyo, Sacramento, and San Joaquin counties (CNPS 2019a). There are 11 records of this species within 5 miles of the proposed project (CDFW 2019a).

Several populations are documented in Snodgrass Slough, approximately 2 miles west of the proposed Thornton Siding Upgrade/Extension footprint, on partially fallen logs (CDFW 2019a). The species is also documented growing on a log in Sycamore Slough, approximately 3 miles west of the Lodi Station footprint (CDFW 2019a).

Side-flowering skullcap is a Covered Species under the SJMCSP (County of San Joaquin 2000).

Suisun Marsh Aster

Suisun Marsh aster (*Symphyotrichum lentum*) is designated as a CRPR 1B.2 species; however, it is not listed under the ESA or the CESA. This species is a perennial rhizomatous herb that occurs in both brackish and freshwater marshes and swamps, and is most often found in sloughs. Suisun Marsh aster blooms from April to November, and is known to occur at elevations ranging from sea level to 10 feet amsl. The species is endemic to California, where its current range includes Contra Costa, Napa, Sacramento, San Joaquin, Solano, and Yolo counties (CNPS 2019a). There are six records of this species within 5 miles of the proposed project (CDFW 2019a).

Suitable habitat for Suisun Marsh aster is in Mosher Slough where it crosses the Hammer Lane Siding Upgrade footprint. One historic record from 1917 overlaps with the northern portion of the Hammer Lane Siding Upgrade footprint, but is not verified by field work (CDFW 2019a). The nearest extant record of the species to the proposed project is along the banks of the Calaveras River, approximately 0.5 mile south of the Hammer Lane Siding Upgrade footprint (CDFW 2019a). Other records near the proposed project are in the Delta within 2 miles of the Lodi Siding Variants and Thornton Siding Upgrade/Extension footprints in a canal that connects to Sycamore Slough and Beaver Slough, respectively (CDFW 2019a).

Suisun Marsh aster is a Covered Species under the SJMCSP (County of San Joaquin 2000).

Saline Clover

Saline clover (*Trifolium hydrophilum*) is designated as a CRPR 1B.2 species; however, it is not listed under the ESA or the CESA. This species is an annual herb that occurs in marshes and swamps, vernal pools, and mesic, alkaline places in valley and foothill grassland. Saline clover blooms from April through June, and is known to occur at elevations ranging from sea level to 985 feet amsl. Saline clover is endemic to California; the current range of this species includes Alameda, Contra Costa, Colusa, Lake, Monterey, Napa, Sacramento, San Benito, Santa Clara, Santa Cruz, San Joaquin, San Luis Obispo, San Mateo, Solano, Sonoma, and Yolo counties (CNPS 2019a). There are six records of this species within 5 miles of the proposed project, all concentrated in vernal pool habitat surrounding the Stone Lakes complex approximately ~~2.5~~ 4.5 miles southwest and 2.5 miles northwest of the proposed Track Curve Reconstruction North of Elk Grove ~~Siding Variants~~ and the Phillips Siding Upgrade/Extension footprints, respectively (CDFW 2019a).

Special-Status Wildlife

The database searches and literature review resulted in a total of 45 taxa of special-status wildlife evaluated for potential to occur on the project site or in the vicinity (see Appendix C, *Supporting Biological Resources Information)*. The following taxa were excluded from further analysis because of a lack of suitable habitat; their known range is outside the study area; or other factors (e.g., microhabitat suitability) that make the taxa unlikely to occur: San Bruno elfin butterfly, Sacramento perch, Delta smelt, Chinook salmon Central Valley spring-run ESU, Chinook Salmon Sacramento River winter-run ESU, Sacramento splittail, longfin smelt, California tiger salamander, foothill yellow-legged frog, California red-legged frog, western spadefoot toad, grasshopper sparrow, golden eagle, western yellow-billed cuckoo, loggerhead shrike, California black rail, bank swallow, yellow warbler, least Bell's vireo, yellow-headed blackbird, riparian brush rabbit, and American badger.

Potentially suitable habitat is present in the study area for the following 24 taxa of special-status wildlife: vernal pool fairy shrimp, vernal pool tadpole shrimp, valley elderberry longhorn beetle, Steelhead-Central Valley DPS, western pond turtle, giant garter snake, Cooper's hawk, burrowing owl, short-eared owl, ferruginous hawk, Swainson's hawk, northern harrier, white-tailed kite, merlin, loggerhead shrike, greater sandhill crane, song sparrow (Modesto population), tricolored blackbird, purple martin, yellow warbler, yellow-breasted chat, double-crested cormorant (rookery), western red bat, and hoary bat. Of these 24, 20 species are covered by regional

conservation plans. The life history and ecology of the 24 special-status wildlife taxa that are known to occur or have potential to occur in the project area are discussed further below.

Vernal Pool Crustaceans

Two special-status crustaceans endemic to vernal pool habitats occur in the project vicinity: vernal pool fairy shrimp (*Branchinecta lynchi*), and vernal pool tadpole shrimp (*Lepidurus packardi*). Designated critical habitat for both species is 12 miles east of the proposed project in rolling vernal-pool grassland near the city of Wilton and the Rancho Seco Recreational Park (USFWS 2019b).

Both vernal pool fairy shrimp and vernal pool tadpole shrimp are Covered Species under the SSHCP and SJMCSP, and under the USFWS Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon (County of Sacramento et al. 2018; County of San Joaquin 2000; USFWS 2005).

Vernal pool fairy shrimp is a federally threatened species under the ESA. Vernal pool fairy shrimp are known to occur mainly in California's Central Valley and coastal ranges from Shasta County in the north to Tulare County in the south. A population in Jackson County, Oregon was discovered in 1998. Vernal pool fairy shrimp occur primarily in small, clear-water sandstone-depression vernal pools and grassed swales or basalt-flow depression vernal pools that fill with water during fall and winter rains, and dry up in the spring and summer. They typically hatch when the first rains of the season fill the vernal pools, and mature in about 41 days under typical winter conditions. Adult fairy shrimp live only for a single season, while there is water in the pools; and toward the end of their brief lifetime, females produce thick-shelled eggs or cysts. During the summer, these cysts become buried in the dried bottom mud of the vernal pools, and during the winter, they are frozen for varying lengths of time. These cysts hatch when the rains come again in the fall and winter (USFWS 2020b). Vernal pool fairy shrimp eat algae and plankton. Suitable habitat is present in the project area, and there are 37 records of the species within 5 miles of the project area (CDFW 2019a). ~~Vernal pool fairy shrimp are known to be present in vernal pool habitats in the Regional San Bufferlands that surround the proposed North Elk Grove Station (including all access and platform variants) and North Elk Grove Siding Variants, with several specimens documented from pools that are directly adjacent to the UPRR tracks in the eastern extent of the proposed North Elk Grove Siding Variants (Regional San 2000)~~.

Vernal pool tadpole shrimp is a federally endangered species under the ESA. Vernal pool tadpole shrimp are known to occur in California's Central Valley and the San Francisco Bay and southern Oregon; however, most individuals are found in the Sacramento Valley. Vernal pool tadpole shrimp occur in vernal pools, seasonal wetlands, and alkaline pools. They have a similar lifecycle as the vernal pool fairy shrimp. Vernal pool tadpole shrimp hatching is temperature-dependent, and is optimal between 50 to 59 degrees Fahrenheit. Vernal pool tadpole shrimp eat organic detritus, fairy shrimp, and other invertebrates (USFWS 2007). Suitable habitat is present in the project area, and there are 26 records of this species from within 5 miles of the proposed project (CDFW 2019a). ~~Vernal pool tadpole shrimp are known to be present in vernal pool habitats in the Regional San Bufferlands that surround the North Elk Grove Station (including all access and platform variants) and North Elk Grove Siding Variants, with several specimens documented from pools within 1,000 feet east of the proposed North Elk Grove Siding Variants (Regional San 2000).~~

Valley Elderberry Longhorn Beetle

Valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*) (VELB) is a federally threatened taxon under the ESA. VELB is known to occur throughout the Central Valley from southern Shasta County to Fresno County, including the valley floor and lower foothills, usually below 500 feet (amsl) in elevation.

This taxon is almost always found on or close to its host plant, elderberry (Sambucus species). Females lay their eggs on the bark of the elderberry bush, and the larvae hatch and burrow into the stems. The larval stage can last 2 years, after which they become pupae, and then transform into adult beetles. Adults are active from March to June, breeding and eating (USFWS 2020c). There are 21 records of this species within 5 miles of the project area in riparian habitats (CDFW 2019a).

Critical habitat for the valley elderberry longhorn beetle falls within the study area surrounding the proposed Old North Sacramento Station (USFWS 2019b) (Figure 3.4-5C), and elderberry shrubs were mapped in this area, as well as in other project footprints (i.e., the Track Curve Reconstruction North of Elk Grove ~~North Elk Grove Siding Variants~~) that could host VELB.

VELB is a Covered Species under the SSHCP and SJMCSP (County of Sacramento et al. 2018; County of San Joaquin 2000).

Steelhead – Central Valley Distinct Population Segment

Steelhead (*Oncorhynchus mykiss irideus pop. 11*) (Central Valley DPS) is a Salmonidae and is a federally threatened species under the ESA. This DPS includes all naturally spawned populations of steelhead in the Sacramento and San Joaquin rivers and their tributaries. They require cool, clear streams with abundant cover and well-vegetated banks, with relatively stable flows, pool and riffle complexes, and cold gravelly streambeds for spawning. They are anadromous fish that are born in freshwater streams, where they spend 1 to 3 years, and then emigrate to the ocean where they grow to adults, and after 1 to 4 years return to their natal freshwater stream to spawn (USFWS 2020d). Central Valley steelhead migrate up the Sacramento River and many of its tributaries to reach spawning habitat. Steelhead have been detected in mainstem Dry Creek in proximity to the proposed Del Paso Siding Upgrade/Extension footprint, which is used as a migratory corridor, and could also be found in the NEMDC/Steelhead Creek adjacent to the proposed project (CDFW 2019a). There are eight records of this species within 5 miles of the project area in aquatic habitats (CDFW 2019a).

Designated critical habitat for Central Valley Steelhead DPS is present in Steelhead Creek (NOAA 2006), which is adjacent to the western boundary of the proposed Old North Sacramento Station and Del Paso Siding Upgrade/Extension footprints, and connects to Arcade Creek, which is crossed by the Del Paso Siding Upgrade/Extension (Figure 3.4-5C).

Western Pond Turtle

Western pond turtle is a CDFW species of special concern. The range of western pond turtle includes north of the San Francisco Bay Area plus populations from the Central Valley north into Oregon and Washington, and an apparently introduced population in Nevada. Western pond turtles are found from sea level to approximately 6,696 feet amsl in elevation. They are found in

rivers, streams, creeks, ponds, marshes, irrigation ditches, damp woodland and forest, and grassland. The turtles require logs, rocks, vegetation mats, or exposed banks to bask in the sun. Adult males do not mate until they are approximately 8 to 10 years old. Mating occurs in April and May, and females lay their eggs between April and August in upland habitat, usually along stream or pond margins. Their diet consists of aquatic plants, invertebrates, worms, frog and salamander eggs and larvae, crayfish, carrion, and occasionally frogs and fish (CalHerps 2020a). Suitable aquatic habitat for western pond turtle occurs throughout the project area; therefore, they have potential to occur within the project area. ~~The nearest record of the species overlaps the North Elk Grove Station (including all access and platform variants) project area.~~ Several other records place the taxa within 2 miles of the following project areas: Phillips Siding Upgrade/Extension; Track Curve Reconstruction South of Desmond Road; and the Hammer Lane Siding Upgrade (CDFW 2019a). There are 17 records of this species within 5 miles of the project area in aquatic/riparian habitats (CDFW 2019a). Western pond turtles are documented in the Bufferlands conservation areas <u>south of the Track Curve Reconstruction North of Elk Grove</u> ~~surrounding the North Elk Grove Siding Variants~~ (Regional San 2000).

Western pond turtle is a Covered Species under the SSHCP and SJMCSP (County of Sacramento et al. 2018; County of San Joaquin 2000).

Giant Garter Snake

Giant garter snake is a state- and federally threatened species under the CESA and the ESA. Endemic to California, the giant garter snake currently ranges from Glenn County to the southern edge of the San Francisco Bay Delta, and from Merced County to northern Fresno County in the San Joaquin Valley. The elevational range of this snake is from sea level to 400 feet amsl. Giant garter snake is found primarily in marshes, sloughs, drainage canals, and irrigation ditches, especially around rice fields, and occasionally in slow-moving creeks (CalHerps 2020b). During the spring and summer, giant garter snake can be found in vegetated upland areas within 200 feet of suitable aquatic habitat. The giant garter snake uses upland habitat for basking, cover, and mammal burrows, and crevices in the soil to escape predation and during ecdysis (shedding of skin). In the fall, around October 1, giant garter snakes move underground into mammal burrows, crevices, or other voids in the ground to avoid potentially lethal cool autumn and winter temperatures. Around April 1, and as early as March 1 in some years and locations, giant garter snakes begin to emerge from overwintering sites and start to forage for food and start to breed. Breeding season occurs from March through April, and females give birth to live young from late July through early September (USFWS 2020e). There are 52 records of giant garter snake within 5 miles of the project area (CDFW 2019a).

Giant garter snake is a Covered Species under the SSHCP and SJMCSP (County of Sacramento et al. 2018; County of San Joaquin 2000).

Nesting Birds and Raptors

Nesting birds and their nests are protected under California Fish and Game Code Section 3503. All birds in the orders Falconiformes and Strigiformes (collectively known as birds of prey) are also protected by California Fish and Game Code Section 3503.5. Birds of prey include raptors, falcons, and owls. The federal MBTA of 1918 (16 USC 703-711) also protects most birds and their nests, including many birds that are non-migratory in California. The MBTA makes it unlawful

to take, possess, buy, sell, purchase, or barter any bird listed in 50 CFR Part 10, including feathers or other parts, nests, eggs, or products, except as allowed by implementing regulations. Any disturbance that causes direct injury, death, nest abandonment, or forced fledging of migratory birds is restricted under the MBTA. Any removal of active nests during the breeding season or any disturbance that results in the abandonment of nestlings is considered a 'take' of the species under federal law. The proposed project and adjacent areas provide nesting and foraging habitat for birds protected under MBTA and/or California Fish and Game Code.

Special-status migratory birds and raptors that could occur in the project area include tricolored blackbird (nesting colony), song sparrow ("Modesto" population), purple martin (nesting colony), Cooper's hawk, western burrowing owl, ferruginous hawk, Swainson's hawk, Northern harrier, white-tailed kite, and merlin. These species are discussed below.

Tricolored Blackbird

Tricolored blackbird is a state-threatened species under the CESA, and is under review to list as endangered under the ESA. Tricolored blackbirds are a permanent resident in California, but make extensive migrations and movements within their range during both the breeding season and in winter. In California, tricolored blackbird breeding occurs in the Sacramento and San Joaquin valleys, the foothills of the Sierra Nevada south to Kern County, the coastal slope from Sonoma County south to the Mexican border, and sporadically on the Modoc Plateau. Colonies vary in size from a minimum of about 50 nests to over 20,000 in an area of 10 acres or less. Breeding colonies require a nearby source of water, suitable nesting substrate (such as marshes, riparian scrub, and other areas that support cattails or dense thickets of shrubs or herbs), and natural grassland, woodland, or agricultural cropland in which to forage. Preferred foraging habitats include crops such as rice, alfalfa, irrigated pastures, and ripening or cut grain fields, as well as annual grasslands, cattle feedlots, and dairies. Tricolored blackbirds also forage in more natural habitats, including wet and dry vernal pools and other seasonal wetlands, riparian scrub, and open marsh borders (USFWS 2020f). Although no records of this species have been documented within the project area, suitable nesting (i.e., blackberry brambles) and foraging (i.e., annual grassland and row/field crops) habitat for tricolored blackbird occurs. There are 16 records of this species within 5 miles of the project area in blackberry thicket habitats (CDFW 2019a). Tricolored blackbirds are documented using the Regional San Bufferlands south of the Track Curve Reconstruction North of Elk Grove ~~that surround the proposed North Elk Grove Station (including all access and platform variants) and North Elk Grove Siding Variants~~ footprint~~s~~ (Regional San 2000).

Tricolored blackbird is a Covered Species under the SSHCP and SJMCSP (County of Sacramento et al. 2018; County of San Joaquin 2000).

Song Sparrow ("Modesto" population)

Song sparrow is a CDFW species of special concern. This species is found throughout most of California, except for higher mountains, and occurs only locally in southern deserts. The song sparrow nests and forages primarily in emergent marsh, riparian scrub, and early successional riparian forest habitats in the north-central portion of the Central Valley; and infrequently in mature riparian forest and sparsely vegetated ditches and levees. The song sparrow forages primarily on exposed ground or in leaf litter. Seeds are the most important foods in their annual diet; however,

insects, spiders, and other small invertebrates make up half of the diet in the nesting season (CDFW 2020). Suitable marsh and riparian habitat are present in the project area. There are 38 records of this species within 5 miles of the project area in grassland habitats (CDFW 2019a).

Purple Martin

Purple martin is a CDFW species of special concern. This species is an uncommon to rare local summer resident throughout California, and generally absent from higher desert regions and higher slopes of the Sierra Nevada. Purple martin nests mainly in old woodpecker cavities, and sometimes in human-made structures such as in nesting boxes, under bridges, and in culverts. This species forages in foothill and low montane oak and riparian woodlands, and less frequently in coniferous forests and open or developed habitats. Suitable foraging habitat exists in the form of oak woodland habitat. However, due to competition with other cavity-nesting bird species, particularly nonnative invasive European starlings, suitable nesting habitat in the Sacramento Valley is restricted to manmade structures, particularly bridges (CDFW 2020). This species was detected nesting in weepholes in the Sutterville Road overpass in the proposed City College Station (CDFW 2019a). There are 10 records of this species within 5 miles of the project area mainly nesting in weepholes under bridges and overpasses (CDFW 2019a).

Yellow Warbler

Yellow warbler is a CDFW species of special concern. This species is usually found in riparian deciduous habitats in summer that consist of cottonwoods, willows, alders, and other small trees and shrubs typical of low, open-canopy riparian woodland (CDFW 2020). Observations of yellow warbler are documented in riparian habitat in the Regional San Bufferlands south of the Track Curve Reconstruction North of Elk Grove ~~near the proposed North Elk Grove Station (including all access and platform variants) and North Elk Grove Siding Variants~~ footprint~~s~~ (Regional San 2000).

Yellow warbler is a Covered Species under the SJMCSP (County of San Joaquin 2000).

Yellow-breasted Chat

Yellow-breasted chat is a CDFW species of special concern. This species requires riparian thickets of willow and other brambles, or dense riparian woodland understory near watercourses for cover and reproduction (CDFW 2020). Observations of yellow-breasted chat are documented in riparian habitat in the Regional San Bufferlands south of the Track Curve Reconstruction North of Elk Grove ~~near the proposed North Elk Grove Station (including all access and platform variants) and North Elk Grove Siding Variants~~ footprint~~s~~ (Regional San 2000).

Yellow-breasted chat is a Covered Species under the SJMCSP (County of San Joaquin 2000).

Loggerhead Shrike

Loggerhead shrike is a CDFW species of special concern. This species is a common resident and winter visitor in lowlands and foothills throughout California. It prefers open habitats with scattered shrubs, trees, posts, fences, utility lines, or other perches where it forages for large insects and various small vertebrates (CDFW 2020). Loggerhead shrike is also known to occur in the Regional San Bufferlands south of the Track Curve Reconstruction North of Elk Grove

~~surrounding the proposed North Elk Grove Station (including all access and platform variants) and North Elk Grove Siding Variants~~ footprint~~s~~ (Regional San 2000).

Loggerhead shrike is a Covered Species under the SSHCP and SJMCSP (County of Sacramento et al. 2018; County of San Joaquin 2000).

Greater Sandhill Crane

Greater sandhill crane is state-listed as threatened, and is a CDFW fully-protected species. This taxon breeds in the northeastern portion of the state, and winters primarily in the Sacramento and San Joaquin valleys, where it frequents annual and perennial grassland habitats, moist croplands with rice or corn stubble, and open, emergent wetlands (CDFW 2020). Sandhill cranes were observed foraging in crop fields near the Phillips Siding Upgrade/Extension footprint during 2019 biological surveys. Sandhill cranes are also known to occur in the Regional San Bufferlands south of the Track Curve Reconstruction North of Elk Grove ~~surrounding the proposed North Elk Grove Station (including all access and platform variants) and North Elk Grove Siding Variants~~ footprint~~s~~ (Regional San 2000).

Greater sandhill crane is a Covered Species under the SSHCP and SJMCSP (County of Sacramento et al. 2018; County of San Joaquin 2000).

Short-eared owl

Short-eared owl is a CDFW species of special concern. This species is a permanent resident along the coast from Del Norte County to Monterey County, in the Sierra Nevada north of Nevada County, on the plains east of the Cascades, and in Mono County. Small, isolated populations nest in the Central Valley. Short-eared owls are ground-nesting birds that inhabit dense grasslands and wetlands. Perennial grasslands typically have a higher habitat value for short-eared owls than annual grasslands because they provide denser nesting cover. Short-eared owls forage in grasslands and wetlands. Short-eared owls were observed on the Regional San Bufferlands south of the Track Curve Reconstruction North of Elk Grove ~~surrounding the proposed North Elk Grove Station (including all access and platform variants) and North Elk Grove Siding Variants~~ footprint~~s~~ in 1997 and 1999 (Regional San 2000).

Short-eared owl is a Covered Species under the SJMCSP (County of San Joaquin 2000).

Western Burrowing Owl

Western burrowing owl is a USFWS bird of conservation concern and a CDFW species of special concern. Burrowing owls are a year-round resident in most of California, including the Central Valley, San Francisco Bay region, Carrizo Plain, and Imperial Valley. Western burrowing owls primarily inhabit open, dry grassland and desert habitats, and levees adjacent to agricultural areas. Primary habitat components include burrows for roosting and nesting, and relatively short vegetation with sparse shrubs and taller vegetation. Burrowing owls most commonly use ground squirrel burrows, but they may also use badger, coyote, and fox holes or dens; or human-made structures such as culverts, piles of concrete rubble, pipes, and nest boxes. This species thrives in highly altered human landscapes. In agricultural areas, burrowing owls nest along roadsides, under water conveyance structures, and near and under runways and similar structures. In urban areas, burrowing owls persist in low numbers in highly developed parcels, busy urban parks, and adjacent to roads with heavy traffic. Burrowing owl is a semi-colonial species that breeds in

California from March through August, although breeding can begin as early as February and extend into December. Burrowing owls typically feed on a broad range of insects, small rodents, birds, amphibians, reptiles, and carrion. Foraging usually occurs close to their burrow (CDFW 2020). The annual grassland and agricultural areas in and adjacent to the project area provides suitable nesting and foraging habitat for burrowing owl. There are 49 records of this species within 5 miles of the project area (CDFW 2019a). Western burrowing owls have been documented nesting adjacent to the UPRR tracks south of the Track Curve Reconstruction North of Elk Grove ~~in the North Elk Grove Siding Variants~~ footprint (Regional San 2000).

Burrowing owl is a Covered Species under the SSHCP and SJMCSP (County of Sacramento et al. 2018; County of San Joaquin 2000).

Cooper's Hawk

Cooper's hawk is a CDFW watch-list species. This species is a breeding resident throughout most of the wooded portion of the state. Cooper's hawk usually nests in deciduous riparian areas near streams or in second-growth conifer stands. It hunts in broken woodland and habitat edges where it feeds on small birds and mammals, as well as reptiles and amphibians (CDFW 2020). Cooper's hawk is known to be present in the Regional San Bufferlands south of the Track Curve Reconstruction North of Elk Grove ~~that surround the proposed North Elk Grove Station (including all access and platform variants) and North Elk Grove Siding Variants~~ footprint~~s~~ (Regional San 2000).

Cooper's hawk is a Covered Species under the SSHCP and SJMCSP (County of Sacramento et al. 2018; County of San Joaquin 2000).

Ferruginous Hawk

Ferruginous Hawk is a CDFW watch-listed species for which there is concern, and a need for additional information to clarify which conservation status is needed. Ferruginous hawk is an uncommon breeding and migrating resident in the Central Valley, Modoc Plateau, and Coast Ranges. It is a common winter resident in the Southwestern part of California. This species prefers open grasslands, sagebrush flats, desert scrub, low foothills surrounding valleys, and fringes of pinyon-juniper habitat. The Ferruginous hawk begins nesting in March-April, and prefers to nest in foothills or prairies on low cliffs, buttes, cut banks, shrubs, or trees, usually in an isolated tree. No breeding records of the species have been recorded in California, because it usually arrives in California in September after the breeding season, and migrates out of California before the start of the breeding season. Potential suitable habitat for the species was observed. However, the species is uncommon, and only two records exist in the project vicinity, both of which are south of the Track Curve Reconstruction North of Elk Grove ~~adjacent to the North Elk Grove Station (including all access and platform variants)~~ footprint (CDFW 2019a).

Ferruginous hawk is a Covered Species under the SSHCP and SJMCSP (County of Sacramento et al. 2018; County of San Joaquin 2000).

Swainson's Hawk

Swainson's hawk is a State-threatened species, and is protected under the CESA. This species of hawk is an uncommon breeding resident and migrant in the Central Valley, Klamath Basin, Northeastern Plateau, Lassen County, and Mojave Desert. Swainson's hawk breed and forage in

the California Central Valley in spring and summer. California populations of this species are believed to overwinter in Mexico. Typical habitat includes open desert, grassland, or cropland containing scattered, large trees or small groves. Swainson's hawk breeds from late March to late August. Swainson's hawk nest in open riparian habitat, in scattered trees, or in small groves in sparsely vegetated flatlands. Nesting areas are usually near water, but are occasionally found in arid regions. They forage in adjacent grasslands, suitable grain or alfalfa fields, or in livestock pastures, feeding on rodents, small mammals, small birds, reptiles, large arthropods, amphibians, and rarely, fish (CDFW 2020). Suitable nesting and foraging habitat are present, and numerous occurrences are documented throughout project area. There are 286 records of this species within 5 miles of the project area, with nests recorded in cottonwood, willow, sycamore, valley oak, and walnut trees (CDFW 2019a). The species is known to occur in the Regional San Bufferlands south of the Track Curve Reconstruction North of Elk Grove ~~surrounding the proposed North Elk Grove Station (including all access and platform variants) and North Elk Grove Siding Variants~~ footprint~~s~~, with one nest documented near the southern boundary of the Regional San plant process facility, within ~~0.25~~ 1.5 mile~~s~~ southwest of the proposed Track Curve Reconstruction North of Elk Grove ~~North Elk Grove Siding Variants~~ (Regional San 2000).

Swainson's hawk is a Covered Species under the SSHCP and SJMCSP (County of Sacramento et al. 2018; County of San Joaquin 2000).

Northern Harrier

Northern harrier is a CDFW species of special concern. This raptor is a permanent resident of the northeastern plateau and coastal areas of California, but is a less common resident of the Central Valley. Northern harrier occurs from annual grassland up to lodgepole pine and alpine meadow habitats, as high as 10,000 feet amsl. This species breeds from sea level to 5,700 feet amsl in the Central Valley and Sierra Nevada, and up to 3,600 feet amsl in northeastern California. This species frequents meadows, grasslands, open rangelands, desert sinks, and fresh and saltwater emergent wetlands; however, it is seldom found in wooded areas. Northern harrier nest on the ground in patches of dense, often tall, vegetation in undisturbed areas (CDFW 2020). Suitable nesting and foraging habitat for Northern harrier exists in the annual grasslands, wetlands, and agricultural areas in and adjacent to the project area. There are no CNDDB records of nesting northern harriers within 5 miles of the project area (CDFW 2019a); however, iNaturalist has one record near the southern portion of the proposed Hammer Lane Siding Upgrade footprint (iNaturalist 2020), and the species is known to occur in the Regional San Bufferlands south of the Track Curve Reconstruction North of Elk Grove ~~surrounding the proposed North Elk Grove Station (including all access and platform variants) and North Elk Grove Siding Variants~~ footprint~~s~~ (Regional San 2000).

Northern harrier is a Covered Species under the SSHCP and SJMCSP (County of Sacramento et al. 2018; County of San Joaquin 2000).

White-tailed Kite

White-tailed kite is a fully protected species under Section 3511 of the California Fish and Game Code. White-tailed kites are a year-round resident of coastal and valley lowlands in cismontane California; they are absent from higher elevations in the Sierra Nevada, the Modoc Plateau, and from most desert regions. White-tailed kites occur in herbaceous and open stages of most

habitats in cismontane California. Areas of substantial groves of dense, broad-leafed deciduous trees are used for nesting and roosting. White-tailed kites breed from February to October, with peak activity from May to August. Nests are typically 20 to 100 feet above the ground near the top of dense oak, willow, or other tree stands, and are often near an open foraging area with a dense population of voles (CDFW 2020). Riparian areas in and adjacent to the project area provide suitable habitat for nesting; and annual grasslands, wetlands, and agricultural areas in and adjacent to the project area provide suitable habitat for foraging for the white-tailed kite. This species is known to nest along the Sacramento and American rivers within 0.5 mile of the proposed Midtown Sacramento Station (CDFW 2019). This species has also been documented ~~at~~ south of the proposed Track Curve Reconstruction North of Elk Grove ~~North Elk Grove Station (including all access and platform variants) and North Elk Grove Siding Variants footprints~~ (Regional San 2000; CDFW 2019a). There are 15 records of this species within 5 miles of the project area (CDFW 2019a).

White-tailed kite is a Covered Species under the SSHCP and SJMCSP (County of Sacramento et al. 2018; County of San Joaquin 2000).

Merlin

The merlin is a CDFW watch-listed species when found wintering in California. Watch-listed species are those for which there is concern for the species and a need for additional information to clarify conservation status. This species is an uncommon winter migrant in California from September to May. The merlin hawk habitat preference ranges from annual grasslands to ponderosa pine and montane hardwood-conifer habitat. It is known to occur in most of the western half of the state below 3,900 feet amsl. This species breeds in Alaska and Canada, and not in California. Suitable nesting and foraging habitat for the species was observed in the proposed Old North Sacramento Station, Midtown Sacramento Station, Track Curve Reconstruction North of Elk Grove ~~North Elk Grove Station (including all access and platform variants)~~, and the Lodi Station portions of the proposed project. One CNDDB occurrence from 2004 was recorded near the proposed Track Curve Reconstruction North of Elk Grove ~~North Elk Grove Station (including all access and platform variants)~~ where one adult was over-wintering near the project footprint (approximately ~~0~~1.55 mile~~s~~). iNaturalist occurrences have been documented within approximately 0.2 mile of the Track Curve Reconstruction North of Elk Grove ~~North Elk Grove Station (including all access and platform variants)~~ and Lodi Station footprints (iNaturalist 2020), and the species is known to winter in the Regional San Bufferlands south of the proposed Track Curve Reconstruction North of Elk Grove ~~surrounding the proposed North Elk Grove Station (including all access and platform variants) and North Elk Grove Siding Variants~~ footprint~~s~~ (Regional San 2000). There are five CNDDB records of this species within 5 miles of the project area (CDFW 2019a).

Merlin is a Covered Species under the SJMCSP (County of San Joaquin 2000).

Heron, Egret, and Cormorant Rookeries

The double-crested cormorant, great egret (*Ardea alba*), great blue heron (*Ardea herodias*), snowy egret (*Egretta thula*), and black-crowned night heron (*Nycticorax nycticorax*) are colonial nesting birds that typically nest in trees and/or riparian areas in rookeries. Although these species are not formally listed and protected pursuant to either the CESA or the ESA, their rookeries are

of interest to CDFW and are subject to CEQA review. These birds are also protected under the federal MBTA. Rookeries can have hundreds of individual nests. Rookery sites have the potential to occur in riparian areas near the proposed project, especially in the vicinity of the Cosumnes River Preserve, Sacramento River, and NEMDC. There is one record of a double-crested cormorant rookery within approximately 1.4 miles of the proposed Track Curve Reconstruction North of Elk Grove ~~North Elk Grove Station (including all access and platform variants)~~ footprint (CDFW 2019a).

Double-crested cormorant is a Covered Species under the SJMCSP (County of San Joaquin 2000).

Common and Special-Status Bats

Western Red Bat

The western red bat is a CDFW species of special conservation concern, as well as a Western Bat Working Group high-priority species. The species is locally common in California, ranging from Shasta County to the Mexican border, and occurring west of the Sierra Nevada and west of the southwestern deserts. Roosting habitat includes forests and woodlands from sea level up to mixed conifer forests. The western red bat typically feeds over a wide variety of habitats, including grasslands, shrublands, open woodlands and forests, and croplands. This species prefers to roost in trees in edge habitats near fields or streams. The species is known to roost in the foliage of large trees and shrubs such as cottonwoods, sycamores, and walnuts. In general, bat species are not well-researched; this particularly applies to the elusive solitary western red bat. Maternity colonies are protected by the CDFW Streambed Alteration Agreement. Suitable habitat for western red bat was observed along the proposed Natomas/Sacramento Airport Station, ~~North Elk Grove Station (including all access and platform variants),~~ Old North Sacramento Station, Thornton Siding Upgrade/Extension, and Track Curve Reconstruction North of North New Hope Road footprints. There are no records of the species within 5 miles of the project area (CDFW 2019a).

Western red bat is a Covered Species under the SSHCP and SJMCSP (County of Sacramento et al. 2018; County of San Joaquin 2000).

Hoary Bat

The hoary bat is the most widespread bat in the United States, and is listed by the Western Bat Working Group as a medium-priority species. It is a common solitary bat that winters along the California coast and in Southern California. The hoary bat typically resides in broadleaved upland forest, cismontane woodland, lower montane coniferous forest, and North Coast coniferous forest. The species prefers open habitats or habitat mosaics, with access to trees for cover and open areas or habitat edges for feeding. The hoary bat is also found in cities with old, large trees, and is known to roost in dense foliage of medium to large trees. Hoary bats feed primarily on moths, and require having water nearby. As with most bat species, this species is not very well documented. Although mostly solitary, females will roost together during the maternity season. Maternity colonies are protected by the CDFW Streambed Alteration Agreement. Suitable habitat for the species was observed along the proposed Natomas/Sacramento Airport Station, ~~North Elk Grove Station (including all access and platform variants),~~ Old North Sacramento Station, Thornton Siding Upgrade/Extension, and the Track Curve Reconstruction North of North New

Hope Road footprints. One CNDDB occurrence from 1991 places the species within 2 miles west of the Midtown Sacramento Station section of the proposed project (CDFW 2019a).

3.4.3.4 Sensitive Natural Communities and Riparian Habitat

Sensitive habitats are defined as habitats with particularly high ecological values or functions; of limited distribution; or otherwise of concern to federal, state, and/or local resource agencies.[3] Sensitive habitats mapped in the project area include riparian and wetland habitats, including seasonal wetlands. Wetland habitats are discussed below.

Riparian habitat is defined in the context of Section 1600 of the California Fish and Game Code. According to guidance provided in *A Field Guide to Lake and Streambed Alteration Agreements: Section 1600 Fish and Game Code*, the outer edge of riparian vegetation is a reasonable and identifiable boundary for the lateral extent of a stream, the protection of which should result in preserving the fish and wildlife at risk in a stream or drainage, and therefore may constitute the limits of CDFW jurisdiction along waterways. CDFW takes jurisdiction over riparian habitat pursuant to Section 1600 of the California Fish and Game Code. In the project area, patches of riparian habitat are common in project footprints situated in rural, agricultural, and natural areas where perennial irrigation runoff or a high water table is available to support riparian tree and shrub species, such as the proposed Lodi Station, Lodi Station South Alternative, Lodi Siding Variants, Thornton Siding Upgrade/Extension, and Track Curve Reconstruction South of Desmond Road~~, North Elk Grove Station (including all access and platform variants), and North Elk Grove Siding Variants footprints~~. Small patches of young oak riparian vegetation are often present in drainages, ditches, and canals that follow along the toe of ballast slope or that cross beneath existing raised track bridges throughout the project area. Thickets of riparian vegetation dominated by the invasive nonnative rattlebox shrub are present along the entire NEMDC/Steelhead Creek to the west of the proposed Old North Sacramento Station and Del Paso Siding Upgrade/Extension, and are particularly dense and widespread in the northern portions of the proposed Natomas/Sacramento Airport Station footprint. Examples of mature riparian habitat dominated by large native riparian trees are not present in the project area, but exist outside of the project area along the banks of major creeks and waterways such as the Cosumnes River, Morrison Creek, American River, Steelhead Creek, and Arcade Creek.

Riparian habitats tend to be dominated by trees, but any vegetation that overlaps waterways in the project area may be subject to regulation by CDFW under Section 1602 of the California Fish and Game Code.

3.4.3.5 Wetlands and Other Waters

Prior to biological surveys, an AECOM wetland specialist reviewed color aerial imagery on Google Earth, National Wetlands Inventory (NWI) data, and the Natural Resources Conservation

[3] Sensitive habitats are often designated because they are declining regionally or statewide. Sensitive habitats are of special concern because they have high potential to support special-status plant and animal species, and can provide other important ecological functions, such as enhancing flood and erosion control and maintaining water quality. Sensitive habitats include Sensitive Natural Communities that are identified by CDFW (e.g., having a high priority for inventory by the CNDDB), or those afforded specific consideration through CEQA, Section 1602 of the California Fish and Game Code, California's Porter-Cologne Act, or Section 404 of the CWA.

Service's (NRCS) soil surveys of Sacramento County and San Joaquin County, California (NRCS 2018) to determine areas of potential USACE and state jurisdiction. Aquatic features were then mapped to the extent feasible in all accessible parts of the project footprints as part of the habitat mapping effort. Wetlands, other waters, and aquatic habitats mapped in and adjacent to the project footprint include seasonal wetlands, cattail marshes, creeks, canals, ditches, open water ponds, managed wetlands, Mosher Slough, and ephemeral drainages.

In 2018, one seasonal wetland was mapped in the northwestern portion of the Track Curve Reconstruction North of Elk Grove. ~~North Elk Grove Station (including all access and platform variants) footprint, near Morrison Creek.~~ The USACE 1987 wetlands delineation manual (Environmental Laboratory 1987) and Regional Supplement to *the Corps of Engineers Wetland Delineation Manual: Arid West Region* (Environmental Laboratory 2008) were used to delineate wetlands potentially subject to USACE jurisdiction under Section 404 of the CWA, and waters of the United States were delineated based on the ordinary high-water mark (OHWM) using the OHWM field guide (Lichvar and McColley 2008) in these areas. Preliminary results from these wetland delineation exercises are included in the analysis presented in this document. A complete Preliminary Delineation of Waters of the United States, including Wetlands, is anticipated prior to final project site design and implementation.

3.4.3.6 Protected/Jurisdictional Trees

City of Stockton

Trees observed in the City of Stockton boundaries include planted landscape ornamental trees (e.g., eucalyptus, Deodor cedar) as well as native oak trees (valley oak and interior live oak) along the eastern and western boundaries of the proposed Hammer Lane Siding Upgrade footprint, south of Bear Creek. The portion of the Hammer Lane Siding Upgrade north of Bear Creek is outside (north of) the city limits. Most of the trees in or adjacent to the proposed Hammer Lane Siding Upgrade track in the City of Stockton are rooted in residential yards, and would likely be avoided by project impacts. Although some trees, including native oak trees, were observed to be growing outside of residential yards, these trees are rooted in existing UPRR ROW, and would not be subject to the local tree ordinance. No street trees were observed to be in or adjacent to the proposed project boundaries.

San Joaquin County

Numerous native oak trees occur along the northern portion of the proposed Hammer Lane Siding Upgrade (north of the Stockton city limits) and in the Lodi Siding Variants, Thornton Siding Upgrade/Extension, and Track Curve Reconstruction North of North New Hope Road footprints in San Joaquin County. Many of these trees may also meet San Joaquin County's definition of a heritage oak tree. All trees mapped in San Joaquin County during biological surveys are either rooted in adjacent private properties that would not be affected by the proposed project, or are in existing UPRR ROW and would not be subject to the local tree ordinances. No oak trees were found outside existing UPRR ROW (i.e., in the Lodi Station or Lodi Station South Alternative footprints).

Sacramento County

Native oak trees (*Quercus* spp.) occur in the proposed Phillips Siding Upgrade/Extension and Track Curve Reconstruction North of Elk Grove ~~North Elk Grove Siding Variants~~ footprints in Sacramento County; however, all these trees are rooted in existing UPRR ROW and would not be subject to the Sacramento County tree ordinance. Trees in the project footprint that are outside existing UPRR ROW and in Sacramento County include several patches of landscape trees west of the tracks along West Elkhorn Boulevard and in the ADESA-Brashers parking lot, and in the Natomas/Sacramento Airport Station footprint. Due to lack of access during biological surveys, tree species in this area are unknown. However, according to the Sacramento County Tree Preservation ordinance, activities in the dripline of or destruction of any tree in the designated urban area of the unincorporated area of Sacramento County must be authorized as a condition of a discretionary project approval.

City of Sacramento

The City of Sacramento Municipal Code (Chapter 12.56 Tree Planting, Maintenance, and Conservation) requires a permit for impacts to "City Trees" or "Private Protected Trees" (includes trees formerly referred to as "Heritage Trees") (discussed above).

Trees observed outside of existing UPRR ROW and within the City of Sacramento boundaries include several street trees adjacent to the proposed Midtown Sacramento Station footprint, and two patches of native oak trees in the Old North Sacramento Station footprint.

3.4.3.7 Connectivity and Migration Corridors

Rivers, creeks, drainages, and associated continuous wetland and riparian habitats that intersect with and are adjacent to the project area are likely to function as movement corridors amongst a landscape that is otherwise developed for agricultural, commercial, industrial, and residential uses.

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 proposed project crosses natural waterways, canals, and other minor drainages that may be used by migratory fish and semi-aquatic species. Steelhead Creek in the NEMDC is recognized as a migratory corridor for the federally listed as threatened Central Valley Steelhead DPS. The proposed project also intersects lowlands along the historic Sacramento/San Joaquin River Delta, where upland wildlife movement is concentrated along natural portions of this riverine and estuarine system, including adjacent riparian habitat. Special-status species that may use these corridors include western pond turtle, giant garter snake, nesting birds, and raptors such as Swainson's hawk.

3.4.4 Environmental Analysis

This section describes the environmental impacts of the proposed project on biological resources. It describes the methods used to evaluate the impacts and the thresholds used to determine whether an impact would be significant. Measures to mitigate significant impacts are provided, where appropriate.

3.4.4.1 Thresholds of Significance

The State CEQA Guidelines Appendix G (14 CCR 15000 et seq.) has identified significance criteria to be considered for determining whether a project could have significant impacts on biological resources. The proposed project would result in a significant impact on biological resources if it would:

- 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, or other approved local, regional, or state HCP.

3.4.4.2 Analysis Methodology

The biological values of resources in, adjacent to, and outside the area to be affected by the proposed project were determined by consideration of several factors. These included the overall size of habitats to be affected; the current level of disturbance of the habitats on the site; the site's surrounding environment and regional context; the on-site biological diversity and abundance; the presence of sensitive and special-status plant and wildlife species, and the site's importance to regional populations of these species; and the degree to which on-site habitats are limited or restricted in distribution on a regional basis, and therefore are considered sensitive in themselves.

Potential impacts of the proposed project on biological resources were determined by:

- Overlaying the project footprint, including permanent and temporary disturbance areas, with maps of biological resources in the study area in GIS;
- Determining impact acreages on the ground by habitat type through GIS calculations;
- Distinguishing between direct impacts (e.g., construction of tracks and facilities) and indirect impacts (impacts resulting from habitat disturbance, operation of the proposed project, and introduction of human activities during project construction and operation); and

- Distinguishing between permanent impacts (built environment) and temporary impacts (during construction).

Habitat loss is the primary impact on biological resources that would result from project construction. Loss of habitat would result from construction of all project components (i.e., new siding tracks and stations). Permanent habitat loss would occur in the permanent footprint of project components, while temporary habitat loss would occur during construction and while habitats are restored and returned to their preconstruction condition. No permanent impacts are associated with curve speed reconstruction improvements, because all work would be classified as maintenance work that is limited to existing UPRR tracks, and would be carried out using on-track equipment. For the installation of siding track improvements, the permanent construction footprint would be limited to areas in existing UPRR ROW. Permanent impact footprints for the proposed Hammer Lane Siding Upgrade, Lodi Siding Variants, Thornton Siding Upgrade/Extension, Phillips Siding Upgrade/Extension, ~~North Elk Grove Siding Variants,~~ Pollock Siding Upgrade, South Sacramento Siding Upgrade, and Del Paso Siding Upgrade/Extension improvements are in areas measured from the centerline of existing UPRR tracks to the eastern boundary of existing UPRR ROW. The entire proposed new station footprints are considered to be permanent impact areas. Temporary impact areas would include staging and access locations on the opposite side of the UPRR tracks from proposed siding tracks for the placement of equipment and materials, and would be constrained to existing disturbed areas to the greatest extent feasible.

Direct impacts on biological resources are those that take place in the permanent and temporary project impact areas and involve the loss, modification, or disturbance of natural habitats (i.e., vegetation or plant communities), which in turn directly affect plant and wildlife species dependent on that habitat. Direct impacts also include the destruction of individual plants or wildlife, which is typically the case in species of low mobility (i.e., plants, amphibians, reptiles, and small mammals). The collective loss of individuals in these manners may also directly affect regional population numbers of a species, or result in the physical isolation of populations, thereby reducing genetic diversity, and therefore, population stability.

Indirect impacts are those that involve the effects of increases in ambient levels of sensory stimuli (e.g., noise, light), unnatural predators (e.g., domestic cats and other nonnative animals), and competitors (e.g., exotic plants, nonnative animals). Indirect impacts may be associated with the construction and/or eventual habitation/operation of a project; therefore, these impacts may be both short-term and long-term in their duration. These impacts are commonly referred to as “edge effects,” and may result in changes in the behavioral patterns of wildlife and species composition of vegetation communities, leading to reduced biodiversity and abundance in habitats adjacent to project impact areas. Other indirect impacts include those to aquatic resources, such as changes in drainage patterns, sediment load, and erosion.

Details on the nature of the analysis and impact determination for each species are provided below for each specific impact topic. Potential impacts generally fall into one of two categories:

1. Construction of the proposed project, which would result in ground-disturbing activities that could degrade and remove natural plant communities, wildlife habitat, and aquatic resources, as well as cause injury, mortality, auditory, and visual disturbance to wildlife.

2. Project operation that could result in injury and mortality of special-status wildlife, as well as ongoing indirect effects on habitat and aquatic resources over the life of the proposed project.

The proposed project was analyzed using quantified acreages of existing habitats and aquatic resources. The methodologies are described below.

3.4.4.3 Impacts and Mitigation Measures

The proposed project includes the following improvements:

- Hammer Lane Siding Upgrade
- Track Curve Reconstruction between East March Lane and East Swain Road
- Lodi Station
- Lodi Station South Alternative
- Lodi Siding Variants
- Thornton Siding Upgrade/Extension
- Track Curve Reconstruction North of North New Hope Road
- Track Curve Reconstruction South of Desmond Road
- Phillips Siding Upgrade/Extension
- ~~North Elk Grove Station (including all platform and access variants)~~
- ~~North Elk Grove Siding Variants~~
- Track Curve Reconstruction North of ~~North~~ Elk Grove ~~Station~~
- Pollock Siding Upgrade
- South Sacramento Siding Upgrade
- Crossover Track South of City College Station
- City College Station
- Midtown Sacramento Station
- Old North Sacramento Station
- Del Paso Siding Upgrade/Extension
- Natomas/Sacramento Airport Station

Table 3.4-3 provides an overview of permanent and temporary impacts by land cover type due to The proposed project.

Table 3.4-3. Land Cover Types Mapped within The proposed project, by Disturbance Type

Type	Disturbance Type	Acres[1]	Total Acreage
Developed/Landscaped	Temporary	107.62	200.75
	Permanent	69.97	
Rural Residential	Temporary	0.29	0.57
	Permanent	0.27	
Ruderal	Temporary	28.47	87.46
	Permanent	20.93	
Non-native Annual Grassland	Temporary	0.20	0.38
	Permanent	0.17	
Oak Tree Canopy	Temporary	4.38	6.25
	Permanent	1.87	
Willow Scrub	Temporary	1.08	1.75
	Permanent	0.67	
Blackberry Scrub	Temporary	3.68	5.72
	Permanent	2.04	
Agriculture (Row & Field)	Temporary	10.48	23.22
	Permanent	12.74	
Agriculture (Vineyard/Orchard)	Temporary	19.76	26.56
	Permanent	6.79	
Agricultural Ditch/Ditch	Temporary	0.81	1.24
	Permanent	0.52	
Canal	Temporary	0.04	0.06
	Permanent	0.02	
Cattail Marsh	Temporary	0.58	0.68
	Permanent	0.10	
Ephemeral Drainage	Temporary	1.86	2.24
	Permanent	0.38	
Open Water (Perennial)	Temporary	0.49	0.51
	Permanent	0.02	
Seasonal Wetland	Temporary	1.49	2.39
	Permanent	0.90	
TOTAL	**Temporary**	**161.34**	**359.76**
	Permanent	**198.42**	

Source: Data compiled by AECOM in 2019

1. Disturbance acreages include the original footprint of the now deleted North Elk Grove Station (including all access and siding variants). As such, actual disturbance totals related only to the Track Curve Reconstruction North of Elk Grove would be much less.

Impact BIO-1: The proposed project could have a substantial adverse effect, either directly or through habitat modifications, on 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 the U.S. Fish and Wildlife Service. However, implementation of mitigation measures would reduce this potentially significant impact to a less-than-significant level (Less-than-Significant Impact with Mitigation).

Special-Status Plants

Most of the proposed project would be constructed in the existing UPRR ROW, which is dominated by ruderal or developed (i.e., barren) areas and adjacent areas of urban development and current/past agricultural cultivation with limited potential to support special-status plant species. However, there are 19 special-status plant species that have potential to occur in or adjacent to the project area. Of these, only one species (Sanford's arrowhead, a CRPR List 1B.2 plant) is recorded in the project footprint in Arcade Creek, where it overlaps with the north-central portion of the proposed Del Paso Siding Upgrade/Extension. ~~The USFWS Vernal Pool Recovery Plan Stone Lakes Core Area overlaps with the south-central portion of the North Elk Grove Siding Variants, and covered species include Boggs Lake hedge-hyssop, legenere, and Ahart's dwarf rush (USFWS 2005).~~ The other species that could occur due to the presence of suitable habitat and nearby records include watershield, bristly sedge, papoose tarplant, Bolander's water-hemlock, Peruvian dodder, dwarf downingia, woolly rose-mallow, Heckard's pepper-grass, pincushion navarretia, slender Orcutt grass, Sacramento Orcutt grass, marsh skullcap, side-flowering skullcap, and saline clover. These species could occur in the limited extents of aquatic habitats (7.12 acres) and nonnative annual grassland (0.38 acre) habitats present in the project footprint, in areas where suitable soils (e.g., clay, alkaline, sandy) and other required microhabitat conditions exist for each respective species.

Habitats by project site are presented in Table 3.4-2 and are summarized for total potential permanent and temporary impact in Table 3.4-3. Aquatic habitats in the project site that may contain suitable habitat for special status plant species include ditches (1.24 acres), canals (0.06 acre), cattail marsh (0.68 acre), open water (0.51 acre), ephemeral drainages (2.24 acres), and seasonal wetlands (2.39 acres); these acreages—which add up to a total of 7.12 acres of aquatic habitat—represent the total acreage of each aquatic habitat type across all project improvement areas that may contain suitable substrate for special-status plants, and include both temporary and permanent project-related disturbance in the acreage calculation (Table 3.4-3).[4] The only upland habitat in the project improvement areas with suitable substrate for special-status plants is annual grassland, which is present at the Thornton and Old North Sacramento project improvement sites and accounts for 0.38 acre (0.01 acre at Thornton and 0.37 acre at Old North Sacramento) of the total project improvement areas.

Bristly sedge, woolly rose-mallow, side-flowering skullcap, and Suisun Marsh aster are all Covered Species under the SJMSCP (County of San Joaquin 2000). Dwarf downingia, pincushion navarretia, slender Orcutt grass, and Sacramento Orcutt grass are Covered Species under the

[4] Disturbance acreages include the original footprint of the now deleted North Elk Grove Station (including all access and siding variants). As such, actual disturbance totals related only to the Track Curve Reconstruction North of Elk Grove would be much less.

SSHCP (County of Sacramento et al. 2018). Both regional conservation plans include Bogg's Lake hedge-hyssop, Ahart's dwarf rush, legenere, and Sanford's arrowhead as Covered Species (County of San Joaquin 2000; County of Sacramento et al. 2018). SSHCP modeled habitats for special-status plant species in the vicinity of the proposed project include ~~dwarf downingia and legenere, both mapped immediately west of the Elk Grove Siding Variants; and~~ Sanford's arrowhead, mapped throughout ditches and other aquatic habitats surrounding footprints of the Track Curve Reconstruction South of Desmond Road, Phillips Siding Upgrade/Extension, ~~North Elk Grove Siding Variants,~~ and Track Curve Reconstruction North of ~~North~~ Elk Grove ~~Station, and North Elk Grove Station (including all platform and access variants)~~ (County of Sacramento et al. 2018).

Construction

If and where special-status plant species are present, ground-disturbing construction activities could result in the direct mortality of individuals from the temporary or permanent removal of vegetation, crushing or trampling, or competition from the introduction of nonnative or invasive plants. Other construction-related impacts could include reduced plant vigor from potential construction-generated dust (e.g., site preparation, grading), from habitat degradation associated with runoff of sediment and contaminants (e.g., oil, grease, concrete), or accidental spills from equipment into adjacent areas that could support special-status plant species. With the conservative assumption that disturbance to and loss of habitats for special-status plants would occur at the highest estimates provided in Table 3.4-3, up to 19 species of special-status plants could experience potentially significant losses as a result of construction of The proposed project; this impact would be potentially significant. Mitigation for modifications to habitats that are suitable for special status plant species are addressed under mitigation measures proposed to reclaim all temporary disturbed areas to pre-project conditions (Mitigation Measure BIO-1.4), compensate for the permanent loss of nesting and foraging habitat for Swainson's hawk and white-tailed kite (Mitigation Measure BIO-1-11), compensate for temporary and permanent impacts on riparian habitat (Mitigation Measure BIO-2.2), and compensate for temporary and permanent impacts on aquatic habitats (Mitigation Measure BIO-3.2).

Operation

Long-term operation of new passenger trains and stations along the UPRR Sacramento Subdivision has the potential for accidental spills or leaks from operating trains along the track, contaminated runoff from new impervious surfaces at stations, or contamination from herbicides used for vegetation and weed control along the track. Resulting habitat degradation could adversely affect special-status plants in adjacent areas. However, use of herbicides and potential accidental leaks/spills along the tracks would not likely contribute to any substantial additional habitat degradation beyond existing conditions in existing UPRR ROW that are already degraded and subject to these effects. Furthermore, as described in Section 3.10, *Hydrology and Water Quality*, the proposed stations would meet requirements of the appropriate MS4 NPDES Permit to reduce potential water quality impacts associated with stormwater runoff from new impervious surfaces. Therefore, operational impacts on special-status plants would be less than significant.

Mitigation Measures

Implementation of Mitigation Measures BIO-1.1 and BIO-1.2 would avoid and minimize potential project impacts on special-status plants through minimization of the temporary project footprint to avoid sensitive habitats to the greatest extent feasible, and require a preconstruction worker environmental awareness training for the identification and avoidance of sensitive habitats. Implementation of Mitigation Measure BIO-1.3 would avoid and minimize impacts on special-status plants by requiring preconstruction surveys and implementation of avoidance measures. Mitigation Measure BIO-1.4 would minimize impacts on special-status plants by preventing the spread of invasive plants. If complete avoidance is not possible, Mitigation Measure BIO-1.5 would require compensation for impacts on special-status plants through translocation or propagation and monitoring of special-status plant populations, and compensation for loss of special-status plant populations consistent with regional conservation plans, where applicable.

Indirect impacts on special-status plants that may occur near the proposed improvements would be reduced through implementation of Mitigation Measures HYD-1.1 and HYD-1.2, which require the proposed project to obtain an NPDES Construction General Stormwater Permit and implement Best Management Practices (BMPs) to minimize and/or avoid the potential for sedimentation, run-off, and discharge of pollutants from construction activities. Furthermore, implementation of Mitigation Measure AQ-2.3 further reduces potential indirect impacts by requiring contractors to implement fugitive dust control measures at all construction and staging areas such as watering surfaces, installing wind barriers, limiting vehicle speeds, covering haul trucks transporting loose materials, and paving roadways, all of which would reduce the potential impact of fugitive dust on neighboring habitats and vegetation. Therefore, indirect impacts related to construction-generated erosion and fugitive dust on special-status plants would be less than significant.

Implementation of Mitigation Measures BIO-1.1 to BIO-1.5, AQ-2.3, HYD-1.1, and HYD-1.2 would reduce the proposed project's impacts on special-status plant species during construction to a less-than-significant level.

BIO-1.1: Minimize the temporary construction impact footprint.

To minimize temporary impacts on habitat for special-status species and sensitive habitat, SJJPA and SJRRC shall implement the following measures:

- During final project design and siting, minimize the temporary project footprint to the areas necessary for construction, and select locations that are already disturbed or developed to the greatest extent feasible.
- Avoid known occurrences of all special-status species, wetlands, riparian habitat, and sensitive natural communities to the greatest extent feasible.
- Minimize grading to the greatest extent feasible to avoid clearing of trees and shrubs.

BIO-1.2: Conduct a Worker Environmental Awareness Training Program for construction personnel.

Before any equipment staging, grading, or vegetation removal in areas supporting or potentially supporting sensitive biological resources (e.g., aquatic, riparian, and wetlands habitat; habitat for special-status plant or wildlife species; active bird nests), SJJPA and SJRRC 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 include information on the life history and habitat requirements of special-status species potentially occurring in or adjacent to the improvement footprints; the importance of protecting habitat; and the terms and conditions of applicable permits. 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. Brochures summarizing special-status and listed species with potential to occur in the project area, as well as project requirements, shall be provided to all crew members (in multiple languages if appropriate). A log shall be maintained of all trained personnel with names and dates of training, and shall be made available for review by CDFW and USFWS, or other agencies on request.

BIO-1.3: Conduct preconstruction botanical surveys for special-status plants; avoid and minimize impacts during construction.

SJJPA and SJRRC shall retain a qualified botanist to conduct preconstruction surveys for special-status plant species specified in Appendix C, *Supporting Biological Resources Information*. During appropriate species-specific identification periods at least 1 year prior to the initiation of construction, the qualified botanist will survey suitable habitat in the work areas for the species, in accordance with CDFW protocols (California Department of Fish and Game 2018). The results of the surveys, which would require multiple visits because of varying blooming periods and differences in work area construction initiation, would be documented in brief reports or technical memoranda. If the survey demonstrates the absence of special-status plant species in the project area, no further actions would be required.

Take of listed plant species such as Bogg's Lake hedge-hyssop, slender Orcutt grass and Sacramento Orcutt grass is not permitted under ~~the SSHCP~~ CESA without appropriate take authorization; therefore, if the qualified botanist encounters a previously undiscovered occurrence of Bogg's Lake hedge hyssop, Sacramento or slender Orcutt grass on a project site, the qualified biologist shall develop an ~~in the SSHCP Plan Area (i.e., the North Elk Grove Station, including all access and platform variants, which is in the UDA of the SSHCP), SJJPA and SJRRC shall contact the Land Use Authority Permittee with authority over the proposed project, who would coordinate with the Wildlife Agencies for written concurrence of~~ avoidance plan to ensure that the proposed project does not cause take of the species. In the event take cannot be avoided the project proponent may seek related take authorization as provided by the Fish and Game Code

or otherwise comply with CESA through an existing Habitat Conservation Plan (if applicable).

Known occurrences of special-status plants in the vicinity of project improvements shall be flagged during preconstruction surveys and avoided to the greatest extent feasible. Avoidance measures may consist of placing an equipment limitation zone or equipment exclusion zone (i.e., flagging, fencing, signage) around special-status plant populations so that direct impacts are minimized, while allowing use of any existing roads or other access areas that may pass through the equipment limitation zone or near the equipment exclusion zone.

BIO-1.4: Develop and implement a revegetation and weed control plan.

To control invasive/noxious weeds, SJJPA and SJRRC shall implement or require contactors to 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) improvement footprint to ensure that no new occurrences of invasive plant species have become established.

SJJPA and SJRRC shall reclaim all areas disturbed by project construction, including temporary disturbance areas around construction sites, laydown/staging areas, and temporary access roads using a locally sourced native and naturalized seed mix in ruderal and natural areas; or reclaim to the pre-existing agricultural condition if temporary impacts occur in agricultural lands. For portions of the proposed project that are outside existing UPRR ROW and overlap with the SJMSCP (i.e., the Lodi Station and Lodi Station South Alternative)~~, SSHCP lands and the Bufferlands Master Plan (i.e., the North Elk Grove Station [including all access and platform variants])~~, the seed mix shall be developed in coordination with the SJMSCP~~, SSHCP, and Regional San management staff~~ (as applicable) to ensure compliance with any provisions of these conservation plans. A qualified biologist with demonstrated experience with the habitat to be restored shall have

oversight for the selection of reclamation species to ensure that temporary impacts, when reclaimed, will have the same habitat value as pre-project conditions.

BIO-1.5: Document affected special-status plant species and prepare a salvage, relocation, or propagation and monitoring plan for special-status plant species.

If preconstruction surveys reveal the presence of special-status plant species in the project footprint or areas immediately adjacent, SJJPA and SJRRC shall notify USFWS and/or CDFW, depending on the listing status of the species. All directly affected areas of special-status plants shall be documented by a qualified botanist or ecologist retained by SJJPA and SJRRC prior to impacts. Documentation shall include density and percent cover; key habitat characteristics, including soil type, associated species, hydrology, and topography; photographs of preconstruction conditions; and a map of the location and extent of potentially impacted populations in the project impact area to quantify impacts.

For any special-status plant species identified in the project footprint that cannot be avoided, a qualified botanist or restoration ecologist shall prepare a salvage, relocation, or propagation and monitoring plan, as deemed appropriate and in coordination with USFWS and/or CDFW prior to construction to address affected special-status plant species. The plan shall include provisions that address the techniques, location, and procedures required for the successful establishment of the plant populations. The plan shall include provisions for performance that address survivability requirements, maintenance, monitoring, implementation, and the annual reporting requirements. Monitoring and success criteria applicable to special-status plant salvage, relocation, or propagation shall require the following:

- At least two surveys by a qualified botanist or ecologist per monitoring year.
- At least 80 percent of the planted area must support vegetation composition and density consistent with reference population conditions.
- At least 80 percent of the planted area must support target species amounts 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 planted areas that fail to meet the success criteria for 3 consecutive years.

If Ahart's dwarf rush, ~~Bogg's Lake hedge-hyssop,~~ dwarf downingia, legenere, pincushion navarretia, or Sanford's arrowhead (or other special-status plants) are detected in an area proposed to be disturbed by the proposed project, ~~in the SSHCP Plan Area (i.e., the North Elk Grove Station [including all access and platform variants], which is in the UDA of the SSHCP),~~ SJJPA and SJRRC would implement compensatory mitigation for impacts that assures permanent protection of the species or otherwise mitigate through an existing Habitat Conservation Plan (if applicable). ~~is consistent with the SSHCP by assuring one unprotected occurrence of the species is protected in an SSHCP Preserve before any ground-disturbance occurs at the North Elk Grove Station (including all access and platform variants) site.~~

AQ-2.3: Implement fugitive dust control measures at all construction and staging areas to reduce construction-related fugitive dust, consistent with SJVAPCD Regulation VIII and SMAQMD Basic Emission Control Practices.

Refer to measure description under Impact AQ-1 in Section 3.3, *Air Quality*.

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

Refer to measure description under Impact HYD-1 in Section 3.10, *Hydrology and Water Quality*.

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

Refer to measure description under Impact HYD-1 in Section 3.10, *Hydrology and Water Quality*.

Special-Status Wildlife

Most of the proposed project would be constructed in the existing disturbed UPRR ROW and adjacent areas with limited potential to support special-status wildlife species. However, potentially suitable habitat for the following 24 special-status wildlife is present in the study area: vernal pool fairy shrimp, vernal pool tadpole shrimp, valley elderberry longhorn beetle, Steelhead-Central Valley DPS, western pond turtle, giant garter snake, Cooper's hawk, short-eared owl, burrowing owl, ferruginous hawk, Swainson's hawk, northern harrier, white-tailed kite, merlin, song sparrow (Modesto population), tricolored blackbird, purple martin, yellow warbler, yellow-breasted chat, loggerhead shrike, greater sandhill crane, double-crested cormorant (rookery), western red bat, and hoary bat; these species are further evaluated below.

Impacts on special-status wildlife include loss of habitat for construction of track improvements and stations; direct mortality or injury during construction activities; increased noise from construction and new passenger train service; and increased noise and light during operations.

Vernal Pool Fairy Shrimp and Vernal Pool Tadpole Shrimp

The majority of the proposed project would be constructed in the existing disturbed UPRR ROW and vernal pool fairy shrimp and vernal pool tadpole shrimp could occur in the limited extents of seasonal wetland habitat (approximately 2.39 acres[5]) or ephemeral drainages (2.24 acres[6]) present in the study area buffer surrounding the proposed Thornton Siding Upgrade/Extension and the Track Curve Reconstruction South of Desmond Road; as well as in the following project footprints: Lodi Siding Variants; ~~North Elk Grove Station (including all access and platform variants); North Elk Grove Siding Variants;~~ Del Paso Siding Upgrade/Extension; and the southern portion of the Natomas/Sacramento Airport Station; and/or in mapped or unmapped seasonal wetlands potentially occurring in adjacent nonnative annual grasslands at these locations. Habitats by project site are presented in Table 3.4-2 and are summarized for total potential

[5] Additional seasonal wetlands may be present in the project area that were not visible at the time of biological surveys.

[6] Additional ephemeral drainages may be present in the project area that were not visible at the time of biological surveys.

permanent and temporary impact in Table 3.4-3. CNDDB occurrences for vernal pool fairy shrimp and vernal pool tadpole shrimp overlap the project footprint at all these locations, except the Track Curve Reconstruction South of Desmond Road and the Del Paso Siding Upgrade/Extension, where vernal pool fairy shrimp or vernal pool tadpole shrimp occurrences are documented within 1 and 1.5 miles from the study area, respectively. Furthermore, several additional CNDDB occurrences are documented elsewhere along existing UPRR ROW and other railway ROWs in the region (CDFW 2019a; Regional San 2000).

Both the vernal pool fairy shrimp and vernal pool tadpole shrimp are Covered Species under the SSHCP and SJMSCP, and under the USFWS Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon (County of Sacramento et al. 2018; County of San Joaquin 2000). ~~Modeled habitat for both species is mapped in grassland habitat in and adjacent to the proposed North Elk Grove Station (including all access and platform variants) and North Elk Grove Siding Variants in the SSHCP UDA and Plan Area (County of Sacramento et al. 2018). Also, the USFWS Vernal Pool Recovery Plan Stone Lakes Core Area overlaps with the south-central portion of the Elk Grove Siding Variants (USFWS 2005).~~

~~Impacts on USFWS Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon Stone Lakes Core Area~~

~~The USFWS Stone Lakes Core Area overlaps with the south-central portion of the North Elk Grove Siding Variants. The Stone Lakes Core Area is ranked in Zone 2 by the USFWS Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon (USFWS 2005). The recovery criteria generally recommend protection of 85 percent of suitable habitat in Zone 2 core areas. Species covered in the Recovery Plan that may occur in the project area consist of Boggs Lake hedge-hyssop, legenere, Ahart's dwarf rush, vernal pool fairy shrimp, and vernal pool tadpole shrimp. A total of 0.38 acre of seasonal wetland and 0.02 acre of ephemeral drainage habitat that could provide suitable habitat for these species was mapped in the North Elk Grove Siding Variants footprint that may be impacted, either directly or indirectly, by the proposed project.~~

~~The 0.38 acre of seasonal wetland habitat and 0.02 acre of ephemeral drainage habitat that could be impacted by the North Elk Grove Siding Variants is not more than 15 percent of the current vernal pool acreage in the Core Area. Because Zone 2 core areas have a goal of maintaining 85 percent of the suitable habitat for vernal pool species, and the total potential impacts on suitable vernal pool species habitat in the Stone Lakes Core Area is not more than 15 percent of the total suitable habitat in the Core Area, construction of the proposed project in this area would not conflict with the goals of the USFWS Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon. Therefore, there would be no impact.~~

Construction

No direct impacts (i.e., removal or fill of) on seasonal wetlands or other aquatic resources would result from the proposed Track Curve Reconstruction South of Desmond Road, where all project construction activities would be limited to the existing UPRR track using on-track equipment, or areas in UPRR ROW west of the track to shift the centerline of mainline tracks. Within the footprints of the Lodi Siding Variants, ~~North Elk Grove Station (including all access and platform variants), North Elk Grove Siding Variants,~~ Del Paso Siding Upgrade/Extension, and the southern portion of the Natomas/Sacramento Airport Station, project construction would result in the

temporary (approximately 3.35 acres) and permanent (approximately 1.28 acres) fill of seasonal wetlands and ephemeral drainages that could be suitable habitat to support federally listed vernal pool fairy shrimp and vernal pool tadpole shrimp, and are likely to be occupied.[7] Construction of these project improvements could also result in the generation of fugitive dust, erosion and sedimentation, and/or pollution from accidental spills, as well as introduction of nonnative invasive plants that could reduce habitat quality for vernal pool fairy shrimp and vernal pool tadpole shrimp in adjacent areas. This impact would be potentially significant. Mitigation for modifications to habitats that are suitable for special status crustaceans are addressed under mitigation measures proposed to reclaim all temporary disturbed areas to pre-project conditions (Mitigation Measure BIO-1.4) and compensate for temporary and permanent impacts on aquatic habitats (Mitigation Measure BIO-3.2).

Operation

Potential impacts to vernal pool fairy shrimp and vernal pool tadpole shrimp and their potential habitat from long-term project operation of new passenger trains and stations along the UPRR Sacramento Subdivision would be similar to those described in Special-Status Plants, above; impacts related to operation would be less than significant.

Mitigation Measures

Implementation of Mitigation Measures BIO-1.1 and BIO-1.2 would avoid and minimize potential project impacts on special-status plants through minimization of the temporary project footprint to avoid sensitive habitats to the greatest extent feasible, and require a preconstruction worker environmental awareness training for the identification and avoidance of sensitive habitats. Implementation of Mitigation Measure BIO-1.4 would reduce the degradation of adjacent habitats from the potential introduction of nonnative or invasive plants. Implementation of Mitigation Measure AQ-2.3 would be required to avoid and/or minimize impacts related to dust and air pollution. Furthermore, implementation of Mitigation Measures HYD-1.1, HYD-1.2, and HAZ-2.3 would reduce impacts on water quality in adjacent aquatic habitats to a less-than-significant level by requiring specific procedures for discharge of groundwater, or dewatering effluent and work adjacent to, within, or crossing surface water, such as installation of temporary physical barriers and performance of water quality monitoring prior to and during project construction. In addition, Mitigation Measures HYD-1.1 and HYD-1.2 require additional measures to reduce potential impact on aquatic resources such as implementation of a Risk Management Plan to ensure that fill materials are not used in a manner that could pollute stormwater runoff, surface waters, or groundwater; design and construction of stormwater controls and treatment systems in accordance with the Storm Water Quality Handbooks Project Planning and Design Guide; compliance with the post-construction requirements of the Construction General Permit; and compliance with the local MS4 NPDES Permit requirements for stormwater control and treatment. Implementation of these mitigation measures would reduce potentially significant impacts to a less-than-significant level.

[7] Disturbance acreages include the original footprint of the now deleted North Elk Grove Station (including all access and siding variants). As such, actual disturbance totals related only to the Track Curve Reconstruction North of Elk Grove would be much less.

Implementation of Mitigation Measure BIO-1.6 would avoid and minimize potential impacts on vernal pool fairy shrimp and vernal pool tadpole shrimp habitats, and compensate for potential project-related loss of potentially occupied habitat for vernal pool fairy shrimp and vernal pool tadpole shrimp through consultation with USFWS and implementation of resulting mitigation requirements, to be consistent with regional conservation plans for both species. Implementation of Mitigation Measure BIO-1.6 would also reduce the proposed project's construction impacts on vernal pool fairy shrimp and vernal pool tadpole shrimp through direct loss of potentially occupied habitat at the Lodi Siding Variants, ~~North Elk Grove Station (including all access and platform variants), North Elk Grove Siding Variants,~~ Del Paso Siding Upgrade/Extension, and the southern portion of the Natomas/Sacramento Airport Station to a less-than-significant level.

BIO-1.1: Minimize the temporary construction impact footprint.

Refer to measure description above.

BIO-1.2: Conduct a Worker Environmental Awareness Training Program for construction personnel.

Refer to measure description above.

BIO-1.4: Develop and implement a revegetation and weed control plan.

Refer to measure description above.

BIO-1.6: Avoid and minimize impacts on, and compensate for loss of, potentially-occupied habitat for vernal pool fairy shrimp and vernal pool tadpole shrimp through consultation with the U.S. Fish and Wildlife Service and implementation of appropriate mitigation.

A qualified biologist shall monitor for impacts on potentially occupied vernal pool fairy shrimp and vernal pool tadpole shrimp habitat during construction to ensure that they are identified for avoidance on site plans, and preserved on-site to the greatest extent feasible. For all potentially occupied vernal pool fairy shrimp and vernal pool tadpole shrimp habitats that cannot be avoided, SJJPA and SJRRC shall quantify refined impact acreages based on the final design before construction, to identify the degree of actual impacts adequately to determine required mitigation. These impact acreages shall be verified on completion of construction, based on monitoring reports and as-built drawings.

SJJPA and SJRRC shall compensate for the project-related temporary loss of approximately 3.35 acres and permanent loss of approximately 1.28 acres of potentially occupied habitat for vernal pool fairy shrimp and vernal pool tadpole shrimp through consultation with the USFWS; obtain incidental take permit (ITP) coverage for proposed project activities; and implement all terms and conditions and compensatory mitigation included in the ITP, as required. USFWS consultation with USACE would occur during the CWA Section 404 permitting process that is required as mitigation for impacts on wetlands and other waters of the United States (see discussion under Impact BIO-3, below).

AQ-2.3: Implement fugitive dust control measures at all construction and staging areas to reduce construction-related fugitive dust, consistent with SJVAPCD Regulation VIII and SMAQMD Basic Emission Control Practices.

Refer to measure description under Impact AQ-2 in Section 3.3, *Air Quality*.

HAZ-2.3: Implement a construction risk management plan (CRMP).

Refer to measure description under Impact HAZ-2 in Section 3.9, *Hazards and Hazardous Materials*.

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

Refer to measure description under Impact HYD-1 in Section 3.10, *Hydrology and Water Quality*.

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

Refer to measure description under Impact HYD-1 in Section 3.10, *Hydrology and Water Quality*.

Valley Elderberry Longhorn Beetle

No CNDDB occurrences for VELB are recorded in the study area; however, several records occur in proximity to the Old North Sacramento Station (CDFW 2019a). Furthermore, designated critical habitat for VELB exists within 500 feet of the Old North Sacramento Station footprint (USFWS 2019b). Elderberry shrubs that could potentially support VELB were observed in the project footprint at Old North Sacramento Station (near the southern end) ~~and the southwestern portion of the North Elk Grove Siding Variants footprint~~. Additional elderberry shrubs may be present in or near these and other project footprints that were not found during biological surveys, or will become established between certification of this EIR and project implementation.

VELB is a Covered Species under both the SSHCP and SJMSCP (County of Sacramento et al. 2018; County of San Joaquin 2000). Modeled habitats for VELB include the Laguna Creek watershed, ~~which crosses the North Elk Grove Siding Variants,~~ and the Cosumnes River Watershed within 1 mile of the Thornton Siding Upgrade/Extension in the SSHCP Plan Area (County of Sacramento et al. 2018).

Construction

Project construction would result in the permanent removal of a small number of elderberry shrubs that could support VELB from the project footprint at Old North Sacramento Station during site preparation (e.g., vegetation clearing) for track and station improvements. ~~Additionally, several elderberry shrubs are in the temporary footprint of the North Elk Grove Siding Variants footprints that may be removed for equipment operations during construction.~~ Additional elderberry shrubs that could support VELB that were not found during biological surveys may be present in or near other project footprints, or may become established in the future that could also be removed or otherwise encroached on by project activities. In addition, construction of The proposed project could result in the generation of fugitive dust, erosion and sedimentation, and/or pollution from

accidental spills that could reduce vigor of elderberry shrubs that could support VELB, if shrubs occur within 100 feet of construction activities. These impacts would be potentially significant.

Operation

Potential impacts to VELB from long-term project operation would be similar to those described for Special-Status Plants, above; impacts related to operation would be less than significant.

Mitigation Measures

Implementation of Mitigation Measures BIO-1.1 and BIO-1.2 would avoid and minimize potential project impacts on special-status plants through minimization of the temporary project footprint to avoid sensitive habitats to the greatest extent feasible, and require a preconstruction worker environmental awareness training for the identification and avoidance of sensitive habitats. Implementation of Mitigation Measure BIO-1.4 would reduce the degradation of adjacent habitats from the potential introduction of nonnative or invasive plants. Implementation of Mitigation Measure AQ-2.3 would be required to avoid and/or minimize impacts related to dust and air pollution. Implementation of Mitigation Measure BIO-1.7 would avoid and minimize potential impacts on VELB habitat; would require protocol-level preconstruction surveys and avoidance measures for VELB; and, if habitat cannot be avoided, compensation for potential project-related loss of potentially occupied habitat for VELB through consultation with USFWS, and implementation of resulting mitigation requirements to be consistent with regional conservation plans for VELB. Implementation of Mitigation Measure BIO-1.7 would reduce the proposed project's impacts on VELB to a less-than-significant level.

BIO-1.1: Minimize the temporary construction impact footprint.

Refer to measure description above.

BIO-1.2: Conduct a Worker Environmental Awareness Training Program for construction personnel.

Refer to measure description above.

BIO-1.4: Develop and implement a revegetation and weed control plan.

Refer to measure description above.

BIO-1.7: Conduct a preconstruction VELB shrub survey, establish avoidance buffers, and/or compensate for removal of potentially-occupied habitat for VELB through consultation with the U.S. Fish and Wildlife Service and implementation of appropriate mitigation.

Before the start of project construction, SJJPA and SJRRC shall retain a qualified biologist to conduct a survey for VELB exit holes in the Old North Sacramento Station ~~and North Elk Grove Siding Variants project~~ segment~~s~~, and prepare a VELB survey report for SJJPA/SJRRC, to be submitted to USFWS for review and consultation before project construction. The VELB survey report will include the following:

- The location of elderberry shrubs in the project segment and within 50 meters of the project footprint;
- The number of elderberry shrubs that will be directly affected by the proposed project;
- A map that delineates the area that will be directly affected and the elderberry shrub locations within 50 meters of the project footprint;
- Information regarding the quality of individual elderberry shrubs and the continuity of riparian habitat outside the project area;
- A determination of the presence of exit holes in elderberry stems, and whether or not these stems will be affected by the proposed project;
- An evaluation of the surrounding habitat and known VELB occurrences within 800 meters of the proposed project segment; and
- A description of surrounding land uses, including land uses that may be incompatible with VELB use or a potential barrier to VELB dispersal.

A qualified biologist shall monitor for impacts on potentially occupied VELB habitat prior to and during construction to ensure that elderberries are identified for avoidance on site plans, and preserved on-site to the greatest extent feasible. For all potentially occupied elderberry shrubs that cannot be avoided, SJJPA and SJRRC shall quantify refined impacts based on the final design before construction, to identify the degree of actual impacts adequately to determine required mitigation acreages as described below. These impact totals shall be verified on completion of construction, based on monitoring reports and as-built drawings. To avoid and minimize impacts on VELB and/or its habitat, SJJPA and SJRRC shall coordinate with USFWS to determine project-specific conservation measures. At a minimum, SJJPA and SJRRC shall implement the following measures, which may be amended in consultation with USFWS:

- To the greatest extent feasible, damaging or removing elderberry shrubs will be avoided. Construction activities that may damage or kill an elderberry shrub (e.g., trenching, paving) will establish an avoidance area of at least 6 meters (20 feet) from the dripline. All areas to be avoided during construction activities will be demarcated by installing concrete barriers (K-rails) at locations where daily construction activities will persist for more than 4 weeks, or temporary orange construction fencing (4-foot-high commercial-quality woven polypropylene). In buffer areas, signs will be posted along fencing for the duration of construction. The signs will contain the following text:

"This area is habitat of the valley elderberry longhorn beetle, a threatened species, and must not be disturbed. This species is protected by the federal ESA, as amended. Violators are subject to prosecution, fines, and imprisonment."

- As much as feasible, all activities that occur within 50 meters (165 feet) of an elderberry shrub will be conducted outside the VELB flight season (March–July).
- Trimming elderberry shrubs will occur between November and February. Trimming will avoid removal of any branches or stems that are greater than or equal to 1 inch in

diameter. Measures to address regular and/or large-scale maintenance (trimming) will be established in consultation with USFWS.

- If determining that adverse impacts on VELB will occur because of the proposed project, SJJPA and SJRRC shall consult with USFWS to determine the appropriate type and amount of compensatory mitigation. Because the proposed project segment is in a non-riparian area, compensation typically will be appropriate for occupied shrubs (USFWS 2017). Appropriate compensatory mitigation can include purchasing credits at a USFWS-approved conservation bank, providing on-site mitigation, or establishing and/or protecting habitat for VELB. At a minimum, impacts on individual shrubs in non-riparian areas will be replaced through a purchase of 1 credit at a USFWS-approved bank for each shrub that will be trimmed, if exit holes are found in any shrub on or within 50 meters (165 feet) of the project area. If the occupied shrub will be completely removed by the activity, the entire shrub will be transplanted to a USFWS-approved location, in addition to a credit purchase (USFWS 2017).

If removal of any mapped elderberry shrubs cannot be avoided, SJJPA and SJRRC shall compensate for their removal through consultation with the USFWS[8]; obtain incidental take permit (ITP) coverage for project activities; and implement all terms and conditions and compensatory mitigation included in the ITP, as required. Consultation with USFWS would occur by USACE during the required CWA Section 404 permitting (see item "Wetlands" and Mitigation Measure BIO-3.1, below).

A qualified biologist shall monitor for impacts on potentially occupied VELB habitat during construction to ensure that elderberries are identified for avoidance on site plans, and preserved on-site to the greatest extent feasible. For all potentially occupied elderberry shrubs that cannot be avoided, SJJPA and SJRRC shall quantify refined impacts based on the final design before construction, to identify the degree of actual impacts adequately to determine required mitigation acreages. These impact totals shall be verified on completion of construction based on monitoring reports and as-built drawings.

AQ-2.3: Implement fugitive dust control measures at all construction and staging areas to reduce construction-related fugitive dust, consistent with SJVAPCD Regulation VIII and SMAQMD Basic Emission Control Practices.

Refer to measure description under Impact AQ-2 in Section 3.3, *Air Quality*.

Steelhead – Central Valley DPS

The NEMDC/Steelhead Creek, which flows from north to south approximately 200 feet to the west of the proposed Del Paso Siding Upgrade/Extensions/Old North Sacramento Station, is suitable habitat for migratory Steelhead – Central Valley DPS (*Oncorhynchus mykiss irideus* pop. 11). The Central Valley DPS Steelhead is federally listed as threatened under the ESA. Populations are known from the Sacramento River and its tributaries, including the American River and Dry Creek

[8] Project proponent may consider inclusion under the *Programmatic Formal Consultation Permitting Projects with Relatively Small Effects on the Valley Elderberry Longhorn Beetle Within the Jurisdiction of the Sacramento Field Office, California* (USFWS 1996); this typically requires transplantation of elderberry shrubs after removal and additional replacement seedling plantings.

in the vicinity of the proposed project. Although this taxon requires pool and riffle complexes and cold gravelly streambeds for spawning, which are not available in the project area, Steelhead Creek in the NEMDC could serve as a migratory corridor for the taxon between spawning grounds to the north and the Sacramento River to the south, and critical habitat is designated for the taxon in Steelhead Creek. Although none of the proposed improvements would impact Steelhead Creek, the construction of a raised track bridge over Arcade Creek included in the proposed Del Paso Siding Upgrade/Extension, which connects to Steelhead Creek, could affect steelhead that may wander up Arcade Creek from Steelhead Creek during the migratory season.

Construction

Construction of the raised track bridge over Arcade Creek (included in the proposed Del Paso Siding Upgrade/Extension) could involve in-water work, such as pile driving of new bridge footings, that would generate noise levels that could result in disturbance to, as well as injury and mortality of special-status fish; this impact would be potentially significant.

In addition, aquatic habitat for special-status fish could be indirectly affected by construction activities, such as grading, clearing, and earth moving near Steelhead Creek and Arcade Creek through the generation of fugitive dust, erosion, and sedimentation, which could increase turbidity (i.e., reduce water quality) in the NEMDC/Steelhead Creek. Increased turbidity could adversely affect fish, fish habitat, and other aquatic resources. Construction activities adjacent to the NEMDC and Arcade Creek could also introduce contaminants (e.g., fuels and lubricants) directly into aquatic resource areas and indirectly in stormwater runoff through accidental spills. Turbidity plumes or fuel/lubricant spills could be transported by moving water, with the potential to affect special-status fish downstream of the project site. The project area is in the Sacramento River watershed, which is tributary to the Sacramento/San Joaquin Delta, an important state and regional estuary. The Delta is approximately 30 miles downstream from the proposed project, and could be affected by upstream activities. This impact would be potentially significant.

Operation

Potential impacts to steelhead from long-term project operation would be similar to those described for Special-Status Plants, above; impacts associated with operation of the proposed project would be less than significant.

Mitigation Measures

Implementation of the following mitigation measures would avoid and minimize potential project impacts on aquatic habitat for special-status fish, including compensation for impacts on riparian habitat and wetlands, and require special procedures for in-water work during bridge construction to avoid direct impacts on special-status fish.

Implementation of Mitigation Measures BIO-1.1 and BIO-1.2 would avoid and minimize potential project impacts on special-status fish through minimization of the temporary project footprint to avoid sensitive habitats to the greatest extent feasible, and require a preconstruction worker environmental awareness training for the identification and avoidance of sensitive habitats. Implementation of Mitigation Measure BIO-1.4 would reduce the degradation of adjacent habitats from the potential introduction of nonnative or invasive plants. Implementation of Mitigation Measure AQ-2.3 would be required to avoid and/or minimize impacts related to dust and air

pollution. Implementation of Mitigation Measures HYD-1.1, HYD-1.2, and HAZ-2.3 that require the proposed project to obtain an NPDES Construction General Stormwater Permit and implement BMPs to minimize and/or avoid the potential for sedimentation, run-off, and discharge of pollutants from construction activities.

Implementation of Mitigation Measures BIO-1.8 would reduce the proposed project's impacts on special-status fish species during construction of the Del Paso Siding Upgrade/Extension over Arcade Creek to a less-than-significant level by minimizing the effects of pile driving and implementing seasonal restrictions for in-water work. Impacts would be further reduced through implementation of Mitigation Measures BIO-2.1, BIO-2.2, and BIO-2.3 (see Impact BIO-2); and Mitigation Measures BIO-3.1 and BIO-3.2 (see Impact BIO-3).

BIO-1.1: Minimize the temporary construction impact footprint.

Refer to measure description above.

BIO-1.2: Conduct a Worker Environmental Awareness Training Program for construction personnel.

Refer to measure description above.

BIO-1.4: Develop and implement a revegetation and weed control plan.

Refer to measure description above.

BIO-1.8: Avoid and minimize impacts on special-status fish while pile driving and implement seasonal restrictions for in-water work.

Potential injury and mortality associated with pile driving, which may be required for the pile installation for the new raised track bridge over Arcade Creek, will be minimized by implementing the measures listed below.

The contractor will be required to implement the following measures, developed in coordination with project design engineers, to minimize the exposure of special-status fish species to potentially harmful underwater sounds and activities:

- If feasible, the contractor shall vibrate all piles to the maximum depth possible before using an impact hammer.
- During impact driving, the contractor shall limit the number of strikes per day to the minimum necessary to complete the work.
- The smallest pile driver and minimum force necessary shall be used to complete the work.
- During impact driving, the contractor shall be required to use a bubble ring or similar device to minimize the extent to which the interim peak and cumulative sound exposure level (SEL) thresholds are exceeded.
- Pile driving activity shall not occur at night.

- If feasible, in-water work shall occur behind a dewatered cofferdam. A biologist shall be present at initial dewatering to salvage and rescue any stranded fish.

There will be a construction work window of June 15 to October 15 for all work in the Arcade Creek channel. As Arcade Creek is typically dry during the summer months, in-channel work will be completed during the dry period to the maximum extent feasible. This time period will minimize impacts on migrating special-status fish species, such as adult steelhead, which are unlikely to be present during these periods of no flow. In-water work in flowing streams will dewater only up to half of the wetted stream at any time to allow fish passage and any obstruction will be made of clean material.

BIO-2.1: Avoid and minimize impacts on sensitive natural communities and riparian habitat.

Refer to measure description under Impact BIO-2 below.

BIO-2.2: Comply with the Section 1600 Streambed Alteration Agreement.

Refer to measure description under Impact BIO-2 below.

BIO-2.3: Implement siting constraint measures.

Refer to measure description under Impact BIO-2 below.

BIO-3.1: Avoid and minimize impacts on wetlands and other waters.

Refer to measure description under Impact BIO-3 below.

BIO-3.2: Compensate for impacts on wetlands and other waters.

Refer to measure description under Impact BIO-3 below.

AQ-2.3: Implement fugitive dust control measures at all construction and staging areas to reduce construction-related fugitive dust, consistent with SJVAPCD Regulation VIII and SMAQMD Basic Emission Control Practices.

Refer to measure description under Impact AQ-2 in Section 3.3, *Air Quality*.

HAZ-2.3: Implement a construction risk management plan (CRMP).

Refer to measure description under Impact HAZ-2 in Section 3.9, *Hazards and Hazardous Materials*.

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

Refer to measure description under Impact HYD-1 in Section 3.10, *Hydrology and Water Quality*.

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

Refer to measure description under Impact HYD-1 in Section 3.10, *Hydrology and Water Quality*.

Western Pond Turtle and Giant Garter Snake

No records of western pond turtle or giant garter snake are found in the project impact area. However, CNDDB records for both species occur in proximity to the proposed Track Curve Reconstruction South of Desmond Road ~~and the North Elk Grove Station (including all access and platform variants)~~; numerous giant garter snake occurrences also occur in the Natomas Basin west of the Natomas/Sacramento Airport Station. Suitable aquatic habitat for western pond turtle and giant garter snake occurs in canal/riverine habitat (NEMDC, Morrison Creek, Laguna Creek) and managed marsh in the vicinity of the proposed Track Curve Reconstruction South of Desmond Road, ~~North Elk Grove Station (including all access and platform variants), North Elk Grove Siding Variants, Old North Sacramento Station,~~ Del Paso Siding Upgrade/Extension, and the Natomas/Sacramento Airport Station. Western pond turtle and giant garter snake could occur in upland habitats in the footprints adjacent to suitable aquatic habitats, especially in areas with existing mammal burrows that could provide wintering refugia sites. Both western pond turtle and giant garter snake are known to occur in areas south of the Track Curve Reconstruction North of Elk Grove ~~near the North Elk Grove Siding Variants footprint~~, including the open water habitat of Laguna Creek (Regional San 2000).

Habitats by project site are presented in Table 3.4-2. Upland habitats for giant garter snake and western pond turtle include undeveloped areas (e.g., grassland, ruderal, field crop, riparian habitat) within 1,300 feet and 200 feet of suitable aquatic habitat, respectively. In this analysis, suitable aquatic habitats are ditches, canals, marshes, and open water with perennial or near-perennial hydrology. To support a conservative assessment of potentially suitable habitats for these species in the project improvement areas, all project sites within 1,300 feet of known occurrences of western pond turtle and/or giant garter snake (i.e., Desmond Road, North Elk Grove, Old North Sacramento/Del Paso Siding, and Natomas project sites) are assumed to provide potentially suitable habitat for both species. A total of 1.16 acres of suitable perennial aquatic habitat (i.e., ditch, canal, cattail marsh, and open water) and 58.59 acres of associated potentially suitable seasonal and upland habitats (i.e., blackberry scrub, ephemeral drainage, oak tree canopy, annual grassland, field/row crops, ruderal, seasonal wetland, and willow scrub) are present at these project improvement sites, adding up to a total of 59.75 acres of potentially suitable habitat for western pond turtle and giant garter snake.

Both western pond turtle and giant garter snake are Covered Species under the SSHCP and SJMCSP (County of Sacramento et al. 2018; County of San Joaquin 2000). Modeled aquatic and upland habitats for the western pond turtle are mapped adjacent to the ~~North Elk Grove Station (including all access and platform variants), North Elk Grove Siding Variants,~~ Phillips Siding Upgrade/Extension, and Track Curve Reconstruction South of Desmond Road footprints in the SSHCP Plan Area (County of Sacramento et al. 2018).

Construction

Project construction would result in disturbance to approximately 60 acres of western pond turtle and giant garter snake upland and aquatic habitat ~~(within 1,300 feet and 200 feet of suitable aquatic habitat, respectively)~~ from activities such as site preparation (e.g., vegetation clearing, grading, stockpiling materials), equipment access and operation, and other ground-disturbing construction at the proposed Track Curve Reconstruction South of Desmond Road, ~~North Elk Grove Station (including all access and platform variants), North Elk Grove Siding Variants,~~ Old Sacramento Station, Del Paso Siding Upgrade/Extensions, and the Natomas/Sacramento Airport Station. Because temporary impacts on upland habitats would be minor in extent, and are expected to return to pre-project conditions within one growing season because they are dominated by herbaceous vegetation, this impact would be less than significant. However, with the conservative assumption that disturbance to and loss of aquatic and adjacent upland habitats for western pond turtle and giant garter snake would occur at the highest estimates provided in Table 3.4-3, this impact would be potentially significant. Mitigation for modifications to habitats that are suitable for special status reptiles are addressed under mitigation measures proposed to reclaim all temporary disturbed areas to pre-project conditions (Mitigation Measure BIO-1.4), compensate for the permanent loss of nesting and foraging habitat for Swainson's hawk and white-tailed kite (Mitigation Measure BIO-1-11), compensate for temporary and permanent impacts on riparian habitat (Mitigation Measure BIO-2.2), and compensate for temporary and permanent impacts on aquatic habitats (Mitigation Measure BIO-3.2).

Three raised railroad track crossings across the following perennial drainages (i.e., creeks) are proposed as part of the proposed project: ~~Laguna Creek (Elk Grove Siding Variants); Union House Creek (North Elk Grove Siding Variants);~~ and Arcade Creek (Del Paso Siding Upgrade/Extension). All these creeks are suitable aquatic habitat for giant garter snake. Construction of raised track bridges would require in-water work in existing UPRR ROW, and would involve the installation of bridge infrastructure identical to existing UPRR bridges at each of these locations. Pile driving associated with installation of siding track bridge footings at these locations has the potential to injure or harm giant garter snake; this impact would be potentially significant.

Project construction could result in habitat degradation and the injury or mortality of western pond turtle or giant garter snake individuals (e.g., equipment strikes, crushing underground individuals), if present in the project footprint during construction of the Track Curve Reconstruction South of Desmond Road, ~~North Elk Grove Station (including all access and platform variants), North Elk Grove Siding Variants,~~ Old North Sacramento Station, Del Paso Siding Upgrade/Extension, and the Natomas/Sacramento Airport Station. This impact would be potentially significant.

Operation

Potential impacts to western pond turtle and giant garter snake from long-term project operation would be similar to those described for Special-Status Plants, above. Additional noise, vibration, and/or lights along the Sacramento Subdivision from seven new roundtrip passenger trains daily could displace individuals from limited areas of marginal upland habitat along the Sacramento Subdivision, but passenger trains would pass through these areas briefly, and are much smaller and less noisy than existing freight train service currently in operation along the Sacramento Subdivision. Individuals could also be subject to potential injury or mortality from additional

passenger train traffic along the Sacramento Subdivision, if present on the tracks (crossing or basking) when a train passes. However, the Sacramento Subdivision provides a limited extent of marginal upland habitat and does not provide a likely movement pathway between adjacent areas of suitable aquatic habitat. Potential impacts from project operation would be less than significant.

Mitigation Measures

Implementation of Mitigation Measures BIO-1.1, BIO-1.2, BIO-1.4, BIO-1.9, and BIO-1.10 would avoid impacts on western pond turtle and giant garter snake by requiring avoidance and minimization of impacts on aquatic habitats, and requiring preconstruction surveys and avoidance measures for individuals of the species. Implementation of these measures would also reduce the proposed project's impacts on western pond turtle and giant garter snake at Track Curve Reconstruction South of Desmond Road, ~~North Elk Grove Station (including all access and platform variants), North Elk Grove Siding Variants,~~ Old North Sacramento Station, Del Paso Siding Upgrade/Extension, and the Natomas/Sacramento Airport Station to a less-than-significant level. Implementation of water quality BMPs (Mitigation Measures HYD-1.1, HYD-1.2, and HAZ-2.3) and implementation of fugitive dust control measures (Mitigation Measure AQ-2.3) would further reduce construction-related habitat degradation.

BIO-1.1: Minimize the temporary construction impact footprint.

Refer to measure description above.

BIO-1.2: Conduct a Worker Environmental Awareness Training Program for construction personnel.

Refer to measure description above.

BIO-1.4: Develop and implement a revegetation and weed control plan.

Refer to measure description above.

BIO-1.9: Minimize impacts on wildlife and retain biological monitors during construction.

SJJPA and SJRRC shall retain qualified biological monitors to continuously implement the following measures during construction to minimize impacts on wildlife, including western pond turtle and giant garter snake:

- Monitor construction activity for compliance with all project permits and the approved mitigation and monitoring program for the proposed project; report on monitoring activities as required by project permits.
- During construction activities, <u>if a special-status species is observed (or</u> if an injured or dead special-status species is encountered<u>)</u>, the work shall stop in the immediate vicinity. The project applicant shall notify the biological monitor, and the appropriate resource agency (e.g., USFWS <u>and/</u>or CDFW). Any measures required by these agencies shall be implemented, and proof of implementation shall be submitted to the agencies before construction is allowed to proceed. <u>If the species is listed under CESA and in the event take cannot be avoided, the project proponent shall comply with CESA</u>

through an existing Habitat Conservation Plan (if applicable) or otherwise seek related take authorization as provided by the Fish and Game Code.

- The project applicant shall cap the top opening or fill the three holes on the top (e.g., with a bolt and nut), of any of u-channel posts, signs, or vertical poles installed temporarily or permanently throughout the course of the project to prevent the entrapment of wildlife, especially birds of prey. Fence posts, signs, or vertical poles will be checked periodically during the project.

- All fiber rolls, straw wattles, and/or hay bales utilized within and adjacent to the project site shall be free of non-native plant materials. Fiber rolls or erosion control mesh shall be made of loose-weave mesh that is not fused at the intersections of the weave, such as jute, or coconut (coir) fiber, or other products without welded weaves. Products with plastic monofilament or cross joints in the netting that are bound/stitched (such as found in straw wattles/fiber rolls and some erosion control blankets), which may cause entrapment of wildlife, shall not be allowed.

- At the end of each work day, the biological monitor shall ensure that all potential wildlife pitfalls (trenches, bores, and other excavations) have been backfilled. If backfilling is not feasible, all trenches, bores, and other excavations shall be sloped at a 3:1 ratio at the ends to provide wildlife escape ramps, or covered completely to prevent wildlife access, or fully enclosed with exclusion fencing. If any wildlife species become entrapped, construction shall not occur until the animal has left the trench or been removed by a qualified biological monitor as feasible.

- Employees and contractors shall look under vehicles and equipment for the presence of wildlife before moving vehicles and equipment. If wildlife is observed, no vehicles or equipment would be moved until the animal has left voluntarily or is removed by the biological monitor. No listed species shall be handled without the appropriate permits.

- Vehicle speed limits shall not exceed 15 miles per hour during construction and operation of the proposed project. A speed limit sign shall be posted at all project site entry locations.

- The use of high-intensity lighting, steady burning, or bright lights such as sodium vapor, quartz, halogen, or other bright spotlights shall be continuously minimized.

- Nighttime vehicle traffic associated with project activities shall be kept to a minimum volume and speed to prevent mortality of nocturnal wildlife species.

To minimize impacts on wildlife at station locations that are adjacent to wildlife habitat and open space, SJJPA and SJRRC shall design and implement lighting controls for station platforms, parking lots, and access roads to the Lodi Station or Lodi Station South Alternative, ~~the North Elk Grove Station (including all access and platform variants),~~ and Natomas/Sacramento Airport Station. Lighting will be designed to have controls that limit nighttime lighting to the minimum necessary. All lighting will be focused and downward-facing to limit illuminated areas to only the platforms and parking lot. All lighting will shut off during periods of non-use (defined as more than 30 minutes before or after scheduled trains).

If fencing is required for new parking lots, rail lines, platforms, and access roads, wildlife-safe fencing will be used and installed in such a manner so as not to entrap wildlife species at fence lines.

BIO-1.10: Implement measures to avoid western pond turtle and giant garter snake during construction.

SJJPA and SJRRC will implement the measures listed below to avoid impacts on western pond turtle and giant garter snake during project construction:

Western Pond Turtle

- Where feasible, construction activities involving construction with heavy equipment (e.g., excavation, grading, contouring) in suitable western pond turtle upland habitat will avoid the western pond turtle egg-laying period (generally mid-May to early July).
- Prior to the start of construction in western pond turtle habitat (i.e., any undeveloped areas within 1,300 feet of riverine aquatic habitat, ponds, seasonal wetlands), SJJPA and SJRRC will retain a biologist approved by the CDFW to survey and handle western pond turtles and conduct preconstruction surveys. Surveys will be conducted at each habitat area no more than 7 days prior to the initiation of ground disturbance at that location.
- If ground-disturbing activities occur during the nesting or overwintering seasons, 1 week before and within 24 hours of beginning work in suitable aquatic habitat, a qualified biologist will conduct surveys for western pond turtle. The surveys will be timed to coincide with the time of day when turtles are most likely to be active (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 quietly observe turtles. Each survey will include a 30-minute wait time after arriving on the 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 turtles are observed during either survey, a biological monitor will be present during construction activities in the aquatic habitat where the turtle was observed; and capture and relocate, if possible, any entrapped turtle. The biological monitor also will be mindful of suitable nesting and overwintering areas in proximity to suitable aquatic habitat, and periodically inspect these areas for nests and turtles.

Giant Garter Snake

- Where feasible, construction activities involving construction with heavy equipment use (e.g., excavation, grading, contouring) in suitable giant garter snake habitat will avoid the snake's inactive/dormant period (generally October 2 to April 30).
- To the maximum extent possible, all construction activities in giant garter snake habitat will be conducted during the snake's active period (May 1 to October 1).
- To reduce the likelihood of snakes entering the active construction areas that include or are adjacent to freshwater wetlands, slow-moving riverine aquatic habitat, marshes,

ditches, and canals in the Central Valley during construction activities, SJJPA and SJRRC or its contractor will install exclusion fencing along the freshwater marsh, aquatic riverine features, and open water areas outside of the environmental footprint (areas within 200 feet of suitable habitat). The exclusion fencing will be installed and maintained for the duration of construction in or adjacent to these features. The fencing will consist of 3- to 4-foot-tall erosion fencing buried at least 6 to 8 inches below the ground. To ensure that construction equipment and personnel do not affect aquatic habitat for giant garter snake outside the construction corridor, orange barrier fencing will be erected (in addition to the exclusion fencing) to clearly define the aquatic habitat to be avoided.

- A qualified biologist will conduct a preconstruction survey in suitable habitat no more than 24 hours before construction. Prior to construction each morning, construction personnel will inspect exclusion and orange barrier fencing to ensure they are in good condition. Observations of snakes in the environmental footprint and access routes will be immediately reported to the biologist, and all activities will cease until appropriate corrective measures have been completed; the snake leaves the construction site under its own volition; or the biologist determines that the snake will not be harmed. The area undergoing construction will be re-inspected and surveyed by the biologist whenever a lapse in construction activity of 2 weeks or more occurs.

- Any ground-disturbing activities within 200 feet of giant garter snake habitat that occur after October 1 will be monitored by a USFWS- and a CDFW-approved biologist for the duration of the work.

- Vegetation clearing within 200 feet of the banks of potential giant garter snake aquatic habitat will be limited to the minimum area necessary. Giant garter snake habitat outside of—but adjacent to—the construction areas will be flagged, and designated as an environmentally sensitive area to be avoided by all construction personnel.

- The movement of heavy equipment within 200 feet of the banks of potential giant garter snake aquatic habitat will be confined to designated access and haul routes to minimize habitat disturbance.

- Staging areas will be at least 200 feet from suitable giant garter snake aquatic habitat.

Potential injury and mortality associated with pile driving, which may be required for the pile installation for the new bridge~~s~~ across ~~Laguna Creek, Union House Creek, and~~ Arcade Creek, will be minimized by implementing the measures listed below.

- The contractor will be required to implement the following measures, developed in coordination with project design engineers, to minimize the exposure of special-status aquatic wildlife species to potentially harmful underwater sounds and activities:

- If feasible, the contractor shall vibrate all piles to the maximum depth possible before using an impact hammer.

- During impact driving, the contractor shall limit the number of strikes per day to the minimum necessary to complete the work.

- The smallest pile driver and minimum force necessary shall be used to complete the work.
- During impact driving, the contractor shall be required to use a bubble ring or similar device to minimize the extent to which the interim peak and cumulative SEL thresholds are exceeded.
- Pile driving activity shall not occur at night.
- If feasible, in-water work shall occur behind a dewatered cofferdam. A biologist shall be present at initial dewatering to salvage and rescue any stranded wildlife.

AQ-2.3: Implement fugitive dust control measures at all construction and staging areas to reduce construction-related fugitive dust, consistent with SJVAPCD Regulation VIII and SMAQMD Basic Emission Control Practices.

Refer to measure description under Impact AQ-2 in Section 3.3, *Air Quality*.

HAZ-2.3: Implement a construction risk management plan (CRMP).

Refer to measure description under Impact HAZ-2 in Section 3.9, *Hazards and Hazardous Materials*.

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

Refer to measure description under Impact HYD-1 in Section 3.10, *Hydrology and Water Quality*.

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

Refer to measure description under Impact HYD-1 in Section 3.10, *Hydrology and Water Quality*.

Swainson's Hawk and White-Tailed Kite

Suitable nesting and foraging habitat are present and numerous occurrences are documented throughout the project area for both Swainson's hawk and white-tailed kite. There are 286 records of Swainson's hawk within 5 miles of the project area, with nests recorded in cottonwood, willow, sycamore, valley oak, and walnut trees (CDFW 2019a). Swainson's hawk are known to occur in the Regional San Bufferlands 1.5 miles southwest of the proposed Track Curve Reconstruction North of Elk Grove ~~surrounding the North Elk Grove Station (including all access and platform variants) and North Elk Grove Siding Variants footprints. One nest has been documented near the southern boundary of the Regional San plant process facility, within 0.25 mile southwest of the proposed North Elk Grove Siding Variants~~ (Regional San 2000). During the project scoping period, Caltrans commented that known records of nesting Swainson's hawk are in the vicinity of the proposed Lodi Station footprint.

Riparian areas and dense-topped trees in and adjacent to the project area provide suitable nesting habitat for white-tailed kite; and annual grasslands, wetlands, and agricultural areas in and adjacent to the project area provide suitable foraging habitat. This species is known to nest

along the Sacramento and American rivers within 0.5 mile of the proposed Midtown Sacramento Station (CDFW 2019a). This species has also been documented at the proposed ~~North Elk Grove Station (including all access and platform variants), North Elk Grove Siding Variants, and~~ Natomas/Sacramento Airport Station footprints ~~(Regional San 2000; CDFW 2019a)~~. There are 15 records of this species within 5 miles of the project area (CDFW 2019a).[9]

Habitats by project site are presented in Table 3.4-2 and are summarized for total potential permanent and temporary impact in Table 3.4-3. Potentially suitable nesting habitat for Swainson's hawk and white-tailed kite in the project improvement areas consists of oak tree canopy at the Hammer Lane, Lodi, Thornton, Old North Sacramento, and Natomas project improvement areas (Table 3.4-2). Potential foraging habitat for these two species in the project improvement areas includes nonnative annual grassland at the Thornton and Old North Sacramento project improvement areas; row and field crops at the Hammer Lane, Lodi, Thornton and Phillips project improvement areas; and open ruderal areas adjacent to grassland or other open habitats at the Hammer Lane, Lodi, Thornton, Desmond Road, Phillips, North Elk Grove, Old North Sacramento and Natomas project improvement areas (Table 3.4-2).

Both Swainson's hawk and white-tailed kites are Covered Species under the SSHCP and SJMCSP (County of Sacramento et al. 2018; County of San Joaquin 2000). Nesting and foraging habitats for Swainson's hawk and white-tailed kite are mapped in the SSHCP Plan Area ~~in and~~ adjacent to the ~~North Elk Grove Station (including all access and platform variants), North Elk Grove Siding Variants, and the~~ Track Curve Reconstruction South of Desmond Road footprints; and foraging habitat for both species is mapped surrounding the Phillips Siding Upgrade/Extension (County of Sacramento et al. 2018).

Construction

Project construction would result in disturbance to or loss of approximately 6.25 acres of potential nesting (i.e., oak tree canopy) and approximately 111 acres of foraging habitat (i.e., nonnative annual grassland, row and field crops, and ruderal habitat) for Swainson's hawk and white-tailed kite from activities such as site preparation (e.g., vegetation clearing, tree removal, grading, stockpiling materials), equipment access and operation, and other ground-disturbing construction. Construction activities could disturb nesting Swainson's hawk and white-tailed kite, causing nest failure; or could result in direct impacts, including removal of trees with active nests, causing injury or mortality of individuals: this impact would be potentially significant.

Because temporary impacts would occur in marginal habitat, be minor in extent, and are expected to return to pre-project conditions within one growing season because they are dominated by herbaceous vegetation, this impact would be less than significant.

Operation

Potential impacts on Swainson's hawk and white-tailed kite from long-term project operation would be similar to those described for Special-Status Plants, above. Additional noise, vibration, and/or lights along the Sacramento Subdivision from seven new roundtrip passenger trains daily could displace individuals from limited areas of marginal upland habitat along the Sacramento

[9] This total may be reduced since it may include records near the now-deleted North Elk Grove Station (including all access and siding variants).

Subdivision; however, passenger trains would pass through these areas briefly, and are much smaller and less noisy than existing freight train service currently operation along the Sacramento Subdivision. Impacts related to project operation would be less than significant.

Mitigation Measures

Implementation of Mitigation Measures BIO-1.1, BIO-1.2, BIO-1.4, BIO-1-9, and BIO-1.11 would avoid and minimize potential project-related impacts on Swainson's hawk and white-tailed kite through preconstruction surveys and avoidance measures that are consistent with regional conservation plans. Furthermore, Mitigation Measure BIO-1.11 would compensate for loss of foraging habitat through participation in regional mitigation fee programs. Implementation of water quality BMPs (Mitigation Measures HYD-1.1, HYD-1.2 and HAZ-2.3) and implementation of fugitive dust control measures (Mitigation Measure AQ-2.3) would further reduce construction-related habitat degradation, along with implementation of Mitigation Measures BIO-1.1 and BIO-1.4, which require minimization of temporary impacts and reclamation of temporary disturbance areas back to pre-project conditions. With implementation of these mitigation measures, project-related impacts on Swainson's hawk and white-tailed kite would be reduced to a less-than-significant level.

BIO-1.1: Minimize the temporary construction impact footprint.

Refer to measure description above.

BIO-1.2: Conduct a Worker Environmental Awareness Training Program for construction personnel.

Refer to measure description above.

BIO-1.4: Develop and implement a revegetation and weed control plan.

Refer to measure description above.

BIO-1.9: Minimize impacts on wildlife and retain biological monitors during construction.

Refer to measure description above.

BIO-1.11: Conduct a preconstruction survey for Swainson's hawk and white-tailed kite, and implement avoidance measures, as needed. Compensate for loss of Swainson's hawk and white-tailed kite foraging habitat.

SJJPA and SJRRC shall implement the following measures to avoid and minimize impacts on Swainson's hawk and white-tailed kite:

- Trees will not be removed during the breeding season for nesting raptors (March 1 through September 15), unless a survey by a qualified biologist verifies that no active nests are in the trees.
- For project activities (including construction staging) that begin between March 1 and September 15, SJJPA and SJRRC shall retain a qualified biologist who will conduct

preconstruction surveys for Swainson's hawk and white-tailed kite, and identify active nests on and within 0.25 mile of the project area. The surveys will be conducted before the beginning of any staging or construction activities between March 1 and September 15 and a separate survey will be conducted for each breeding season in which project activities will occur.

- Surveys for Swainson's hawk will be timed in accordance with the Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in California's Central Valley (Swainson's Hawk Technical Advisory Committee 2000). To meet the minimum level of protection for the species, the surveys will be completed for at least the two survey periods immediately before the project's implementation and/or initiation surveys the year or season prior to construction. Appropriate survey periods will include:

  - Between January and March 20, before Swainson's hawk returns from migration, an optional survey of the project segments may be conducted to determine potential nest locations.

  - Between March 20 and April 5, old nests, staging birds, and competing species will be observed. The hawks are expected to be in their territories during survey hours from sunrise to 10 a.m., and from 4 p.m. to sunset.

  - Between April 5 and April 20, both males and females are expected to be actively nest-building, visiting their selected site frequently. Territorial and courtship displays and copulation will be increased. The birds will tend to vocalize often, and their nest locations will be identified easily.

  - Between June 10 and July 30 (post-fledging), from sunrise to noon, and from 4 p.m. to sunset, young birds are expected to be active and visible. Both adult parents will make numerous trips to the nest, and often will soar above, or will perch near or on the nest tree, allowing easy observation.

  If no active nests are found, a letter report documenting the survey methods and results will be submitted to CDFW, and no further mitigation will be required.

- If an active Swainson's hawk or white-tailed kite nest is found, impacts on nesting Swainson's hawks and white-tailed kites will be avoided by establishing appropriate buffers around active nest sites and utilizing a biological monitor to establish baseline nesting behavior and to assess responses to disturbance during construction activities. ~~assess bird behavior for any nests identified during preconstruction Swainson's hawk surveys.~~ CDFW guidelines and the SSHCP recommend implementation of a ~~0.25-~~ 0.5-mile-wide buffer for Swainson's hawk and a 0.25-mile wide buffer for white-tailed kite, but the size of the buffer may be adjusted if a qualified biologist and SJJPA and SJRRC, ~~in consultation with CDFW,~~ determine that such an adjustment would not be likely to adversely affect the nest. No project activity will begin in the buffer areas until a qualified biologist has determined, in coordination with CDFW, that the young have fledged, the nest is no longer active, or reducing the buffer will not be likely to result in nest abandonment. Nest monitoring by a qualified biologist

during and after construction or staging activities will be required if the activity has the potential to adversely affect a nest.

- In the event take of Swainson's hawk cannot be avoided, the project proponent may seek related take authorization as provided by the Fish and Game Code or otherwise comply with CESA through an existing Habitat Conservation Plan (if applicable).
- If it is determined during surveys or project implementation that project activities may impact white-tailed kite, project personnel shall fully avoid any impacts that may result in take if white-tailed kite is observed to be utilizing the project area or adjacent area.

To mitigate for the permanent removal of habitat, the SJJPA and SJRRC shall mitigate for in accordance with the Staff Report for Impacts to Swainson's Hawks (Buteo swainsoni) in the Central Valley of California (CDFW 1994). Permanent impacts to nesting habitat will be mitigated and may include permanent protection, enhancement, or restoration of suitable nesting habitat, purchase of credits at a CDFW-approved bank or conservation site, or through an existing Habitat Conservation Plan (if applicable). Permanent impacts to foraging habitat will be mitigated and may include permanent protection, enhancement, or restoration of suitable nesting habitat, purchase of credits at a CDFW-approved bank or conservation site, or through an existing Habitat Conservation Plan (if applicable). ~~approximately 30 acres of suitable grassland foraging habitat at the North Elk Grove Station (including all access and platform variants) As portions of the project~~ footprint are in unincorporated Sacramento County, SJJPA and SJRRC may also ~~shall~~ participate in Sacramento County's voluntary Swainson's Hawk Mitigation Program. ~~Because the North Elk Grove station will impact fewer than 40 acres, mitigation can be achieved by paying a mitigation fee or providing replacement habitat (title or easement to suitable Swainson's hawk mitigation lands on a per-acre basis)~~.

AQ-2.3: Implement fugitive dust control measures at all construction and staging areas to reduce construction-related fugitive dust, consistent with the SJVAPCD Regulation VIII and SMAQMD Basic Emission Control Practices.

Refer to measure description under Impact AQ-2 in Section 3.3, *Air Quality*.

HAZ-2.3: Implement a construction risk management plan (CRMP).

Refer to measure description under Impact HAZ-2 in Section 3.9, *Hazards and Hazardous Materials*.

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

Refer to measure description under Impact HYD-1 in Section 3.10, *Hydrology and Water Quality*.

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

Refer to measure description under Impact HYD-1 in Section 3.10, *Hydrology and Water Quality*.

Western Burrowing Owl

The annual grassland and field/row crop agricultural areas in and adjacent to the project area provide suitable nesting and foraging habitat for burrowing owl. Hundreds of ground squirrel burrows were documented along UPRR tracks during biological surveys that, when present adjacent to suitable foraging habitats (i.e., grazed/managed grasslands and row/field crops) could support nesting burrowing owls. There are 49 records of this species within 5 miles of the project area (CDFW 2019a). Western burrowing owls have been documented nesting adjacent to the UPRR tracks south of the Track Curve Reconstruction North of Elk Grove ~~in the North Elk Grove Siding Variants~~ footprint (Regional San 2000).

Habitats by project site are presented in Table 3.4-2 and are summarized for total potential permanent and temporary impact in Table 3.4-3. Potentially suitable habitats for western burrowing owl in the project improvement areas include grassland habitat in the Thornton and Old North Sacramento project improvement areas; field and row crops at the Hammer Lane, Lodi, Thornton, and Phillips project footprints; and low-growing or mowed ruderal habitats adjacent to open habitats.

The western burrowing owl is a Covered Species under the SSHCP and SJMSCP (County of Sacramento et al. 2018; County of San Joaquin 2000). Modeled nesting habitat for western burrowing owl in the SSHCP Plan Area is present in the grasslands in and surrounding the Track Curve Reconstruction North of Elk Grove ~~North Elk Grove Station (including all access and platform variants) and the North Elk Grove Siding footprints~~, and wintering habitats are mapped in areas surrounding the Phillips Siding Upgrade/Extension and Track Curve Reconstruction South of Desmond Road footprints (County of Sacramento et. al. 2018).

Construction

Project construction would result in disturbance to or the loss of approximately 30 acres of potential nesting and wintering habitat for western burrowing owl (i.e., nonnative annual grassland, row and field crops, and mowed ruderal vegetation where burrows are present) resulting from activities such as site preparation (e.g., vegetation clearing, grading, stockpiling materials), equipment access and operation, and other ground-disturbing construction at the Natomas/Sacramento Airport Station, Old North Sacramento Station, City College Station, ~~North Elk Grove Siding Variants~~, and Track Curve Reconstruction between East March Lane and East Swain Road footprints. Construction of the proposed project could result in direct impacts, including burying/removal of occupied burrows and mortality of individual burrowing owls. This impact would be potentially significant.

Because temporary impacts would occur in marginal habitat, be minor in extent, and are expected to return to pre-project conditions within one growing season because they are dominated by herbaceous vegetation, this impact would be less than significant. However, project construction could also result in habitat degradation, which would be a potentially significant impact. Mitigation for modifications to habitats that are suitable for western burrowing owl are addressed under mitigation measures proposed to reclaim all temporary disturbed areas to pre-project conditions (Mitigation Measure BIO-1.4), compensate for the permanent loss of nesting and foraging habitat for Swainson's hawk and white-tailed kite (Mitigation Measure BIO-1-11), and compensate for temporary and permanent impacts on aquatic habitats (Mitigation Measure BIO-3.2).

Operation

Potential impacts on burrowing owl from long-term project operation would be similar to those described for Special-Status Plants, above. Additional noise, vibration, and/or lights along the Sacramento Subdivision from seven new roundtrip passenger trains daily could displace individuals from limited areas of marginal upland habitat along the Sacramento Subdivision; however, passenger trains would pass through these areas briefly, and are much smaller and less noisy than existing freight train service currently operation along the Sacramento Subdivision. Therefore, impacts related to operation would be less than significant.

Mitigation Measures

Implementation of Mitigation Measure BIO-1.12 would avoid and minimize impacts on habitat for and impacts on western burrowing owl, and is consistent with SSHCP Avoidance and Minimization Measures for the species, implementation of which would compensate for potential project-related impacts on western burrowing owl through preconstruction surveys and avoidance measures. Implementation of Mitigation Measure BIO-1.12 would reduce project-related impacts on western burrowing owl to a less-than-significant level. Implementation of water quality BMPs (Mitigation Measures HYD-1.1 HYD-1.2, and HAZ-2.3) and implementation of fugitive dust control measures (Mitigation Measure AQ-2.3) would further reduce construction-related habitat degradation, along with implementation of BIO-1.1, BIO-1.2 and BIO-1.4, which require minimization of temporary impacts and reclamation of temporary disturbance areas back to pre-project conditions.

BIO-1.1: Minimize the temporary construction impact footprint.

Refer to measure description above.

BIO-1.2: Conduct a Worker Environmental Awareness Training Program for construction personnel.

Refer to measure description above.

BIO-1.4: Develop and implement a revegetation and weed control plan.

Refer to measure description above.

BIO-1.12: Conduct ~~a~~ preconstruction surveys for western burrowing owl and implement avoidance measures, as needed.

Prior to any ground disturbance, SJJPA and SJRRC shall retain an approved biologist to conduct preconstruction surveys in all areas that were identified as suitable habitat for burrowing owls (i.e., annual grassland and row/crop fields) in and adjacent to project components. The purpose of the preconstruction surveys is to document the presence or absence of burrowing owls on the project site, particularly in areas within 150 meters ~~250 feet~~ of construction activities. To maximize the likelihood of detecting owls, the preconstruction surveys will consist of 3 or more surveys during daylight hours, a ~~last a~~ minimum of 3 hours, and each survey will be 3 weeks apart. The preconstruction surveys must be conducted during peel breeding season (April 15 to July 15) (CDFW 2012). The

surveys will begin 1 hour before sunrise and continue until at least 2 hours after sunrise (minimum of 3 hours total)~~; or begin 2 hours before sunset and continue until 1 hour after sunset~~. Additional time may be required for large project sites. ~~A minimum of two preconstruction surveys will be conducted (if owls are detected on the first survey, a second survey is not needed).~~ It is also recommended that surveys occur during three important periods in the burrowing owl's breeding season; during the incubation period, during the nesting period, and during the late nestling period in order to maximize the effectiveness of detecting burrowing owl (CDFW 2012). All owls observed will be counted, and their location will be mapped. ~~Surveys will conclude no more than 2 calendar days prior to construction.~~ Therefore, SJJPA and SJRRC must begin surveys the nesting season ~~no more than 4 days~~ prior to construction ~~(2 days of surveying plus up to 2 days between surveys and construction). To avoid last-minute changes in schedule or contracting that may occur if burrowing owls are found, the Third-Party Project Proponent may also conduct a preliminary survey up to 15 days before construction. This preliminary survey may count as the first of the two required surveys, as long as the second survey concludes no more than 2 calendar days in advance of construction~~.

If western burrowing owl or evidence of western burrowing owl is observed on the project site or within ~~250 feet~~ 150-meters of the project site during preconstruction surveys, then the following will occur:

During Breeding Season: If the approved biologist finds evidence of western burrowing owls in a project site during the breeding season (February 1 through August 31), all project-related activities will avoid nest sites during the remainder of the breeding season, or while the nest remains occupied by adults or young (nest occupation includes individuals or family groups foraging on or near the site following fledging). Avoidance is establishment of a minimum ~~250-foot~~ 150-meter buffer zone around nests. Construction and other project-related activities may occur outside of the ~~250-foot~~ 150-meter buffer zone with a qualified biological monitor. Construction and other project-related activities may be allowed inside of the ~~250-foot~~ 150-meter non-disturbance buffer during the breeding season if the nest is not disturbed, and the Third-Party Project Proponent develops an avoidance, minimization, and monitoring plan that is approved by the ~~Implementing Entity and Wildlife Agencies~~ SJJPA and SJRRC prior to project construction, based on the following criteria:

- Wildlife Agencies approve of the avoidance and minimization plan provided by the project applicant.
- An approved biologist monitors the owls for at least 3 days prior to construction to determine baseline nesting and foraging behavior (i.e., behavior without construction).
- The same approved biologist monitors the owls during construction and finds no change in owl nesting and foraging behavior in response to construction activities.

If there is any change in owl nesting and foraging behavior as a result of construction activities, the approved biologist will have authority to shut down activities within the ~~250-foot~~ 150-meter buffer. Construction cannot resume within the 250-foot buffer until any owls present are no longer affected by nearby construction activities, and with concurrence from the Wildlife Agencies.

If monitoring by the approved biologist indicates that the nest is abandoned prior to the end of nesting season and the burrow is no longer in use, the non-disturbance buffer zone may be removed if approved by the Wildlife Agencies. The approved biologist will excavate the burrow in accordance with the latest CDFW guidelines for burrowing owl to prevent reoccupation after receiving approval from the Wildlife Agencies. The Implementing Entity and Wildlife Agencies will respond to a request from the Third-Party Project Proponent to review the proposed construction monitoring plan within 21 days.

During the Non-Breeding Season: During the non-breeding season (September 1 through January 31), the approved biologist will establish a minimum 250-foot non-disturbance buffer around occupied burrows. Construction activities outside of this 250-foot buffer will be allowed. Construction activities within the non-disturbance buffer will be allowed if the following criteria are met to prevent owls from abandoning overwintering sites:

- An approved biologist monitors the owls for at least 3 days prior to construction to determine baseline foraging behavior (i.e., behavior without construction).
- The same approved biologist monitors the owls during construction, and finds no change in owl foraging behavior in response to construction activities.
- If there is any change in owl foraging behavior as a result of construction activities, the approved biologist will have authority to shut down activities within the 250-foot buffer.
- If the owls are gone for at least 1 week, the SJJPA and SJRRC may request approval from Wildlife Agencies that an approved biologist excavate usable burrows and install one-way exclusionary devices to prevent owls from re-occupying the site. After all usable burrows are excavated, the buffer zone will be removed, and construction may continue.
- Monitoring must continue as described above for the non-breeding season as long as the burrow remains active.

AQ-2.3: Implement fugitive dust control measures at all construction and staging areas to reduce construction-related fugitive dust, consistent with the SJVAPCD Regulation VIII and SMAQMD Basic Emission Control Practices.

Refer to measure description under Impact AQ-2 in Section 3.3, *Air Quality*.

HAZ-2.3: Implement a construction risk management plan (CRMP).

Refer to measure description under Impact HAZ-2 in Section 3.9, *Hazards and Hazardous Materials*.

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

Refer to measure description under Impact HYD-1 in Section 3.10, *Hydrology and Water Quality*.

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

Refer to measure description under Impact HYD-1 in Section 3.10, *Hydrology and Water Quality*.

Greater Sandhill Crane

Greater sandhill crane require open shortgrass plains, grain fields, and open wetlands to forage, where they feed on grasses, forbs, cereal crops, roots, tubers, seeds, grains, and soil invertebrates (CDFW 2020). The species roosts at night in flocks standing in moist fields or shallow water, or expansive, dry grasslands. There are numerous records of greater sandhill crane (including winter roost sites) reported in the wetlands adjacent to the Track Curve Reconstruction South of Desmond Road project footprint, as well as in Stone Lakes Wildlife Refuge approximately ~~2~~ 4.5 miles southwest of the proposed Track Curve Reconstruction North of Elk Grove ~~North Elk Grove Siding Variants~~ (County of Sacramento et al. 2018). The species is documented in the Regional San Bufferlands south of the Track Curve Reconstruction North of Elk Grove ~~near the North Elk Grove Station/ North Elk Grove Siding~~ footprint~~s~~ (Regional San 2000). The SSHCP maps high-value forage habitat adjacent to the Track Curve Reconstruction South of Desmond Road and Phillips Siding Upgrade/Extension footprints, and high-value roost habitat within 1 mile of the Thornton Siding Upgrade/Extension, Track Curve Reconstruction South of Desmond Road, and Phillips Siding Upgrade/Extension improvements (County of Sacramento et al. 2018). Sandhill cranes were observed foraging in fields adjacent to the Phillips Siding Upgrade/Extension footprint during 2019 biological surveys.

Habitats by project site are presented in Table 3.4-2 and are summarized for total potential permanent and temporary impact in Table 3.4-3. Suitable foraging habitats for greater sandhill crane are present in low-growing vegetation communities (i.e., annual grassland, seasonal wetland, and field/row crops) and open water habitat in the project improvement areas within one mile of known records and occupied or modeled habitats for greater sandhill crane (i.e., Desmond Road, Phillips, North Elk Grove, and Thornton).

Construction

Project construction would result in the loss of approximately 2.4~~3~~ acres of potential foraging habitat (i.e., grasslands, seasonal wetlands, and crop fields) for greater sandhill crane resulting from activities such as site preparation (e.g., vegetation clearing, grading, stockpiling materials), equipment access and operation, and other ground-disturbing construction at project footprints in the vicinity of the Cosumnes River Preserve (i.e., the Phillips Siding Upgrade/Extension and Thornton Siding Upgrade/Extension improvements) ~~and the North Elk Grove Station (including all access and platform variants) and North Elk Grove Siding Variants footprints~~. No impacts on greater sandhill crane habitat would result from the Track Curve Reconstruction South of Desmond Road, because all work would be on existing track. Data from the Consumnes River Preserve 2019-2020 survey season shows roosting sandhill cranes in three seasonal wetland ponds within the 500-foot buffer of the Track Curve Construction South of Desmond Road environmental footprint and within two additional wetland ponds adjacent to the 500-foot buffer of the Track Curve Construction South of the Desmond Road environmental footprint (Consumnes River Preserve Data 2020). No potential suitable roost sites would be impacted (i.e., removed) by

the proposed project. ~~No known roosts or roost habitats are mapped in the project footprint; therefore, no suitable roost sites would be impacted (i.e., removed) by the proposed project.~~ Construction of the proposed project could result in direct loss of sandhill crane foraging habitat that would be potentially significant. Mitigation for modifications to habitats that are suitable for greater sandhill crane are addressed under mitigation measures proposed to reclaim all temporary disturbed areas to pre-project conditions (Mitigation Measure BIO-1.4), compensate for the permanent loss of nesting and foraging habitat for Swainson's hawk and white-tailed kite (Mitigation Measure BIO-1-11), and compensate for temporary and permanent impacts on aquatic habitats (Mitigation Measure BIO-3.2).

Temporary impacts on greater sandhill crane at the Thornton Siding Upgrade/Extension, Track Curve Reconstruction North of North New Hope Road, Track Curve Reconstruction South of Desmond Road, Phillips Siding Upgrade/Extension, ~~the North Elk Grove Station (including all access and platform variants)~~, and Track Curve Reconstruction North of Elk Grove ~~North Elk Grove Siding Variants~~ include disturbance from noise and activity related to the use of construction equipment and the presence of construction personnel that may cause individuals to become stressed, and leave foraging and/or roosting habitat, potentially causing the species to abandon the safety of their roosts, and lead to potential injury and mortality: this impact would be potentially significant.

Operation

Potential impacts on greater sandhill crane from long-term project operation would be similar to those described for Special-Status Plants, above. Additional noise, vibration, and/or lights along the Sacramento Subdivision from seven new roundtrip passenger trains daily could displace individuals from limited areas of marginal upland habitat along the Sacramento Subdivision and the Track Curve Construction South of Desmond Road project component; however, passenger trains would pass through these areas briefly, and are much smaller and less noisy than existing freight train service currently operation along the Sacramento Subdivision. Therefore, impacts related to operation would be less than significant.

Mitigation Measures

Implementation of Mitigation Measures BIO-1.1, BIO-1.2, BIO-1.4, and BIO-1.9, which require minimization of temporary impacts, and reclamation of temporary disturbance areas back to pre-project conditions. Implementation of Mitigation Measure BIO-1.13 would avoid and minimize potential impacts on greater sandhill cranes through project design and construction BMPs. The mitigation measure is consistent with the SSHCP's avoidance and minimization measures for greater sandhill crane, and would compensate for potential project-related impacts on greater sandhill crane through preconstruction surveys and avoidance measures. Implementation of these mitigation measures would reduce impacts on greater sandhill crane at the proposed Thornton Siding Upgrade/Extension, Track Curve Reconstruction North of North New Hope Road, Track Curve Reconstruction South of Desmond Road, Phillips Siding Upgrade/Extension, ~~the North Elk Grove Station (including all access and platform variants)~~, and Track Curve Reconstruction North of Elk Grove ~~North Elk Grove Siding Variants~~ footprints to a less-than-significant level.

BIO-1.1: Minimize the temporary construction impact footprint.

Refer to measure description above.

BIO-1.2: Conduct a Worker Environmental Awareness Training Program for construction personnel.

Refer to measure description above.

BIO-1.4: Develop and implement a revegetation and weed control plan.

Refer to measure description above.

BIO-1.9: Minimize impacts on wildlife and retain biological monitors during construction.

Refer to measure description above.

BIO-1.13: Conduct a preconstruction survey for greater sandhill crane roost sites and implement avoidance measures, as needed.

Prior to project construction, SJJPA and SJRRC will retain a qualified biologist to conduct preconstruction surveys to determine if active roosting sites are present within a 0.5-mile radius of a project footprint if existing or potential roosting sites were found during initial surveys or if ~~, and~~ construction activities will occur when wintering flocks are present in the project area ~~SSHCP Plan Area~~ (September 1 through March 15). An approved biologist will conduct preconstruction surveys within 15 days prior to ~~of~~ initiating ground-disturbing activities, and within 0.5 mile of a project footprint, to determine presence of roosting greater sandhill cranes. Preconstruction surveys will be conducted September 1 through March 15, when wintering flocks are present in the ~~Plan Area~~ project area. If birds are present at active roosting sites within a 0.5-mile buffer of a project footprint, then the following avoidance measures will be implemented. The qualified ~~approved~~ biologist will inform the ~~Land Use Authority Permittee and Implementing Entity of species locations, and they in turn will notify the Wildlife Agencies~~ SJJPA and SJRRC.

- The SJJPA and SJRRC will establish a 0.5-mile temporary roosting disturbance buffer around the roosting site until the cranes have left, or construct a visual barrier for the duration of project construction.

- A qualified biologist experienced with greater sandhill crane behavior will be retained by the SJJPA and SJRRC to monitor the roosting site throughout the roosting season, and to determine when the birds have left. The approved biologist will be on site daily while construction-related activities are taking place in the disturbance buffer. Work within the temporary disturbance buffer can only occur with the written permission of the SJJPA and SJRRC ~~Implementing Entity and Wildlife Agencies~~. If greater sandhill cranes show any sign of disturbance ~~are abandoning their roosting and/or forage sites~~, the ~~approved~~ qualified biologist will have the authority to shut down construction activities. If roost abandonment occurs, the SJJPA and SJRRC will consult with CDFW ~~approved biologist, SJJPA, SJRRC, Implementing Entity, and Wildlife Agencies will~~

~~meet~~ to determine the best course of action to avoid harm and harassment of individuals.

- The ~~approved~~ qualified biologist will also train construction personnel on the avoidance procedures, buffer zones, and protocols in the event that greater sandhill cranes move into an active construction zone (i.e., outside the buffer zone).
- If it is determined during surveys or project implementation that project activities may impact greater sandhill crane, project personnel shall fully avoid any impacts that may result in take of greater sandhill crane.

Other Special-Status Birds, Migratory Birds, and Other Raptors

Other special-status birds and raptors with potential to occur in the project site include tricolored blackbird, yellow warbler, yellow-breasted chat, loggerhead shrike, song sparrow (Modesto population), double-crested cormorant (rookery), purple martin, cooper's hawk, northern harrier, ferruginous hawk, ~~and~~ merlin, as well as migratory waterfowl and waterbirds. Of these, ferruginous hawk and merlin do not breed in the project region, and would only be present during the winter. Ferruginous hawk is a Covered Species under the SSHCP and SJMSCP, and merlin is a Covered Species under the SJMSCP (County of Sacramento et al. 2018; County of San Joaquin 2000).

Records of ferruginous hawk and merlin during winter exist near the Track Curve Reconstruction North of Elk Grove, ~~North Elk Grove Station (including all access and platform variants), North Elk Grove Siding Variants~~, Lodi Station, Lodi Station South Alternative, and Lodi Siding Variants footprints. Project-related impacts on wintering ferruginous hawk and merlin include disturbance during project construction, and loss of foraging habitat (i.e., grassland and field/row crop habitats) at these locations. Loss of other riparian forest habitat that may be occupied would be minimal due to the limited and patchy distribution of these habitats in the Track Curve Reconstruction North of Elk Grove ~~North Elk Grove Siding Variants~~ and Lodi Siding Variants. Loss of grassland and agricultural foraging habitat for wintering ferruginous hawk and merlin would be mitigated through implementation of Mitigation Measure BIO-1.11, described above; impacts on suitable riparian foraging habitats are reduced through implementation of Mitigation Measures BIO-2.1, BIO-2.2, and BIO-2.3 under Impact BIO-2. Temporary disturbance to wintering ferruginous hawk and merlin include noise and activity related to use of construction equipment and increased human presence; however, these species are highly mobile and could avoid temporary disturbance by flying to other suitable grassland, agricultural, and riparian habitat near the proposed project. Project-related impacts on wintering ferruginous hawk and merlin are less than significant.

Suitable nesting habitat for tricolored blackbird, yellow warbler, yellow-breasted chat, loggerhead shrike, song sparrow (Modesto population), purple martin, short-eared owl, cooper's hawk, northern harrier occurs in and adjacent to the proposed project. Suitable habitats include blackberry scrub, willow scrub, cattail marsh, and riparian habitats that could be used by the tricolored blackbird, yellow warbler, yellow-breasted chat, double-crested cormorant, and song sparrow (Modesto population); weepholes in the Sutterville and Cosumnes river overpasses that could be used by purple martin; riparian and oak canopy habitats that could be used by Cooper's hawk; and open grassland and dense ruderal areas that could be used by Northern Harrier.

Cooper's hawk, tricolored blackbird, northern harrier, and loggerhead shrike are all Covered Species under the SSHCP and SJMSCP (County of Sacramento et al. 2018; County of San Joaquin 2000). The SJMSCP also includes short-eared owl, yellow warbler, yellow-breasted chat, and double-crested cormorant as Covered Species (County of San Joaquin 2000).

Suitable foraging and nesting habitat for migratory waterfowl and waterbirds is present in the Cosumnes River Preserve ponds and the Bufferlands.

Construction

Project construction involves the removal of vegetation, including trees, shrubs, and herbaceous plants that may be used as nesting habitat for birds and raptors. There is a potential for special-status and other nesting birds to be directly impacted through removal of vegetation containing nests, and indirectly impacted through noise and other disturbance during construction of the proposed project; this impact is potentially significant. If project implementation occurs during the bird breeding season (generally February 1 through August 31), active nests may be present in vegetation slated for removal. In addition, increased disturbance may occur from noise, human presence, and grading/construction activities. Construction noise would have the potential to cause bird nest abandonment in locations adjacent to work areas. Indirect impacts from these activities would be temporary, and such impacts would end with project completion. Mitigation for modifications to habitats that are suitable for special status and nesting birds are addressed under mitigation measures proposed to reclaim all temporary disturbed areas to pre-project conditions (Mitigation Measure BIO-1.4), compensate for the permanent loss of nesting and foraging habitat for Swainson's hawk and white-tailed kite (Mitigation Measure BIO-1-11), compensate for temporary and permanent impacts on riparian habitat (Mitigation Measure BIO-2.2), and compensate for temporary and permanent impacts on aquatic habitats (Mitigation Measure BIO-3.2).

Operation

Potential impacts on nesting birds and raptors from long-term project operation would be similar to those described for "Special-Status Plants," above. Additional noise, vibration, and/or lights along the Sacramento Subdivision from seven new roundtrip passenger trains daily could displace individuals from limited areas of marginal upland habitat along the Sacramento Subdivision; however, passenger trains would pass through these areas briefly, and are much smaller and less noisy than existing freight train service currently operation along the Sacramento Subdivision. Therefore, impacts related to operation would be less than significant.

Mitigation Measures

Implementation of Mitigation Measures BIO-1.1, BIO-1.2, BIO-1.4, BIO-1.9, and BIO-1.14 would avoid and minimize potential construction-related impacts on nesting birds and raptors, and would compensate for potential project-related direct and indirect impacts on nesting birds through preconstruction surveys and avoidance measures that are consistent with the SSHCP avoidance and minimization measures for special-status nesting birds. Impacts on suitable riparian foraging habitats would be reduced through implementation of Mitigation Measures BIO-2.1, BIO-2.2, and BIO-2.3. Implementation of these mitigation measures would reduce the proposed project's impacts on nesting birds and raptors in all project impact areas to a less-than-significant level.

BIO-1.1: Minimize the temporary construction impact footprint.

Refer to measure description above.

BIO-1.2: Conduct a Worker Environmental Awareness Training Program for construction personnel.

Refer to measure description above.

BIO-1.4: Develop and implement a revegetation and weed control plan.

Refer to measure description above.

BIO-1.9: Minimize impacts on wildlife and retain biological monitors during construction.

Refer to measure description above.

BIO-1.14: Conduct a preconstruction survey for nesting birds and other raptors, and implement avoidance measures, as needed.

If project implementation is to occur during the bird breeding season (generally February 1 through August 31), SJJPA and SJRRC shall retain a qualified biologist to conduct preconstruction surveys no more than 7 days prior to the start of project implementation to determine if active nest sites for any avian species protected under the federal MBTA occur within all project work areas and a 500-foot buffer for passerines and 0.25-mile buffer for raptors. Additional preconstruction surveys will be conducted in each year in which project activities occur during the nesting season. Additional surveys may be needed if a lapse in project-related activities of 14 days or longer occurs to capture any newly established nests. If work is conducted outside of this timeframe, then no preconstruction surveys are necessary. If an active nest (defined as a bird building a nest, sitting on a nest, carrying food to young, etc.) is found, then the following buffers may apply.

- 0.25 mile for raptors;
- 500 feet for tricolored blackbird; and
- 300 feet for all other bird species.

At the discretion of the qualified biologist, the buffer for certain species may be reduced to permit project implementation to occur (depending on the duration, intensity, and type of work that is necessary). The biologist will be present to ensure that no harassment or potential take occurs. The biologist will have the authority to stop work if they determine that the activity may result in harassment, through the bird flushing off the nest or preventing adult birds from carrying food to the nest, or otherwise jeopardize the survival of the nest contents (eggs, young, fledglings, etc.).

If nesting tricolored blackbirds are present in the project footprint or within 500 feet of any project-related activities, then an approved biologist experienced with tricolored blackbird behavior will be retained by the SJJPA and SJRRC to monitor the nests throughout the

nesting season, and to determine when the young have fledged. The approved biologist will be on site daily while construction-related activities are taking place near the disturbance buffer. Work within the nest disturbance buffer will not be permitted. If the approved biologist determines that tricolored blackbirds are exhibiting agitated behavior, construction will cease until the buffer size is increased to a distance necessary to result in no harm or harassment to the nesting tricolored blackbirds. If the biologist determines that the colonies are at risk, a meeting with the SJJPA and SJRRC and Wildlife Agencies will be held to determine the best course of action to avoid nest abandonment or take of individuals. The approved biologist will also train construction personnel on the required avoidance procedures, buffer zones, and protocols in the event that a tricolored blackbird flies into an active construction zone (i.e., outside the buffer zone). In the event take of tricolored blackbird or other listed bird cannot be avoided, the SJJPA and SJRRC may seek related take authorization as provided by the Fish and Game Code or otherwise comply with CESA through an existing Habitat Conservation Plan (if applicable).

If project-related activities within the 0.25-mile temporary nest disturbance buffer of a special-status raptor are determined to be necessary during the nesting season, then an approved biologist experienced with raptor behavior will be retained by the SJJPA and SJRRC to monitor the nest throughout the nesting season, and to determine when the young have fledged. The approved biologist will be on site daily while construction-related activities are taking place within the disturbance buffer. Work within the temporary nest disturbance buffer can occur with the written permission of the Wildlife Agencies. If nesting raptors begin to exhibit agitated behavior, such as defensive flights at intruders, getting up from a brooding position, or flying off the nest, the approved biologist/monitor will have the authority to shut down construction activities. If agitated behavior is exhibited, the biologist, SJJPA, SJRRC, and Wildlife Agencies will meet to determine the best course of action to avoid nest abandonment or take of individuals. The approved biologist will also train construction personnel on the required avoidance procedures, buffer zones, and protocols in the event that a covered raptor species flies into an active construction zone (i.e., outside the buffer zone).

BIO-2.1: Avoid and minimize impacts on sensitive natural communities and riparian habitat.

Refer to measure description under Impact BIO-2 below.

BIO-2.2: Comply with the Section 1600 Streambed Alteration Agreement.

Refer to measure description under Impact BIO-2 below.

BIO-2.3: Implement siting constraint measures.

Refer to measure description under Impact BIO-2 below.

Special-Status Bats

No surveys for bat roosts have been conducted in the project area, but large trees and riparian habitats offer appropriate features to support individual and maternity bat roosts for western red bats and hoary bats. Western red bats tend to roost in trees in edge habitats near fields or

streams, and hoary bats roost in dense foliage of medium to large trees. Suitable roosts for both species of special-status bats were observed along the Natomas/Sacramento Airport Station~~,~~ ~~North Elk Grove Station (including all access and platform variants),~~ Old North Sacramento Station, Thornton Siding Upgrade/Extension, and Track Curve Reconstruction North of North New Hope Road footprints. Western red bat is a Covered Species under the SSHCP and SJMSCP (County of Sacramento et al. 2018; County of San Joaquin 2000).

Construction

Construction activities that would cause temporary disturbance or permanent removal of an occupied bachelor, migratory, maternity, or solitary bat roost could cause direct and indirect adverse effects on individual bats or groups. Potential adverse effects could include direct mortality during roost removal; dysfunctional allocation of time and energy to vigilance behaviors; increased energy costs for maintenance, growth, and reproduction; degradation of physiological condition and social order; shifts in habitat use patterns, species distribution, and community structure; and roost abandonment (Caltrans 2016). Roost abandonment may cause pup mortality, expose bats to predation, require them to redirect their limited energy reserves to finding new roosts, and require bats to expend more energy for thermoregulation in suboptimal replacement roosts (Caltrans 2016).

However, western red bats and hoary bats change roosts frequently and mothers can move their young; therefore, they would have the capacity to fly away from disturbance. In addition, bats inhabiting bachelor and migratory roosts would be volant, and would be able to fly away from construction disturbances. None of the indirect adverse effects would be expected to cause mortality in large numbers of bats, and would not be expected to cause a local bat population to drop below self-sustaining levels. Furthermore, implementation of Mitigation Measures BIO-1.1 and BIO-1.2, introduced in Special-Status Plants, above, would include avoidance and minimization of impacts on special-status bats through designing temporary impact areas to avoid suitable roost habitats (i.e., trees and riparian habitat) and conducting worker environmental awareness training. This impact would be less than significant. No mitigation measures are required.

Permanent loss of approximately 0.17 acre of grassland and 1.94 acres of aquatic features would result in the loss of bat foraging habitat; and permanent loss of 1.87 acres of oak tree canopy and 0.67 acre of willow scrub habitat could result in the permanent loss or degradation of nonessential roosts. Because abundant foraging habitat is available in the project vicinity, the temporary and permanent loss or degradation of foraging habitat would not be expected to cause indirect mortality to large numbers of bats, or to substantially reduce their habitat. Likewise, nonessential roosts are not critical for sustaining bat populations, and the permanent loss of some nonessential roosts would not be expected to cause indirect mortality to large numbers of bats, reduce their number, or restrict their range. This impact would be less than significant. No mitigation measures are required.

Operation

Potential impacts on special-status bats from long-term project operation would be similar to those described for Special-Status Plants, above. Additional noise, vibration, and/or lights along the Sacramento Subdivision from seven new roundtrip passenger trains daily could displace

individuals from limited areas of marginal upland habitat along the Sacramento Subdivision; however, passenger trains would pass through these areas briefly, and are much smaller and less noisy than existing freight train service currently operation along the Sacramento Subdivision. Therefore, impacts related to operation would be less than significant. No mitigation measures are required.

Impact BIO-2: The proposed project could have a substantial adverse effect on riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations or by the California Department of Fish and Game or the U.S. Fish and Wildlife Service. However, implementation of mitigation measures would reduce this potentially significant impact to a less-than-significant level (Less-than-Significant Impact with Mitigation).

Riparian habitat is under the jurisdiction of CDFW under Section 1600 of the California Fish and Game Code, and includes vegetation growing in association with waterways (e.g., rivers and perennial, ephemeral, and intermittent drainages). Riparian habitats that could be impacted by the proposed project include vegetation present in drainages, ditches, and canals that follow along the toe of ballast slope or in creeks and waterways that cross beneath track bridges in Sacramento County. Habitats mapped in the project site associated with waterways, and that could be in CDFW-jurisdictional riparian zones, include willow scrub (1.75 acres), canal (0.06 acre), ditch (1.24 acres), and ephemeral drainage habitats (2.24 acres), totaling approximately 5.3 acres, of which approximately 1.6 acres would be permanently affected, and 3.7 acres would be temporarily affected by implementation of the proposed project.

Sensitive habitats mapped in the project area include riparian and wetland habitats, including seasonal wetlands. Project-related impacts on riparian habitats are addressed in this section; wetland habitats, including seasonal wetlands, are discussed in Wetlands and Other Waters, below.

Construction

Clearing and grading activities related to installation of new siding tracks at the Thornton Siding Upgrade/Extension, Phillips Siding Upgrade/Extension, and Track Curve Reconstruction North of Elk Grove ~~North Elk Grove Siding Variants~~ improvement areas would result in disturbance to 1.75 acres (1.08 acres of temporary disturbance and 0.67 acre of direct removal) of willow scrub riparian habitat in Sacramento County. To the greatest extent feasible, temporary impact areas (i.e., construction access and staging) would be designed to avoid riparian and other sensitive habitats (see Mitigation Measure BIO-1.1). Riparian habitats within 200 feet of construction and staging activities may be indirectly impacted by clearing and grading that results in alterations to existing topography and hydrology regimes; accumulation of fugitive dust on vegetation; disruptions to native seed banks from ground disturbance; and potential colonization of disturbed areas of the project site by nonnative, invasive plant species. Riparian habitats within 200 feet of the proposed project and that may experience indirect impacts are in ditches and drainages adjacent to existing UPRR ROW in Sacramento County along the Thornton Track Siding and Track Curve Reconstruction South of Desmond Road, and Phillips Siding Upgrade/Extension footprints; along the banks of Steelhead Creek in the NEMDC west of the Old North Sacramento Station and Del Paso Siding Upgrade/Extensions; and in Arcade Creek, east of the Del Paso Siding Upgrade/Extensions.

A total of ~~four~~ two raised railroad track crossing~~s~~ spanning perennial drainages (i.e., sloughs and creeks) is proposed as part of the proposed project, to be installed as part of siding track improvements over Mosher Slough (Hammer Lane Siding Upgrade)~~; Laguna Creek (North Elk Grove Siding Variants); Union House Creek (North Elk Grove Siding Variants);~~ and Arcade Creek is included in the proposed project (Del Paso Siding Upgrade/Extension). Construction of raised track bridges, including any permanent impacts on riparian and wetland habitat, will occur in existing UPRR ROW, and will involve the installation of bridge infrastructure identical to existing UPRR bridge~~s~~ at each of these location~~s~~. Construction BMPs will include restoration of the bed and bank of drainages where any new crossing is installed, and setbacks to aquatic and riparian habitats wherever possible.

In addition to track bridges, installation of siding tracks would also require extension or removal and replacement of approximately six existing culverts throughout the proposed project, where ditches, canals, and other drainages currently pass under the UPRR track. Beaver Creek, which intersects the northern extent of the Hammer Lane Siding Upgrade footprint, currently flows beneath the UPRR tracks via a corrugated culvert pipe. Another five unnamed ditches and drainages pass under the proposed project through existing culverts at the Lodi Siding Variants, Thornton Siding Upgrade/Extension, and Phillips Siding Upgrade/Extension~~, and North Elk Grove Siding Variants footprints~~. Additional culverted drainages may be present near road crossings throughout the proposed project to convey stormwater runoff. CDFW, under Section 1600 of the California Fish and Game Code, takes jurisdiction over vegetation growing in association with waterways (e.g., rivers and perennial, ephemeral, and intermittent drainages), with the entire width of a drainage channel considered to be “riparian” under Section 1600.

Standard NR-1.2c of the City of Elk Grove General Plan requires that development adjacent to a natural stream shall provide a “stream buffer zone” along the stream. “Natural streams” defined by the City include Morrison Creek in the vicinity of the Track Curve Reconstruction North of Elk Grove ~~North Elk Grove Station (including all access and platform variants), which is proposed to be constructed outside of existing UPRR ROW in the City of Elk Grove General Plan Area~~. Where impacts on this stream are to be avoided, the City of Elk Grove requires stream buffer zones that measure at least 50 feet from the stream centerline (total width of 100 feet or more), depending on the characteristics of the stream, and shall include sufficient width for a mowed fire-break (where necessary); access for channel maintenance and flood control, and for planned passive recreation uses; and sufficient width to provide for protection of existing habitat and wildlife, areas for regeneration of vegetation, vegetative filtration for water quality, a corridor for wildlife habitat linkage, and protection from runoff and other impacts of urban uses adjacent to the corridor. ~~Furthermore, the North Elk Grove Station (including all access and platform variants) is within the Sacramento County General Plan Area, which requires that any impacts on riparian habitat in the County be mitigated by the preservation and/or restoration of this habitat at a 1:1 ratio, in perpetuity.~~

Construction-related direct and indirect impacts on riparian habitat, including proposed rail bridge crossings and culvert installations that would fall under the jurisdiction of Section 1600 of the California Fish and Game Code, would be potentially significant.

Operation

Potential impacts on riparian habitat from long-term project operation would be similar to those described for Special-Status Plants, such as trampling or crushing of native vegetation by vehicles or foot traffic if maintenance personnel leave access roads; erosion and sedimentation; accidental leaks/spills of hazardous materials; and the introduction of nonnative, invasive plants as a result of increased human presence (see Impact BIO-1). However, use of herbicides, potential accidental leaks/spills, and introduction of invasive plants along the tracks would not likely contribute to any substantial additional habitat degradation beyond existing conditions in the UPRR ROW that are already degraded and subject to these effects. Railroad maintenance personnel are generally confined to on-track equipment, and it is highly unlikely that personnel would leave the UPRR ROW access roads and tracks due to lack of access to adjacent areas, because adjacent lands are privately owned or otherwise fenced, or are under agricultural production. Furthermore, as described in Section 3.10, *Hydrology and Water Quality*, the proposed stations would meet requirements of the appropriate MS4 NPDES Permit to reduce potential water quality impacts associated with stormwater runoff from new impervious surfaces. Therefore, operational impacts on riparian habitat would be less than significant.

Mitigation Measures

Implementation of Mitigation Measures BIO-1.1, BIO-1.2, BIO-1.4, BIO 1.9, AQ-2.3, HAZ-2.3, HYD-1.1, and HYD-1.2 would compensate for potential project-related direct and indirect impacts on riparian habitat and sensitive natural communities through avoidance measures. Implementation of Mitigation Measures BIO-2.1, BIO-2.2, and BIO-2.3 would reduce the proposed project's impacts on riparian habitat and sensitive natural communities in all project impact areas to a less-than-significant level.

BIO-1.1: Minimize the temporary construction impact footprint.

Refer to measure description under discussion of Impact BIO-1 above.

BIO-1.2: Conduct a Worker Environmental Awareness Training Program for construction personnel.

Refer to measure description under discussion of Impact BIO-1 above.

BIO-1.4: Develop and implement a revegetation and weed control plan.

Refer to measure description under discussion of Impact BIO-1 above.

BIO-1.9: Minimize impacts on wildlife and retain biological monitors during construction.

Refer to measure description under discussion of Impact BIO-1 above.

BIO-2.1: Avoid and minimize impacts on sensitive natural communities and riparian habitat.

A qualified biologist shall monitor impacts on riparian habitat and sensitive natural communities during construction to ensure that they are identified for avoidance on site

plans, and preserved on-site to the greatest extent feasible. For all riparian habitat and sensitive natural communities that cannot be avoided, SJJPA and SJRRC shall quantify refined impact acreages based on the final design before construction, to identify the degree of actual impacts adequately to determine required mitigation acreages under Mitigation Measure BIO-2.2, below. These impact acreages shall be verified on completion of construction based on monitoring reports and as-built drawings.

BIO-2.2: Comply with the Section 1600 Streambed Alteration Agreement.

Before construction, SJJPA and SJRRC shall obtain a Section 1600 Streambed Alteration Agreement from CDFW for any activities proposed in or near drainages and/or associated riparian vegetation that could potentially fall under the jurisdiction of CDFW. The project applicant shall implement all conditions in the permit, including any requirements for compensatory mitigation for loss of riparian habitat as part of the Section 1600 Streambed Alteration Agreement. Where feasible, the compensatory mitigation requirement may be combined with those for other mitigation measures such as that required for the USACE CWA Section 404 permit. To comply with Sacramento County General Plan policies related to compensation for the loss of riparian habitats, impacts on riparian habitat shall be mitigated by the preservation riparian habitat at a minimum 1:1 ratio, in perpetuity.

If on-site restoration is selected as compensatory mitigation for impacts on riparian habitat, SJJPA and SJRRC shall prepare and implement Mitigation Measure BIO-1.4 “Develop and Implement a Revegetation and Weed Control Plan” to include reestablishment of riparian habitat, including riparian vegetation subject to CDFW jurisdiction, and/or enhancement of existing habitat, on a per-acre basis. To offset the temporary loss of riparian habitat during construction, the minimum mitigation ratio shall be no less than 1.5 acres of riparian habitat restored/created/enhanced for each acre of permanent or temporary impact. The revegetation and weed control plan shall include the following provisions for the restoration of affected riparian habitat:

- Baseline data collection at reference sites in the project site to establish expected ranges and minimum thresholds for species composition, relative species richness, and vegetative cover (i.e., herbaceous, shrub, and/or woody canopy) for each sensitive habitat that would be affected.
- An appropriate species planting palette for each sensitive habitat that would be affected.
- Minimum planting densities designed to achieve minimum performance standards for survival cover and density, while maintaining the natural character of the vegetation community being restored/created.
- Minimum performance standards for percent survival, species composition, relative species richness, and vegetative cover (i.e., herbaceous, shrub, and/or woody canopy) based on data collected from nearby reference sites and life history traits of the plants being restored (i.e., herbaceous versus woody, fast-growing primary colonizers versus slow-growing successional species).

- Compensation for the temporal loss of habitat resulting from the removal of trees. Any trees removed from riparian habitat shall be replaced with the same or similar species at a ratio of 3:1 (three trees planted for every one tree removed). Tree replacement may be carried out concurrently on riparian habitats that are also being restored/created/enhanced on a per-acre compensatory basis.

BIO-2.3: Implement siting constraint measures.

To comply with local ordinances related to protection of riparian habitats and setback constraints to riparian and sensitive communities, the SJJPA and SJRRC shall implement the following measures and provide documentation to the City of Elk Grove and Sacramento County that these design measures have been incorporated in the final siting plan:

- Requirements set by the City of Elk Grove for the establishment of a 50-foot (as measured from the centerline of the creek) Stream Buffer Zone around Morrison Creek shall be implemented.
- All work involving hazardous materials shall be conducted at least 100 feet from stream, wetland, and riparian areas.
- A qualified biologist shall be assigned to flag or fence environmentally sensitive areas in the immediate vicinity of construction activity to clearly delineate the extent of the construction (see Mitigation Measures BIO-1.1, BIO-1.3, and BIO-1.6). All construction crew members shall have access to a set of drawings showing the locations of the known environmentally sensitive areas, and shall undergo a Worker Environmental Awareness Training Program (see Mitigation Measure BIO-1.2).
- Any rail crossings or other work that would affect drainages and/or riparian vegetation in a drainage shall be conducted in accordance with the project's Streambed Alteration Agreement issued by CDFW.

AQ-2.3: Implement fugitive dust control measures at all construction and staging areas to reduce construction-related fugitive dust, consistent with the SJVAPCD Regulation VIII and SMAQMD Basic Emission Control Practices.

Refer to measure description under Impact AQ-2 in Section 3.3, *Air Quality*.

HAZ-2.3: Implement a construction risk management plan (CRMP).

Refer to measure description under Impact HAZ-2 in Section 3.9, *Hazards and Hazardous Materials*.

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

Refer to measure description under Impact HYD-1 in Section 3.10, *Hydrology and Water Quality*.

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

Refer to measure description under Impact HYD-1 in Section 3.10, *Hydrology and Water Quality*.

Impact BIO-3: The proposed 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. However, implementation of mitigation measures would reduce this potentially significant impact to a less-than-significant level (Less-than-Significant Impact with Mitigation).

Implementation of the proposed project would require a CWA Section 404 permit from USACE, and a CWA Section 401 Water Quality ~~c~~Certification from the Central Valley RWQCB. Wetlands and other waters of the United States that do not meet all three USACE wetland criteria could be subject to regulation by the Central Valley RWQCB under the state's Porter-Cologne Act and may require a Waste Discharge Permit.

Aquatic resources mapped in the project area total approximately 7.12 acres consisting of seasonal wetlands (2.39 acres), ephemeral drainages (2.24 acres), ditches (1.24 acres), cattail marsh (0.68 acre), canals (0.06 acre), and perennial open water ponds/creeks (0.51 acre). Of these, approximately 5.27 acres of temporary impacts and 1.94 acres of permanent impacts on aquatic resources may result from project construction. Aquatic features mapped in the project area during biological surveys and potential impacts are summarized in Table 3.4-4, below.

Table 3.4-4. Aquatic Land Cover Types Mapped within Proposed Improvements, by Disturbance Type

Aquatic Feature Type	Disturbance Type	Acres[1]	Total Acreage
Agricultural Ditch/Ditch	Temporary	0.81	1.24
	Permanent	0.52	
Canal	Temporary	0.04	0.06
	Permanent	0.02	
Cattail Marsh	Temporary	0.58	0.68
	Permanent	0.1	
Ephemeral Drainage	Temporary	1.86	2.24
	Permanent	0.38	
Open Water (Perennial)	Temporary	0.49	0.51
	Permanent	0.02	
Seasonal Wetland	Temporary	1.49	2.39
	Permanent	0.9	
TOTAL	Temporary	5.27	7.12
	Permanent	1.94	
Source: Data compiled by AECOM 2019			

1. Disturbance acreages include the original footprint of the now deleted North Elk Grove Station (including all access and siding variants). As such, actual disturbance totals related only to the Track Curve Reconstruction North of Elk Grove would be much less.

The actual disturbance acreage would be refined during site design and engineering and permitting, and would likely be reduced, because temporary construction components (i.e., staging and access areas) would be sited to avoid and minimize impacts on wetlands and other waters of the United States where possible. Temporary direct impacts on wetlands and other waters would be associated with ground disturbance, primarily during the construction phase. These activities are considered temporary, if wetlands and other waters of the United States are not filled or replaced; the site hydrology is not permanently altered; and restoration is deemed feasible before project implementation.

A complete, formal wetland delineation for the proposed project has not been conducted. Aquatic resources mapped in the project area as part of land cover mapping and habitat assessment surveys include features that may meet the USACE definition of wetlands, as well as other features, such as open water and drainages (perennial, intermittent, and ephemeral) that may qualify as waters of the United States and/or state.

Construction

Construction activities associated with the proposed project, such as grading and clearing for the installation of siding tracks and new stations, could result in the temporary and/or permanent placement of dredged or fill material into wetlands and other waters of the United States, resulting in the loss of wetland area or wetland habitat functions. Activities to construct or improve access roads, install or replace culverts, construct new raised track bridges at creek crossings, and establish staging areas could result in fill and/or disturbance of aquatic resources, transport of sediment, and runoff of contaminants (e.g., fuel, lubricants) into waters. Other indirect impacts on wetlands and other waters include impacts on wetland vegetation, soil erosion, degradation of water quality, and/or loss of wetland functions and services, and changes in hydrology. The precise extent of wetlands and other waters affected would be determined on submittal of the final site plan during the CWA Section 404 permitting process. However, with the conservative assumption that disturbance and loss would occur at the estimates provided in Table 3.4-3, the proposed project could result in significant losses of aquatic resources that may be considered wetlands and other waters of the United States. This impact would be potentially significant.

Operation

Potential impacts on wetlands and other waters from long-term project operation would be similar to those described for riparian habitat and sensitive natural communities, above, that would affect water quality, such as erosion and sedimentation and accidental leaks/spills of hazardous materials, and the introduction of nonnative, invasive plants as a result of increased human presence (see Impact BIO-2). However, potential erosion and sedimentation and accidental leaks/spills along the tracks would not likely contribute to any substantial additional habitat degradation beyond existing conditions in existing UPRR ROW that are already degraded and subject to these effects. Furthermore, as described in Section 3.10, *Hydrology and Water Quality*, proposed stations would meet requirements of the appropriate MS4 NPDES Permit to reduce potential water quality impacts associated with stormwater runoff from new impervious surfaces. Therefore, operational impacts on wetlands and other waters would be less than significant.

Mitigation Measures

Implementation of Mitigation Measures BIO-1.1, BIO-1.2, BIO-3.1, and BIO-3.2 would avoid and minimize potential project-related direct and indirect impacts on wetlands and other waters through avoidance measures, and would compensate for any loss of wetlands or other waters on a per-acre basis at a 1:1 ratio. Implementation of Mitigation Measure BIO-1.4 would reduce the degradation of adjacent habitats from the potential introduction of nonnative or invasive plants. Implementation of Mitigation Measures BIO-2.2 and BIO-2.3 would reduce the proposed project's impacts on riparian habitat and sensitive natural communities. Implementation of Mitigation Measure AQ-2.3 would be required to avoid and/or minimize impacts related to dust and air pollution. Furthermore, implementation of Mitigation Measures HYD-1.1, HYD-1.2, and HAZ-2.3 would reduce impacts on water quality in adjacent aquatic habitats to a less-than-significant level by requiring specific procedures for discharge of groundwater or dewatering effluent; and work adjacent to, within, or crossing surface water, such as installation of temporary physical barriers and performance of water quality monitoring prior to and during project construction. Implementation of these mitigation measures would reduce the proposed project's impacts on wetlands and other waters in all project impact areas to a less-than-significant level.

BIO-1.1: Minimize the temporary construction impact footprint.

Refer to measure description under discussion of Impact BIO-1 above.

BIO-1.2: Conduct a Worker Environmental Awareness Training Program for construction personnel.

Refer to measure description under discussion of Impact BIO-1 above.

BIO-1.4: Develop and implement a revegetation and weed control plan.

Refer to measure description under discussion of Impact BIO-1 above.

BIO-2.2: Comply with the Section 1600 Streambed Alteration Agreement.

Refer to measure description under discussion of Impact BIO-2 above.

BIO-2.3: Implement siting constraint measures.

Refer to measure description under discussion of Impact BIO-2 above.

BIO-3.1: Avoid and minimize impacts on wetlands and other waters.

SJJPA and SJRRC shall avoid and minimize impacts on wetlands and other waters of the United States by implementing the following mitigation measures:

- Before any construction activity, the project applicant shall submit a wetland delineation to USACE for verification. The verified delineation shall serve as the baseline to determine actual project impacts for the purpose of permitting and determining compensatory mitigation needs. The project applicant shall obtain a CWA Section 404 permit from USACE before project construction, and shall abide by all permit conditions, including those for compensatory mitigation. The mitigation ratio will

be determined by USACE, but shall be no less than 1:1 for both permanent and temporary impacts to ensure no net loss of wetlands functions and values in the project area in the long term (see Mitigation Measure BIO-3.2). To ensure consistency and a comprehensive approach to mitigation planning, compensatory mitigation may be planned and implemented concurrently with other mitigation requirements, such as those for riparian habitat mitigation under Mitigation Measure BIO-2.2 "Comply with the Section 1600 Streambed Alteration Agreement."

- ~~The project applicant shall also submit wetland mapping to the City of Elk Grove and Sacramento County, and identify corresponding setback requirements as appropriate (i.e., 100-foot setback) on project maps to comply with local setback requirements for the North Elk Grove Station (including all access and platform variants). Any required setback shall be shown on project construction drawings and plans (e.g., grading and improvement plans).~~

- Construction activities and project components shall be situated at least 100 feet from aquatic resources wherever feasible.

- Before any construction activity, the project applicant shall assign a qualified biologist to identify the locations of wetlands and other waters and their corresponding setbacks (if applicable), as required by project permits, for avoidance. Identification of wetlands and other waters for avoidance shall be in addition to and distinguished from any required construction boundary fencing or flagging.

BIO-3.2: Compensate for impacts on wetlands and other waters.

The standard for mitigation shall be no net loss of wetlands and/or other waters. If restoration is selected as a method of compensatory mitigation, the project applicant shall prepare a Wetland Mitigation and Monitoring Plan as part of the proposed project's Revegetation and Weed Control Plan (Mitigation Measure BIO-1.4), and shall submit it to USACE for review, determination of adequacy, and approval. Mitigation ratios shall be calculated following USACE wetland mitigation procedures, and shall be based on the actual impact acreage of final design per as-built construction drawings and the results of the preconstruction surveys. After review and approval by the pertinent agencies, mitigation shall be carried out at a ratio no less than 1:1, or another ratio approved by the appropriate jurisdictional agency, whichever is higher.

The Wetland Mitigation and Monitoring Plan shall be written by a qualified biologist, and shall include the following elements, at minimum:

- Goals of the plan and permitting requirements satisfied;

- Wetland restoration activities and locations, including the restoration of temporarily affected wetlands and other waters to preconstruction condition;

- Monitoring and reporting requirements (including monitoring period), and criteria to measure mitigation success;

- Remedial measures, should mitigation efforts fall short of established targets; and

- The project applicant shall consult with USACE about the adequacy of the plan, and may consult with other agencies, if the plan aims to fulfill multiple permitting and mitigation requirements.

AQ-2.3: Implement fugitive dust control measures at all construction and staging areas to reduce construction-related fugitive dust, consistent with the SJVAPCD Regulation VIII and SMAQMD Basic Emission Control Practices.

Refer to measure description under Impact AQ-2 in Section 3.3, *Air Quality*.

HAZ-2.3: Implement construction risk management plan (CRMP).

Refer to measure description under Impact HAZ-2 in Section 3.9, *Hazards and Hazardous Materials*.

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

Refer to measure description under Impact HYD-1 in Section 3.10, *Hydrology and Water Quality*.

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

Refer to measure description under Impact HYD-1 in Section 3.10, *Hydrology and Water Quality*.

Impact BIO-4: The proposed project could interfere 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. However, implementation of mitigation measures would reduce this potentially significant impact to a less-than-significant level (Less-than-Significant Impact with Mitigation).

Most of the project area is developed for urban and agricultural purposes, resulting in limited terrestrial landscape linkages for wildlife. The primary existing barriers to wildlife movement across the project area are roads, rail lines, urban, and agricultural development (particularly orchards and vineyards). Given the high degree of development and disturbance in the region, the various unimproved roads, ruderal areas, and railroad track alignments that traverse the region may facilitate wildlife movements at a local scale for larger animals, while limiting movement of smaller animals or those that rely on connected aquatic habitat (such as giant garter snake). Linear aquatic features that traverse the project area, such as ditches, sloughs, canals, creeks, and drainages, likely provide the best options for continuous habitat linkages for aquatic species, reptiles, birds, and some mammals, including special-status species like the western pond turtle, giant garter snake, Swainson's hawk, and western red bat. Outside of the project area, the Cosumnes, Mokelumne, and Sacramento rivers, as well as their associated tributaries, serve as important migration and dispersal corridors for anadromous fish and other aquatic species. Birds and mammals also use these large riparian corridors as avenues for movement, migration, and dispersal.

~~The SSHCP recognizes Laguna Creek, which crosses the North Elk Grove Siding Variants, as a Wildlife Movement Corridor that maintains movement and resident habitat for wildlife inside the~~

~~UDA (County of Sacramento et al. 2018). SJJPA and SJRRC propose to construct a raised track bridge crossing where the North Elk Grove Siding Variants would cross Laguna Creek. Although specific designs for this structure have not yet been developed, these types of structures can typically be constructed so as not to impede wildlife movement. An existing UPRR raised track bridge adjacent to the proposed new bridge completely spans the drainage, allowing for wildlife movement beneath the bridge. If SJJPA and SJRRC were to construct a similar structure, they would minimize or avoid impacts on wildlife movement across Laguna Creek.~~ ~~Other s~~Siding track improvements over Mosher Slough (Hammer Lane Siding Upgrade)~~, Union House Creek (North Elk Grove Siding Variants)~~ and Arcade Creek (Del Paso Siding Upgrade/Extension) would ~~also~~ occur in existing UPRR ROW, and would involve the installation of similar bridge structures at each of these locations, thereby minimizing or avoiding impacts on wildlife movement at these locations as well. Construction BMPs will include restoration of the bed and bank of drainages where any new crossing is installed, and setbacks to aquatic and riparian habitats wherever possible.

The proposed project would be designed to use existing roadways and urban areas as much as possible for equipment staging and laydown areas (Mitigation Measure BIO-1.1), thereby reducing the potential impacts of project construction and operation on wildlife movement. In addition, the proposed project does not propose any new barriers to riparian corridors or drainages. Where siding tracks would cross creeks and drainages, new bridges would be constructed adjacent to existing track bridge, and would be designed to maintain surface flows and minimize disturbance to adjacent aquatic and riparian habitats. ~~Furthermore, the proposed North Elk Grove Station (including all access and platform variants) would be constructed with County-required setbacks to nearby riparian habitat (Mitigation Measure BIO-2.3).~~

Known nursery sites in the project area include purple martin colonies at the Sutterville Road overpass that cross over the northern extent of the proposed South Sacramento Siding Upgrade~~, and a double-crested cormorant rookery within 1.4 miles of the North Elk Grove Station (including all access and platform variants)~~ footprint (CDFW 2019a).

Construction

Construction-related impacts on wildlife movement in the project area involve the loss of available terrestrial habitat, and potential collisions with construction equipment. Temporary construction-related disturbance of existing habitats, such as clearing and grading for staging and laydown areas, would be reclaimed to natural habitat after construction concludes (Mitigation Measure BIO-1.4). Any new access roads constructed as part of the proposed project would not represent barriers to wildlife movement because they would be rural, small, and lightly traveled. The potentially significant impact related to wildlife collisions with construction vehicles and equipment would be reduced to less than significant with mitigation measures such as limiting traffic to daytime hours and speeds of less than 15 miles per hour (Mitigation Measure BIO-1.9).

Of the total amount of new infrastructure proposed to be installed as part of the proposed project, most of the impact on existing habitats would be from the installation of siding tracks adjacent to UPRR tracks in the existing UPRR ROW, resulting in a relatively narrow loss of habitat that would not create new habitat fragmentation and would not impede wildlife movement through adjacent open space, agricultural, and developed areas. The remaining areas of permanent habitat loss related to the proposed project would be for the construction of new stations. The proposed Lodi

Station or the Lodi Station South Alternative would remove approximately 25 acres of agricultural land (either vineyard or row/field crop, depending on which station alternative is selected) that is already regularly disturbed by human activities. ~~The proposed North Elk Grove Station (including all access and platform variants) would remove approximately 30 acres of ruderal habitat that is bounded by Cosumnes River Boulevard to the south, and dense residential development to the north, both of which act as existing barriers to wildlife movement in this area. Furthermore, larger expanses of grassland habitat and riparian corridors (i.e., Laguna Creek, Morrison Creek, and the Stone Lakes National Wildlife Refuge) exist to the south and west in the Regional San Bufferlands that provide high-quality and connected movement corridors for wildlife in the vicinity of the North Elk Grove Station (including all access and platform variants).~~ All other new stations (i.e., City Collect Station, Midtown Sacramento Station, Old North Sacramento Station, and the Natomas/Sacramento Airport Station) are proposed in developed areas that do not support wildlife habitat.

With the limited extent of new infrastructure, a lack of new barriers to wildlife movement corridors that impede wildlife movement, and the availability of large expanses of suitable habitat elsewhere, construction impacts on land-based migration corridors would be less than significant. No mitigation measures are required.

Operation

Potential impacts on wildlife movement from long-term project operation would be similar to those described for Special-Status Plants, above (see Impact BIO-1). Additional noise, vibration, and/or lights along the Sacramento Subdivision from seven new roundtrip passenger trains daily could deter some individuals from using limited areas of marginal habitat along the Sacramento Subdivision; however, passenger trains would pass through these areas briefly, and are much smaller and less noisy than existing freight train service currently operation along the Sacramento Subdivision. Therefore, impacts related to operation would be less than significant.

Mitigation Measures

Any potential impacts on these nursery sites related to project construction would be reduced to less than significant through implementation of Mitigation Measures BIO-1.1, BIO-1.2, BIO-1.4, BIO-1.9, BIO-1.14, and BIO-2.3 to protect special-status species and nesting birds. With implementation of these mitigation measures, this potentially significant impact would be reduced to a less-than-significant level.

BIO-1.1: Minimize the temporary construction impact footprint.

Refer to measure description under Impact BIO-1 above.

BIO-1.2: Conduct a Worker Environmental Awareness Training Program for construction personnel.

Refer to measure description under Impact BIO-1 above.

BIO-1.4: Develop and implement a revegetation and weed control plan.

Refer to measure description under Impact BIO-1 above.

BIO-1.9: Minimize impacts on wildlife and retain biological monitors during construction.

Refer to measure description under Impact BIO-1 above.

BIO-1.14: Conduct a preconstruction survey for nesting birds and other raptors, and implement avoidance measures, as needed.

Refer to measure description under Impact BIO-1, above.

BIO-2.3: Implement siting constraint measures.

Refer to measure description under Impact BIO-2, above.

Impact BIO-5: The proposed project may conflict with local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance. However, implementation of the mitigation measures would reduce this potentially significant impact to a less-than-significant level (Less-than-Significant Impact with Mitigation).

Impacts on the Delta Plan

The following proposed project impact areas are within the boundaries of the Legal Delta:

- Thornton Siding Upgrade/Extension
- Track Curve Reconstruction North of North New Hope Road
- Track Curve Reconstruction South of Desmond Road
- Phillips Siding Upgrade/Extension

State and local agencies are required to demonstrate consistency with the Delta Plan when carrying out, approving, or funding a covered action (California Water Code Sections 85057.5 and 85225). According to the Delta Plan (Delta Stewardship Council 2019), only certain activities qualify as covered actions. To be considered a covered action, a project must meet all of the following criteria:

- Will occur, in whole or in part, within the boundaries of the Delta or Suisun Marsh;
- Will be carried out, approved, or funded by the state or a local public agency;
- Is covered by one or more provisions of the Delta Plan; and
- Will have a significant impact on the achievement of one or both of the coequal goals or the implementation of government-sponsored flood control programs to reduce risks to people, property, and state interests in the Delta.

Provisions of the Delta Plan include policies and recommendations for increased water conservation and expansion of local and regional supplies; improvements in groundwater management; improvements in conveyance and expansion of storage; improvements in water management information; creation of more natural functional flows; and protection of opportunities to restore habitat, including protection of priority habitat restoration areas. According to California Water Code Section 85054, "coequal goals" means the two goals of providing a more reliable

water supply for California; and protecting, restoring, and enhancing the Delta ecosystem (Delta Stewardship Council 2019).

The proposed Thornton Siding Upgrade/Extension, Track Curve Reconstruction North of North New Hope Road, Track Curve Reconstruction South of Desmond Road, and Phillips Siding Upgrade/Extension exist in whole or in part in the boundaries of the Legal Delta, and would be carried out, approved, and funded by local public agencies. Project-related activities in these areas include the construction of new siding track adjacent to existing track in existing UPRR ROW, and curve speed corrections along existing track. These proposed project activities do not require water supply infrastructure, and do not impact groundwater or surface conveyances, water storage, or water management systems. Furthermore, these activities would not impact any areas designated by the Delta Plan as a Priority Habitat Restoration Area; the nearest Priority Habitat Restoration Area to the proposed project is approximately 2 miles west of the proposed Track Curve Reconstruction South of Desmond Road footprint and west of I-5 at the confluence of the Mokelumne and Cosumnes rivers (Delta Stewardship Council 2013).

Project activities in the Delta will not have significant impacts on the achievement of one or both of the coequal goals or the implementation of government-sponsored flood control programs to reduce risks to people, property, and state interests in the Delta, and therefore is not a covered action under ~~are not covered by any provisions in~~ the Delta Plan. ~~Furthermore, t~~ The total potential impact in these areas includes the conversion of approximately 55 acres of disturbed ruderal, scrub, and developed habitats in the existing UPRR ROW, with no impacts proposed on surface waterways or potential Delta Plan restoration habitat. Therefore, the proposed project does not conflict with the coequal goals of providing a more reliable water supply for California; and protecting, restoring, and enhancing the Delta ecosystem. Given that project activities in the Delta are not a covered action ~~by provisions~~ of the Delta Plan and would not conflict with the coequal goals of the Delta Plan, the proposed project impacts on the Delta Plan are less than significant; no mitigation is required.

Impacts on Protected Trees and Landscaping Requirements

Native and/or City-maintained trees are present (or potentially present) at several sites in the proposed project, including Hammer Lane Siding Upgrade, Lodi Siding Variants, Thornton Siding Upgrade/Extension, Track Curve Reconstruction North of North New Hope Road, ~~North Elk Grove Siding Variants,~~ Track Curve Reconstruction North of ~~North~~ Elk Grove ~~Station~~, Midtown Sacramento Station, Old North Sacramento Station, Del Paso Siding Upgrade/Extension, and the Natomas/Sacramento Airport Station. However, it is unlikely that all trees in the footprint would be affected by the proposed project (e.g., removed, or otherwise damaged) because trees at most sites occur in the temporary footprint and in areas that are likely to be avoidable by ground-disturbing activities (e.g., with existing UPRR ROW boundary). Furthermore, as described above, activities in existing UPRR ROW are exempt from local building and zoning codes and other land use ordinances. Only native and City-maintained trees at the following locations occur outside existing UPRR ROW, and may be impacted by project activities: Midtown Sacramento Station, Old North Sacramento Station, and Natomas/Sacramento Airport Station. These sites occur in either the City of Sacramento or in unincorporated Sacramento County, and typically would be subject to tree preservation regulations under the respective jurisdiction. This impact would be potentially significant.

City of Sacramento Tree Protection Ordinance

A City of Sacramento tree permit is required to impact a "city tree" or "private protected tree." The proposed Midtown Sacramento Station and Old North Sacramento Station are in the City of Sacramento, with much of the proposed station footprints outside of existing UPRR ROW.

Sacramento County Tree Protection Ordinance

The proposed Natomas/Sacramento Airport Station is in unincorporated Sacramento County, with the proposed parking lot component proposed to be constructed outside of existing UPRR ROW. A Sacramento County tree permit is required to impact native oak trees of the following species: valley oak, interior live oak, blue oak, or oracle oak (*Quercus morehus*) that have at least one trunk of 6 inches or more in diameter measured 4.5 feet above the ground, or a multi-trunked native oak tree having an aggregate diameter of 10 inches or more, measured 4.5 feet above the ground (diameter at breast height [dbh]) (Sacramento County 2019a). Although access to this area was not granted during biological surveys, interpretation of aerial images indicates that several landscape trees exist in this area along road edges that may be native oak species. Project implementation would be consistent with the requirements of the County's tree permit.

Mitigation Measures

Implementation of Mitigation Measures BIO-5.1 and BIO-5.2 would compensate for potential project-related impacts to protected trees through coordination with the City of Sacramento and the County of Sacramento, respectively, for tree permits as needed. Implementation of Mitigation Measures BIO-5.1 and BIO-5.2 would reduce impacts on protected trees in the Sacramento Midtown Sacramento Station, Old North Sacramento Station, and Natomas/Sacramento Airport Station impact areas to a less-than-significant level.

BIO-5.1: City of Sacramento Code compliance for trees.

The proposed project may result in impacts to "city trees" and/or "private protected trees" through trenching, grading, and/or filling within the dripline of these trees at the Midtown Sacramento Station and Old North Sacramento Station project areas. Approval for actions that affect trees protected by the City's ordinance must be obtained by City of Sacramento officials prior to project implementation. Project approval may be contingent on the receipt of a tree permit.

BIO-5.2: Sacramento County Code compliance for trees

The proposed project may result in impacts to protected oaks through trenching, grading, and/or filling within the dripline of these trees. Approval for actions that affect trees protected by the County's ordinance must be obtained by Sacramento County officials (Board of Supervisors or County Planning Commission). Project approval may be contingent on the receipt of a tree permit. A tree permit can be obtained from the Sacramento County Building Assistance Center at 827 7th Street, Room 102, Sacramento County.

Impacts on the Bufferlands Master Plan

Construction of the proposed Track Curve Reconstruction North of Elk Grove would be confined to the existing UPRR ROW. No project improvements are proposed in lands within the Bufferlands Master Plan Area. Therefore, implementation of the proposed project would not result in loss of habitat in the Bufferlands and would not conflict with the goals of the Bufferlands Master Plan for protection of open space and sensitive biological resources. The impact is less than significant; no mitigation is required.

~~The proposed North Elk Grove Station (including all access and platform variants) and the North Elk Grove Siding Variants overlap with the Regional San Bufferlands Master Plan (Regional San 2000). The North Elk Grove Siding Variants are within the UPRR ROW and would not affect lands within the Bufferlands Master Plan Area. The North Elk Grove Station (including all access and platform variants) footprint is outside existing UPRR ROW, and overlaps with an area designated as Open Space under the Bufferlands Master Plan. Open Space areas are managed by Regional San to provide a buffer between the Regional San water treatment plant process area and adjacent landowners. These areas are passively managed for wildlife habitat. The Bufferlands management policies for open space areas emphasize the protection of public health and safety and the preservation of sensitive biological and cultural resources. The creation of a station in this location would result in the permanent loss of approximately 30 acres of open-space grassland ruderal habitat, and could therefore conflict with the Bufferlands Management Plan's goals to protect open space and sensitive biological resources (such as Swainson's hawk and western burrowing owl) that rely on these habitats for nesting and foraging. However, mitigation measures for the avoidance and minimization of special-status species with potential to occur in the North Elk Grove Station (including all access and platform variants) footprint described above for Impact BIO-1 would reduce the impact on sensitive biological resources in this area, and would therefore be consistent with the goals of the Bufferlands Master Plan for protection of sensitive biological resources, reducing project impacts to a less-than-significant level.~~

~~Although construction of the North Elk Grove Station (including all access and platform variants) would result in the conversion of approximately 30 acres of lands designated as Open Space by the Bufferlands Master Plan; this only represents approximately 1.1 percent of the total Bufferlands study area. In addition, the lands to be converted lie on the edge of the Bufferlands area adjacent to existing transportation facilities (Cosumnes River Boulevard and the SacRT Franklin LRT Station), and would not bisect major sections of the Bufferlands area. Therefore, this loss of lands from the overall Bufferlands study area would be less than significant.~~

~~Mitigation Measures~~

~~Implementation of Mitigation Measures BIO-1.1 to BIO-1.11 would compensate for potential project-related impacts on areas designated as Open Space in the Bufferlands Master Plan, and would reduce these impacts to a less-than-significant level.~~

> **~~BIO-1.1: Minimize the temporary construction impact footprint.~~**
>
> ~~Refer to measure description under discussion of Impact BIO-1 above.~~

~~BIO-1.2: Conduct a Worker Environmental Awareness Training Program for construction personnel.~~

~~Refer to measure description under discussion of Impact BIO-1 above.~~

~~BIO-1.3: Conduct preconstruction botanical surveys for special-status plants; avoid and minimize impacts during construction.~~

~~Refer to measure description under discussion of Impact BIO-1 above.~~

~~BIO-1.4: Develop and implement a revegetation and weed control plan.~~

~~Refer to measure description under discussion of Impact BIO-1 above.~~

~~BIO-1.5: Document affected special-status plant species and prepare a salvage, relocation, or propagation and monitoring plan for special-status plant species.~~

~~Refer to measure description under discussion of Impact BIO-1 above.~~

~~BIO-1.6: Avoid and minimize impacts on, and compensate for loss of, potentially-occupied habitat for vernal pool fairy shrimp and vernal pool tadpole shrimp through consultation with the U.S. Fish and Wildlife Service and implementation of appropriate mitigation.~~

~~Refer to measure description under discussion of Impact BIO-1 above.~~

~~BIO-1.7: Conduct a preconstruction VELB shrub survey, establish avoidance buffers, and/or compensate for removal of potentially-occupied habitat for VELB through consultation with the U.S. Fish and Wildlife Service and implementation of appropriate mitigation.~~

~~Refer to measure description under discussion of Impact BIO-1 above.~~

~~BIO-1.8: Avoid and minimize impacts on special-status fish while pile driving and implement seasonal restrictions for in-water work.~~

~~Refer to measure description under discussion of Impact BIO-1 above.~~

~~BIO-1.9: Minimize impacts on wildlife and retain biological monitors during construction.~~

~~Refer to measure description under discussion of Impact BIO-1 above.~~

~~BIO-1.10: Implement measures to avoid western pond turtle and giant garter snake during construction.~~

~~Refer to measure description under discussion of Impact BIO-1 above.~~

~~**BIO-1.11: Conduct a preconstruction survey for Swainson's hawk and white-tailed kite, and implement avoidance measures, as needed.**~~

~~Refer to measure description under discussion of Impact BIO-1 above.~~

Impact BIO-6: The proposed 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 (Less-than-Significant Impact).

The Lodi Station and Lodi Station South Alternative would both be outside of existing UPRR ROW and in the Plan Area of the SJMSCP (County of San Joaquin 2006), and the Track Curve Reconstruction North of Elk Grove ~~North Elk Grove Station (including all access and platform variants)~~ is in the Urban Development Area of the South Sacramento Habitat Conservation Plan (SSHCP) (County of Sacramento et. al. 2018).

According to the SJMSCP information packet (SJCOG 2016), the SJMSCP Application/Review Form should be completed and submitted for all activities in the SJMSCP plan area that are or may be subject to the SJMSCP, whether the Applicant is or is not seeking coverage under the SJMSCP. All activities that are required to pay a SJMSCP fee (as identified on the SJMSCP Compensation Zone Maps), or that may have a potential to impact biological resources (e.g., ground disturbance, vegetation removal) must complete the SJMSCP Review Form and submit to SJCOG, Inc.

Although development of the Lodi Station (or Lodi Station South Alternative) and the Track Curve Reconstruction North of Elk Grove ~~North Elk Grove (including all access and platform variants)~~ may be considered covered activities under the SJMSCP and SSHCP, respectively, SJJPA and SJRRC are not participatory to either of these conservation plans. However, the proposed project seeks to be consistent with the prescriptions of the SJMSCP and SSHCP, and to not impair implementation of the SJMSCP or SSHCP in any way. The SJJPA and SJRRC would obtain project-specific incidental take permits for listed species, including those covered under the SJMSCP and SSHCP, as applicable.

The avoidance, minimization, and mitigation measures included in this EIR are consistent with those in the SJMSCP and SSHCP (County of San Joaquin 2006; County of Sacramento et al. 2018). In addition, the proposed project would comply with the San Joaquin County and Sacramento General Plan policies and implementation programs, and these maintain consistency with the SJMSCP and SSHCP, respectively. There are no habitats or other lands in the project area that are identified in the SJMSCP or SSHCP as a part of the future preserve or reserve systems. Therefore, implementation of the proposed project would not reduce the effectiveness of the SJMSCP or SSHCP conservation strategies, and would not interfere with attaining the overall biological goals and objectives of these conservation plans. The impact is less than significant; no mitigation is required.

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3.5 Cultural Resources

3.5.1 Introduction

This section describes the regulatory and environmental setting for cultural resources in the vicinity of the Valley Rail Sacramento Extension Project (proposed project) improvements. It also describes the potential impacts on cultural resources that would result from implementation of the proposed project, and mitigation measures that would reduce significant impacts, where feasible and appropriate. Appendix D, *Supporting Cultural Resources Technical Report*, contains additional technical information for this section.

Cultural resources include historic-age buildings and structures, districts, sites, prehistoric and historic-age archaeological sites, objects, and artifacts. The term “historical resource” is a California Environmental Quality Act (CEQA) term that includes both archaeological and built cultural resources, as described in above. Historical resources are further defined as they relate to their recognition under CEQA (see above). Cumulative impacts on cultural resources, in combination with planned, approved, and reasonably foreseeable projects, are discussed in Chapter 4, *Other CEQA-Required Analysis*.

During the public scoping comment period, the following comments relevant to cultural resources were received:

- Consult with California Native American tribes that are traditionally and culturally affiliated with the project area to avoid inadvertent discoveries of Native American human remains.
- Perform an archaeological records search with the California Historical Research Information System.
- Perform a Sacred Lands File search.
- Include provisions for identification and evaluation of inadvertently discovered archaeological resources, disposition of recovered cultural items that are not burial associated, and treatment and disposition of inadvertently discovered Native American human remains.

This section addresses these concerns. The comments received during the scoping period are included in Appendix A, *NOP and Scoping Summary Report.*

3.5.2 Regulatory Setting

This section summarizes federal, state, regional, and local regulations related to cultural resources and applicable to the proposed project.

3.5.2.1 Federal

National Historic Preservation Act

The National Historic Preservation Act (NHPA) (54 United States Code [U.S.C.] 300101 et seq.) establishes the federal government policy on historic preservation and the programs, including the National Register of Historic Places (NRHP), through which this policy is implemented. Under

the NHPA, significant cultural resources, referred to as historic properties, include any prehistoric or historic district, site, building, structure, object, or landscape included in, or determined eligible for inclusion in, the NRHP. Historic properties also include resources determined to be a National Historic Landmark (NHL), which are nationally significant historic places designated by the Secretary of the Interior (SOI) because they possess exceptional value or quality in illustrating or interpreting United States heritage. A property is considered historically significant if it meets one or more of the NRHP criteria, and retains sufficient historic integrity to convey its significance. This act also established the Advisory Council on Historic Preservation (ACHP), an independent agency that promotes the preservation, enhancement, and productive use of United States historic resources, and advises the President and Congress on national historic preservation policy. The ACHP also provides guidance on implementing Section 106 of the NHPA by developing procedures to protect cultural resources included in, or eligible for inclusion in, the NRHP. Regulations are published in Code of Federal Regulations (C.F.R.), Title 36, Parts 60, 63, 800.

Section 106 of the NHPA (codified as 36 C.F.R. Part 800) requires that effects on historic properties be taken into consideration in any federal undertaking. The process generally has five steps: (1) initiating the Section 106 of the NHPA process; (2) identifying historic properties; (3) assessing adverse effects; (4) resolving adverse effects; and (5) implementing stipulations in an agreement document.

Section 106 of the NHPA affords the ACHP and the State Historic Preservation Officer (SHPO), as well as other consulting parties, a reasonable opportunity to comment on any undertaking that would adversely affect historic properties. SHPOs administer the national historic preservation program at the state level, review NRHP nominations, maintain data on historic properties that have been identified but not yet nominated, and consult with federal agencies during Section 106 review.

The NRHP eligibility criteria (36 C.F.R. 60.4) are used to evaluate significance of potential historic properties. The criteria for evaluation are as follows:

a. [Properties] that are associated with events that have made a significant contribution to the broad patterns of our history; or

b. [Properties] that are associated with the lives of persons significant to our past; or

c. [Properties] that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master; or that possess high artistic values; or that represent a significant and distinguishable entity whose components may lack individual distinction; or

d. [Properties] that have yielded, or may be likely to yield, information important in prehistory or history.

Properties meeting any of the above criteria are considered eligible for listing in the NRHP if they retain integrity of the property's location, design, setting, materials, workmanship, feeling, or association.

Section 101(d)(6)(A) of the NHPA allows properties of traditional religious and cultural importance to a Native American tribe to be determined eligible for NRHP inclusion. In addition, a broader

range of Traditional Cultural Properties (TCP) is also considered, and may be determined eligible for or listed in the NRHP. TCPs are places associated with the cultural practices or beliefs of a living community that are rooted in that community's history, and that may be eligible because of their association with cultural practices or beliefs of living communities that (a) are rooted in that community's history; and (b) are important in maintaining the continuing cultural identity of the community. In the NRHP programs, "culture" is understood to mean the traditions, beliefs, practices, lifeways, arts, crafts, and social institutions of any community, be it a Native American tribe, a local ethnic group, or the nation as a whole.

American Antiquities Act of 1906

The American Antiquities Act (16 U.S.C.] 431–433) was enacted with the primary goal of protecting cultural resources in the U.S. It 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. The act also establishes penalties for such actions, and sets forth a permit requirement for collection of antiquities on federally owned lands.

American Indian Religious Freedom Act

The 1978 American Indian Religious Freedom Act (42 U.S.C. 1996) protects and preserves the traditional religious rights and cultural practices of American Indians, Eskimos, Aleuts, and Native Hawaiians. The act requires policies of all governmental agencies to respect the free exercise of Native religion, and to accommodate access to and use of religious sites to the extent that the use is practicable and is not inconsistent with an agency's essential functions.

Archaeological Resources Protection Act

The Archaeological Resources Protection Act (16 U.S.C. 470aa et seq.) was enacted in 1979 to provide more effective law enforcement to protect public archaeological sites. The Archaeological Resources Protection Act provides detailed descriptions of the prohibited activities, and larger financial and incarceration penalties for convicted violators.

Native American Graves Protection and Repatriation Act

The Native American Graves Protection and Repatriation Act (NAGPRA) (25 U.S.C. 3001) was enacted in 1990 to address the rights of lineal descendants, Indian tribes, and Native Hawaiian organizations to cultural items recovered from federal lands. Cultural items include human remains, funerary objects, sacred objects, and objects of cultural patrimony. NAGPRA also establishes procedures for the inadvertent discovery of Native American cultural items.

Indian Sacred Sites

Federal Executive Order (EO) 13007 was established in 1996 to protect and preserve Indian religious practices. Federal EO 13007 requires federal agencies to: (1) provide access to and ceremonial use of Indian sacred sites by Indian religious practitioners; (2) avoid adversely affecting the physical integrity of such sites; and (3) maintain the confidentiality of sacred sites where appropriate. This federal EO also outlines procedures federal agencies must follow if a sacred site may be adversely affected or if access to or ceremonial use of a sacred site may be restricted.

3.5.2.2 State

California Environmental Quality Act

CEQA states that if implementation of a project would result in significant effects on historical and unique archaeological resources, then alternative plans or mitigation measures must be considered. Under CEQA, these resources are called "historical resources" whether they are of historic or prehistoric age. Public Resources Code Section 21084.1 defines historical resources as those listed, or eligible for listing, in the California Register of Historical Resources (CRHR), or those listed in the historical register of a local jurisdiction (county or city). NRHP-listed "historic properties" located in California are considered historical resources for the purposes of CEQA, and are also listed in the CRHR. The CRHR criteria for listing such resources are based on, and are very similar to, the NRHP criteria. Public Resources Code Section 21083.2 and CEQA Guidelines Section 15064.5(c) provide further definitions and guidance for archaeological sites and their treatment.

Section 15064.5 also provides a process and procedures for addressing the existence of, or probable likelihood of, Native American human remains, as well as the unexpected discovery of any human remains in the CEQA study area. This includes consultations with appropriate Native American tribes. Therefore, before impacts and mitigation measures can be identified, the significance of historical resources must be determined.

Under CEQA, historical resources are recognized as being part of the environment. Because the proposed project is a discretionary project and requires the approval or permitting of a public agency, adherence to Public Resources Code Section 5024.1 is required. Properties that are listed in or eligible for listing in the NRHP are considered eligible for listing in the CRHR (Public Resources Code Section 5024.1(d)(1)), and therefore are significant historical resources for the purpose of CEQA. Previously unidentified and identified or known cultural resources in the study area would be evaluated per the CRHR criteria (as needed) for eligibility to determine if the resource is significant on a state level.

According to CEQA, a project that may cause a substantial adverse change in the significance of a historical resource is a project that may have a significant impact on the environment (14 California Code of Regulations Section 15064.5(b)). Under CEQA, a substantial adverse change in the significance of a resource means the physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings to the extent that the significance of the historical resource would be materially impaired. Actions that would materially impair the significance of a historic resource are any actions that would demolish or adversely alter the physical characteristics that convey the property's historical significance, and qualify it for inclusion in the CRHR or in a local register or survey that meet the requirements of Public Resources Code Sections 5020.1(k) and 5024.1(g).

CEQA includes in its definition of historical resources "any object [or] site … that has yielded or may be likely to yield information important in prehistory" (State CEQA Guidelines Section 15064.5[3], State CEQA Guidelines Appendix G).

The San Joaquin Regional Rail Commission (SJRRC), as the lead agency for the proposed project, has the potential to directly affect cultural resources; therefore, the proposed project qualifies as a "project" defined as:

"an activity which may cause either a direct physical change in the environment, or a reasonably foreseeable indirect physical change in the environment, and which is any of the following:

a. An activity directly undertaken by any public agency.

b. An activity undertaken by a person which is supported, in whole or in part, through contracts, grants, subsidies, loans, or other forms of assistance from one or more public agencies.

c. An activity that involves the issuance to a person of a lease, permit, license, certificate, or other entitlement for use by one or more public agencies. An activity undertaken by a public agency or private activity which must receive some discretionary approval from a government agency which may cause either a direct physical change in the environment or a reasonably foreseeable indirect change in the environment" (Public Resources Code Section 21065).

The State CEQA Guidelines define three ways that a property may qualify as a historical resource for the purposes of CEQA review.

1. The resource is listed in or determined eligible for listing in the CRHR.

2. The resource is included in a local register of historical resources, as defined in Section 5020.1[k] of the Public Resources Code or identified as significant in a historical resource survey meeting the requirements of Public Resources Code Section 5024.1[g], unless the preponderance of evidence demonstrates that it is not historically or culturally significant.

3. The lead agency determines the resource to be significant, as supported by substantial evidence in light of the whole record (14 California Code of Regulations, Division 6, Chapter 3, Section 15064.5(a)).

Properties that are listed in or eligible for listing in the NRHP are considered eligible for listing in the CRHR, and therefore are significant historical resources for the purpose of CEQA (Public Resources Code Section 5024.1(d)(1)).

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. Cultural resources are recognized as nonrenewable resources, and receive additional protection under the California Public Resources Code and CEQA.

- California Public Resources Code Sections 5020 through 5029.5 continued the former Historical Landmarks Advisory Committee as the State Historical Resources Commission. The commission oversees the administration of the CRHR, and is responsible for the designation of State Historical Landmarks and Historical Points of Interest.

- California Public Resources Code Sections 5079 through 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.

- California Public Resources Code Sections 5097.9 through 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. The NAHC, on notification of the discovery of human remains by the Coroner, is required to notify those persons it believes to be most likely descended from the deceased Native American. It enables the descendant to inspect the site of the discovery of the Native American human remains and to recommend to the land owner (or person responsible for the excavation) means of treating, with dignity, the human remains and any associated grave goods. Furthermore, under Section 5097.99, it is a felony to obtain or possess Native American artifacts or human remains taken from a grave or cairn, and the Section sets penalties for these actions. Section 5097.99 also mandates that it is the policy of California to repatriate Native American remains and associated grave goods.

If Native American human remains are identified in the cultural resources study area (also known as the "CEQA study area," as defined above), and are on non-federal lands (including private lands), the proposed project must follow the procedures set forth under Section 5097.98.

California Register of Historical Resources

Public Resources Code Section 5024.1 establishes the CRHR, which lists all California properties considered to be significant historical resources. The CRHR also includes all properties listed or determined eligible for listing in the NRHP, including properties evaluated under Section 106 of the NHPA. The criteria for listing in the CRHR are similar to those of the NRHP. A historical resource may be eligible for inclusion in the CRHR if it meets any of the following conditions:

1. Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage.
2. Is associated with lives of persons important in our past.
3. Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values.
4. Has yielded, or may be likely to yield, information important in prehistory.

Aside from meeting a CRHR criterion, a potential historical resource must also retain its historic integrity.

California Health and Safety Code—Treatment of Human Remains

Under Section 8100 of the California Health and Safety Code (Health & Safety Code), six or more human burials at one location constitute a cemetery. Disturbance of Native American cemeteries is a felony (Health & Safety Code Section 7052).

Section 7050.5 of the Health & Safety Code requires that construction or excavation be stopped in the vicinity of discovered human remains until the County Coroner can determine whether the remains are those of a Native American. If the remains are determined to be Native American,

the Coroner must then contact NAHC, which has jurisdiction pursuant to Public Resources Code Section 5097.

~~Assembly Bill 52~~

~~On September 25, 2014, Governor Jerry Brown signed Assembly Bill (AB) 52, which requires the lead agency on a proposed project to consult with any California Native American tribes affiliated with the geographic area. The legislation creates a broad new category of environmental resources, "tribal cultural resources," which must be considered under CEQA. AB 52 creates a distinct category for tribal cultural resources, requiring a lead agency to not only consider the resource's scientific and historical value, but also whether it is culturally important to a California Native American tribe. AB 52 defines tribal cultural resources as "sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe" that are included in or determined to be eligible for inclusion in the CRHR or the local register of historical resources.~~

~~AB 52 also sets up an expanded consultation process. Since July 1, 2015, lead agencies are required to provide notice of proposed projects to any tribe traditionally and culturally affiliated with the geographic area. If, within 30 days, a tribe requests consultation, the consultation process must begin before the lead agency can release a draft environmental document. Consultation with the tribe may include discussion of the type of review necessary, the significance of tribal cultural resources, the significance of the project's impacts on the tribal cultural resources, and alternatives and mitigation measures recommended by the tribe. The consultation process will be deemed concluded when either (a) the parties agree to mitigation measures; or (b) any party concludes, after a good faith effort, that an agreement cannot be reached. Any mitigation measures agreed to by the tribe and lead agency must be recommended for inclusion in the environmental document. If a tribe does not request consultation, or otherwise assist in identifying mitigation measures during the consultation process, a lead agency may still consider mitigation measures if the agency determines that a project will cause a substantial adverse change to a tribal cultural resource.~~

3.5.2.3 Regional and Local

The San Joaquin Joint Powers Authority (SJJPA), a state joint powers agency, and the San Joaquin Regional Rail Commission (SJRRC) propose improvements within and outside of the Union Pacific Railroad (UPRR) right-of-way (ROW). The Interstate Commerce Commission Termination Act (ICCTA) affords railroads engaged in interstate commerce considerable flexibility in making necessary improvements and modifications to rail infrastructure, subject to the requirements of the Surface Transportation Board.[1] ICCTA broadly preempts state and local regulation of railroads, and this preemption extends to the construction and operation of rail lines. Therefore, activities in existing UPRR ROW are exempt from local building and zoning codes and other land use ordinances. Project improvements proposed outside of the UPRR ROW, however, would be subject to regional and local plans and regulations. Although ICCTA does broadly preempt state and local regulation of railroads, SJJPA and SJRRC intend to obtain local agency

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

permits for construction of facilities that fall outside of the UPRR ROW, even though SJRRC has not determined that such permits are legally necessary, and such permits may not be required.

Appendix E, *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 project improvements are proposed. 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 preparation of this analysis, and reviewed to assess whether the proposed project would be consistent with the plans of relevant jurisdictions.[2] The proposed project would be generally consistent with the applicable goals, policies, and objectives related to cultural resources identified in Appendix E.

3.5.3 Environmental Setting

This section describes the environmental setting related to cultural resources for the proposed 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 information presented in this section is summarized from cultural resource supporting documentation (see Appendix D, *Supporting Cultural Resources Technical Report*).

3.5.3.1 Regional Prehistory[3]

The project area is in the larger Central Valley, encompassing areas in Sacramento and San Joaquin counties. Surrounded by the Sierra Nevada to the east, the Cascade Range to the north, and the Tehachapi Mountains to the south, the Central Valley is divided into two physiographic provinces separated by the Delta: the Sacramento Valley, and the San Joaquin Valley. The vast agricultural region of the Central Valley is drained by the Sacramento River in the north, and the San Joaquin River in the south. This region is warm and well-watered, and is one of the most diverse and productive environmental zones in California.

The project footprint skirts the eastern edge of the American Basin in the north, and is near several large canals, creeks, and the American, Cosumnes, and Mokelumne rivers. These watercourses provided plentiful, year-round resources, and the surrounding lands, including those low, rolling hills along the eastern fringe of the American Basin, were ideal locations for prehistoric settlements.

The archaeology of the Central Valley is as varied as the area is extensive, including a full range of hunter-gatherer adaptations from the earliest, technologically conservative, low-density colonizers to the most recent, technologically elaborate, and densely packed populations that were present at historic contact. The cultural sequence of the area was established by Fredrickson (1974, as cited in Rosenthal et al. 2007), and then developed further using radiocarbon determinations, adjusted with modern calibration curves by Groza (2002), LaJeunesse and Pryor (1996), Meyer and Rosenthal (1997), as cited in (Rosenthal et al. 2007:150), is commonly used to interpret the prehistoric occupation of Central California. The

[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.
[3] Portions of this section were excerpted from Rosenthal et al. 2007.

sequence is broken into three broad periods: the Paleo-Indian period (11,550 to 8550 calibrated (cal) Before Present [B.P.]); the three-staged Archaic Period, consisting of the Lower Archaic (8550 to 5550 cal B.P.), Middle Archaic (5550 to 550 cal B.P.), and Upper Archaic (550 cal B.P. to cal 1100 A.D. [*anno domini*]); and the Emergent period (cal A.D. 1100 to 1769).

Paleo-Indian (11,550 – 8550 cal B.P.)

The Paleo-Indian period began with the first entry of people into California. The Central Valley area was settled by native Californians as early as 13,500 years ago (Rosenthal et al. 2007:147-164). Human populations during this period were low, and probably consisted of small groups moving frequently to exploit plant and animal resources. Archaeological deposits associated with this time period were likely affected by periodic episodes of erosion and deposition, and have either been destroyed or buried beneath more recent alluvial deposits. This period is evident in the archaeological record from basally thinned and fluted projectile points discovered at surface locations primarily in the southern portion of the Central Valley.

Lower Archaic (8550 – 5550 cal B.P.)

Following the Paleo-Indian Period, the Lower Archaic is characterized by mostly isolated finds, including stemmed points, chipped stone crescents, and other distinctive flaked stone artifacts commonly found along ancient shores. Few sites dating to this time period have been identified in the Central Valley.

Middle Archaic (5550 – 550 cal B.P.)

During the Middle Archaic, the climate became warmer and drier, with archaeological sites suggesting a more sedentary lifestyle, as indicated by refined and specialized tool assemblages, a wide range of non-utilitarian artifacts, and abundant trade objects (Moratto 1984). In addition, plant and animal remains were identified in Middle Archaic archaeological sites, indicative of year-round occupation. Exchange of commodities such as obsidian, shell beads, and ornaments, as well as other perishable items, was widespread. Evidence indicates there were two distinct settlement-subsistence adaptations operating in Central California beginning in the Middle Archaic: one in the foothills; and one centering on the valley floor.

Upper Archaic (550 cal B.P. – A.D. 1100)

The beginning of the Upper Archaic Period corresponds roughly with the onset of Late Holocene environmental conditions, marked by an abrupt turn to a cooler, wetter, and more stable climate. This period is better represented and understood than previous time periods. Development of new technologies appear, including new types of bone tools and implements, and widespread manufactured goods such as Haliotis (abalone) ornaments and ceremonial blades. Polished and ground stone plummets are common in regions surrounding rivers and marshlands of the delta and southern San Joaquin Valley.

Emergent Period (cal A.D. 1000 – Historic)

The stability of the climate established in the Upper Archaic prevailed in the Emergent Period, with the exception of several flood and drought events. The archaeological record of this period is the most substantial and comprehensive for any period, and the assemblages and adaptations represented are the most diverse.

The distinctive cultural pattern of the Emergent Period is marked by the appearance of small, arrow-sized projectile points over the dart and atlatl. Increased variation in burial types and furnishings suggest more complex social developments. Other characteristics of the Emergent Period include increasingly varied subsistence practices; a greater distribution of raw obsidian cobbles (as opposed to central biface manufacturing facilities); and a decentralization in the production of shell beads.

3.5.3.2 Ethnography

The project area is within the ethnographic boundaries of the Valley Nisenan, Plains Miwok, and Northern Valley Yokuts (north to south, respectively). The Nisenan territory extended east from the Sacramento River to the drainages of the Yuba, Bear, and American rivers (Wilson and Towne 1978:387). The term Nisenan, sometimes referred to as the Southern Maidu, were the southern linguistic group of the Maidu tribe, a Penutian linguistic family. Valley villages were built on low, natural rises along streams and rivers or on gentle slopes with a southern exposure. Hunting, gathering, and fishing were year-round activities for the Valley Nisenan. Each village varied in size from a few houses covered in grass and tule mats to 50 houses, with upwards of 500 people (Wilson and Towne 1978:388).

The Plains Miwok, one of five separate Eastern Miwok linguistic and cultural groups, inhabited the lower reaches of the Mokelumne and Cosumnes rivers and both banks of the Sacramento River from Rio Vista to Freeport (Levy 1978:398). The Plains Miwok, part of the Utian language family, were a number of separate and politically independent nations that happened to share a common language and cultural background. The foremost political unit was the tribelet; within each tribelet were several less-permanently inhabited settlements and a larger number of seasonally occupied camps for hunting, fishing, and gathering (Levy 1978:398).

The Northern Valley Yokuts territory extended from near where the San Joaquin River makes a big bend northward to a line midway between the Calaveras and Mokelumne rivers (Wallace 1978: 462). Villages were typically along primary water sources, subsisting on hunting waterfowl, fishing, and harvesting acorns, tule root, and seeds (Wallace 1978:464). The principal settlements were built atop low mounds, on or near the banks of large watercourses, for protection against spring floods (Schenck and Dawson 1929:308,404). Each tribe had a headman, and populations averaged around 300 people. Houses were round or oval, with a conically shaped pole frame sunk into the ground and covered with tule mats.

The Valley Nisenan, Plains Miwok, and Northern Valley Yokuts all suffered great population decline and cultural breakdown with the introduction of Spanish settlers and the establishment of the mission system. The populations of all three cultural groups were nearly decimated due to European-borne diseases and harsh living conditions. Today, descendants of these groups are active in maintaining their traditions and advocating for Native American issues.

3.5.3.3 Regional History

The historical era in California began with Spanish colonization and is often divided into three distinctive chronological and historical periods: the Spanish or Mission Period (1542–1821), the Mexican or Rancho Period (1821–1848), and the American Period (1848–present). After Mexican independence in 1821, Spain transferred its lands to the newly established country of Mexico. The Mexican Period was also a time when large parcels of land, known as ranchos, were granted

to trusted Mexican citizens, many of whom were Americans who had converted to Catholicism and married the daughters of the Mexican nationals, or had otherwise become Mexican citizens to promote settlement in California, and encourage agricultural and ranching enterprises. More than 800 rancho grants were bestowed during the Mexican Period throughout California. Three ranchos are in the study area. Rancho Campo De Los Franceses (granted 1844, patented 1861) is near the southern end of the CEQA study area at present-day Stockton in San Joaquin County. Rancho New Helvetia (granted 1841, patented 1866) is near the northern end of the study area in present-day Sacramento, south of the American River and east of the Sacramento River. Rancho Del Paso (granted 1844, patented 1858) is also near the northern end of the study area in present-day Sacramento on the northern side of the American River (SJRRC 2017; Cowan 1956; Kyle 2002: 302-303). There are no extant built environment features from the Spanish or Mission Period or the Mexican or Rancho Period in the study area (SJRRC 2017; Cowan 1956 as cited in AECOM 2020). The United States took control of California after the Mexican-American War in 1848 with the signing of the Treaty of Guadalupe Hidalgo. California became a state in 1850, and the development patterns in California during the late-nineteenth and early-twentieth centuries were characterized by agricultural ventures, ranching, mining, and settlement.

Railroads

The project's rail improvements are situated along the existing UPRR, formerly the Western Pacific Railroad (WPRR). At the start of the American Period, development and new settlement in California were concentrated north of the San Joaquin Valley as a result of the Gold Rush, which began in 1848. Settlement increased in the San Joaquin Valley when the Transcontinental Railroad was constructed through the area in 1869. The railroad provided easy passenger travel and efficient commercial transport of goods to and from large urban centers such as San Francisco and Sacramento.

Western Pacific Railroad

The WPRR was incorporated in 1903 (in California) and was the last of eight transcontinental railroads to be built. The railroad offered the first serious competition to the Southern Pacific Railroad (SPRR) in northern California. (This Western Pacific Railway, reorganized in 1916 as WPRR, has no relation to the earlier, short-lived Western Pacific Railroad that was acquired by the Central Pacific Railroad [CPRR] in 1867). Construction began in 1906 of a northerly route from Salt Lake City, Utah, to the San Francisco Bay, crossing the Sierra Nevada via Beckwourth Pass and the Feather River Canyon. The route through the nearly impassable terrain of the Feather River Canyon included a 1 percent grade through the Sierra Nevada, a remarkable engineering achievement. By routing its line to a terminus in Oakland, California, the WPRR broke the SPRR monopoly on the Oakland waterfront, gaining access to San Francisco Bay. Freight service to Oakland began December 1, 1909, and passenger service on August 10, 1910 (Robertson 1998). Despite its initial success, the WPRR was forced into receivership in 1915, and reorganized as the Western Pacific Railroad Corporation in 1916. The WPRR had inadequate connections to points of origin for shipping—being constructed through sparsely populated mountain and desert regions, and without feeder branch lines—which handicapped the company, and the company was burdened by construction costs (Krase 1999:5; McKee 1998:4).

After the reorganization of the company, freight and passenger business for the WPRR increased with the opening of the San Francisco Panama Pacific Exposition in 1915, and with the growth of

the California economy during World War I. Between 1916 and 1929, the company expanded with the construction and acquisition of more than a dozen branch and short railroad lines, including the Sacramento Northern Railway (P-34-000747 and P-34-005125), which stimulated its growth in the transportation of industrial freight, agricultural freight, and passengers. Whereas the CPRR was built largely as a military and strategic railroad to connect the Pacific Coast territory to the United States during and after the Civil War, the WPRR was designed with freight capacity in mind, at a time when the agricultural industry was flourishing in California. However, the WPRR faltered with the economic conditions of the Great Depression, and the company was once again facing bankruptcy before it was jumpstarted by the rail business brought about by World War II.

World War II stimulated railroad business nationwide. Rail lines were used to transport servicemen and -women, military equipment, and heavy industrial freight across the country. In the boom time of the post-war years, the company's prospects improved. During this period, the WPRR modernized its engines from steam to diesel locomotives, and implemented high-speed passenger service across the country (Kaptain and Shantry 2005). The 1950s and 1960s were the height of the WPRR's *California Zephyr* passenger train, which provided luxury options such as reserved berths, a buffet lounge, a cocktail bar, and a dining car. The company survived a buy-out threat by the SPRR in the 1960s; and in 1970, became a subsidiary to Western Pacific Industries in a phase of aggressive equipment modernization. However, this proved inadequate to the fundamental problems of being a carrier required to participate in other railroads joint rates to the same points served by single-line carriers given economic advantage by the Staggers Act of 1980. Therefore, in 1982, the WPRR merged with the UPRR. After the merger, rails and associated hardware were changed to support heavier equipment.

A number of segments of the former Western Pacific Railroad in Sacramento County have been previously determined not eligible for listing in the NRHP. Although the WPRR appears eligible for listing in the NRHP/CRHR under Criterion A/1 for its important contribution to California's transportation history, recorded segments of the railroad lack integrity to convey its significance.

Sacramento County

Sacramento's significance as a major California city originate with Captain John Sutter, who persuaded Governor Juan Alvarado to grant him permission to establish a frontier outpost in northern California in 1841. Sutter, a Swiss-German immigrant, had sailed up the Sacramento River in August 1839, and first camped on the southern bank of the American River in the vicinity of present-day B Street between 28th and 29th streets in Sacramento. Sutter subsequently moved the settlement slightly to the south between present-day I and J streets. In 1841, he was granted his roughly 1,000-square-mile "New Helvetia" rancho, on which he constructed an adobe fort and trading post. On this land, Sutter embarked on a number of endeavors to support his new community, including growing and milling wheat, grazing cattle and horses, and establishing a launch to ship materials and people between the fort and San Francisco, among other pursuits. Sutter's fort became an important stop-over for travelers and immigrants on their way to Oregon or entering California from the east over the Sierra Nevada. It was at Sutter's Mill, near present-day Coloma, that John Marshall discovered gold in early 1848. Soon afterwards, the famous Gold Rush began, and the region became quickly populated with prospectors, entrepreneurs, and others seeking easy fortunes (Kyle et al. 2002:302-303).

The Gold Rush boom of the late 1840s and 1850s transformed the city into a transportation and exportation hub of commerce for the Sierra Nevada Mother Lode. As the city developed, it soon became a gateway of communication and transportation services that included the Pony Express, the Central Overland Mail and Stage Line, and the transcontinental railroad. As it stands today, the downtown contains more buildings constructed during the Gold Rush than any other major west coast city (Kyle et al. 2002: 301-320). These buildings represent a variety of businesses, including retail, municipal, publication, and service sectors.

The City of Sacramento was laid out by Sutter's son, John A. Sutter, Jr., and Captain William A. Warner in December 1848, and the first log buildings were constructed by January 1849. The fledgling town had 100 buildings by June, and the first elections were held in August. Fueled by the wave of those hoping to find riches in the gold fields, Sacramento's population quickly grew to 2,000 residents, with another 5,000 regularly moving through the community. This rapid growth enabled Sacramento to become incorporated as a city in 1850 (Kyle et al. 2002:307).

Sacramento's developmental history was consistently altered by a series of devastating fires and floods. The fires led to the construction of sturdier buildings made of brick and iron, rather than the original cloth, wood frame, and log structures. As a result, one of the more important industries in Sacramento was the production of bricks, which were also exported to San Francisco and other northern towns. At least five major floods inundated the city from 1850 to 1862. To defend from the encroaching waters, a series of levees was constructed. This system is still in place today (Snell 1964).

An additional defense to flooding was a massive effort to raise the streets of downtown Sacramento 10 feet over a 13-year period. The raising of the streets began haltingly in 1853, and was primarily accomplished after the devastating flood of 1862. Ultimately, the area involved included a broad swath from Front Street east to just past 11th Street, and from I Street south to L street (Tremaine and Farris 2009:55, Figure 57, Figure 65). During this endeavor, buildings were left in place, and fill was brought in to raise the street level, which resulted in the creation of hollow sidewalks below the new (and current) city streets.

Despite early hardships, Sacramento was appointed as the State Capitol in 1854. The city prospered and grew accordingly, and with that came an evolving infrastructure (i.e., sewers) and streetscape. Bare dirt gave way to streets constructed of gravel, cobblestone, and wood block, until they were eventually covered during the raising of street level (Tremaine and Farris 2009:46-47). Redwood sidewalk remnants discovered by Tremaine and Farris (2009:45) also reflect these earlier street manifestations.

The development of inner-city transportation also demonstrated the urban growth of the city. Horse-drawn trolleys, run on street rails, began in the 1860s (Bunse 2008:14). These were replaced with an electrified rail system in 1895. A map from 1926 (in Tremaine and Farris 2009: Figure 56) shows the electrified trolley system running along 3rd, 7th, and 8th streets, on K Street, and on Capitol, all just to the southwest of the terminus of the current system at North 7th Street and Richards Boulevard.

Agriculture and Flood Control in the Sacramento County Region

Agriculture and ranching were the primary industries in the present-day Sacramento County region during the historic period. Regional ranching originated in the early 1840s on the New

Helvetia rancho, which spanned from Marysville to the north to Sacramento along the Sacramento and American rivers. The Gold Rush precipitated further growth in agriculture and ranching, as ranchers and farmers realized handsome returns from supplying food and other goods to miners. However, frequent floods plagued the residents of the region, and posed a considerable threat to the viability of agricultural interests and further settlement (AECOM 2010).

Initial efforts at flood control were usually uncoordinated, consisting of small levees and drains constructed by individual landowners. These features proved insufficient to protect cultivated land, and much of the Sacramento River basin flooded regularly. In 1861, the California Legislature created the State Board of Swampland Commissioners to reclaim swamp and overflow lands. Lack of cooperation among the landowners in the districts led to chronic financial crises. When the legislature terminated the State Board of Swampland Commissioners in 1866, responsibility for swamp and overflow land fell to the individual counties. Many counties offered incentives to landowners for reclaiming agriculturally unproductive land. If a landowner could certify that he had spent at least $2 per acre in reclamation, the county would refund the purchase price of the property to the owner. Speculators took advantage of this program, and a period of opportunistic and often-irrational levee-building followed (AECOM 2010).

In the early part of the twentieth century, the state legislature established the State of California Reclamation Board (now the Central Valley Flood Protection Board) to exercise jurisdiction over reclamation districts and levee plans. In 1917, the state approved and began implementation of the Sacramento River Flood Control Project (SRFCP). The ambitious project included the construction of levees, weirs, and bypasses along the Sacramento River to channel floodwaters away from population centers. Under the SRFCP, new reclamation districts were created, including Reclamation District (RD) 1000, consisting of approximately 55,000 acres in the Natomas Basin. RD 1000 was largely controlled by the Natomas Company, which had access to more money than any individual landowner. The Natomas Company was formed in 1851 in Sacramento County to supply water for placer mining and irrigation. In the years following its founding, the company continued to expand its water supply business, and began dredging for gold. The Natomas Company became involved in land reclamation partially to rebut criticism that farmland was being destroyed by the company's gold-dredging activities (AECOM 2010).

20th Century Sacramento

The citizens of Sacramento embraced modernity and growth at the turn of the twentieth century, and had the economic backing to expand and improve their city. Flood control, a robust agricultural growing and shipping hub, and investment in public transportation allowed Sacramento to develop and grow.

The city expanded its boundaries for the first time in 1911, when the Oak Park neighborhood was annexed. Subsequent land annexations to the east and south of the main city core were built out by residential developers to create the desirable neighborhoods of Land Park, Curtis Park, and East Sacramento. Houses, parks, and schools were built in these new neighborhoods, and trolley lines were expanded to bring these new suburbanites into the city center.

After surviving the Great Depression, Sacramento was bolstered during World War II through employment at nearby McClellan Air Base, Sacramento Army Depot, and Mather Field, as well as government jobs. Industrial and educational jobs opened up in post-war years with companies

like Firestone Tires and Campbell Soup opening plants, as well as the establishment of Sacramento State College in 1947.

North Sacramento Area Development

The area that would become North Sacramento, which is largely bounded by the Sacramento city limits on the north along Ascot Avenue, the American River on the south, Natomas East Main Drainage Canal on the west, and Auburn Boulevard, the UPRR, and McClellan Business Park on the east. North Sacramento incorporated as a city in 1924, but merged with the City of Sacramento in 1964. The area was originally part of *Rancho del Paso* land grant, which was patented to Eliab Grimes and John Sinclair in 1841. After California was annexed into the United States, Grimes and Sinclair lost the grant to Samuel Norris, who successfully filed a claim for the grant to the Public Lands Commission in 1852. Following a lengthy legal battle, Norris became indebted to his attorneys, and was forced to sell the land to them in 1862. One of his attorneys, James Ben Ali Haggin, operated a well-known horse-breeding ranch on the land until 1905, when he moved his operation to Kentucky. The history of the Haggin period lives on in the community through the names of the Hagginwood neighborhood and Ben Ali Way (Williams 1956:5).

In 1910, the ownership of the rancho was transferred to O.A. Robertson, a capitalist from Minnesota who organized the Sacramento Valley Colonization Company to develop suburbs in the Sacramento vicinity (Williams 1957:2). That same year, Robertson sold about 4,000 acres of his land to the North Sacramento Land Company, which began an intense advertising campaign to promote a new suburb known as North Sacramento (Burg 2008; Williams 1957:2). Initially, development was slow due to frequent flooding and dangerous rail crossings between downtown Sacramento and North Sacramento. The rail crossings were improved following the acquisition of the local interurban Northern Electric Railway by the Sacramento Northern Railroad in 1914 (Schmid 1937). The railroad lines that passed through North Sacramento—the WPRR, the Sacramento Northern Railroad, and the SPRR (now operated as UPRR)— were important in the development of the area. Improved passenger rail allowed residents of North Sacramento to easily commute across the American River into Sacramento for work, and the WPRR and UPRR allowed industrial production to flourish in the area.

During World War I and through the 1920s, the Sacramento area continued to grow (Avella 2008:16). A robust military presence was established in Sacramento in the 1930s, providing thousands of jobs with the founding of Mather Field, McClellan Field, and the Army Signal Depot. Canning also was a major industry in the Sacramento area in the early twentieth century. Fruit and vegetables from the Sacramento Valley were processed in canning plants in Sacramento, and transported across the nation. In 1924, six major canning plants existed in the city, including California Parking Corporation's two large Del Monte plants; and Libby, McNeill, and Libby (Avella 2008:15).

From the World War II era to the early 1960s, the population of North Sacramento increased dramatically, mostly due to employment opportunities offered by the railroad, increased activity at McClellan Air Force Base, and construction of new housing. By 1963, North Sacramento's population had increased to 16,000; and in 1964, after a contested election, North Sacramento was annexed into the City of Sacramento (North Sacramento Chamber of Commerce 2014).

San Joaquin County

The Delta region was first visited in historic times by Spanish explorers, including Pedro Fages and Juan Bautista de Anza in the 1770s. Exploration of the interior by the Spanish continued into the 1800s, including Gabriel Moraga's expedition into the region that became San Joaquin County in 1808. The first Euro-American settlement of the Stockton area was at French Camp, where a group of Hudson's Bay Company fur trappers established a camp in 1832, but then left the region a dozen years later (Costello and Marvin 1999: 10). Subsequent Euro-American settlement of the project vicinity began in 1844, with the 48,747-acre Mexican land grant *Rancho Campo de Los Franceses* given to Guillermo (William) Gulnac by Governor Manuel Micheltorena (Beck and Haase 1974: 28). Gulnac's attempts to settle the rancho failed, and he later sold the land to his former business partner, German immigrant Charles M. Weber, in 1845 (Gudde 1998:375). A year later, Weber induced a number of settlers to locate to *Rancho Campo de Los Franceses,* when the Mexican-American War broke out. Weber cast aside his California ties and became a captain in the United States Cavalry. Captain Weber moved to *Rancho Campo de Los Franceses* in 1847, and laid out the town of Tuleburg in 1849. Weber later changed the town's name to Stockton after Commodore Robert F. Stockton, who had given Weber his commission in 1846 (Gudde 1998: 375; Kyle et al. 2002: 371). The grant for *Rancho Campo de Los Franceses* was confirmed by the Public Land Commission in 1855; and in 1861, the final confirmation of the land grant was received.

Settlement of San Joaquin County increased with the completion of the transcontinental railroad in 1869, because the railroad provided easy passenger travel and efficient commercial transport of goods to and from large urban centers such as San Francisco and Sacramento. Construction of the SPRR's San Joaquin Valley main line, originally known as the San Joaquin Valley Railroad, began in 1869, and branched off the transcontinental line at the newly established town of Lathrop in San Joaquin County. By 1871, Lathrop had become a major railroad stop.

The properties recorded for the Lodi Station and Lodi Station South Alternative are in the vicinity of the former railroad stop of Kingdon. The WPRR alignment was platted through the area between 1905 and 1906, but the line was not completed until 1910. WPRR purchased this parcel, which extended along the railroad from DeVries Road to Harney Lane, when the line opened for freight and passenger traffic in 1910 (San Joaquin County Assessor 1905, 1906, 1909, 1911; *San Francisco Chronicle* 1910a, b, c). When the station opened in 1910, it included a depot and two other small buildings (*San Francisco Call* 1910; San Joaquin County Recorder 1913). The station at this railroad siding was originally called West Lodi, but after the name confused a number of railway passengers who wanted to get to Lodi proper, a name change was proposed. Locals wished to christen the station Treadway, in honor of an early pioneer and large landholder William Treadway; but ultimately, WPRR changed it to Kingdon in 1912, after Kingdon Gould, grandson of railroad magnate Jay Gould and a member of the board of directors of the WPRR (Gudde 1998:194; *San Francisco Call* 1910; *Railway Employee's Magazine* 1912; *San Francisco Call* 1911).

The station was thereafter called Kingdon, sometimes Kingdon Station, and at the time of construction, the station was surrounded by vineyards and almond orchards, and was active in shipping the tail-end of Lodi's boom watermelon crop (*San Francisco Call* 1910; Kennedy 2013). In 1927, a 9-mile-long track extension connecting Kingdon to the Delta shipping hub of Terminous was constructed. The end of the line was at the junction of the Mokelumne River and Little Potato

Slough. In addition to the line, WPRR also constructed warehouses, packinghouses, spur lines, wharves, and docks in Terminous that were leased to growers. Before the rail line, locals who were growing celery, asparagus, potatoes, onions, beets, and carrots in nutrient-rich, recently reclaimed Delta lands shipped their crops out of the area using barges (WPRR 1927; Oakland Tribune 1927; Weitze 1983).

By the end of the 1930s, personal and market use of railroads decreased with the increasing popularity of automobiles and trucking lines. As a result, service at Kingdon was discontinued in 1949; it appears that around this time, or sometime before, the railroad-related buildings were demolished, and two residences were constructed on the parcel. The only reminder of the former Kingdon station is 2.25-mile-long West Kingdon Road, which runs between DeVries Road on the east and terminates at the western end at Thornton Road along Interstate 5 (I-5). WPRR service to Terminous ended in the 1960s; and by the late 1960s, most of the track along the 9-mile extension was removed, but the alignment can still be seen in aerial photography (California Public Utilities Commission 1949: 600; Weitze 1983; UCSB 1957; USGS 1968).

San Joaquin County remains a leader in the state's agricultural output, but has experienced "out-migration" from the San Francisco Bay area due to relatively low land prices. The transportation infrastructure of railroads, highways, and the Port of Stockton have served, and will continue to serve, the growing population of commuter communities and employment centers (San Joaquin County 2016).

Stockton

Captain Weber recognized early that Stockton, at the head of navigation on the San Joaquin River, would become an important supply center to the thousands of miners who flocked to the Sierra Nevada gold fields during the California Gold Rush of 1849 (Tinkham 1923). With the opening of the southern mines, Stockton grew rapidly in importance and size, and soon became a flourishing trade center (Marschner 2000). Commerce expanded to include freighting and staging activities, along with the cattle and agriculture industries. In 1849, the population of Stockton was 1,000 individuals, increasing to 5,000 individuals a year later; the town then became incorporated and was chosen as the County seat (Costello and Marvin 1999: 12; Kyle et al. 2002).

Beginning in 1850, Stockton served as a river landing with paddle steamers such as the *Delta King* and *Delta Queen* navigating the San Joaquin River until 1938. Stockton quickly developed into a transportation hub thanks to mining. Building materials, machinery, food, clothing, and tools were shipped to the mines from San Francisco by way of Stockton. Due to the demand for goods, freight and warehouse businesses increased, with other associated industries following suit. Stage lines and freight services radiated outwards from the head of the Stockton Channel towards the mining regions (Marvin and Brejla 2008). This development continued through the years despite the waning productivity from the mines; and in 1933, Stockton opened the first inland seaport in California, located 75 nautical miles east of San Francisco's Golden Gate Bridge, with the establishment of Stockton's Deep Water Channel.

3.5.4 Cultural Resource Data Sources

The study area for cultural resources is defined as follows:

- The study area for archaeological resources is the footprint for the proposed project, and consists of those areas affected by physical changes, including both horizontal surface disturbance and vertical subsurface disturbance.
- The study area for built environment resources includes the parcels intersected by the project footprints, including the existing railroad ROW, and project improvements such as new or improved track alignments, stations, siding areas, staging areas, access roads and pedestrian paths, parking structures, crossings, and ancillary structures (like bridges, berms, and culverts). This study area includes areas where construction, demolition, destruction, or physical change may occur as part of the proposed project. To consider the potential for indirect impacts, the study area for built-environment resources extends outside of the footprint and railroad ROW in certain areas to consider visual and audible intrusions on properties. This occurs when the improvements are outside of the existing railroad ROW; properties where railroad materials, features, and activities have not been part of their historic setting; or where the introduction of visual or audible elements may affect the use or characteristics of those properties that would be the basis for their eligibility as a historical resource.

3.5.4.1 Records Searches

A record search of the Sacramento County project area was conducted by staff at the North Central Information Center (NCIC) of the California Historical Resources Information System (CHRIS), California State University, Sacramento, on September 13, 2019 (NCIC File No. SAC-19-181). Staff at the Central California Information Center (CCIC), California State University, Stanislaus, conducted a record search of the San Joaquin County project area on September 10, 2019 (CCIC File No. 11183L). Additional searches of variations of the project area occurred prior at both the NCIC and CCIC on the following dates: October 4, 2017 (NCIC File No. SAC-17-153), October 6, 2017 (CCIC File No. 10464L), August 13, 2018 (NCIC File No. SAC-18-144), and August 27, 2018 (CCIC File No. 10821L). The NCIC and CCIC, affiliates of the California OHP, are the official state repository of cultural resources records and studies for Sacramento and San Joaquin counties, respectively. Site records and previous studies were accessed for the CEQA study area and a 0.5-mile radius on the Rio Linda, Sacramento East, Florin, Bruceville, Thornton, and Lodi North and Lodi South, California, United States Geological Survey (USGS 1967, 1968a, 1968b, 1975, 1978, 1980) 7.5-minute topographic quadrangles. For full NCIC and CCIC records search results see Appendix D, *Supporting Cultural Resources Information*.

To establish the construction dates of and document alterations to built-environment resources in the study area, AECOM consulted County Assessor record databases; reviewed historic and current USGS topographic maps (USGS 1910a, 1910b, 1910c, 1911); and historic and modern aerial photography. Additional sources were consulted in establishing historic contexts and property-specific histories, including newspaper research, historic county assessor maps, research at the California State Library in Sacramento, and other online library resources. The following references also were reviewed:

- NRHP;
- CRHR;

- *Historical Significance – State Agency Bridges* Inventory (California Department of Transportation [Caltrans] 2018 Sept);
- *Historical Significance – Local Agency* Bridges Inventory (California Department of Transportation [Caltrans] 2018 Oct);
- State Historical Resource Commission minutes;
- Historic Property Data File for Sacramento and San Joaquin Counties (OHP April 2012, March 2014);
- *California State Historical Landmarks* (OHP 1996);
- *California Inventory of Historic Resources* (California Department of Parks and Recreation [DPR 1976);
- *California Points of Historical Interest* (OHP 1992);
- *Five Views: An Ethnic Historic Site Survey for California* (OHP 1988);
- *California Place Names* (Gudde 1998);
- *Historic Spots in California* (Kyle et al. 2002); and
- *Historical Atlas of California* (Beck and Haase 1974).

The records search identified more than 100 previous studies that have been conducted in portions of the study area, covering approximately 40 percent of the study area. The record searches identified 18 previously recorded cultural resources in the study area, but one is no longer extant (see Table 3.5-1). No prehistoric archaeological resources have been previously identified in or adjacent to the study area. The nearest prehistoric archaeological resource to the study area is P-39-000193/CA-SJO-57, in San Joaquin County, over 100 feet east of the proposed Thornton Siding Upgrade/Extension, outside the project footprint and the UPRR ROW.

Aerial photography of the CEQA study area depict the Union House Creek (also known as Beacon Creek), north of Cosumnes River Boulevard ~~the Elk Grove Station~~, as originally channelized to the north of the existing railroad trestle bridge over the creek (UCSB 1952, 1961)(AECOM 2020: Plate 1). The area was modified after 1961 to its current configuration, and the area east of the existing bridge was also modified to create the existing channel (UCSB 1961, 1971)(see AECOM 2020: Plates 1 and 2). Over the years, the proposed station area was used as pastureland and for agriculture, both north and south of what is now Cosumnes Boulevard, with large swaths of land also used for utility ROW (a utility pole is approximately 80 feet east of the current Laguna Creek railroad bridge) and ranch roads (UCSB 1981). Manholes, pipelines, excavation debris piles are all visible in the area south of Union House Creek (UCSB 1971)(AECOM 2020: Plate 2). Similarly, the existing railroad bridge over Arcade Creek is constructed on a levee that appears to be modified in the early 1970s, likely prior to the replacement of the bridge that preceded the existing bridge (UCSB).

The records searches at CCIC and NCIC, and the OHP directory identified the 17 extant resources in the study area. This included eight segments and one trestle of the former WPRR (recorded under Map ID 01 [Sacramento County] and Map ID 10 [San Joaquin County]); one bridge of the former WPRR (Map ID 02); one segment of the American River Flood Control District

Levee (Map ID 04); one segment of the former Sacramento Northern Railroad (Map ID 05); one segment of the former SPRR (Map ID 08); one segment of the Morrison Creek and Union House Creek Levee (Map ID 09); one former communications line (Map ID 11); and one canal segment (Map ID 12). One vehicular bridge over a canal was also identified in the records search at CCIC, but was demolished in 2009.

Additionally, AECOM staff conducted an inventory and evaluation on a single property in June 2017 as part of initial project development. A memorandum was prepared for the 5.82-acre industrial property at 2175 Acoma Street in Sacramento that included two Quonset huts constructed in 1946, a warehouse constructed in 1961, and an office building constructed in 1975 (Map ID 07). AECOM staff concluded that the Quonset huts and the Warehouse did not appear to meet the criteria for listing in the NRHP, CRHR, or the Sacramento Register of Historic and Cultural Resourced (SRHCR), or were historical resources for the purposes of the CEQA.

None of the 17 extant resources appear to be eligible for listing in the NRHP or the CRHR, and therefore are not considered historical resources for the purposes of CEQA. A summary of these resources is provided in Table 3.5-1.

3.5.4.2 Consultation with Native Americans

On October 31, 2017, AECOM sent a letter to the NAHC in Sacramento on behalf of SJRRC that described the project, along with maps depicting the project area; and asked NAHC to review their Sacred Lands File (SLF) for any Native American cultural resources that might be affected by the proposed project. Names of Native Americans who might have information or concerns about the project area were also requested. The NAHC replied that a review of the SLF indicated Native American "sacred sites were identified in the project areas provided," and to contact the Ione Band of Miwok Indians (IBMI) and the United Auburn Indian Community (UAIC) directly for more information.

On November 30, 2017, SJRRC sent letters to the 13 individuals provided by NAHC, including the IBMI and the UAIC. Tiger Polk of the California Valley Miwok Tribe telephoned AECOM on December 6, 2017, and stated they were not aware of any "cultural impacts" in the area of the project. He requested that if cultural items were identified during construction, the California Valley Miwok Tribe be contacted so that the items can be removed and repatriated. Two tribes (the UAIC [on January 18, 2018] and the Shingle Springs Band of Miwok Indians (SSBMI) [on December 28, 2017]) requested formal consultation with SJRRC on the proposed project under AB 52. In January 2018, both UAIC and SSBMI were contacted by SJRRC acknowledging their requests for consultation and to inform them of a project delay due to issues with the Lodi and Elk Grove stations.[4] SJRRC would make contact after the issues were resolved and schedule individual meetings at that time.

In March 2018, as requested and on behalf of SJRRC, AECOM shared the records search findings with the UAIC and the SSBMI tribes. Neither tribe responded after receipt of project materials.

[4] Note that the North Elk Grove Station is no longer under consideration as part to the proposed project.

Table 3.5-1. Summary Historic Status for Previously Identified Buildings, Structures, and Objects in the CEQA Study Area

Map ID #	Primary Number	Common Name / Historic Name	Year Built	CHR Status Code*	Recorded by (Date)	Proposed Project Element
01	P-34-000491	UPRR / WPRR	None provided	6Y (WPRR); 7R (recorded segment)	Hale of Dames & Moore (1994)	Natomas / Sacramento Airport Station
01	P-34-000491	UPRR / WPRR	1906-1909	6Y (WPRR); 7R (recorded segment)	Derr and Boghosian of Cultural Resources Unlimited (1993a)	Old North Sacramento Station; Del Paso Siding Upgrade/Extension
01	P-34-000491	UPRR / WPRR	1906-1909	6Y (WPRR); 6 (NRHP evaluation)	Kaptain and Shantry of LSA Associates (2005)	Old North Sacramento Station; Del Paso Siding Upgrade/Extension
01	P-34-000491	UPRR / WPRR	1909	6Y (WPRR); 6 (NRHP evaluation)	Byrd of Jones & Stokes (2002)	Track Curve Reconstruction north of ~~North~~ Elk Grove ~~Station (including all access and platform variants); North Elk Grove Siding Variants~~
01	P-34-000491	UPRR / WPRR	1909	6Y (WPRR); 6Z (recorded segment)	Webb and Blosser of JRP (2001)	Track Curve Reconstruction north of ~~North~~ Elk Grove ~~Station (including all access and platform variants); North Elk Grove Siding Variants~~
01	P-34-000491	UPRR / WPRR	1909	6Y (WPRR); 7R (recorded segment)	Deis of EDAW (2006)	Track Curve Reconstruction South of Desmond Road
01	P-34-000491	UPRR and Trestles	1908-1910; Upgraded ca. 1990	6Y (WPRR); 6Z (recorded trestle)	Webb and Blosser of JRP (2001)	Track Curve Reconstruction north of ~~North~~ Elk Grove ~~Station (including all access and platform variants); North Elk Grove Siding Variants~~
03	P-34-000647	UPRR / Arcade Creek Bridge	Ca. 1970	6Y; 6Z (AECOM 2017)	Napoli (2001)	Old North Sacramento Station
04	P-34-000508	American River Flood Control District Levees	Ca. 1955	6 (NRHP evaluation only)	Blosser and Walters of JRP (2002)	Old North Sacramento Station
05	P-34-000746	Sacramento Northern Railway	Ca. 1907	7R	Derr and Boghosian of Cultural Resources Unlimited (1993b)	Old North Sacramento Station

Map ID #	Primary Number	Common Name / Historic Name	Year Built	CHR Status Code*	Recorded by (Date)	Proposed Project Element
07	None	2175 Acoma Street, Sacramento	1946-1975	6Z (AECOM 2017)	(AECOM 2017)	Old North Sacramento Station
n/a	P-34-001436	West El Camino Bridge over Natomas Canal	1945; Demolished	6Y	Andrew Hope of Caltrans (2002)	Old North Sacramento Station
08	P-34-000455	Southern Pacific Railroad	Ca. 1903; removed in 1980s	6Z	Maniery (2009) and Baker (2013), both of PAR Environmental Services	Midtown Sacramento Station
09	P-34-001363	Morrison Creek Levee and Union House Creek Levee	1937-1953; 1961	6Z	Webb and Blosser of JRP (2002); Bowen of Jones & Stokes (2005); Arrington and Hayes of Natural Investigations Co. (2014)	Track Curve Reconstruction north of ~~North~~ Elk Grove ~~Station (including all access and platform variants); North Elk Grove Siding Variants~~
10	P-39-000098	UPRR / WPRR	1905-1909	7R	Larson and Johnson of JRP (2003)	Lodi Station
10	P-39-000098	UPRR / WPRR	1905-1909	7R	Spillane and Alexander of SWCA (2015)	Lodi Station
10	P-39-000098	UPRR / WPRR	1905-1909	7R	Patrick of Patrick GIS Group (2015)	Lodi Station South Alternative
11	P-39-005226	Communication Line along Western Pacific Railway	None provided	7R	Baloian of Applied EarthWorks (2014)	Lodi Siding Variants
12	P-39-005242	Unnamed Canal	Ca. 1910-1939	7R	Spillane and Alexander of SWCA (2015)	Lodi Siding Variants

*California Historical Resource (CHR) Status Code assigned/maintained by the California Office of Historic Preservation (OHP).

6Y = Determined ineligible for the National Register by consensus through Section 106 process – Not evaluated for CR or Local Listing.

6Z = Found ineligible for the National Register, California Register, or Local designation through survey evaluation.

7R = Identified in Reconnaissance Level Survey; Not evaluated.

On August 15, 2018, AECOM on behalf of SJRRC contacted the IBMI in order to gain more knowledge on Sacred Lands in the project area. A follow-up call by AECOM on August 21, 2018, resulted in a new contact for the IBMI Cultural Committee Chair, Elizabeth Lydell. An email to Ms. Lydell from AECOM resulted in a telephone call on September 7, 2018, from Jereme Dutschke, IBMI Cultural Committee member, requesting more information. AECOM shared project information in October and November 2018, of the entire project area as well as a specific area in Lodi that was surveyed for the project, but has since been dropped. On December 6, 2018, AECOM sent an email to IBMI asking for more information related to the sacred lands identified by the NAHC in the project area. On January 24, 2019, IBMI responded to AECOM via email, concerned about construction near P-39-000193/CA-SJO-57 (which is located near the proposed Thornton Siding Upgrade/Extension, but still outside project activities), as well as P-39-000192/CA-SJO-56, P-39-000194/CA-SJO-58 (also within the proposed Thornton Siding Upgrade/Extension, but well outside project activities) and P-34-000217/CA-SAC-190 (within the Track Curve Reconstruction south of Desmond Road, but well outside project activities). AECOM acknowledged receipt of the email from IBMI, and replied that it would be forwarded to SJRRC, and that when more information about the project was available, it would be forwarded to IBMI.

On September 9, 2019, AECOM sent a letter to the NAHC describing the revised project, along with maps depicting the project area, asking them to review their SLF for any Native American cultural resources that might be affected by the proposed project. NAHC replied that a review of the SLF was negative for the updated project area.

On September 25, 2019, AECOM sent a copy of the Notice of Preparation (NOP) of an EIR to all ten individuals listed on NAHC's updated 2019 list of Native Americans. AECOM, on behalf of SJRRC, sent specific letters to the three tribes (IBMI, SSBMI, and UAIC) that were responsive to the previous inquiries and/or who requested formal consultation during the early iteration of the project, asking if they were still interested in consulting. SJRRC was contacted by UAIC and SSBMI for continued consultation; no other responses were received.

In November 2019, UAIC requested additional project mapping data, which AECOM provided. UAIC then requested a meeting to discuss the tribe's concerns related to project impacts to archaeological resources, protection measures, and tribal monitoring. AECOM followed up in an email to UAIC to schedule a meeting regarding the project. Although a meeting has yet to be scheduled, consultation between SJRRC and the UAIC is ongoing. UAIC apologized for the delay in their response to the project and requested a copy of the EIR in order to make appropriate recommendations and comment on mitigation measures.

On November 7, 2019, the SSBMI requested formal consultation with SJRRC. On February 10, 2020, SJRRC met with Kara Perry, Site Protection Manager, and James Sarmento, Executive Director of Cultural Resources, along with project staff from AECOM to discuss the Tribe's concerns related to project impacts to archaeological resources, protection measures, and tribal monitoring. The Tribe requested pre-construction cultural sensitivity training and an invitation to monitor ground-disturbing construction activities; in addition, the Tribe suggested installation of interpretive outreach materials, such as educational panels or displays at the station locations regarding the Native American presence in the area. Mitigation measures were incorporated to address the Tribe's concerns. Consultation between SJRRC and the SSBMI is ongoing.

3.5.4.3 Interested Parties Consultation

AECOM sent project notification letters and project location mapping to eight local historic preservation organizations, archives, and city planning departments on September 12, 2018, requesting information regarding cultural resources that may be in the project areas. Recipients of the letter were:

- Preservation Sacramento;
- Center for Sacramento History;
- City of Sacramento, Carson Anderson, Preservation Director;
- Elk Grove Historical Society;
- City of Elk Grove Historic Preservation Committee;
- Sacramento County Historical Society;
- San Joaquin County Historical Society and Museum; and
- City of Stockton Cultural Heritage Board.

AECOM received an email response from William Burg at Preservation Sacramento on September 24, 2018, requesting higher resolution maps for the North Sacramento layout, Midtown Sacramento Station, and City College Station. Architectural Historian Chandra Miller sent enhanced mapping for the requested project locations via email the following day. AECOM did not receive any additional responses.

3.5.4.4 Field Survey and Results

All archaeological and built-environment surveys were conducted by individuals who meet the SOI Professional Qualification Standards (PQS) for Archaeology and/or Architectural History and History. AECOM conducted built-environment and archaeological surveys on multiple field days in late October and early November 2017; July, August, September, and October 2018; and November and December 2019.

All accessible portions of the CEQA study area were surveyed with transects spaced less than 5 meters apart. Visibility ranged from good to poor (less than 20 percent) depending on the vegetation. Areas within the UPRR ROW were generally good, while overgrown pastureland, agricultural crops, or vineyards growing in the station locations marred visibility.

In addition to previous use of the land as mentioned above, areas that were developed or had some sort of previous ground disturbance included: Lodi Station Alternatives ~~Variants~~ (agriculture and vineyard); ~~Elk Grove Station Variants (agriculture, creek/levee modification, road development/modification, flood control/storm drain/sewer infrastructure);~~ City College Station (railroad infrastructure); Midtown Station (railroad infrastructure); Old North Sacramento (railroad infrastructure, road/trail modification; levee modification); Natomas/Sacramento Airport Station (industrial infrastructure).

Archaeological Resources

No archaeological resources were identified during the field surveys.

Historic-Age Built Environment Resources

Twenty-three built environment resources were recorded during field surveys, and were reported on sixteen DPR 523 forms. As discussed above, the records searches at CCIC and NCIC and OHP directory, as well as a previous recordation by AECOM in the initial stages of the project, identified 17 extant resources in the CEQA study area. This included eight segments and one trestle of the former WPRR (recorded under Map ID 01 [Sacramento County] and Map ID 10 [San Joaquin County]); one bridge of the former WPRR (Map ID 02); one segment of the American River Flood Control District Levee (Map ID 04); one segment of the former Sacramento Northern Railroad (Map ID 05); one industrial property (Map D 07); one segment of the former SPRR (Map ID 08); one segment of the Morrison Creek and Union House Creek Levee (Map ID 09); one former communications line (Map ID 11); and one canal segment (Map ID 12) (see Table 3.5-1). None of these resources are eligible or appear to be eligible for listing in the NRHP or the CRHR, and therefore are not considered historical resources for the purposes of CEQA. These resources, along with the newly recorded resources, are discussed below.

The El Camino Bridge over Natomas Canal (P-34-001436), built in 1945, was in the CEQA study area, but was demolished in 2009, and is therefore not further discussed.

Six historic-age built-environment resources were identified during the field surveys (see Table 3.5-2). These resources, along with the previously recorded, but not evaluated resources, are discussed below.

Table 3.5-2. Summary Historic Status for Buildings, Structures, and Objects in the CEQA Study Area Recorded and Evaluated by AECOM for the Project

Map ID #	Address	Common Name/ Historic Name	Year Built	CHR Status Code*	Proposed Project Element
02	North of West Elkhorn Boulevard, Rio Linda	Telegraph poles	Early 20th Century	6Z	Natomas/Sacramento Airport Station
06	Sacramento	Swanston Branch – Northern Electric Railway / Sacramento Northern Railway (P-34-005125)	1915	6Z	Old North Sacramento Station
13	3434 Highway 12, Lodi	West 12 Ranch	1910-1918 through 2008	6Z	Lodi Station
14	14250 North DeVries Road, Lodi	Woods Dairy	Circa late 1930s-2015	6Z	Lodi Station South Alternative
15	13712 North DeVries Road, Lodi	none	1961	6Z	Lodi Station South Alternative
16	2851 West Harney Lane, Lodi	Simplot Grower Solutions	1964-1967; 1967-1993	6Z	Lodi Station South Alternative

*California Historical Resource (CHR) Status Code assigned/maintained by the California Office of Historic Preservation (OHP).
6Z = Found ineligible for the National Register, California Register, or Local designation through survey evaluation.

3.5.4.5 Previously Recorded Historic-Age Built-Environment Resources

Previously Recorded and Evaluated Historic-Age Built-Environment Resources (6, 6Z)

P-34-000491; UPRR / WPRR; at Del Paso Siding Upgrade/Extension; Map ID 01

In 2005, Neal Kaptain and Kate Shantry of LSA Associates, Inc. recorded an approximately 3,600-foot-long segment of the former WPRR, now UPRR, that is located in the proposed Del Paso Siding Upgrade/Extension, just north of the proposed Old North Sacramento Station. Kaptain and Shantry evaluated the segment for eligibility in the NRHP, and concluded that the segment of the railroad is potentially significant at the state level for the NRHP under Criterion A as a contributing element to the WPRR, but the segment lacks sufficient integrity to convey its significance.

P-34-000491; UPRR/WPRR; at Track Curve Reconstruction North of Elk Grove; Map ID 01

In 2001, David S. Byrd of Jones and Stokes recorded a small segment of rails and a five-span bridge of the former WPRR, now UPRR, that overlaps with the Track Curve Reconstruction North of Elk Grove. ~~of the proposed North Elk Grove Siding Variant, just north of the proposed North Elk Grove Station (including all access and platform variants).~~ Byrd evaluated the segment for eligibility in the NRHP, and determined that the segment of the railroad is not eligible for listing under any criteria because it lacks integrity to its period of significance (1909-1957).

In 2002, Toni Webb and Amanda Blosser of JRP Historical Consulting Services (JRP) recorded an approximately 3,200-foot-long segment of rails, including two railroad trestle bridges of the former WPRR, now UPRR, that overlap with the Track Curve Reconstruction North of Elk Grove. ~~northern end of the proposed North Elk Grove Siding Variant, just north of the proposed North Elk Grove Station (including all access and platform variants).~~ Webb and Blosser concluded that although the WPRR appears to be significant under Criterion A, the segment lacks integrity to its period of significance.

Previously Recorded, but Unevaluated Historic-Age Built-Environment Resources (7R)

P-34-000491; UPRR/WPRR; at the Natomas/Sacramento Airport Station; Map ID 01

In 1994, Mark Hale of Dames & Moore recorded an approximately 1.5-mile-long segment of the former WPRR, now UPRR, that is partially located in the footprint of the proposed Natomas / Sacramento Airport Station. Hale did not evaluate the segment, but noted that a section of the rail line to the south, near Arden Way, was previously recorded by Derr and Boghosian in 1993 (Hale of Dames & Moore 1994).

P-34-000491; UPRR/WPRR; at Del Paso Siding Upgrade/Extension; Map ID 01

In 1993, Eleanor H. Derr and Paula Boghosian of Cultural Resources Unlimited recorded an approximately 30-mile-long segment of the former WPRR, now UPRR, that is in the proposed Del Paso Siding Upgrade/Extension. Derr and Boghosian did not evaluate the segment (Derr and Bogoshian of Cultural Resources Unlimited 1993a).

P-34-00491; UPRR/WPRR; at Track Curve Reconstruction South of Desmond Road; Map ID 01

In 2006, Richard Deis of EDAW, Inc., recorded a small segment of the former WPRR, now UPRR, that overlaps with the Track Curve Reconstruction South of Desmond Road. Deis did not evaluate the segment (Deis of EDAW 2006).

P-39-000098; UPRR/WPRR; at Lodi Station and Lodi Station South Alternative; Map ID 10

In 2003, B. Larson and E. Johnson of JRP recorded a 200-foot-long segment of the former WPRR, now UPRR, that is in the footprint of the proposed Lodi Station. Larson and Bryan did not evaluate the segment, but noted that "the integrity of this resource has been compromised through replacement of its track, ballast, ties, and other engineering features following Union Pacific's 1983 acquisition of Western Pacific" (Larson and Johnson of JRP 2003).

In 2015, T. Spillane and D. Alexander from SWCA Environmental Consultants (SWCA) recorded a 3-mile-long segment of the former WPRR, now UPRR, that is partially located in the northern periphery of the footprint of the proposed Lodi Station, as an update to JRP's 2003 recordation. The segment was not evaluated, but reiterated JRP's integrity observation that "the integrity of this resource has been compromised through replacement of its track, ballast, ties, and other engineering features following Union Pacific's 1983 acquisition of Western Pacific" (Larson and Johnson 2003 of JRP via Spillane and Alexander 2015a).

In 2015, Ian Patrick of Patrick GIS Group, Inc. recorded a 1.23-mile-long segment of the former WPRR, now UPRR, that is in the footprint of the proposed Lodi Station South Alternative. Patrick did not evaluate the segment, but noted that rails were well maintained (Patrick of Patrick GIS 2015).

These segments of railroad and railroad trestles, recorded under primary numbers P-34-00491 and P-39-000098, are just a few of the many segments of the former WPRR that have been recorded and updated in numerous counties, including Sacramento and San Joaquin. The railroad, which was purchased by UPRR in 1980 and upgraded in subsequent years, was completed in 1909, and served as the United States' third transcontinental railroad. Although the railroad as a whole appears eligible for listing in the NRHP/CRHR under Criterion A/1 for its important contribution to California's transportation history, the recorded segments of the railroad lack the integrity necessary to convey its historical significance, and none have been determined eligible for listing in the NRHP/CRHR. In light of these previous recordations and evaluations, and the upgraded rails and plates, all of the segments appear ineligible for listing in the NRHP/CRHR, or for local designation, and therefore would not qualify as historic properties or historical resources.

P-34-000508; American River Flood Control District Levees; at Old North Sacramento Station; Map ID 04

In 1995, S. Flint and D. Bradley of Dames & Moore recorded approximately 11.5 miles of American River Flood Control District Levees in which the western terminus of the recorded levee segment appears to just cross over the western boundary of the footprint of the proposed Old North Sacramento Station. Flint and Bradley did not evaluate the levee (Flint and Bradley of Dames & Moore 1995).

JRP recorded and evaluated two sections of the levee in 2001 and 2002. The 2001 evaluation stated that although the levees are an important part of flood control for the city of Sacramento, the levee was built initially built in 1955, and has been "regularly maintained and strengthened after flood events. Because of these alterations and maintenance, they do not have integrity to their period of significance" and are not eligible for listing in the NRHP (Herbert and Blosser of JRP 2001; Blosser and Walters of JRP 2002). Because the segment of the levee near the western boundary of the footprint of the proposed Old North Sacramento Station shares the same history and maintenance as these other sections, it can be assumed that this segment would also not be eligible for listing in the NRHP due to integrity, and therefore would not qualify as a historic property or historical resource.

P-34-000746; Sacramento Northern Railway; at Old North Sacramento Station; Map ID 05

Between 1992 and 1993, Eleanor Derr and Paula Boghosian of Cultural Resources Unlimited recorded a segment of the former Sacramento Northern Railroad (SNR) alignment that passes through the footprint of the proposed Old North Sacramento Station. Derr did not evaluate the segment, but noted that the railroad tracks were removed and replaced with a paved bike path (Derr and Boghosian of Cultural Resources Unlimited 1993b).

Another section of the former SNR alignment that has been turned into a bike path was recorded and evaluated in 2002 as part of a Federal Highways Administration project (Reference No. FHWA0202425C) and received SHPO concurrence that the resource was not eligible for the NRHP (6Y) (OHP 2012).

Because this other SNR alignment shares the same loss of integrity of the segment in the footprint of the proposed Old North Sacramento Station, it would also appear ineligible for listing in the NRHP, and therefore would not qualify as a historic property or historical resource.

P-39-005226; Communication Line along Western Pacific Railway; at Lodi Siding Variants; Map ID 11

In 2014, Randy Baloian from Applied EarthWorks, Inc. recorded a 3,100-foot-long segment of a telegraph or telephone communication line, which parallels the alignment of the former WPRR, now UPRR, in the footprint of the proposed Lodi Siding Variants. An estimated construction date was not provided, and the form lacked a discussion of integrity, as well as an evaluation (Baloian of Applied EarthWorks 2014). Fieldwork and research did not indicate that this communications line is historically significant for the NRHP or the CRHR under any criteria.

P-39-005242; Unnamed Canal; at Lodi Siding Variants; Map ID 12

In 2015, T. Spillane and D. Alexander from SWCA Environmental Consultants (SWCA) recorded a 2,360-foot long segment of an unnamed canal, which travels under the alignment of the former WPRR, now UPRR, in the footprint of the proposed Lodi Siding Variants. An estimated construction date of circa 1910-1939 was given, but the form lacked a discussion of integrity, as well as an evaluation (Spillane and Alexander 2015b). Fieldwork and research do not indicate that this canal is historically significant for the NRHP or the CRHR under any criteria. The canal was a later addition into an older, established canal system. Furthermore, the construction of additional track in the existing UPRR ROW that passes over the segment of this unnamed canal would not cause an adverse effect to the canal or its route.

Previously Recorded and Reevaluated Historic-Age Built Environment Resources

P-34-00064;7 Arcade Creek Bridge; at Del Paso Siding Upgrade/Extension; Map ID 03

Arcade Creek Bridge (located in the footprint of the proposed Del Paso Siding Upgrade/Extension) is an approximately 93-foot-long railroad bridge that carries rail traffic over Arcade Creek. David S. Napoli recorded the bridge in 2001 for "Bridge Evaluation Report, Ueda Parkway Project, Sacramento County, California" (Napoli 2001). When Napoli recorded the bridge, he estimated the construction date on the DPR form as circa 1970, but as circa 1975 in his report. Because the bridge was less than 50 years old at the time of recordation, he stated it was not old enough to have historical significance, and that it was ineligible for the NRHP and the CRHR. The form and the accompanying report were submitted to OHP, and the railroad bridge was assigned an individual Primary Number (P-34-000647) by California OHP, rather than the same Primary Number assigned to the former WPRR (P-34-000491). Additionally, the bridge was erroneously entered into the Directory of Properties in the Historic Property Data File for Sacramento County with a Status Code of 6Y (Determined ineligible for the National Register by consensus through Section 106 process – Not evaluated for the California Register or Local Listing). This railroad bridge is a common and ubiquitous piece of railroad infrastructure that replaced an older bridge at this location, and lacks the integrity necessary to convey its historical significance as part of the former WPRR. Fieldwork and research did not indicate that this railroad bridge is historically significant for the NRHP or the CRHR under any criteria.

Previously Recorded Historic-Age Built Environment Resources for this Project

2175 Acoma Street, Sacramento; at Old North Sacramento Station; Map ID 07

AECOM staff conducted an inventory and evaluation of the 5.82-acre industrial property at 2175 Acoma Street in Sacramento in June 2017 as part of initial project development. The property is in the footprint for the proposed Old North Sacramento Station. A memorandum was prepared to determine the eligibility of the property, which included two Quonset huts constructed in 1946, a warehouse constructed in 1961, and an office building constructed in 1975 (Map ID 07). AECOM staff concluded that the Quonset huts and the warehouse did not appear to meet the criteria for listing in the NRHP, CRHR, or the SRHCR.

3.5.4.6 Newly Recorded Historic-Age Built Environment Resources

Six historic-age built environment resources were identified during the field surveys (see Table 3.5-2). These resources include rural agricultural properties, an industrial site, a segment of telegraph poles, and a segment of a former electric railway line, which are discussed below.

Segment of Telegraph Poles; at Natomas/Sacramento Airport Station; Map ID 02

The resource is an approximately 1.5-mile-long segment of telegraph poles, 833 feet (0.15 mile) of which are in the corridor proposed for improvements for the Natomas/Sacramento Airport Station. The segment is on the eastern side of the UPRR (formerly WPRR) tracks in the UPRR ROW north of West Elkhorn Boulevard. The construction date of the telegraph line was not determined, but they were most likely constructed in the early twentieth century. AECOM staff

concluded that the segment of telegraph poles did not appear to meet the criteria for listing in the NRHP or the CRHR.

Swanston Branch – Northern Electric Railway/Sacramento Northern Railway; at Old North Sacramento Station; Map ID 06

This segment of the Sacramento Northern Railway has never been formally recorded, but has been assigned a Primary Number by the OHP (P-34-005125). It is the remnants of the Swanston Branch line that split from the main Northern Electric Railway (P-34-00746) just northeast of its intersection with the WPRR (P-34-000491) before turning east and paralleling Arden Way (formerly Bassettlaw Avenue). The Swanston Branch line was constructed in 1914 (completed in 1915) and connected the City of Sacramento to the Town of North Sacramento (North Sacramento Chamber of Commerce 2014, terminating at Swanston and Son meat packing plant near the SPRR (Technical Publishing Company 1915:95). At this location, only the railroad grade remains—no rails or ties are present—and the grade is currently used for a paved bicycle path called the Sacramento Northern Bikeway Trail. It appears as though the railroad grade has been destroyed east of this location by the construction of the Arden Way-Garden Highway Connector. AECOM staff concluded that the Swanston Branch Line does not meet any of the criteria for the NRHP or CRHR, nor does it retain its historic integrity.

3434 Highway 12, Lodi; at Lodi Station; Map ID 13

This 37.65-acre horse ranch property spans two parcels and is adjacent to the footprint of the proposed Lodi Station. Aerial photography indicated the presence of nine buildings (including four residences), 10 small horse shelters, and two corrals, dating from 1910-1918 through 2008. AECOM staff concluded that the property did not appear to meet the criteria for listing in the NRHP or the CRHR.

14250 North DeVries Road, Lodi; at Lodi Station South Alternative; Map ID 14

This 141.3-acre dairy property is in the footprint of the proposed Lodi Station South Alternative. The property consists of a cluster of 11 buildings and structures, including a residence, barns, and shelters, dating from the 1930s through 2015. AECOM staff concluded that the property did not appear to meet the criteria for listing in the NRHP or the CRHR.

13712 North DeVries Road, Lodi; at Lodi Station South Alternative; Map ID 15

This triangular 5.9-acre parcel is adjacent to the footprint of the proposed Lodi Station South Alternative, and contains a 1,521-square-foot Ranch-style residence built in 1961, and a detached outbuilding. AECOM staff concluded that the property did not appear to meet the criteria for listing in the NRHP or the CRHR.

2851 West Harney Lane, Lodi; at Lodi Station South Alternative; Map ID 16

This 2.5-acre fertilizer storage and sales facility is adjacent to the footprint of the proposed Lodi Station South Alternative and fronts the UPRR (formerly the WPRR) and a railroad siding. The parcel contains four buildings: two warehouses, a combination warehouse and office, flammable storage shed, and numerous storage silos and tanks, dating from 1964-1967, and 1967 through 1993. AECOM staff concluded that the property did not appear to meet the criteria for listing in the NRHP or the CRHR.

3.5.5 Environmental Analysis

This section describes the proposed project's environmental impacts on cultural resources. It describes the methods used to evaluate the impacts and the thresholds used to determine whether an impact would be significant. Measures to mitigate significant impacts are provided, where appropriate.

3.5.5.1 Methods for Analysis

Impacts were considered significant if construction or operation of the proposed project could cause a substantial change in the significance of a historical resource. Substantial changes could be caused by direct and indirect impacts from the proposed project. 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 historic-age built environment resources result from physical changes to a property (such as demolition, physical alterations, or a partial ROW acquisition that could change the historic setback of built-environment historical resources in a parcel), that would affect the character-defining features and integrity of the resource that conveys its significance. 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 that could affect the historic aspects of the setting and feeling of built-environment historical resources include visual, sound, and vibration impacts or changes resulting from construction or operation of the proposed project.

The following impact analysis has been completed for the purposes of CEQA and considers the impacts of the proposed project on the historical resources identified in the study area. The impact analysis considers whether project improvements would cause a substantial change in the significance of the identified historical resource.

3.5.5.2 Thresholds of Significance

The State 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 and tribal cultural resources. The discussion of impacts on paleontological resources is provided in Section 3.7, *Geology and Soils*. The discussion of impacts on tribal cultural resources is provided in Section 3.17, *Tribal 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 as defined in 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 formal cemeteries.

In addition, the 2019 CEQA Appendix G has identified Tribal Cultural Resources as a separate environmental factor that could potentially be affected by projects. The following includes the checklist criteria:

- Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code Section 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 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 Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.

3.5.5.3 Impacts and Mitigation Measures

Impact CUL-1: The proposed project would not cause a substantial adverse change in the significance of a historical resource pursuant to Section 15064.5 (No Impact).

Previous research identified 17 extant built-environment resources, with six more historic-age built-environment resources identified during the various surveys for this project. These resources were evaluated for the NRHP and CRHR (either by AECOM or others), and did not appear to be eligible for listing. Therefore, the project would have no impact to a historical resource, and no mitigation is required.

Impact CUL-2: The proposed project could cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5. However, as described in this section, this potentially significant impact would be reduced to a less-than-significant level through implementation of Mitigation Measures CUL-2.1, CUL-2.2, and CUL-2.3 (Less-than-Significant Impact with Mitigation).

The background research identified that all station locations have been developed or used for pastureland, agricultural land, vineyards, or railroad (or other) infrastructure at some time over the years. ~~Aerial photography and survey efforts identified ground disturbance from flood control efforts, manholes, and water system piping in the area of Elk Grove Station and vicinity.~~ Likewise, the Old North Sacramento Station location is a maze of old sidings that used to service local warehouses and ditches. The land surrounding the Lodi Station Variants have been used for agriculture for many decades and are currently used as agricultural land and vineyards.

The records search identified no previously recorded archaeological resources in the project footprint. Most of the proposed project would include minimal ground disturbance of 2 feet or less, while the platform access tunnels and the bridge foundation piles would have a deeper impact: the tunnels at the Lodi Station Variants and Old North Sacramento Station would be at 12 and 5 feet below grade, respectively. While the bridge foundation piles will be deeper, the project design has only been completed to 15 percent, so the depth of these is unknown at this time. However,

the background research has shown that the bridges would be constructed on previously disturbed soils from levee and flood control construction (AECOM 2020).

However, project construction would involve ground-disturbing activities that could result in the discovery or damage of as-yet undiscovered archaeological resources, which could be a potentially significant impact; therefore, the mitigation measures presented below would be required.

During consultation with Tribes, the request was made that pre-construction cultural resources sensitivity training be conducted, as well as an opportunity to review the final design of the project, as it has only been designed to 15 percent completion. This would allow tribal cultural representatives to assess areas that may require further review and then request tribal monitors be present during ground disturbing activities. In addition, SSBMI requested that interpretive outreach be considered for incorporation at station locations.

Mitigation Measures: Mitigation Measures CUL-2.1 and CUL-2.2 address the concerns expressed during Native American consultation with the SJRRC. Conformance with this mitigation measure would reduce potential impacts on as-yet undiscovered archaeological resources to a less-than-significant level.

CUL-2.1: Worker cultural resources training.

Prior to any construction activities, including demolition and grading, the project developer shall have a qualified archaeologist implement cultural resources sensitivity training to all construction personnel and supervisors who will have the potential to encounter and alter cultural resources. The training shall describe, at a minimum:

- Types of cultural resources that may be expected in the project area;
- Types of evidence that indicate the presence of cultural resource (e.g., midden soils, ash, charcoal, chipped or groundstone materials, projectile points, trash scatters or concentrations, privies, structural remains such as foundation footings and walls, bottle and ceramic fragments, or gravestones);
- What to do, and who to contact, if cultural resources are encountered;
- What to do if bones, especially human remains, are encountered; and
- What the legalities are of removing or intentionally disturbing cultural resources or human remains.

CUL-2.2: Native American monitoring.

Prior to completion of the final project design and construction, SJRRC will continue consultation with the previously identified Tribes to discuss areas that may need further field review by tribal members due to ~~of~~ concern that may require a tribal monitor present during ground-disturbing activities of archaeologically and culturally sensitive areas. In the event that a resource is discovered, the archaeologist shall evaluate it to determine its eligibility for the CRHR. If it is a historic resource, unique archaeological resource, or tribal cultural resource as defined by CEQA, SJRRC will consult with the project archaeologist

and tribal members regarding methods to ensure that no substantial adverse change would occur to the significance of the resource, either by, but not limited to, avoidance or through archaeological and tribal monitoring.

Mitigation Measure: Mitigation Measure CUL-2.3 is applicable to all areas where significant ground disturbance would occur. Conformance with this mitigation measure would reduce potential impacts on unique archaeological resources to a less-than-significant level.

CUL-2.3: Inadvertent archaeological discovery.

Although it is not anticipated, ground-disturbing activities could result in discovery of damage of as-yet undiscovered archaeological resources as defined in Section 15064.5. If prehistoric or historic-era cultural materials are encountered during project site preparation or construction activities, all ground-disturbing activities in the area of the discovery shall be halted until a qualified archaeologist ~~is~~ and Tribal Representative from consulting Native American Tribes are contacted and can assess the discovery. If the archaeologist and Tribal Representative from consulting Native American Tribes determine~~s~~ that the find does not meet CRHR standards of significance for cultural resources or tribal cultural resources, work activities may proceed.

If the discovery is determined to be potentially significant, the archaeologist, in consultation with SJRRC and the appropriate Native American representative, shall determine if preservation in place is feasible. If avoidance is not feasible, project impacts shall be mitigated in accordance with CEQA Guidelines Section 15126.4 (b)(3)(C), which requires implementation of a data recovery plan. The data recovery plan shall include provisions for adequately recovering all scientifically consequential information from and about any discovered archaeological materials, and include recommendations for the treatment of these resources. In-place preservation of the archaeological or cultural resources is the preferred manner of mitigating potential impacts, because it maintains the relationship between the resource and the archaeological context and maintains tribal cultural values and integrity. In-place preservation also reduces the potential for conflicts with the religious or cultural values of groups associated with the resource. Other mitigation options include, but are not limited to, the full or partial removal and curation of the resource. No matter the approach, the resource must be recorded following accepted professional standards on DPR 523 Series forms, and the information submitted to the appropriate CHRIS office (either NCIC or CCIC), along with associated reports.

Impact CUL-3: The proposed project could disturb human remains, including those interred outside of formal cemeteries. However, as described in this section, this potentially significant impact would be reduced to a less-than-significant level through implementation of Mitigation Measure CUL-3.1 (Less-than-Significant Impact with Mitigation).

There are no known archaeological resources or formal cemeteries recorded in the project footprint. Although there is no indication that human remains are present in the project footprint, there is always a possibility that ground-disturbing activities during construction may uncover previously unknown buried human remains. The disturbance/destruction of human remains would be a potentially significant impact.

Based on research, no evidence suggests that any prehistoric or historic-era marked or unmarked human internments are present in the project footprint. The location of grave sites and Native American remains can occur outside of formal cemeteries or burial sites. Ground-disturbing construction activities could uncover previously unknown human remains, which could be archaeologically or culturally significant.

California law recognizes the need to protect Native American human burials, skeletal remains, and items associated with Native American burials from vandalism and inadvertent destruction. The procedures for the treatment of Native American human remains are contained in California Health and Safety Code Sections 7050.5 and 7052, and California Public Resources Code Section 5097.

Mitigation Measure: Implementation of Mitigation Measure CUL-3.1 would reduce impacts of the project construction relating to the potential disturbance of human remains to a less-than-significant level.

CUL-3.1: Discovery of previously unknown human remains.

If human remains are discovered during any construction activities, all work within ~~50~~ 100 feet of the remains should be redirected, and the County Coroner notified immediately. At the same time, an archaeologist shall be contacted to assess the situation. If it is determined that the human remains are of Native American origin, the Coroner must notify the NAHC within 24 hours of this identification. The NAHC will identify a Most Likely Descendant (MLD) to provide recommendations for the proper treatment of the remains and any associated grave goods. The archaeologist ~~shall~~ may recover scientifically valuable information, as appropriate and in coordination with the MLD. On completion of the archaeologist's assessment, a report should be prepared documenting methods and results, as well as recommendations regarding the treatment of the human remains and any associated archaeological materials. The report should be submitted to the SJRRC and the appropriate Information Center under CHRIS.

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3.6 Energy

3.6.1 Introduction

This section describes the regulatory setting and environmental setting for energy resources in the vicinity of the Valley Rail Sacramento Extension Project (proposed project). It also describes the impacts on energy resources that would result from implementation of the proposed project and mitigation measures that would reduce significant impacts, where feasible. Cumulative impacts to energy resources, in combination with planned, approved, and reasonably foreseeable projects, are discussed in Chapter 4, *Other CEQA-Required Analysis*.

During the public scoping comment period, comments were received from interested parties requesting that the EIR acknowledge any project impacts related to energy efficiency. These concerns are discussed in this section. The comments received during the scoping period are included in Appendix A, *NOP and Scoping Summary Report.*

3.6.2 Regulatory Setting

This section summarizes federal, state, regional, and local regulations related to energy resources and applicable to the proposed project.

3.6.2.1 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 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 2.5 billion gallons per year by 2020.

Energy Policy Act of 2005

The Energy Policy Act of 2005 (EPCA), 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 U.S., 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, the 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 (USDOT) 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 (EISA) was intended to increase U.S. energy security, develop renewable fuel production, and improve vehicle fuel economy. The EISA amended the EPCA to introduce more aggressive requirements. The three key provisions strengthened the CAFE Standards, the federal Renewable Fuel Standard, and the federal energy efficiency standards for appliances and lighting.

On August 2, 2018, USDOT and the U.S. Environmental Protection Agency (EPA) proposed the Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule. The SAFE Vehicles Rule would amend the existing NHTSA CAFE standards and the existing EPA tailpipe carbon dioxide emissions standards for passenger cars and light trucks and establish new standards covering model years 2021 through 2026. The proposed rule would retain the model year 2020 standards for both programs through model year 2026. In response to the proposed SAFE Vehicles Rule, on July 25, 2019, the California Air Resources Board (CARB), Ford, Volkswagen, Honda, and BMW announced a voluntary framework agreement to set fuel economy and carbon dioxide limits at levels between the existing federal standards and the standards proposed by the SAFE Vehicles Rule. Under the framework, the auto companies that are party to the voluntary agreement would sell in the United States only cars that meet these levels.

3.6.2.2 State

Assembly Bill 2076, Reducing Dependence on Petroleum

The California Energy Commission (CEC) and 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 is to reduce petroleum demand to 15% less than 2003 demand by 2020.

Assembly Bill 1493, Pavley Rules/Advanced Clean Cars

Known as “Pavley I,” AB 1493 outlined the nation’s first GHG standards for automobiles. Additional strengthening of the Pavley standards (referred to previously as “Pavley II,” and now referred to as the “Advanced Clean Cars” measure) has been proposed for vehicle model years 2017–2020. Together, the two standards are expected to increase average fuel economy to roughly 43 miles per gallon by 2020. EPA and CARB have also adopted joint rulemaking to establish GHG emissions standards for 2017-2025 model year passenger vehicles.

Senate Bills 1078, 107, and 2—Renewables Portfolio Standard

Senate Bills (SB) 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% of retail sales from renewable resources by 2020. 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, 100 Percent Clean Energy Act of 2017)

SB 350 was approved by the 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% and (2) a doubling of 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 2018 and signed by Governor Brown in September 2018. Its key provisions include updating the SB 350 RPS requirement from 50% to 60% 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% clean energy.

California Code of Regulations, Title 20 and Title 24

New buildings constructed in California must comply with the standards contained in California Code of Regulations (CCR) Title 20, Energy Building Regulations, and Title 24, Energy Conservation Standards. 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. 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 most recently revised in 2016 (24 CCR 6). The standards are updated periodically to allow for consideration and possible incorporation of new energy efficiency technologies and methods.

On July 17, 2008, the California Building Standards Commission adopted the nation’s first green building standards. The California Green Building Standards Code (Part 11, Title 24) was adopted as part of the California Building Standards Code (24 CCR). The code was last updated in 2016. Part 11 establishes mandatory standards, including planning and designing for sustainable site development, energy efficiency (in excess of the California Energy Code requirements), water efficiency and conservation, material conservation and resource efficiency, and environmental quality. The 2019 standards will improve upon the 2016 standards for new construction of, and additions and alterations to, residential and nonresidential buildings. The 2019 standards went into effect on January 1, 2020.

California Energy Code

California’s energy efficiency standards for residential and nonresidential buildings are described in 24 CCR 6. These standards were established in 1978 in response to a legislative mandate to reduce California’s energy consumption and have been updated periodically to include new energy efficiency technologies and methods. The California Energy Code requires compliance with energy efficiency standards for all new construction of, and additions and alterations to, residential and nonresidential buildings.

California Energy Action Plan

CEC is responsible for preparing the State Energy Action Plan, 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 the 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.

3.6.2.3 Regional and Local

The San Joaquin Joint Powers Authority (SJJPA), a state joint powers agency, and the San Joaquin Regional Rail Commission (SJRRC) propose improvements within and outside of the Union Pacific Railroad (UPRR) right-of-way (ROW). The Interstate Commerce Commission Termination Act (ICCTA) affords railroads engaged in interstate commerce considerable flexibility in making necessary improvements and modifications to rail infrastructure, subject to the requirements of the Surface Transportation Board.[1] ICCTA broadly preempts state and local regulation of railroads, and this preemption extends to the construction and operation of rail lines. Therefore, activities in existing UPRR ROW are exempt from local building and zoning codes and other land use ordinances. Project improvements proposed outside of the UPRR ROW, however, would be subject to regional and local plans and regulations. Although ICCTA does broadly preempt state and local regulation of railroads, SJJPA and SJRRC intend to obtain local agency permits for construction of facilities that fall outside of the UPRR ROW, even though SJRRC has not determined that such permits are legally necessary, and such permits may not be required.

Appendix E, *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 project improvements are proposed. 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 preparation of this analysis, and reviewed to assess whether the proposed project would be consistent with the plans of relevant jurisdictions.[2] The proposed project would be generally consistent with the applicable goals, policies, and objectives related to energy identified in Appendix E.

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

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

3.6.3 Environmental Setting

This section describes the environmental setting related to energy resources and energy use. The study area for energy use and resources as it relates to the proposed project includes the service areas of the energy providers within San Joaquin and Sacramento counties that would serve the proposed project during construction and operation. Figure 3.6-1A-C depicts the study area for energy resources.

3.6.3.1 Overview of Energy Consumption in the State

Overall, California's energy consumption (per capita) and production are among the lowest and highest, respectively, in the nation. Because of its mild climate and energy efficiency programs, California ranked 48th in the nation for per capita energy consumption in 2016 (the most recent year for which data is available). In 2017, California ranked second in the nation in conventional hydroelectric generation and first in net electricity generation from other renewable energy resources. As of January 2018, California ranked third in the nation in petroleum refining capacity (U.S. Energy Information Administration 2020).

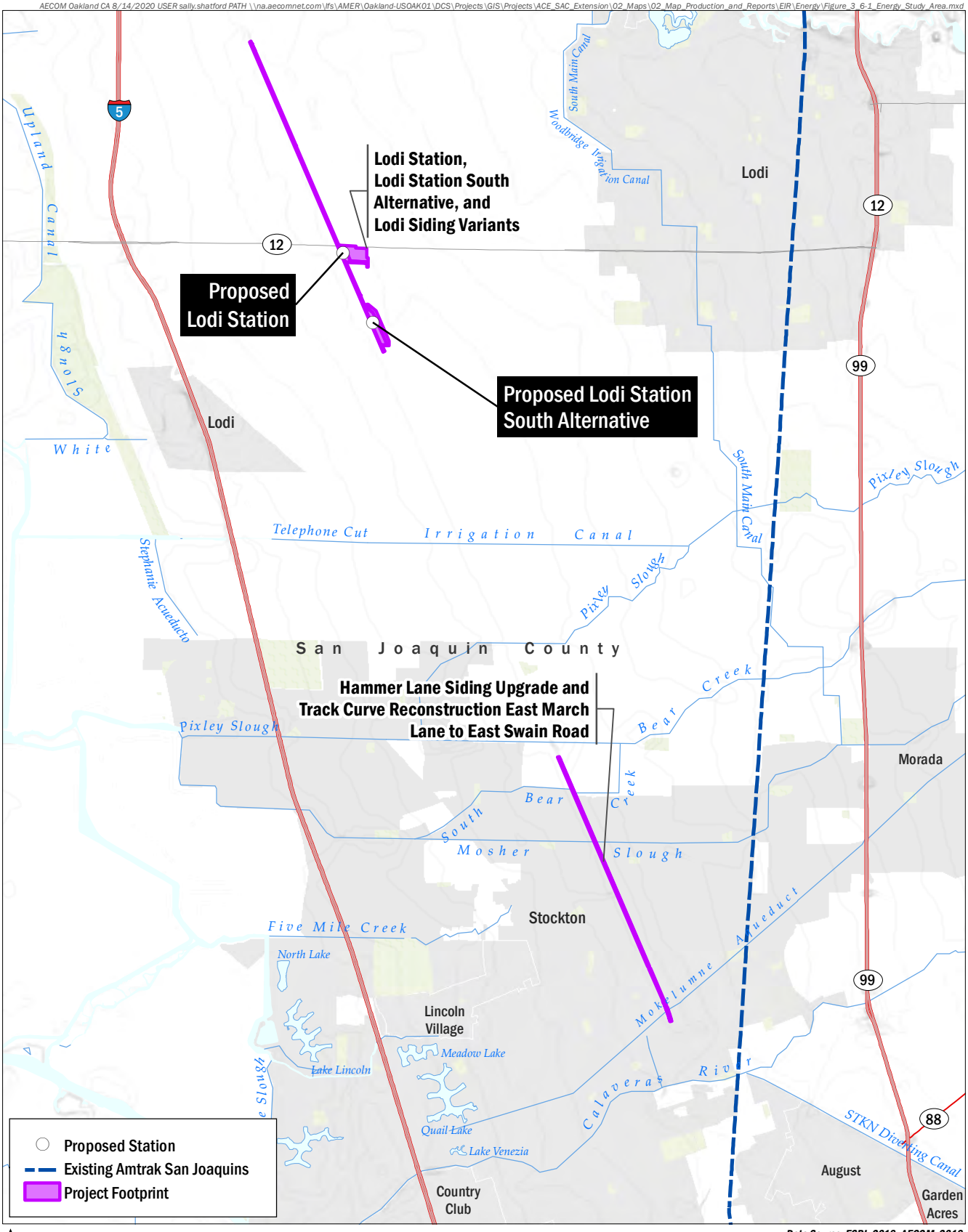
The transportation end-use sector consumes the largest share of energy in California. In 2017, transportation accounted for 40.3% of all energy consumed in California, compared to 23.1% for industrial uses, 18.7% for commercial uses, and 18.0% for residential uses (U.S. Energy Information Administration 2020).

Table 3.6-1 compares various modes of passenger travel within the United States and the approximate energy use for each mode. Rail transit energy use per passenger-mile was less than that for cars, personal trucks, and transit buses in 2016. In other words, rail transit is more energy efficient per passenger-mile than other common transportation modes.

Table 3.6-1. 2019 U.S. Passenger Travel Mode and Energy Use

Travel Mode	Vehicle-miles (millions)	Passenger-miles (millions)	Energy Usage	
			(Btu per vehicle-mile)	(Btu per passenger-mile)
Cars	1,453,356	2,238,169	4,526	2,939
Personal Trucks	1,167,371	2,124,615	6,255	3,437
Motorcycles	20,455	23,728	2,847	2,454
Aircraft	5,758	661,911	266,640	2,320
Buses (Transit)	2,255	20,565	37,404	4,102
Rail (Transit)	810	20,923	19,654	761
Rail (Commuter)	372	11,768	53,709	1,696
Rail (Intercity-Amtrak)	316	6,520	31,958	1,551

Source: U.S. Energy Information Administration, 2020
Btu = British thermal unit



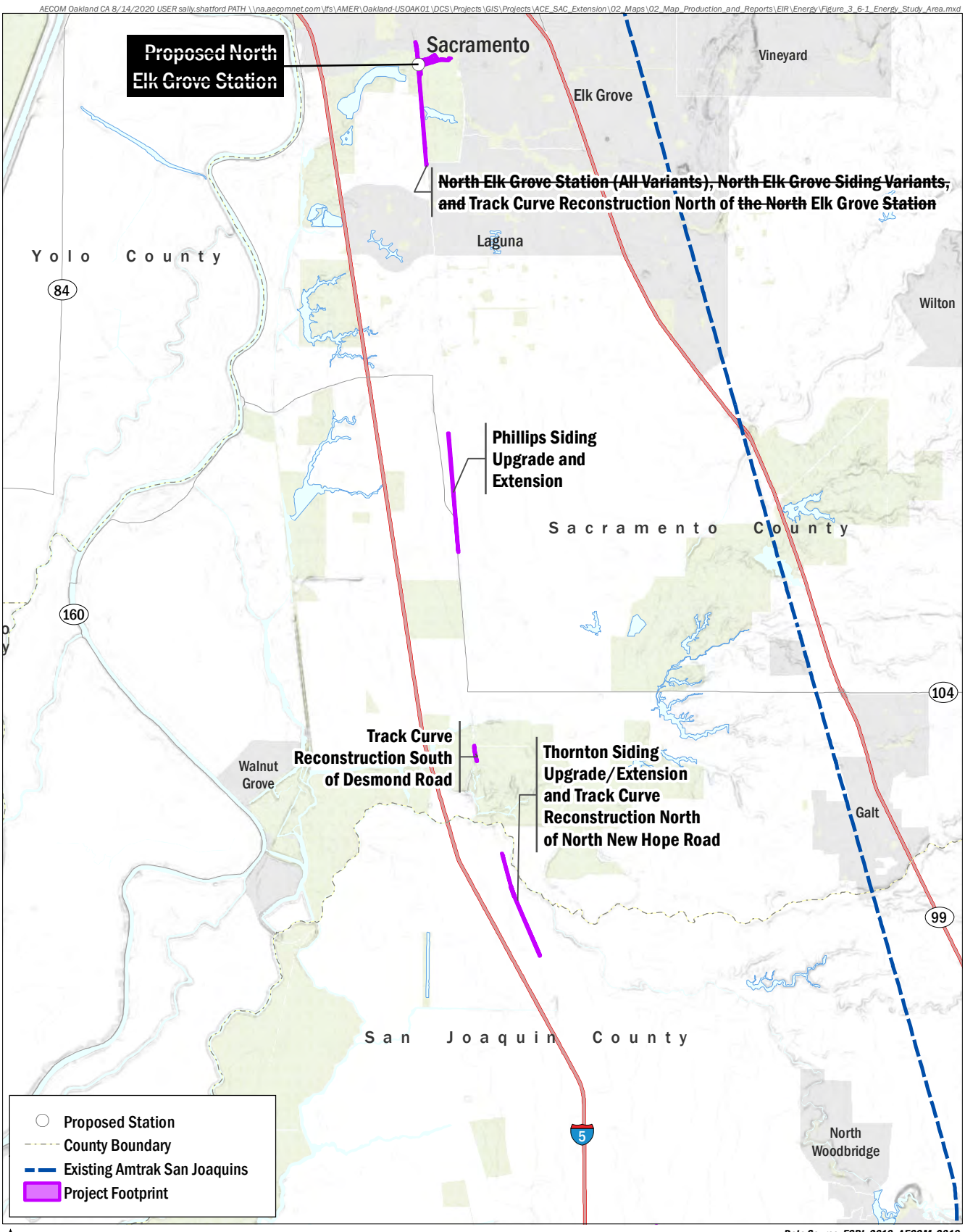
Data Source: ESRI, 2019; AECOM, 2019; San Joaquins and Capital Corridor Rail Alignments: California Department of Transportation, 2013.

AECOM

San Joaquin Regional Rail Commission

FIGURE 3.6-1A

Energy Study Area
Stockton to Lodi



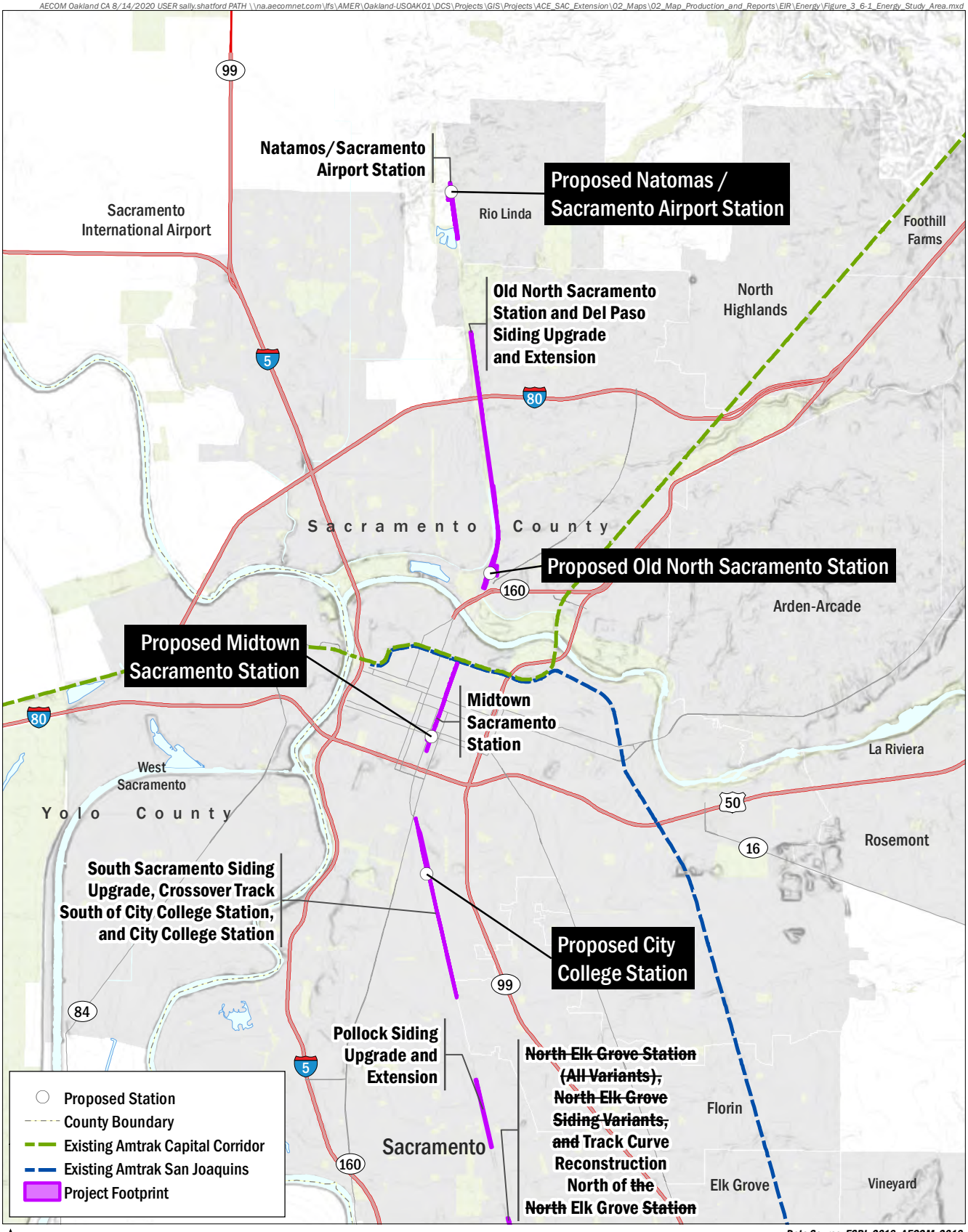
AECOM

San Joaquin Regional Rail Commission

Note: The North Elk Grove Station, including all access and siding variants, is no longer under consideration. Therefore, the footprint shown above would be reduced to only the portion of the proposed project that includes the Track Curve Reconstruction North of Elk Grove.

FIGURE 3.6-1B

Energy Study Area
Lodi to Elk Grove



Data Source: ESRI, 2019; AECOM, 2019; San Joaquins and Capital Corridor Rail Alignments: California Department of Transportation, 2013.

AECOM
San Joaquin Regional Rail Commission

FIGURE 3.6-1C

Energy Study Area
Elk Grove to Natomas

3.6.3.2 Petroleum, Electricity, and Natural Gas

Among the various types of energy sources, petroleum (diesel fuel) is the primary fuel consumed, in terms of construction and operational energy demand, and would be used to propel trains on their scheduled runs. Of the other primary energy sources, electricity would be used principally for the operation of the stations. Natural gas would not be used by the proposed project These energy sources and the providers are described in the following sections.

Petroleum

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 almost 5% of total U.S. production in 2019 (U.S. Energy Information Administration 2019a). California ranks third in the nation in petroleum refining capacity and accounts for more than one-tenth of the total U.S. capacity (U.S. Energy Information Administration 2019a).

California imported approximately 369 million barrels of crude oil from foreign countries in 2018 and obtained approximately 73 million barrels of crude oil from Alaska (California Energy Commission 2019a). CEC reported in-state crude oil production and domestic crude oil imports of approximately 200 million barrels for 2018; this value includes both crude oil produced in California and crude oil transported to California from the other lower 48 states, including North Dakota and Gulf Coast states. Overall petroleum supplied in 2018 in California was therefore approximately 642 million barrels of crude oil (California Energy Commission 2019a).

Almost 40% of California's energy consumption results from the transport of goods and people. In 2018 sales of diesel fuel to California end users was approximately 1,187,100 gallons per day (gpd) and sales of gasoline to California end users was approximately 455,900 gpd (U.S. Energy Information Administration 2019c, 2019d).

Valley Pacific Petroleum would provide diesel fuel for the operation of ACE trains. Valley Pacific Petroleum obtains its fuel from the Chevron Richmond Refinery, a 2,900-acre petroleum refinery in Richmond, California, which processes about 250,000 barrels of crude oil a day (Chevron 2018).

Electricity

California's electricity use is assessed annually by 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. Substantial 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 RPS.

According to CEC, total statewide electricity consumption grew from 228,970 million kilowatt hours (kWh) in 1990 to 281,120 million kWh in 2018 (California Energy Commission 2019b). Within the study area, the Sacramento Municipal Utility District (SMUD) provides electric service

to Sacramento County and the Pacific Gas and Electric Company (PG&E) provides electric service to San Joaquin County.

Sacramento Municipal Utility District

SMUD is responsible for the generation, transmission, and distribution of electrical power to its 900 square mile service area, which includes the portion of the proposed project that would be in Sacramento County. SMUD's service area includes most of Sacramento County and a small portion of Placer County. SMUD is a publicly-owned utility governed by an elected board of seven directors that make policy decisions and appoint the general manager, the individual responsible for the district's operations.

SMUD supplies electricity to over 1.5 million customers in Sacramento County and a small portion of adjacent Placer County. It is the sixth-largest community-owned electric utility in the U.S., generating the bulk of its power through natural gas and large hydroelectric generation plants. SMUD was the first large California utility to receive more than 20% of its energy from renewable resources, and currently supplies 46% of its electricity powered from non-carbon-emitting resources (SMUD 1 2018).

Demand: According to CEC, the forecasted consumption for the SMUD planning area in 2020 is between 11,207 to 12,121-gigawatt hours (GWh). The forecasted peak demand for 2020 is between 3,219 and 3,532 megawatts (MW). The average growth rate from 2012 to 2020 is estimated to be 1.28 to 1.80% (CEC 2014).

Generation Capacity/Supply: In 2018, SMUD generated and procured approximately 11,700 GWh of electricity (SMUD 2, 2018). SMUD energy resources come from natural gas (36%), hydroelectric (33%), renewable energy (25%), and around 6% from market purchase. SMUD's single biggest source of power is from the Cosumnes Power Plant, a 500-megawatt hour (MWh) gas-fired power plant that supplies power to 450,000 single-family homes. SMUD has a wind farm of 107 turbines that generates 230 megawatts of clean power; a fourth phase is expected to be operational in 2023. SMUD's Upper American River Project (UARP) has 11 reservoirs and eight powerhouses and provides roughly 1,800 GWh of electricity, providing approximately 20% of SMUD's power needs (SMUD 2 2018). An unspecified source of power comes from solar energy.

Pacific Gas and Electric

PG&E provides natural gas and electric service to approximately 16 million people throughout its 70,000 square mile service area in northern and central California. PG&E is one of the largest combined natural gas and electric energy companies in the US (PG&E 1 2018). Nearly 80% of its electricity is powered from non-carbon-emitting resources.

Demand: According to CEC, the forecasted consumption within the PG&E planning area in 2020 is between 115,908 and 124,374 GWh. The forecasted peak demand for 2020 is between 24,715 and 26,749 MW. The average growth rate from 2012 to 2020 is estimated at 1.32% to 2.33% (CEC 2014).

Generation Capacity/Supply: Electricity in San Joaquin County is supplied by PG&E. PG&E provides electricity for approximately 5.2 million customer accounts in a 70,000-square-mile service area in northern and central California. PG&E's service area stretches from Eureka in the north to Bakersfield in the south, and from the Pacific Ocean in the west to the Sierra Nevada in

the east. PG&E currently (as of December 2018) operates 18,000 circuit miles of interconnected transmission and distribution lines (PG&E 2019).

In 2018, PG&E generated and procured 48,832 GWh of electricity (PG&E 2019). The California Energy Demand Revised Forecast 2018-2030, which describes electricity consumption, sales, and peak demand, reports that peak demand within the PG&E service area reached almost 21,000 MW in the same year (California Energy Commission 2018). Peak demand is the amount of electricity consumed at any given moment, usually integrated over a 1-hour period. Peak demand is important in evaluating system reliability, identifying congestion points on the electrical grid, and designing required system upgrades. Peak demand has grown steadily since 1990. The increase in peak electricity demand represents overall growth since 1990; however, peak demand fluctuates in the short term as a result of many factors, including the economy (California Energy Commission 2018).

PG&E's generation portfolio includes hydroelectric facilities (18%), nuclear generation (27%), natural gas (20%), renewable energy resources (33%) and unspecified power (2%) (PG&E 2 2018). The net operating capacity of these facilities at the end of 2018 was 7,686 MW (PG&E 2019). San Joaquin County represented 2% of total statewide consumption in 2018 (5,629 million kWh).

Natural Gas

PG&E supplies the natural gas service in San Joaquin and Sacramento counties and is responsible for maintaining the infrastructure for natural gas distribution and transmission. PG&E serves approximately six million gas customers, and delivers 970 billion cubic feet (BCF) of gas per year, or 2.6 BCF per day. PG&E's gas transmission and distribution pipelines stretch from Eureka in the north to Bakersfield in the south, and from the Pacific Ocean in the west to the Sierra Nevada Mountain Range in the east. PG&E has more than 6,400 miles of gas transportation pipeline and 42,000 miles of gas distribution pipeline. PG&E's network of high-pressure natural gas transmission pipelines generally follows existing transportation corridors, such as roads and railroad tracks (PG&E 2018b).

3.6.4 Environmental Analysis

This section describes the environmental impacts of the proposed project on energy resources. It describes the methods used to evaluate the impacts and the thresholds used to determine whether an impact would be significant. Measures to mitigate significant impacts are provided, where appropriate.

3.6.4.1 Methods for Analysis

Construction and operational-related energy consumptions were analyzed for the proposed improvements between Stockton and Natomas. Project improvements and operations would take place along the project alignment, which is within the jurisdiction of two counties: San Joaquin and Sacramento. Construction and operational activities occurring within the boundaries of both counties were quantified and analyzed separately. Energy calculations for each project improvement in both counties were based on a combination of project-specific data inputs and model defaults. A summary of the data inputs, calculation factors, and calculation methodologies used is provided below for both the construction and operational elements of the proposed project.

Detailed project inputs, assumptions, and calculations are provided in Appendix B, *Quantification of Criteria Air Pollutant and Greenhouse Gas Emissions, and Energy Use.*

Project improvements proposed in San Joaquin County include the following elements:

- Hammer Lane Siding Upgrade
- Track Curve Reconstruction between East March Lane and East Swain Road
- Lodi Siding Variants
- Lodi Station or Lodi Station South Alternative
- Thornton Siding Upgrade/Extension
- Track Curve Reconstruction north of North New Hope Road

Project improvements proposed in Sacramento County include the following elements:

- Track Curve Reconstruction south of Desmond Road
- Phillips Siding Upgrade/Extension
- ~~North Elk Grove Station (including all access and platform variants)~~
- ~~Elk Grove Siding Variants~~
- Track Curve Reconstruction north of Elk Grove ~~North Elk Grove Station~~
- Pollock Siding Upgrade
- South Sacramento Siding Upgrade
- Crossover Track south of City College Station
- City College Station
- Midtown Sacramento Station
- Old North Sacramento Station
- Del Paso Siding Upgrade/Extension
- Natomas/Sacramento Airport Station

Energy impacts were analyzed by assessing energy usage associated with the construction and operation of the proposed project. The analysis of energy demand (fuel) associated with the construction of the proposed project considers the use of diesel-powered off-road construction equipment, diesel-powered locomotives for transporting rail materials during construction, and on-road vehicles (construction worker vehicles, haul trucks, and other on-site construction support vehicles such as water trucks). The use of this equipment and vehicles would be temporary (i.e. limited to the construction period) and would cease when construction activities are complete.

The analysis of energy demand associated with project operations used quantified fuel and electricity demand estimates for the following proposed project components.

- Train operation and idling: The project would result in and increased consumption of diesel fuel for train operations.
- Station operations: New stations would be established, resulting in new electricity demand at these facilities.
- Displaced passenger vehicle miles: The shift of travelers from automobiles to passenger rail transit would result in reduced automobile vehicle-miles traveled (VMT) and thus regional reductions in personal (household) automobile fuel consumption.

The energy usage for each project improvement was calculated based on its respective "energy intensity factor," which expresses the amount of energy used per unit of activity (e.g., per hour or per VMT). For comparison purposes and to derive the net operational energy consumption, the energy usage for each component is converted into British thermal units (Btu). The methodology for deriving the operational energy demand for each of the project improvements is summarized below.

The discussion below presents the methods used for the energy analysis and how the significance of the proposed project's energy impacts was determined.

Construction

Construction of the proposed project would require diesel fuel as the primary source of energy for construction off-road equipment, locomotive use to transport materials, trucks, and worker vehicles. While some on-road vehicles could be gasoline-powered, this analysis assumed that most of the vehicles are diesel powered; based on conversion rates from exhaust GHG emissions to Btu energy demand. This is considered a conservative assumption for the purposes of estimating overall energy demands. Energy consumption associated with the construction would be temporary and would cease when construction activities are complete. Construction-period energy demand was estimated by applying energy factors from U.S. Energy Information Administration (US EIA 2016) to the anticipated construction equipment and vehicle GHG exhaust emissions estimates. The GHG emissions estimation methodology is further detailed in Section 3.8, *Greenhouse Gas Emissions,* and full calculation inputs, assumptions, and outputs are available in Appendix B, *Air Quality, Health Risk Assessment, Greenhouse Gas, and Energy.*

Operations

Passenger Shuttle Bus and Locomotive Operations

The operation of the proposed project would result in increased diesel fuel consumption from new and extended passenger rail service between the existing Stockton Downtown/ACE Station to the proposed Natomas/Sacramento Airport Station, including travel over the route and idling while loading passengers at stations. The route mileage for the track variants would be the same. The proposed shuttle-bus service between the proposed Natomas/Sacramento Airport Station and the Sacramento Airport would also result in fuel demand under project operations. Indirect energy use would include electricity use at the proposed stations.

Although the proposed project would increase the operational energy use within the two counties the alignment traverses, the proposed project is expected to result in a transportation mode shift

(i.e., attract passengers who otherwise would have driven cars). This shift would reduce travel by personal (household) automobiles, reducing associated mobile fuel demand.

Locomotive, shuttle-bus, and on-road vehicle energy use and reductions were estimated using engine exhaust GHG emissions calculated in Section 3.8, *Greenhouse Gas Emissions*.

Station Operation

Station operations would result in new electricity consumption for lighting at surface parking lots and station platforms~~, and to operate the passenger elevator included at the North Elk Grove Station~~. The platforms would not include bathrooms or other structures that would use water, nor would they consume natural gas. Emission factors for electricity use were unique to each local electricity provider (PG&E within San Joaquin County and SMUD within Sacramento County). Monthly forecasted electricity use for each proposed station was based upon historical information from electricity use by existing stations and adjusted for the size of the proposed stations.

Displaced Vehicle Miles

Although the proposed project would increase the operational fuel consumption sources within the counties the alignment traverses, the proposed project is expected to result in a transportation mode shift (i.e., attract passengers who otherwise would have driven cars). This shift would reduce travel by highway vehicles, reducing mobile source energy consumption. Project operations would introduce new passenger rail service in the corridor, which would divert passengers from driving to riding the train, which would reduce automobile usage and reduce traffic volumes on the region's roadways, and in turn reduce fuel usage by vehicles. This "displaced VMT" analysis was used to derive changes in energy demand by personal vehicles. Reduced VMT due to this modal shift was quantified for the proposed project.

Passenger vehicle fuel demand avoided by the proposed project operations was estimated using methodology detailed in Section 3.8, *Greenhouse Gas Emissions,* and the reduced VMT emissions were then apportioned to San Joaquin and Sacramento counties based on the project alignment length within each county.

3.6.4.2 Thresholds of Significance

According to Appendix F of the State CEQA Guidelines, conserving energy may be achieved by decreasing overall per capita energy consumption; decreasing reliance on fossil fuels such as coal, natural gas, and oil; and increasing reliance on renewable energy sources. The state 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 resources. The project would result in a significant impact on energy if it would:

- 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.

3.6.4.3 Impacts and Mitigation Measures

Impact ENG-1: Implementation of the proposed project would not result in potentially significant environmental impacts due to wasteful, inefficient, or unnecessary consumption of energy resources during project construction or operation (Less-than-Significant Impact).

Construction

Construction impacts are defined as those resulting from building the proposed project facilities (e.g., new and upgraded track, bridge crossing structures, at-grade crossing modifications, and new stations), associated infrastructure, and related physical changes. During construction, energy in the form of gasoline and diesel fuel would be used to transport construction materials, operate construction equipment and trucks, and for worker commuting. Natural gas is not typically used during construction and none of the construction equipment likely to be used would require electricity. Energy consumption associated with construction activities would be temporary and would cease when construction is complete. Table 3.6-2 summarizes the estimated consumption of fuel associated with construction of the proposed project.

San Joaquin County Segment

The major portion of the total fuel consumption occurs during the construction activities of the proposed project. As shown in Table 3.6-2 and expressed in millions of British thermal units (MMBtu), the total energy consumption within San Joaquin County for construction would be ~~632~~ 15,931 MMBtu (total for all 3 years) (531 MMBTU per year when amortized over a 30-year operational period) and the peak demand year would be in 2021 when the most intensive construction activities would take place, which include construction of the Lodi Station (or Lodi Station South Alternative).

Sacramento County Segment

Similar to the segment in San Joaquin County, the major portion of the total fuel consumption would occur during construction of the proposed project in Sacramento County. As shown in Table 3.6-2, the total energy consumption within Sacramento County for construction would be ~~2,047~~ 36,005 MMBtu (total for all 3 years) (1,631 MMBTU per year when amortized over a 30-year operational period) and the peak demand year would be in 2021 when the most intensive construction activities would take place, which includes construction of the proposed stations within Sacramento County.

Operations

Operational impacts are those resulting from ongoing, routine, and occasional activities associated with the implementation of the proposed project. The operation of the proposed project would involve train service, station operations, and shuttle operations, all of which would result in an increase in energy usage. However, the proposed project, by providing an alternative to driving, would encourage the diversion of travelers and commuters from personal vehicles to passenger rail, as described in Section 3.16, *Transportation*.

Table 3.6-2. Estimated Fuel Consumption From Project Construction

Segment and Facility	Total GHG Emissions (metric CO_2e tons)/Year			Emission Factor[1] (MT CO_2/gallon)	Fuel Usage[2] (gallons/year)			Total Energy (MMBtu)
	2021	2022	2023		2021	2022	2023	
San Joaquin County								
Lodi Station	692 ~~686~~	0	0	0.0102	68,109 ~~67,564~~	0	0	9,406 ~~9,330~~
Lodi Station South Alternative	692 ~~686~~	0	0	0.0102	68,109 ~~67,564~~	0	0	9,406 ~~9,330~~
Track Curve Reconstruction East March Lane to East Swain Road	0	60	0	0.0102	0	5,907 ~~5,858~~	0	816 ~~809~~
Track Curve Reconstruction North of North New Hope Road	0	60	0	0.0102	0	5,907 ~~5,858~~	0	816 ~~809~~
Hammer Lane Siding Upgrade	0	0	120 ~~119~~	0.0102	0	0	11,814 ~~11,717~~	1,631 ~~1,618~~
Thornton Siding Upgrade/Extension	0	0	240 ~~238~~	0.0102	0	0	26,628 ~~23,433~~	3,263 ~~3,236~~
Lodi Siding Variants	480 ~~476~~	0	0	0.0102	47,256 ~~46,867~~	0	0	6,526 ~~6,472~~
Sacramento County								
~~North Elk Grove Station Access Variant 2 (new intersection west of existing)~~ ~~*Inclusive of North Elk Grove platform improvements*[3]~~	~~606~~	~~0~~	~~0~~	~~0.0102~~	~~59,644~~	~~0~~	~~0~~	~~8,236~~
~~North Elk Grove Station Access Variant 1 (fourth leg of existing intersection)~~ ~~*Inclusive of North Elk Grove platform improvements*[3]~~	~~606~~	~~0~~	~~0~~	~~0.0102~~	~~59,644~~	~~0~~	~~0~~	~~8,236~~
City College Station	0	0	614 ~~608~~	0.0102	0	0	60,424 ~~59,822~~	8,344 ~~8,261~~
Midtown Sacramento Station	785 ~~779.16~~	0	0	0.0102	77,303 ~~76,689~~	0	0	10,675 ~~10,590~~
Old North Sacramento Station	0	0	919 ~~911~~	0.0102	0	0	90,471 ~~89,644~~	12,494 ~~12,379~~

Segment and Facility	Total GHG Emissions (metric CO_2e tons)/Year			Emission Factor[1] (MT CO_2/gallon)	Fuel Usage[2] (gallons/year)			Total Energy (MMBtu)
	2021	2022	2023		2021	2022	2023	
Natomas/Sacramento Airport Station	756 ~~751.06~~	0	0	0.0102	74,388 ~~73,923~~	0	0	10,273 ~~10,208~~
Track Curve Reconstruction South of Desmond Road	0	60	0	0.0102	0	5,907 ~~5,858~~	0	816 ~~809~~
Track Curve Reconstruction North of Elk Grove ~~Station~~	0	60	0	0.0102	0	5,907 ~~5,858~~	0	816 ~~809~~
Philips Siding Upgrade/Extension	120 ~~119.04~~	0	0	0.0102	11,814 ~~11,717~~	0	0	1,631 ~~1,618~~
Pollock Siding Upgrade	0	0	120 ~~119~~	0.0102	0	0	11,814 ~~11,717~~	1,631 ~~1,618~~
South Sacramento Siding Upgrade	0	0	283 ~~280~~	0.0102	0	0	27,845 ~~27,557~~	3,845 ~~3,806~~
Del Paso Siding Upgrade/Extension	2021	0	0	0.0102	198,917	0	0	27,470
~~Elk Grove Siding Variants~~	~~533~~	~~0~~	~~0~~	~~0.0102~~	~~52,424~~	~~0~~	~~0~~	~~7,239~~
Crossover Track South of City College Station	0	0	120 ~~119~~	0.0102	0	0	11,814 ~~11,717~~	1,631 ~~1,618~~
Total Construction								
San Joaquin County	1,172 ~~1,163~~	120 ~~119~~	360 ~~357~~	0.0102	115,365 ~~114,431~~	11,814 ~~11,717~~	35,442 ~~35,150~~	15,931 ~~15,802~~
Sacramento County	3,765	119	2,037	0.0102	260,725 ~~370,607~~	11,814 ~~11,717~~	202,369 ~~200,456~~	36,005 ~~51,179~~
Amortized Demands (over 25 years)								
San Joaquin County					3,845.50 ~~4,577.22~~	393.80 ~~468.67~~	1,184.40 ~~1,406.00~~	531 ~~632~~
Sacramento County					8,690.84 ~~14,824.27~~	393.80 ~~468.67~~	6,745.62 ~~8,018.26~~	1,200 ~~2,047~~

Notes:

GHG = greenhouse gas; MT CO_2e = metric tons of carbon dioxide equivalents; MMBtu = millions of British thermal units

1. Source: U.S. Energy Information Administration 2016 (https://www.eia.gov/environment/emissions/co2_vol_mass.php).

2. Conservatively assuming that all construction-related vehicles would use diesel fuel.

~~3. While Elk Grove platform improvement variants would differ in location, they are equivalent in emissions-generating construction activity.~~

Table 3.6-3 summarizes the estimated consumption of gasoline, diesel fuel, and electricity with the operation of the proposed project. At the end of the table the total energy usage by source is expressed in MMBtu to provide a common unit for comparison. The operation of trains would account for most of the energy usage (as MMBtu) associated with the operation of the proposed project. As shown, the reduction in VMT and the related decrease in fuel consumption would offset the operational energy demands of the proposed project, resulting in a net energy savings relative to no project conditions.

Table 3.6-3. Estimated Energy Usage During Project Operation

County	Activity	Energy Requirement	Energy Unit	Annual Energy Consumption (MMBtu)
Proposed Project Operation				
San Joaquin County	Locomotive Operations	264,976 ~~98,706~~	Gallons Diesel/year	36,592 ~~13,631~~
	Electricity Use	*117,120*	KWh/yr	400
	Subtotal			*36,992* *~~14,031~~*
Sacramento County	Locomotive Operations	348,001 ~~129,634~~	Gallons Diesel/year	48,057 ~~17,902~~
	Shuttle Service	4,844 ~~3,404~~	Gallons Diesel/year	669 ~~470~~
	Electricity Use	119,700 ~~391,824~~	KWh/yr	409 ~~1,337~~
	Subtotal			*49,135* *~~19,709~~*
On-Road Fuel Demand Avoided Due to VMT Displaced by Rail Ridership Increase				
San Joaquin County	Diesel-fueled on-road vehicles	(8,576) ~~(6,006)~~	Gallons Diesel/year	(1,184) ~~(829)~~
	Gasoline-fueled on-road vehicles	(837,770) ~~(586,719)~~	Gallons Gasoline/year	(104,721) ~~(73,340)~~
	Subtotal			*(105,906)* *~~(74,169)~~*
Sacramento County	Diesel-fueled on-road vehicles	(11,263) ~~(7,888)~~	Gallons Diesel/year	(1,555) ~~(1,089)~~
	Gasoline-fueled on-road vehicles	(1,100,270) ~~(770,556)~~	Gallons Gasoline/year	(137,534) ~~(96,319)~~
	Subtotal			*(139,089)* *~~(97,409)~~*
Net Energy Reductions				
San Joaquin County	Operational Demand			36,992 ~~14,031~~
	Operational Offsets			(105,906) ~~(74,169)~~
	Subtotal			*(68,914)* *~~(60,139)~~*
Sacramento County	Operational Demand			49,135 ~~19,709~~
	Operational Offsets			(139,089) ~~(97,409)~~
	Subtotal			*(89,954)* *~~(77,700)~~*

Notes:
MMBtu = millions of British thermal units; KWh/year = kilowatt hours per year

San Joaquin County

As shown in Table 3.3-3, total energy consumption within San Joaquin County for the operation would be ~~14,031~~ 36,992 MMBtu per year ~~over all 3 years of the project~~. The major portion of the total energy usage in San Joaquin County is due to diesel fuel consumption for train operations. As also shown, the reduced energy consumption from fewer on-road vehicles due to the operation of the proposed project in San Joaquin County would be ~~74,169~~ 105,906 MMBtu. The operation of the proposed project would therefore result in a ~~60,139~~ 68,914 MMBtu net energy reduction in San Joaquin County, as shown in Table 3.6-4.

Sacramento County

As shown in Table 3.6-3, the total energy consumption within San Joaquin County for the operation of the proposed project would be ~~19,709~~ 48,900 MMBtu per year ~~over all 3 years of the project~~. The major portion of the total energy usage in this segment is due to diesel fuel consumption for train operations. As shown, the reduced energy consumption from fewer on-road vehicles in Sacramento County due to the operation of the proposed project would be ~~97,409~~ 139,089 MMBtu. The proposed project would therefore result in a ~~77,700~~ 89,954 MMBtu net energy reduction in Sacramento County, as shown in Table 3.6-3.

Significance Conclusion

Construction

Equipment and materials for the construction of the proposed project would require energy inputs. As shown in Table 3.6-3, construction would require fuel use for construction equipment, locomotive use, trucks, and worker commuting. However, the energy expenditure associated with the proposed project construction would be temporary and limited to the duration of the construction period. Many financial incentives are offered by government agencies 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 incentive for efficiency. In addition, jurisdictions in which construction would occur require the reuse and recycling of construction and demolition materials, which would reduce the inherent energy cost of materials and the construction impacts would be less than significant.

Furthermore, as discussed in Section 3.6, *Greenhouse Gas Emissions,* implementation of Mitigation Measure GHG-1.1, which would require the implementation of specific emission reduction measures associated with the off-road construction equipment, would also result in a reduction in overall fuel use during construction. For example, Mitigation Measure GHG-1.1 would require the idling of construction equipment to be limited to no more than 3 minutes; the use of alternative fuels to power construction equipment when feasible; the use of CARB low carbon fuel to power construction equipment; the promotion of carpools, shuttle vans, transit passes, and/or secure bicycle parking for construction worker commutes; recycling or salvaging non-hazardous construction and demolition debris, with a goal of at least 75% by weight; and the use of locally sourced or recycled construction materials. With the implementation of Mitigation Measure GHG-1.1, the construction of the proposed project would be generally more fuel efficient that without the implementation of such measures. Therefore, non-renewable energy resources would not be

consumed in a wasteful, inefficient, or unnecessary manner during construction. Therefore, this impact would be less than significant.

Operation

As shown in Table 3.6-3, project operations would result in a net energy savings because the fuel savings from reduced personal vehicle VMT would more than offset the energy demand from train operations, stations, and the shuttle. This net reduction in energy usage due to the proposed project would be an environmental benefit.

Energy demand at new stations would be minimized by compliance with Title 24 Cal. Code Regs. standards. The only energy demand at the proposed stations would be in the form of electricity. In both counties, electricity would be provided by utility providers that currently exceed the RPS standards. Also, the facilities would not be staffed, and the new stations would not result in activities that consume electricity in an inefficient manner. Therefore, the operation of the proposed project stations would not encourage or result in activities that consume large amounts of electricity in an inefficient manner.

Energy use benefits achieved through the operation of the proposed project would offset the short-term construction energy use in less than a year of operation. Energy savings achieved thereafter would contribute to reductions in energy use. Total construction energy demand over the three years of construction would come to approximately ~~15,802~~ 15,931 MMBtu in San Joaquin County and ~~51,179~~ 51,623 MMBtu in Sacramento County. Based on annual operational energy savings of ~~60,139~~ 36,005 MMBtu in San Joaquin County and ~~77,700~~ 89,954 MMBtu in Sacramento County, energy use benefits achieved through project operations would offset the short-term construction energy use in less than a year in both San Joaquin and Sacramento counties.

Therefore, energy impacts from construction and operation of the proposed project would be less than significant. Because the impacts would result in less energy use than under no project conditions, the energy savings would be an environmental benefit and no adverse impact would result, so no mitigation is required.

Impact ENG-2: Implementation of the proposed project would not conflict with or obstruct a state or local plan for renewable energy or energy efficiency (Less-than-Significant Impact).

As discussed above in Impact ENG-1, during construction of the proposed project, energy would be used to transport construction materials, operate construction equipment and trucks, and for worker commutes. Overall, energy consumption would involve mostly diesel fuel for construction equipment and transport, with smaller amounts of gasoline for worker commuting.

The energy consumption during construction would not result in a substantial increase in energy demand that would affect local or regional energy supplies outlined above. Diesel fuel for construction could be obtained from the refineries in the region that would be determined by the construction contractors. As stated above, the Chevron Richmond Refinery is a large processing facility and the refinery produces 250,000 barrels of crude oil per day. This would result in

approximately 21,000 barrels of diesel fuel. [3] The demand for diesel fuel for the construction of near-term improvements would be a small percentage of the production capacity of this refinery and others that could meet the construction energy needs.

The operation of the proposed project would involve train and shuttle service and the operation of new stations, all of which would result in an increase in energy consumption. The energy consumption would be associated primarily with the consumption of diesel fuel for the operation of trains and the usage of electricity at the stations.

The energy consumption during operation would not result in a substantial increase in energy demand that would affect the local or regional energy supplies identified above. The increased demand for diesel fuel to operate the trains would be minor (about 0.003%) compared to the petroleum-producing capacity of the Chevron Richmond Refinery.

During operation, trains would run on diesel fuel, which would not require electricity from the grid. The proposed stations are estimated to increase the demand for electricity by approximately 117,000 kWh (0.117 gWh) per year in San Joaquin County, and 392,000 kWh (0.392 gWh) per year in Sacramento County, as shown in Table 3.6-3. Given that PG&E supplied 48,832 gWh in 2018 and SMUD supplied 11,700 gWh in 2018, the net addition of 0.39 gWh per year would represent a negligible amount in the context of the electricity demanded annually.

Significance Conclusion

The large equipment used for construction would be powered with diesel fuel, which would not require electricity directly from the grid. As a result, construction activities would not significantly increase peak electricity demands or base period electricity demands. PG&E would be able to accommodate the increase in temporary electricity use with existing resources. Electricity consumption during construction would not be substantial and, thus, would not affect the ability of PG&E to serve the region with existing supplies. Therefore, this impact would be less than significant, and no mitigation is required.

During operation, the new stations would comply with applicable Title 24 Cal. Code Regs. standards, which require the installation and maintenance of energy-efficient electrical systems in new construction. The proposed project would not result in a substantial increase in energy demand that would affect local or regional energy supplies or require additional capacity to meet that increased demand.

The transportation end-use sector consumes the largest share of energy in California. State plans focus on reducing VMT to reduce overall energy use in the state (for example, the Sacramento Area Council of Governments [SACOG] Metropolitan Transportation Plan [MTP]/ Sustainable Communities Strategy [SCS]). The proposed project supports a mode shift from personal automobiles to transit, thereby supporting regional reductions in VMT and a net reduction in transportation energy demand. In addition, the implementation of the proposed project would be along an existing rail route and would not impede regional or local efforts for renewable energy or other energy efficiency improvements in any way. Therefore, the proposed project would

[3] Petroleum refineries in the United States produce about 19 to 20 gallons of motor gasoline and 11 to 12 gallons of ultra-low sulfur distillate fuel oil (most of which is sold as diesel fuel and in several states as heating oil) from one 42-gallon barrel of crude oil (US EIA May 23, 2018).

support state and local efforts to reduce overall transportation-related energy use and would not conflict with or obstruct a state or local plan for renewable energy or energy efficiency.

Overall, the proposed project would represent a negligible amount of the electricity demanded in the PG&E service area. Moreover, the electrical demand at the stations is expected to be relatively constant, as that electrical demand would not be subject to changes in train operation. Therefore, the operation of the proposed project is not expected to affect peak demand in the PG&E service area. This impact would be less than significant, and no mitigation is required.

3.7 Geology and Soils

3.7.1 Introduction

This section describes the regulatory and environmental setting for geology, soils, and paleontological resources in the vicinity of the Valley Rail Sacramento Extension Project (proposed project). It also describes the impacts on geology, soils, and paleontological resources that would result from implementation of the proposed project, and mitigation measures that would reduce significant impacts, where feasible and appropriate.

For purposes of this analysis, the study area for geology and soils consists of the project footprint. The study area for paleontological resources is defined as the horizontal project footprint, and extending below ground to the maximum depth of disturbance to include all geologic units that could be encountered during construction or operation.

Cumulative impacts on geology, soils, and paleontological resources, in combination with planned, approved, and reasonably foreseeable projects, are discussed in Chapter 4, *Other CEQA-Required Analysis*.

During the public scoping comment period, no comments relevant to geology or paleontological resources were received. The comments received during the scoping period are included in Appendix A, *NOP and Scoping Summary Report.*

3.7.2 Regulatory Setting

This section summarizes the federal, state, regional, and local regulations related to geology, soils, and paleontological resources that are applicable to the proposed project. This section also includes a list of key design standards and guidelines related to geology and soils that will be used during design and construction of the proposed project.

3.7.2.1 Federal

Track Safety Standards

Section 213.239, Special Inspections, of 49 Code of Federal Regulations (CFR) 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.

Earthquake Hazards Reduction Act

The U.S. Congress passed the Earthquake Hazards Reduction Act in October 1977 to reduce the risks to life and property from future earthquakes through the establishment and maintenance of an effective earthquake hazards reduction program. To accomplish this goal, the act established the National Earthquake Hazards Reduction Program (NEHRP). This program was substantially amended in November 1990 by the National Earthquake Hazards Reduction Program Act (NEHRPA), which refined the description of agency responsibilities, program goals, and objectives.

The mission of the NEHRP includes improved understanding, characterization, and prediction of hazards and vulnerabilities; improved building codes and land use practices; risk reduction through post-earthquake investigations and education; development and improvement of design and construction techniques; improved mitigation capacity; and accelerated application of research results. The NEHRPA designates the Federal Emergency Management Agency (FEMA) as the lead agency of the program, and assigns several planning, coordinating, and reporting responsibilities. Other NEHRPA agencies include the National Institute of Standards and Technology, National Science Foundation, and the U.S. Geological Survey (USGS).

Paleontological Resources

No federal regulations pertain to paleontological resources in the study area because no federal lands are present in the study area.

3.7.2.2 State

Geology and Soils Resources

Alquist-Priolo Earthquake Fault Zoning Act

The Alquist-Priolo Earthquake Fault Zoning Act (Alquist-Priolo Act) (California Public Resources Code [PRC] Sections 2621–2630) was enacted in 1972 to reduce the hazard of surface faulting to structures designed for human occupancy. The main purpose of the law is to prevent the construction of buildings used for human occupancy on the surface trace of active faults. The law addresses only the hazard of surface fault rupture, and is not directed toward other earthquake hazards. The Alquist-Priolo Act requires the State Geologist to establish regulatory zones known as Earthquake Fault Zones around the surface traces of active faults and issue appropriate maps, which are distributed to all affected cities, counties, and state agencies for their use in planning efforts. Before a project can be permitted in a designated Alquist-Priolo Earthquake Fault Zone, the permitting agency must require a geologic investigation to demonstrate that buildings intended for human habitation would not be constructed across active faults.

Seismic Hazards Mapping Act

The Seismic Hazards Mapping Act of 1990 (California PRC Sections 2690–2699.6) addresses earthquake hazards from non-surface fault rupture, including liquefaction and seismically induced landslides. The act established a mapping program for areas that have the potential for liquefaction, landslides, strong ground shaking, or other earthquake and geologic hazards. The act also specifies that the lead agency for a project may withhold development permits until geologic or soils investigations are conducted for specific sites, and mitigation measures are incorporated into plans to reduce hazards associated with seismicity and unstable soils.

As required by the act, the California Geological Survey (CGS) has issued official Seismic Hazard Zone Maps that indicate zones of required investigation for earthquake faulting, landslides, and 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 Code

Title 24 of the California Code of Regulations (CCR), known as the California Building Standards Code (CBC) or "Title 24," contains the regulations that govern the construction of buildings in California. The CBC contains general building design and construction requirements relating to fire and life safety, structural safety, and access compliance (Division of the State Architect, 2018).

Chapter 18, *Soils and Foundations*, of the CBC regulates the excavation of foundations and retaining walls, including the preparation of preliminary soil, engineering geologic, geotechnical, and supplemental ground-response reports. Chapter 18 also regulates analysis of expansive soils and the determination of the depth to groundwater table. For Seismic Design Category C, Chapter 18 requires analysis of slope instability, liquefaction, and surface rupture attributable to faulting or lateral spreading. For Seismic Design Categories D, E, and F, Chapter 18 requires these same analyses plus an evaluation of lateral pressures on basement and retaining walls, liquefaction and soil strength loss, and lateral movement or reduction in foundation soil-bearing capacity. It also requires that seismic mitigation measures be considered in structural design.

Paleontological Resources

California Environmental Quality Act and California Environmental Quality Act Guidelines for Protection of Paleontological Resources

The California Environmental Quality Act (CEQA; PRC Section 21000 et seq.) Guidelines (14 CCR Section 15064.7) provide specific guidance for determining the significance of impacts on historic and unique archaeological resources. Under CEQA, these resources are called *historical resources* whether they are of historic or prehistoric age.

Guidelines for implementing CEQA define procedures, types of activities, persons, and public agencies required to comply with CEQA. Section 15064.7(b) prescribes that project effects that would “cause a substantial adverse change in the significance of an historical resource” are significant effects on the environment. Substantial adverse changes include physical changes to both the historical resource and its immediate surroundings.

Appendix G of the CEQA Guidelines provides an environmental checklist of questions that a lead agency should normally address if relevant to a project’s environmental impacts. One of the questions to be answered in the Environmental Checklist (Section 15023, Appendix G, Section VII, part f) is the following: “Would the project directly or indirectly destroy a unique paleontological resource or site?” Although CEQA does not define what constitutes “a unique paleontological resource or site,” Section 21083.2 defines *unique archaeological resources* as “any 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:

- Contains information needed to answer important scientific research questions and show that there is a demonstrable public interest in that information.
- Exhibits a special and particular quality, such as being the oldest of its type or the best available example of its type.

- Is directly associated with a scientifically recognized important prehistoric or historic event or person."

This definition is equally applicable to recognizing "a unique paleontological resource or site." CEQA Section 15064.7 (a)(3)(D), provides additional guidance, indicating that "generally, a resource shall be considered historically significant if it has yielded, or may be likely to yield, information important in prehistory or history."

The CEQA lead agency having jurisdiction over a project is responsible for ensuring that paleontological resources are protected in compliance with CEQA and other applicable statutes. PRC Section 21081.6, *Mitigation Monitoring Compliance and Reporting*, requires that the CEQA lead agency demonstrate project compliance with mitigation measures developed during the environmental impact review process.

California Public Resources Code Section 5097.5

PRC Section 5097.5 provides protection for paleontological resources on public land, which is defined as lands owned by, or under the jurisdiction of, the state, or any city, county, district, authority, or public corporation, or any agency. Unauthorized collection of fossils on public land is considered a misdemeanor, punishable by fine and/or imprisonment. PRC Section 5097.5(a) states as follows:

> A person shall not knowingly and willfully excavate upon, or remove, destroy, injure, or deface, any historic or prehistoric ruins, burial grounds, archaeological or vertebrate paleontological site, including fossilized footprints, inscriptions made by human agency, rock art, or any other archaeological, paleontological or historical feature, situated on public lands, except with the express permission of the public agency having jurisdiction over the lands.

3.7.2.3 Regional and Local

The San Joaquin Joint Powers Authority (SJJPA), a state joint powers agency, and the San Joaquin Regional Rail Commission (SJRRC) propose improvements within and outside of the Union Pacific Railroad (UPRR) right-of-way (ROW). The Interstate Commerce Commission Termination Act (ICCTA) affords railroads engaged in interstate commerce considerable flexibility in making necessary improvements and modifications to rail infrastructure, subject to the requirements of the Surface Transportation Board.[1] ICCTA broadly preempts state and local regulation of railroads, and this preemption extends to the construction and operation of rail lines. Therefore, activities in existing UPRR ROW are exempt from local building and zoning codes and other land use ordinances. Project improvements proposed outside of the UPRR ROW, however, would be subject to regional and local plans and regulations. Although ICCTA does broadly preempt state and local regulation of railroads, SJJPA and SJRRC intend to obtain local agency permits for construction of facilities that fall outside of the UPRR ROW, even though SJRRC has not determined that such permits are legally necessary, and such permits may not be required.

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

Appendix E, *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 project improvements are proposed. 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 preparation of this analysis, and reviewed to assess whether the proposed project would be consistent with the plans of relevant jurisdictions.[2] The proposed project would be generally consistent with the applicable goals, policies, and objectives related to geology, soils, and paleontological resources identified in Appendix E.

Society of Vertebrate Paleontology

The Society of Vertebrate Paleontology (SVP), a national scientific organization of professional vertebrate paleontologists, has established standard guidelines that outline acceptable professional practices in the conduct of paleontological resource assessments and surveys, monitoring and mitigation, data and fossil recovery, sampling procedures, specimen preparation, analysis, and curation. In its standard guidelines for assessment and mitigation of adverse impacts on paleontological resources, SVP established four categories of sensitivity for paleontological resources: high, low, no, and undetermined. Areas where fossils have been previously found are considered to have a high sensitivity and a high potential to produce fossils. Areas that are not sedimentary in origin and that have not been known to produce fossils in the past typically are considered to have low sensitivity. Areas consisting of high-grade metamorphic rocks (e.g., gneisses and schists) and plutonic igneous rocks (e.g., granites and diorites) are considered to have no sensitivity. Areas that have not had any previous paleontological resource surveys or fossil finds are considered to be of undetermined sensitivity until surveys are performed. After reconnaissance surveys, a qualified paleontologist can determine whether the area of undetermined sensitivity should be categorized as having high, low, or no sensitivity. In keeping with SVP's 2010 significance criteria, all vertebrate fossils are generally categorized as being of potentially significant scientific value.

3.7.3 Environmental Setting

This section describes the environmental setting related to geology, soils, and paleontological resources by segment for the proposed project.

3.7.3.1 Regional Geologic Setting

The study area lies in the Central Valley, which is part of the Great Valley Geomorphic Province. The Central Valley is an asymmetric trough approximately 400 miles long and 50 miles wide that is bounded by the Sierra Nevada to the east and south, the Coast Ranges to the west, and the Klamath Mountains to the north. The Central Valley is drained by the Sacramento and San Joaquin rivers, which join and flow out of the Great Valley province through San Francisco Bay. This geomorphic province is characterized by a relatively flat alluvial plain made up of a deep sequence of sediment deposits from Jurassic (approximately 200 million years Before Present [B.P.]) to recent age. The sediments in the Central Valley range from 3 to 6 miles in thickness and

[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.

were derived primarily from erosion of the Sierra Nevada to the east, with lesser material from the Coast Ranges to the west.

The Central Valley basin began to form during the Jurassic period, as the Pacific oceanic plate was subducted underneath the adjacent North American continental plate. During the Jurassic and Cretaceous periods of the Mesozoic era, the Central Valley existed in the form of an ancient ocean. By the end of the Mesozoic, the northern portion of the Central Valley began to fill with sediment as tectonic forces caused uplift of the basin. Geologic evidence surrounding the Stockton Arch suggests that the Sacramento Valley and San Joaquin Valley gradually separated into two separate waterbodies as uplift and sedimentation continued. By the time of the Miocene epoch (approximately 24 million years B.P.), sediments deposited in the Sacramento Valley were mostly of terrestrial origin. In contrast, the San Joaquin Valley continued to be inundated with water for another 20 million years, as indicated by marine sediments dated to the late Pliocene (approximately 5 million years B.P.). By the Pleistocene epoch, the San Joaquin Valley had emerged from the water, and was enclosed by the Sierra Nevada Range to the east and the Coast Range to the west (Bartow 1991).

Overlying the thick sequence of sedimentary rock units that form the deeply buried bedrock units in the mid-basin areas of the valley are shallower Pleistocene (2.6 million–11,700 years B.P.]) and Holocene (i.e., 11,700 years B.P.–Present Day) alluvial deposits, consisting of reworked fan and stream materials that were deposited by streams before the construction of the existing flood control systems. The youngest geomorphic features in the study area are low floodplains, which are found primarily along major river courses that exist today, such as the Sacramento, American, Cosumnes, Mokelumne, and the San Joaquin. The natural floodplains of these rivers are very wide because the land is relatively flat. These major drainage ways were originally confined within broad natural levees sloping away from the rivers or streams. The natural levees formed through the deposition of alluvium during periods of flooding. As flood waters lost energy, the coarser materials settled out nearest the rivers and streams, forming the natural levees and sand bars in the vicinity of the river channel (i.e., levee and channel deposits). The finer material was carried in suspension farther from the rivers or streams, and settled out in quiet water areas such as swales, abandoned meander channels, and lakes (i.e., basin deposits). However, because the streams have meandered and reworked the previously deposited sediments, extreme variations in material types may be found over a limited distance or depth.

Flanking the Holocene alluvial deposits in the study area are late Pleistocene alluvial fan and terrace deposits of the Modesto and Riverbank formations. Stream terrace deposits, mapped as the Modesto Formation, are higher in elevation and older than the levee, channel, and basin deposits. Before the construction of the existing flood-control levees, these stream terraces were occasionally flooded, but only small amounts of sediment were deposited during flood events. The lower fan terraces of the Riverbank Formation are higher in elevation and older than stream terraces, and were only rarely flooded. In the Sacramento area, the younger Modesto Formation has been worn away by erosional processes, leaving the older Riverbank Formation exposed at the surface. In San Joaquin County, by contrast, the younger Modesto Formation is still present at the surface in the central portion of the valley from Stockton to Chowchilla. (Helley and Harwood 1985; Wagner et al. 1981, 1991).

Elevations in the study area range from 21 to 25 feet above mean sea level (amsl) in the Stockton to Lodi Segment, from 5 to 17 feet amsl in the Lodi to Elk Grove Segment, and from 6 to 23 feet amsl in the Elk Grove to Natomas Segment.

Surficial geologic formations in the study area are described in Table 3.7-1, and shown in Figures 3.7-1 A through 3.7-1C.

Table 3.7-1. Surficial Geologic Formations within the Study Area

Map Unit Symbol[1]	Geologic Formation Name	Description
Qa	Levee and Channel Deposits	Alluvium deposited on fans, terraces, or in basins along modern-day watercourses. Sand, gravel, and silt that are poorly to moderately sorted.
Qb	Basin Deposits	Fine-grained sediments with horizontal stratification deposited by standing or slow-moving water in topographic lows.
Qm_2 Qm_1	Modesto Formation	Tan and light-gray gravely sand, silt, and clay forming alluvial terraces, alluvial fans, and abandoned channel ridges of major streams and rivers. Qm_2 = Upper member; composed of unconsolidated, unweathered deposits of gravel, sand, silt, and clay. Terraces are topographically lower than Qm_1. The age is estimated to be approximately 12,000 to 26,000 years B.P. Qm_1 = Lower member; composed of unconsolidated, slightly weathered deposits of gravel, sand, silt, and clay. Terraces are topographically higher than Qm_2. The age is estimated to be approximately 29,000 to 42,000 years B.P.
Qr	Riverbank Formation	Deposits of weathered reddish gravel, sand, and silt that form higher alluvial fans and terraces of major rivers. In the Sacramento Valley, this formation contains more mafic igneous rock fragments as compared to the San Joaquin Valley, where the Riverbank tends to contain more arkosic alluvium. The age of the Riverbank ranges from approximately 130,000 to 450,000 years B.P.

Notes:

B.P. = Before Present

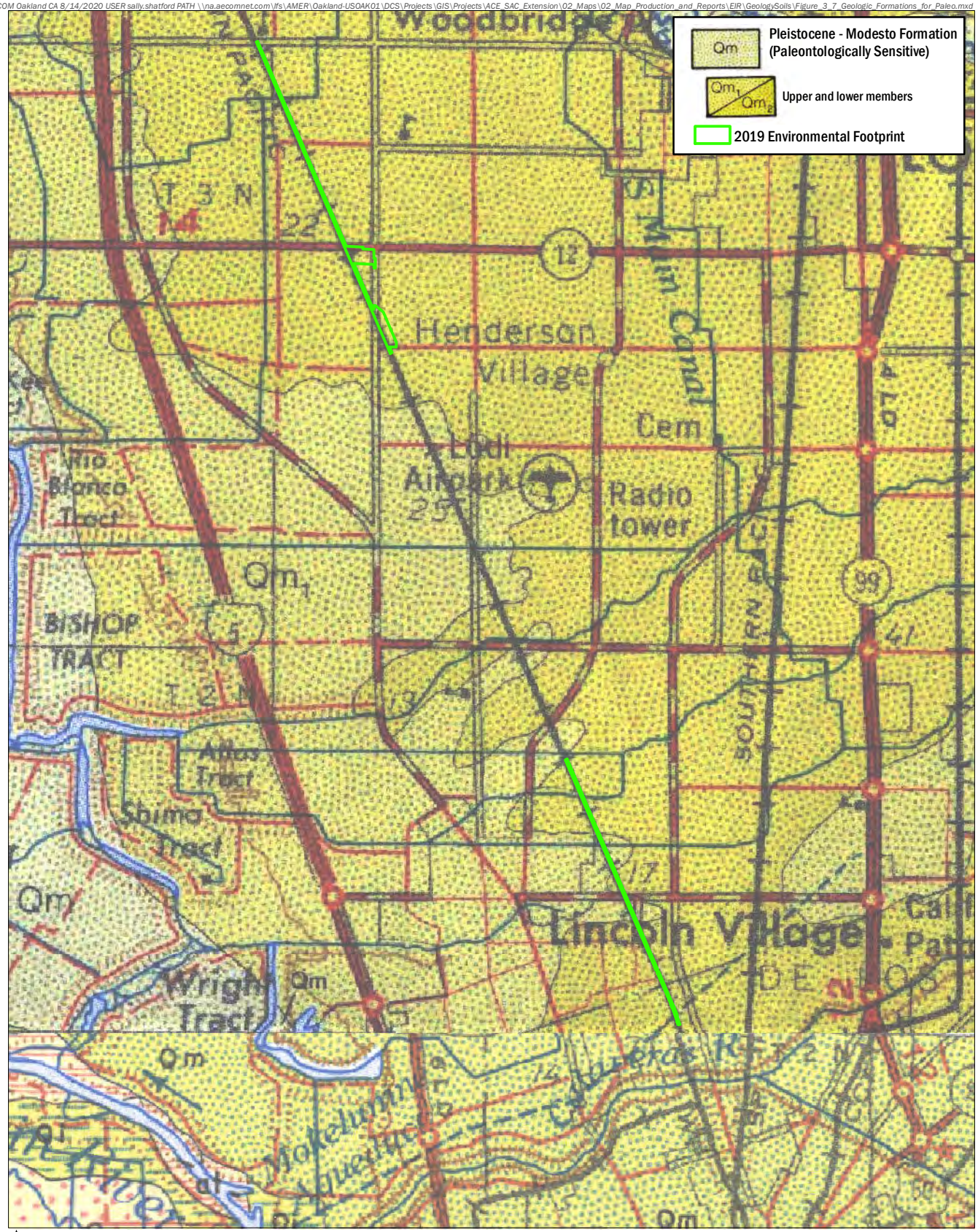
[1] Map unit symbols correspond to Figures 3.7-1A through 3.7-1C.

Sources: Gutierrez 2011; Helley and Harwood 1985; Marchand and Allwardt 1981; Wagner et al. 1981, Wagner et al. 1991

3.7.3.2 Seismic Hazards

According to USGS Fault Maps, Sacramento and San Joaquin counties (including the project footprint) are not seismically active areas (USGS 2019a). The study area is not in the Alquist-Priolo earthquake fault zone, nor is it near active faults. The active faults closest to the study area are smaller faults, which include Greenville fault (approximately 30 miles west of the Stockton to Lodi Segment) and Great Valley Thrust fault (approximately 30 miles west of Lodi to Elk Grove and Elk Grove to Natomas segments).

Moderate earthquakes have also occurred in the Central Valley; these have occurred along active faults along the crest of the western Sacramento Valley. Larger quakes from more distant faults such as those in the San Francisco Bay Area and east of the Sierra Nevada can cause damage to infrastructure, especially in areas where water levels are high in soft soils.



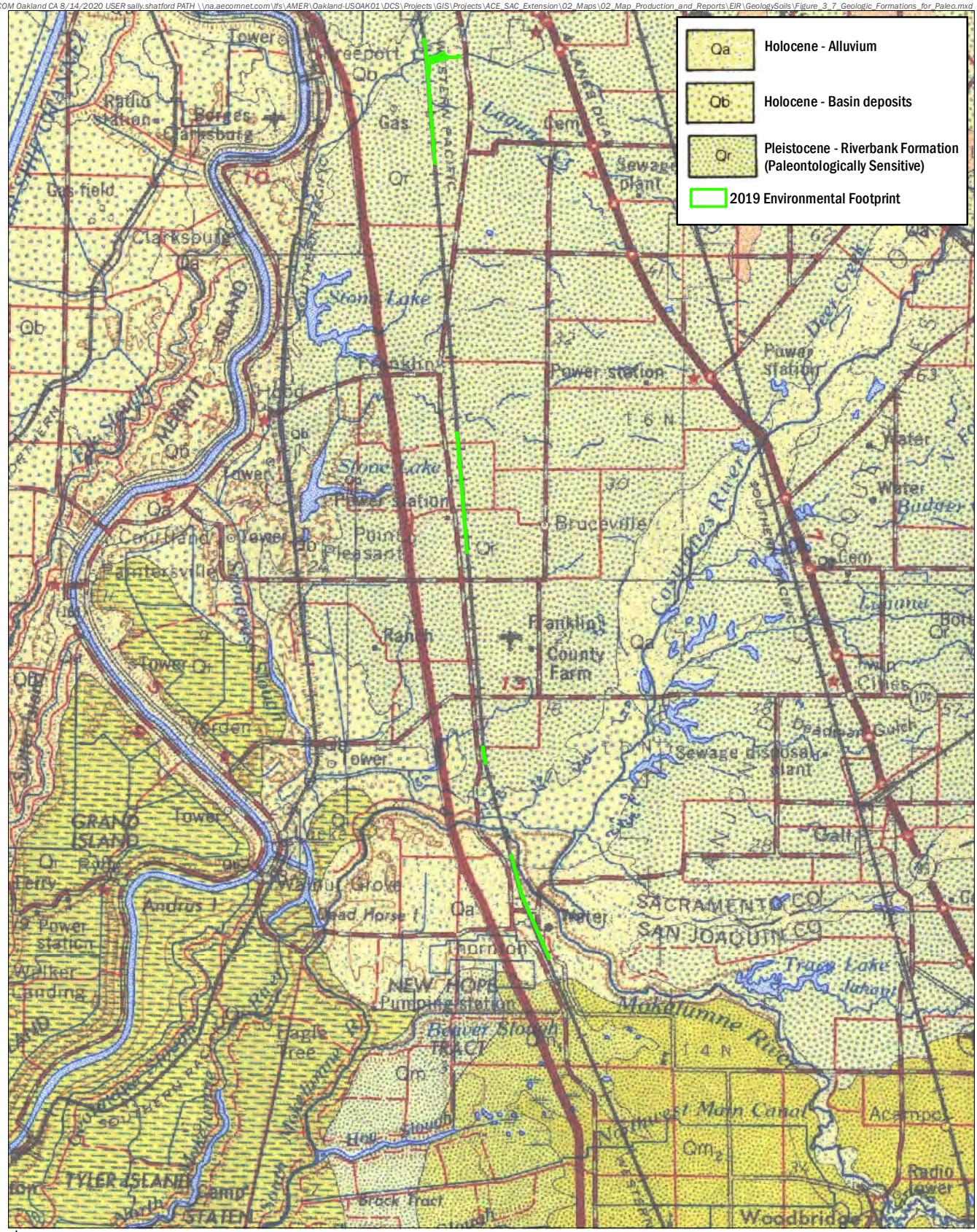
Source: ESRI, 2019; Wagner et al. 1987, Wagner et al. 1991; AECOM, 2019

AECOM

San Joaquin Regional Rail Commission

FIGURE 3.7-1A

Geologic Formations
Stockton to Lodi



N

0 2 Miles

Source: ESRI, 2019; Wagner et al. 1987; AECOM, 2019

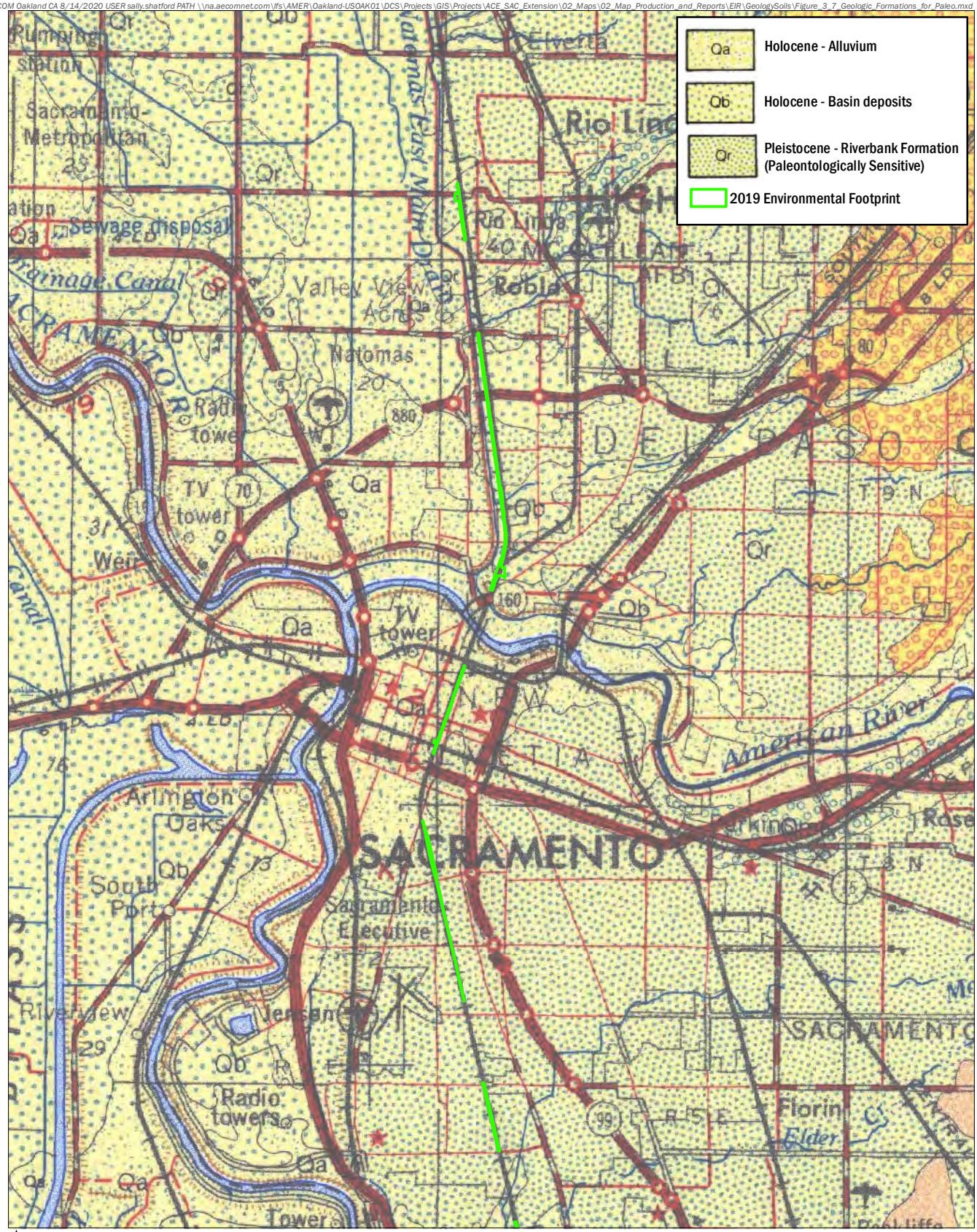
AECOM

San Joaquin Regional Rail Commission

Note: The North Elk Grove Station, including all access and siding variants, is no longer under consideration. Therefore, the footprint shown above would be reduced to only the portion of the proposed project that includes the Track Curve Reconstruction North of Elk Grove.

FIGURE 3.7-1B

Geologic Formations
Lodi to Elk Grove



Source: ESRI, 2019; Wagner et al. 1987; AECOM, 2019

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FIGURE 3.7-1C

Geologic Formations
Elk Grove to Natomas

There are no geologic units or soils that are unstable in the study area that could potentially result in landslide, lateral spreading, liquefaction, or collapse. Due to the distance from seismic sources and the general greater depth to the groundwater table in Sacramento and San Joaquin counties, the study area has a low risk for liquefaction and lateral spreading (USGS 2019b). Furthermore, since the study area is in a generally flat alluvial plain, the proposed project would not be constructed in any mapped landslide deposits (California Department of Conservation, 2015).

3.7.3.3 Soil

Soils in the study area vary from somewhat poorly drained to moderately well-drained, from silty with low shrink-to-swell potential to clayey soils with high shrink-swell potentials. Soils in the project footprint come from land forms, including basin floors, terraces, and flood plains. In more urbanized areas of the project footprint (Elk Grove and Sacramento cities), many of the soils have been disturbed or paved over. Soils in the Stockton-to-Lodi segment include Galt clay and Egbert clay; these are expansive soils. Generally, soils in the project footprint in the Lodi to Elk Grove and Elk Grove to Natomas segments are San Joaquin silt loam and Cosumnes-Urban land complex. Near the Sacramento River, in the northern portion of the project corridor, there are expansive clays. Table 3.7-2, Soil Characteristics in the Study Area, presents relevant soil characteristics based on U.S. Natural Resources Conservation Service (NRCS) soil survey data (NRCS 2019).

Table 3.7-2. Soil Characteristics in the Study Area

Soil Type	Segments	Shrink-Swell Potential[1]	Water Erosion[2]	Wind Erosion[3]	Corrosion of Steel	Corrosion of Concrete	Hydrologic Group[4]
San Joaquin silt loam (Alfisols), 0 to 1 percent slopes	Lodi to Elk Grove Elk Grove to Natomas	Low	0.43 High	6 Low	High	Low	C Medium to High
Cosumnes-Urban land complex (Entisols), 0 to 2 percent slopes	Lodi to Elk Grove Elk Grove to Natomas	Low	0.20 Moderate	6 Low	High	Low	C/D Medium to High
Egbert clay, (Mollisol), 0 to 2 percent slopes	Stockton to Lodi Elk Grove to Natomas	High	0.20 Moderate	4 Moderate	High	Low	C/D Medium to High
Galt clay (Vertisols), 0 to 2 percent slopes	All Project segments	High	0.28 Moderate	4 Moderate	High	Low	D High

Notes:

1. Based on the plasticity index; ratings of moderate to very high can result in damage to buildings, roads, bridges, and other structures.
2. Based on the erosion factor “Kw whole soil,” which is a measurement of relative soil susceptibility to sheet and rill erosion by water. Values of K range from 0.02 to 0.69. The higher the value the more potential for water erosion.
3. Soils assigned to wind erodibility group 1 are the most susceptible to wind erosion, and those assigned to group 8 are the least susceptible.
4. Group A soils = low runoff potential, Group B soils = low to medium runoff potential, Group C soils = medium to high runoff potential, Group D soils = high runoff potential.

3.7.3.4 Paleontological Resources

The paleontological importance of a project site can be assessed by identifying the paleontological sensitivity of geologic formations that are exposed there. Because geologic and topographic maps can be used to easily delineate the distribution of a rock formation, this method is conducive to determining the parts of a project area that are of higher and lower sensitivity for paleontological resources.

A paleontologically sensitive geologic formation is one that is rated high for potential paleontological productivity (i.e., the recorded abundance and types of fossil specimens, and the number of previously recorded fossil sites), and is known to have produced unique, scientifically important fossils. Exposures of a specific geologic formation at any given project site are most likely to yield fossil remains representing particular species or quantities similar to those previously recorded from that geologic formation in other locations. Therefore, the paleontological sensitivity determination of a rock formation is based primarily on the types and numbers of fossils that have been previously recorded from that formation.

An individual vertebrate fossil specimen may be considered unique or significant if it is identifiable and well preserved, and it meets one of the following criteria:

- A type specimen (i.e., the individual from which a species or subspecies has been described);
- A member of a rare species;
- A species that is part of a diverse assemblage (i.e., a site where more than one fossil has been discovered) wherein other species are also identifiable, and important information regarding life history of individuals can be drawn;
- A skeletal element different from, or a specimen more complete than, those now available for its species; or
- A complete specimen (i.e., all or substantially all of the entire skeleton is present).

The value or importance of different fossil groups varies depending on the age and depositional environment of the rock unit that contains the fossils, their rarity, the extent to which they have already been identified and documented, and the ability to recover similar materials under more controlled conditions (such as for a research project). Marine invertebrates are generally common; the fossil record is well-developed and well-documented, and they would generally not be considered a unique paleontological resource. Identifiable vertebrate marine and terrestrial fossils are generally considered scientifically important because they are relatively rare.

To develop a baseline paleontological resource inventory of the study area and to establish the paleontological sensitivity of each geologic formation present in the study area, background research was conducted and each geologic formation exposed at the surface, or likely to be encountered at depth in the study area was assigned a paleontological sensitivity rating based on the number and type of previously recorded fossil sites from that formation, and the scientific importance of the fossil remains recorded. These methods are consistent with SVP (2010) guidelines for assessing the importance of paleontological resources.

Geologic maps and available published geological and paleontological literature covering the stratigraphy and surficial geology of the study area were reviewed to determine the exposed and subsurface rock formations; to assess the potential paleontological productivity of each rock formation; and to delineate their respective areal distribution in the study area. The number and location of previously recorded fossil sites from rock formations exposed in the study area, and the types of fossil remains each rock formation has produced were evaluated based on published geological and paleontological literature. The literature review was supplemented by a records search from the University of California, Berkeley Museum of Paleontology (UCMP) on September 16, 2019.

Table 3.7-3 presents the results of the paleontological sensitivity assessment for the study area (see Table 3.7-1 for a description of the geologic formations).

Table 3.7-3. Paleontological Sensitivity Assessment

Geologic Formation Name and Age	Summary of Records and Literature Search Results	Paleontological Sensitivity
Levee and Channel Deposits, Holocene	To be considered a unique paleontological resource, a fossil must be more than 11,700 years old. Holocene deposits contain only the remains of extant, modern taxa (if any resources are present), which are not considered "unique" paleontological resources.	Low
Basin Deposits, Holocene	To be considered a unique paleontological resource, a fossil must be more than 11,700 years old. Holocene deposits contain only the remains of extant, modern taxa (if any resources are present), which are not considered "unique" paleontological resources.	Low
Modesto Formation[1], Late Pleistocene (12,000–42,000 years B.P.)	Fossil specimens from sediments referable to the Modesto Formation have been reported at a variety of locations throughout the San Joaquin Valley, including Stockton, Tracy (along the Delta-Mendota Canal), Manteca, Modesto, and Merced. The Tranquility site in Fresno County (UCMP V-4401), has yielded more than 130 Rancholabrean-age fossils of fish, turtles, snakes, birds, moles, gophers, mice, wood rats, voles, jack rabbits, coyote, red fox, grey fox, badger, horse, camel, pronghorn antelope, elk, deer, and bison from sediments referable to the Modesto Formation.	High
Riverbank Formation[2], Pleistocene (130,000–450,000 years B.P.)	Nine recorded vertebrate fossil localities in the Sacramento area have yielded remains of Rancholabrean-age mammoth, bison, camel, coyote, horse, Harlan's ground sloth, mammoth, antelope, deer, rabbit, woodrat, fish, mole, mice, squirrel, snake, and gophers, dire wolf, frog, Pacific pond turtle, and the family Anatidae (ducks, geese, and swans). There are additional vertebrate fossil localities from the Riverbank Formation and from similar unnamed Rancholabrean-age alluvial sediments in Yolo, San Joaquin, Merced, Stanislaus, Fresno, and Madera counties.	High

Notes:

B.P. = Before Present

[1] In the study area, the Modesto Formation is present only in San Joaquin County.

[2] In the study area, the Riverbank Formation is present only in Sacramento County.

Sources: UCMP 2019; Jefferson 1991a and 1991b; Kolber 2004; Hilton et al. 2000; Helley and Harwood 1985; Hay 1927

3.7.4 Environmental Analysis

This section describes the environmental setting related to geology, soils, and paleontological resources by segment for the project.

As described above, for purposes of this analysis, the study area for geology and soils consists of the proposed project footprint. The analysis also considers faults and geologic formations at local and regional levels.

The study area for paleontological resources is defined as the horizontal environmental footprint, and extending below ground to the maximum depth of disturbance to include all geologic units that could be encountered during construction or operation.

3.7.4.1 Thresholds of Significance

The State 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 and soils. The project would result in a significant impact on geology and soils if it would:

- Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:
    1. 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 CGS Special Publication 42.)
    2. Strong seismic ground shaking.
    3. Seismic-related ground failure, including liquefaction.
    4. 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 UBC (1994, as updated), creating substantial direct or indirect risks to life or property.
- Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water.
- Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.

3.7.4.2 Methods for Analysis

Geology, Soils, and Seismicity

The methodology used to evaluate the potential environmental impacts of and on the project associated with geology, soils, and seismicity involved a review and assessment of published maps, professional publications, and reports pertaining to the study area. The information included USGS topographic maps; USGS, CGS, and other geologic, landslide, and liquefaction susceptibility maps; NRCS soil survey data; CGS Seismic Hazard Zone maps; USGS and CGS potential ground shaking maps; and CGS Alquist-Priolo Earthquake Fault Zoning data.

Impacts related to geology, soils, and seismicity have been analyzed qualitatively, based on a review of published geologic, seismic, and soils information for the study area and on professional judgment, in accordance with the current standard of care for geotechnical engineering and engineering geology. The analysis focuses on the construction and operational potential of the proposed project (including new facilities), 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.

Paleontological Resources

The fossil-yielding potential of geologic units in a particular area depends on the geologic age and origin of the units, as well as on the geologic and anthropogenic processes they have undergone. The methods used to analyze potential impacts on paleontological resources and develop mitigation for the identified impacts involved the following steps:

1. Identify the geologic units in the paleontological study area.
2. Assess the likelihood that the sediments affected by implementing the proposed project contain scientifically important, unique paleontological resources.
3. Evaluate the potential of the identified geologic units to contain significant fossils (their paleontological sensitivity).
4. Identify the geologic units that would be affected by each project element, based on each element's or alternative's depth of excavation—either at ground surface or below ground surface (bgs; at least 5 feet bgs).
5. Identify and evaluate impacts on paleontologically sensitive geologic units that may occur as a result of near-term and longer-term construction and operation that involves ground disturbance.

3.7.4.3 Impacts and Mitigation Measures

Impact GEO-1: The proposed project would not cause potential substantial adverse effects, including the risk of loss, injury, or death involving rupture of a known earthquake fault; strong seismic ground shaking; seismic-related ground failure, including liquefaction; or landslides (No Impact).

Construction and Operation

Construction and operation of the proposed project would not exacerbate the potential for rupture of a known earthquake fault, strong seismic ground shaking, or seismic-related ground failure. The proposed project includes the construction of new stations (including parking lots, passenger platforms, and pedestrian access routes) and improvements to existing UPRR tracks and roadways. Human activities that could cause earthquakes, such as the use of injection wells, drilling for mineral resources, groundwater extraction, and use of dams, are not associated with project improvements. Furthermore, the study area is not in a designated Alquist-Priolo Earthquake Zone or in a seismically active region, and would therefore be unlikely to experience surface fault rapture or strong seismic ground shaking.

Construction and operation of the proposed project would not exacerbate the potential for seismic liquefaction, which is a function of the location of the epicenter, the size of the event, and the underlying soils. Liquefaction occurs when ground vibrations or water pressure cause soil particles to spread apart and lose contact with each other, causing soil to temporarily behave as a viscous liquid. Poorly drained fine-grained soils such as sandy, silty, and gravelly soils are the most susceptible to liquefaction. These soils types are not present in the project footprint (NRCS 2019). The project footprint has very low liquefaction susceptibility (USGS 2019b).

The project improvements would be constructed in areas that are relatively flat, with little to no slopes, and would therefore have a low potential to cause landslides. Because the proposed project would be constructed in a generally flat alluvial plain, construction would not occur in any mapped landslide deposits. Additionally, the project footprint is not in any Earthquake-Induced Landslide Zone Areas where previous occurrence of landslide movement, or local topographic, geological, geotechnical and subsurface water conditions would indicate a potential for permanent ground displacements (California Department of Conservation, 2015). It is unlikely that a landslide would occur at any areas in the project footprint.

For the above reasons, construction and operation of the proposed project would not exacerbate the potential for risk of loss, injury, or death involving rupture of a known earthquake fault; strong seismic ground shaking; or seismic-related ground failure, including liquefaction or landslides. There would be no impact.

Impact GEO-2: The proposed project could result in substantial soil erosion or the loss of topsoil. However, implementation of Mitigation Measure GEO-2.1 would reduce this potentially significant impact to a less-than-significant level (Less-than-Significant Impact with Mitigation).

Contruction

During the implementation of project improvements (including new stations, parking lots, track and roadway improvements, and bridges) activities such as grading, excavation, trenching, drilling, and clearing and grubbing of brush, shrubs, and other types of vegetation could potentially result in substantial soil erosion or the loss of topsoil. Soil erosion is caused by two forces: water, and wind. Runoff water has the energy to detach soil particles by scour and to transport entrained soil materials either in suspension or by pushing or rolling larger particles. In this way, overland flow causes erosion and loss of topsoil.

Table 3.7-2, Soil Characteristics in the Study Area, illustrates the potential for soil erodibility by water and wind, and water runoff potential in each segment. The erosion potential for the Stockton to Lodi segment is moderate; however, the runoff potential is medium to high. The erosion potential for the Lodi to Elk Grove segment is moderate for water erosion and low for wind erosion; the potential for water runoff is medium to high. The erosion potential for the Elk Grove to Natomas segment ranges from moderate to high for water erosion, and low to moderate for wind erosion; the potential for water runoff is medium to high.

Soils on steep slopes are often more erodible, especially during heavy rain events. Because the project footprint is relatively flat, substantial soil erosion is not expected to occur. However, based on the soil characteristics in study area, soil erosion and loss of topsoil could potentially be a significant impact.

Mitigation Measure. Implementation of Mitigation Measure GEO-2.1 would reduce potentially significant construction impacts associated with soil erosion to a less-than-significant level.

> **GEO-2.1: Implement Best Management Practices to reduce soil erosion.**
>
> Implementation of Best Management Practices (BMPs) would include the utilization of gravel bags, straw rolls, and geotixiles to prevent erosion caused by water runoff. Additionally, dust control measures, such as misted water, silt fences, and polymer additives, would control loss of topsoil caused by wind. Furthermore, loss of topsoil during construction activities would be prevented by standard measures required as part of the National Pollutant Discharge Elimination System program (NPDES), as described in Section 3.10*, Hydrology and Water Quality*. NPDES requires stormwater pollution prevention plans (SWPPPs) that include BMPs to minimize water quality degradation, including erosion and subsequent sediment transport, during construction activities. Implementation of these BMPs would further prevent impacts to soil. Therefore, the project's construction would have a less-than-significant impact related to soil erosion and loss of topsoil.

Operation

Operation of the proposed project would include the use of rail, stations, and parking lots. No impacts are expected to occur during the operation of the project, because no soil would be disturbed and/or covered over with pavement or landscape after the construction phase is complete. Therefore, there would be no impact related to soil erosion and loss of topsoil during the operation of the project.

Impact GEO-3: The proposed project would not 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 (No Impact).

Construction and Operation

As discussed in Impact GEO-1, the proposed project would not be situated on a geologic unit or soil that is prone to landslides or liquefaction, nor would the project improvements exacerbate the potential for landslides and liquefaction. Project improvements would be constructed in areas that are relatively flat, with little to no slopes. Additionally, these areas are not near active seismic sources, and generally have greater depth to the groundwater table. Therefore, the study area is not prone to liquefaction. Lateral spreading could represent a hazard where project facilities would be constructed in Holocene-age streambeds deposits: these deposits are loose and unconsolidated, and a shallow depth to groundwater is immediately adjacent to the streambeds. However, prior to construction, a geotechnical report would be completed to determine the site-specific locations and potential magnitude of effects, and determine appropriate design.

Subsidence is the gradual settling or sudden sinking of the ground surface resulting from subsurface movement of earth materials. Seismically induced settlement refers to the compaction of soils and alluvium caused by ground shaking. Fine-grained soils are subject to seismic settlement and differential settlement. A potential for differential settlement exists where low-density, unconsolidated material is encountered, such as overbank river deposits common along the river and streambeds. Subsidence and settlement may also occur from construction due to both immediate settlements in granular soils and the consolidation of fine-grained soils. Subsidence and settlement can result in damage to building foundations and other structures.

Table 3.7-4, Paleontological Resources Impacts by Project Element and Alternative/Variant, illustrates geologic formations where each project improvement or alternative/variants would be constructed. Although subsidence and settlement can occur in any of the land forms, areas that were formed by basin, levee, and channel deposits are more prone to subsidence. Because some of the project improvements would be constructed in areas of recent Holocene streambed deposits, there is a potential for subsidence and settlement in these soft, unconsolidated sediments. However, a geotechnical report will be completed to identify site-specific areas and magnitudes where subsidence and settlement could occur. Appropriate building techniques will be identified and used to prevent damage to foundations related to settlement and subsidence.

Because the project is not in a geologic unit or soil that is unstable, or that would become unstable, and construction and operation of the project would not result in lateral spreading, subsidence, liquefaction, or collapse, no impact would occur.

Impact GEO-4: The proposed project could potentially be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994, as updated), creating substantial direct or indirect risks to life or property. However, prior to construction, a geotechnical report would be prepared to characterize soil types and describe appropriate construction techniques reducing potentially significant impacts to a less-than-significant level (Less-than-Significant Impact).

Expansive soils are composed largely of clays, which greatly increase in volume when saturated with water, and shrink when dried (referred to as shrink-swell potential). Because of this effect, structural foundations may rise during the rainy season and fall during the dry season. If this expansive movement varies beneath different parts of a structure, the foundation may crack, and portions of the structure may become distorted. Retaining walls and underground utilities may be damaged for the same reasons. Plasticity Index is a commonly used method to help determine the expansive properties of soils for engineering purposes.

Table 3.7-2 illustrates the shrink-swell potential of each project segment based on the NRCS plasticity index ratings. Expansive Galt clay soils are located in parts of the Stockton to Lodi, Lodi to Elk Grove, and Elk Grove to Natomas segments. In the Stockton to Lodi segment, the Hammer Lane Siding Upgrade and the Track Curve Reconstruction between East March Lane and East Swain Road would be constructed in an area with expansive soils; there are no expansive soils at the locations of the Lodi Station, the Lodi Station South Alternative, or Lodi Siding Variants. In the Lodi to Elk Grove segment, parts of the proposed ~~North Elk Grove Station (including all access and platform variants), North Elk Grove Siding Variants, and~~ Phillips Siding Upgrade/Extension would be constructed in expansive soils. In the Elk Grove to Natomas segment, the Del Paso Siding Upgrade/Extension and the Pollack Siding Upgrade would be constructed in expansive soils; none of the proposed stations in this segment would be constructed in expansive soils. Prior to construction, a geotechnical report would be prepared to identify site-specific areas and magnitudes where expansive soils could occur, and describe appropriate building techniques (such as treating soil with lime to reduce expansive characteristics, or excavate expansive soil and replace with clean fill dirt) would be proposed to prevent damage to foundations related to this hazard. Therefore, potential impacts related to expansive soils would be less than significant.

Impact GEO-5: The proposed project would not 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 (No Impact).

No septic systems or alternative wastewater disposal systems are associated with the proposed project. Therefore, there would be no impact related to the soils' capability to support these systems during construction and operation of the project.

Impact GEO-6: The proposed project could directly or indirectly destroy a unique paleontological resource or site, or a unique geologic feature. However, implementation of Mitigation Measure GEO-6.1 would reduce this potentially significant Impact to a less-than-significant level (Less-than-Significant Impact with Mitigation).

Construction

As discussed in detail above, the Levee and Channel Deposits, as well as the Basin Deposits, are of Holocene age. Holocene deposits contain only the remains of extant, modern taxa (if any

resources are present), which are not considered “unique” paleontological resources. Therefore, these formations are considered to be of low paleontological sensitivity, and earthmoving activities in these formations would have no impact on unique paleontological resources.

Project-related earthmoving activities would also occur in the Pleistocene-age Modesto and Riverbank formations. Because numerous vertebrate fossils have been recovered from the Modesto and Riverbank formations throughout the Central Valley, these formations are considered to be paleontologically sensitive. Therefore, earthmoving activities in the Modesto and Riverbank Formations could result in accidental damage to or destruction of unique paleontological resources, and this impact is considered potentially significant.

Where geologic units with high paleontological sensitivity are present, construction-related ground disturbance could result in damage to or destruction of unique paleontological resources in the following two situations:

- Where rock formations with high paleontological sensitivity are exposed at the ground surface in areas subject to earthmoving activities (such as grading); or
- Where highly sensitive units are not exposed at the surface, but earthmoving activities would extend deep enough to encounter underlying highly sensitive materials (such as excavation).

Where geologic units with low paleontological sensitivity are adjacent to units with high paleontological sensitivity, the units with low sensitivity are assumed to overlie the adjacent unit at a shallow depth. Therefore, for purposes of this impact analysis, it is assumed that any ground disturbance deeper than 5 feet would encounter the unit of high paleontological sensitivity.

As discussed in Chapter 2, *Project Description*, construction would involve installation of track, relocation of utilities, construction of track-supporting structures and pedestrian overpass structures, and construction of stations. Installation of track would involve grading for the track subgrade. Construction of bridges (including pedestrian overpasses) would involve grading for temporary construction access roads, drilling and placing piles, and excavating for foundations. Construction of stations would involve grading for parking structures, rough grading for stations and pedestrian overpasses and underpasses, structural excavation for foundations and walls, and excavation for installation of utilities. The maximum depth of grading is anticipated to be approximately 15 to 20 feet bgs, while the maximum depth for drilling and placing piles is anticipated to be 60 to 80 feet bgs.

For each project element and alternative, Table 3.7-4 presents the geologic formation in which construction would occur, its paleontological sensitivity, the level of impact, and any required mitigation measures.

Table 3.7-4. Paleontological Resources Impacts by Project Element and Alternative/Variant

Project Element or Alternative/Variant	Geologic Formation	Paleontological Sensitivity	Impact Conclusion	Mitigation
Stations				
Lodi Station	Modesto	High	Potentially Significant	Mitigation Measure GEO-6.1
Lodi Station South Alternative	Modesto	High	Potentially Significant	Mitigation Measure GEO-6.1
Elk Grove				
~~North Elk Grove Station Platform Location Variant 1 (P1)~~	~~Riverbank~~	~~High~~	~~Potentially Significant~~	~~Mitigation Measure GEO-6.1~~
~~North Elk Grove Station Platform Location Variant 2 (P2)~~	~~Riverbank~~	~~High~~	~~Potentially Significant~~	~~Mitigation Measure GEO-6.1~~
~~North Elk Grove Station Access Variant 1 (A1)~~	~~Riverbank~~	~~High~~	~~Potentially Significant~~	~~Mitigation Measure GEO-6.1~~
~~North Elk Grove Station Access Variant 2 (A2)~~	~~Riverbank~~	~~High~~	~~Potentially Significant~~	~~Mitigation Measure GEO-6.1~~
City College Station	Riverbank	High	Potentially Significant	Mitigation Measure GEO-6.1
Midtown Sacramento Station	Levee and Channel Deposits	Low	No Impact	No mitigation measures required
	Riverbank	High	Potentially Significant	Mitigation Measure GEO-6.1
Old North Sacramento Station	Levee and Channel Deposits	Low	No Impact	No mitigation measures required
	Basin Deposits	Low	No Impact	No mitigation measures required
Natomas/Sacramento Airport Station	Basin Deposits	Low	No Impact	No mitigation measures required
	Riverbank	High	Potentially Significant	Mitigation Measure GEO-6.1
Track Improvements				
Stockton to Lodi	Modesto	High	Potentially Significant	Mitigation Measure GEO-6.1
Lodi to Elk Grove	Levee and Channel Deposits	Low	No Impact	No mitigation measures required
	Modesto south of Thornton	High	Potentially Significant	Mitigation Measure GEO-6.1
	Riverbank	High	Potentially Significant	Mitigation Measure GEO-6.1
Elk Grove to Natomas	Levee and Channel Deposits	Low	No Impact	No mitigation measures required
	Basin Deposits	Low	No Impact	No mitigation measures required
	Riverbank	High	Potentially Significant	Mitigation Measure GEO-6.1

Source: Data compiled by AECOM in 2019.

Mitigation Measure: Mitigation Measure GEO-6.1, described below, would be implemented to avoid damage to or destruction of paleontological resources during construction. Mitigation Measure GEO-6.1 would require training for construction crews to better recognize paleontological resources; periodic monitoring during construction; stopping work if paleontological resources are discovered; evaluating those resources by a qualified paleontologist; and as appropriate, preparing and implementing a recovery plan. Therefore, implementing Mitigation Measure GEO-6.1 would reduce the proposed project's potentially significant impacts on unique paleontological resources to a less-than-significant level for all project elements, alternatives, and variants.

As indicated in Table 3.7-4, Mitigation Measure GEO-6.1 would be implemented for all project elements, alternatives, and variants (except the Old North Sacramento Station), all of which would have a potentially significant impact on unique paleontological resources (Stockton to Lodi track improvements; Lodi Station; Lodi Station South Alternative; Lodi to Elk Grove track improvements; ~~North Elk Grove Station (including all access and platform variants);~~ Elk Grove to Natomas track improvements; City College Station; Midtown Sacramento Station; and Natomas/Sacramento Airport Station).

> **GEO-6.1: Conduct construction personnel education and implement periodic monitoring; stop work if paleontological resources are discovered; assess the significance of the find, and prepare and implement a recovery plan, as required.**
>
> Before the start of any earthmoving activities, SJRRC will retain a qualified paleontologist to 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 SJRRC.
>
> The qualified paleontologist will also make periodic visits during earthmoving activities in high-sensitivity sites to verify that workers are following the established procedures.
>
> If paleontological resources are discovered during earthmoving activities, the construction crew will immediately cease all work within 50 feet of the find and notify SJRRC. SJRRC will retain a qualified paleontologist to evaluate the resource and prepare a recovery plan, in accordance with SVP guidelines. The recovery plan may include, but is not limited to, 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 SJRRC, as the CEQA lead agency, to be necessary and feasible will be implemented before construction activities can resume at the site where the paleontological resources were discovered. SJRRC will be responsible for ensuring that the monitor's recommendations regarding treatment and reporting are implemented.

Operations and Maintenance

Typical operations and maintenance activities include railroad tie replacement, ballast recontouring, landscaping, spraying of herbicides to reduce weeds, maintenance of drainage features and signal infrastructure, car and locomotive maintenance and repair, and train washing. These activities would not require grading or excavation, and would take place on geologic units that were disturbed during project construction. Therefore, project-related operational activities would have no impact on unique paleontological resources.

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