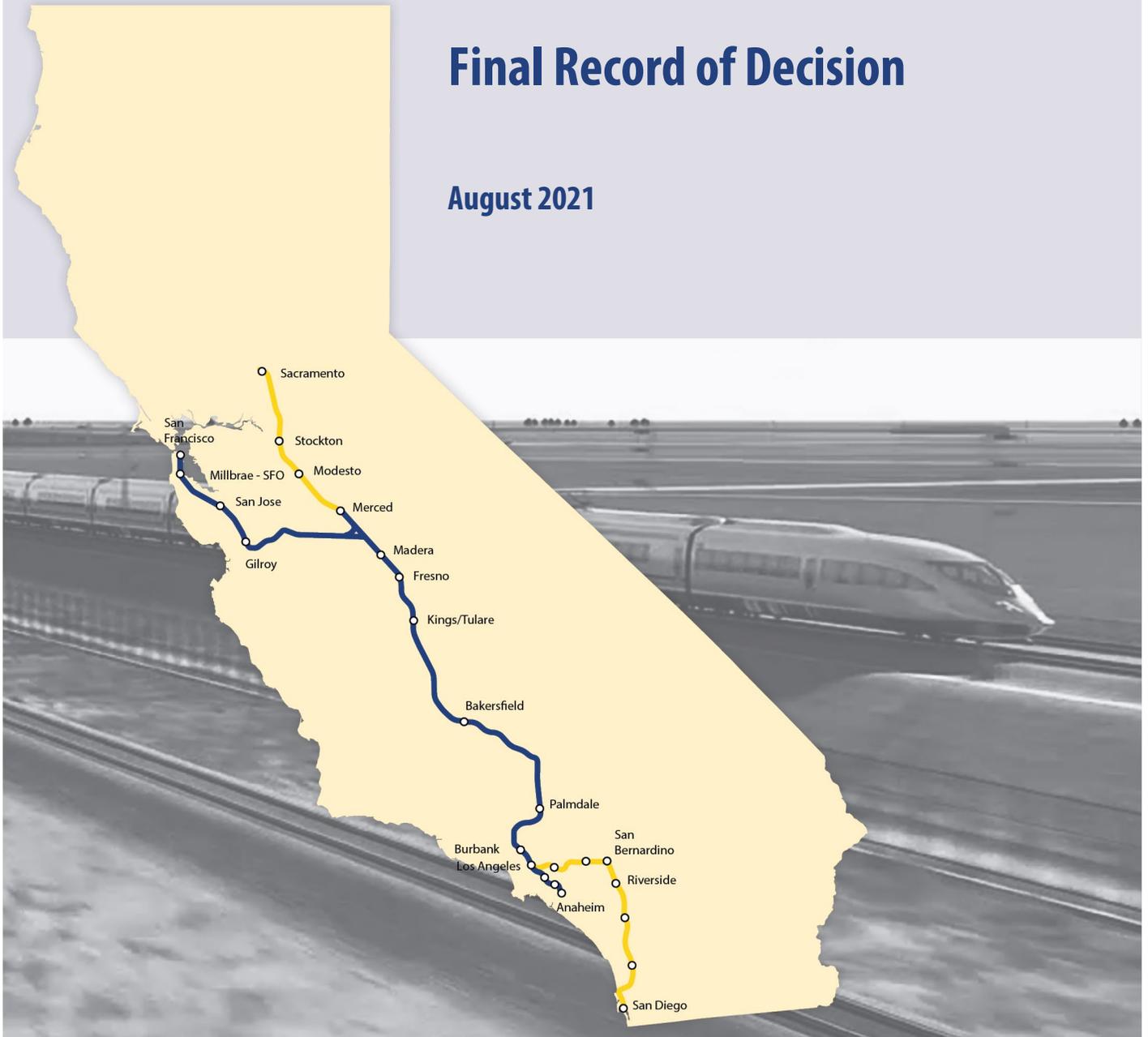


California High-Speed Rail Authority

Bakersfield to Palmdale *Project Section*

Final Record of Decision

August 2021



The environmental review, consultation, and other actions required by applicable Federal environmental laws for this project are being or have been carried out by the State of California pursuant to 23 U.S.C. 327 and a Memorandum of Understanding dated July 23, 2019, and executed by the Federal Railroad Administration and the State of California.

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- Appendix F: State Historic Preservation Office Section 106 Concurrence Letter and Memorandum of Agreement, June 22, 2021
- Appendix G: Section 4(f) Concurrence Letters

ACRONYMS AND ABBREVIATIONS

Authority	California High-Speed Rail Authority
AVAQMD	Antelope Valley Air Quality Management District
BA	Biological Assessment
BCHSHD	Big Creek Hydroelectric System Historic District
BETP	Built Environment Treatment Plan
BLM	U.S. Bureau of Land Management
BMP	best management practice
B-P	Bakersfield to Palmdale Project Section
C.F.R.	Code of Federal Regulations
CCNM Design Option	César E. Chávez National Monument Design Option
CDFW	California Department of Fish and Wildlife
CEQ	Council on Environmental Quality
CEQA	California Environmental Quality Act
CRHR	California Register of Historic Resources
CWA	Clean Air Act
DOT	(U.S.) Department of Transportation
EIR/EIS	Environmental Impact Report/Environmental Impact Statement
EKAPCD	East Kern Air Pollution Control District
F-B LGA	Fresno to Bakersfield Locally Generated Alternative
FESA	federal Endangered Species Act
FRA	Federal Railroad Administration
HSR	high-speed rail
IAMF	impact avoidance and minimization feature
La Paz	César E. Chávez National Monument/Nuestra Señora Reina de la Paz National Historic Landmark
LMF	light maintenance facility
MMEP	mitigation monitoring and enforcement plan
MOA	memorandum of agreement
MOU	memorandum of understanding
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NRHP	National Register of Historic Places
PCT	Pacific Crest Trail
project	Bakersfield to Palmdale Project Section

ROD	Record of Decision
RSA	resource study area
SAA	<i>Supplemental Alternatives Analysis</i>
Section 106 PA	<i>Programmatic Agreement among the Federal Railroad Administration, the Advisory Council on Historic Preservation, the California State Historic Preservation Officer, and the California High-Speed Rail Authority Regarding Compliance with Section 106 of the National Historic Preservation Act as it Pertains to the California High-Speed Train Project</i>
SHPO	State Historic Preservation Officer
SJVAPCD	San Joaquin Valley Air Pollution Control District
SR	State Route
STB	Surface Transportation Board
U.S.C.	U.S. Code
UPRR	Union Pacific Railroad
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service

1 INTRODUCTION

This document is the California High-Speed Rail Authority's (Authority) Record of Decision (ROD) under the National Environmental Policy Act (NEPA) for the California High-Speed Rail (HSR) Bakersfield to Palmdale Project Section (referred to as the project). The Authority is the federal NEPA lead agency under what is commonly referred to as NEPA Assignment. More specifically, the environmental review, consultation, and other actions required of a lead federal agency by federal environmental laws for this project are being or have been carried out by the State of California pursuant to 23 U.S. Code (U.S.C.) 327 and a Memorandum of Understanding effective July 23, 2019, executed by the Federal Railroad Administration (FRA) and the State of California. The Authority is also the lead agency for state environmental reviews under the California Environmental Quality Act (CEQA).

This ROD approves Alternative 2 with the Refined César E. Chávez National Monument (CCNM) Design Option, Palmdale Station, the Avenue M Maintenance Site and Maintenance-of-Way Facility (MOWF), as described in the *California High Speed Rail Project Bakersfield to Palmdale Section: Final Environmental Impact Report/Environmental Impact Statement (Final EIR/EIS)* dated June 25, 2021. As set forth in this ROD, Alternative 2 with the Refined CCNM Design Option, the Palmdale Station, and the Avenue M Maintenance Site and MOWF serves the purpose and need for this project and minimizes economic, social, and environmental impacts, and is therefore the Selected Alternative.

The Authority proposes to construct and operate the project after receiving the required approvals from the appropriate federal agencies. These agencies include the federal cooperating agencies—the U.S. Army Corps of Engineers (USACE), the U.S. Bureau of Land Management (BLM) and the Surface Transportation Board (STB). Other federal agencies with specific review or permitting responsibilities include the U.S. Environmental Protection Agency and the U.S. Fish and Wildlife Service (USFWS). Refer to Table 1 on page 1-6 for a list of major NEPA milestones.

To comply with NEPA and CEQA, the Authority issued a joint Draft Environmental Impact Report/Environmental Impact Statement (EIR/EIS) for the project in February 2020, and a Revised Draft EIR/Supplemental Draft EIS in February 2021 generally limited to new information about certain federal and state candidate species under federal and state Endangered Species Acts. Following public review of the Draft EIR/EIS and the Revised Draft EIR/Supplemental Draft EIS, the Authority considered and responded to public comments; revised the EIR/EIS to address public comments; incorporated design refinements to further minimize environmental impacts, improve safety or reduce costs; and published a Final EIR/EIS on June 25, 2021. Consistent with 40 Code of Federal Regulations (C.F.R.) 1506.2,¹ the Final EIR/EIS is one document that covers both state and federal environmental requirements. However, because this ROD contains only the decision of the Authority under its assigned responsibilities for NEPA, the documents are referred to as the "Draft EIS," "Supplemental Draft EIS," and "Final EIS." In making its decision, the Authority considered the information and analysis contained in the 2020 Draft EIS, the 2021 Supplemental Draft EIS, and the 2021 Final EIS (collectively, "EIS Documents"). The Authority also considered public and agency comments received on the EIS Documents.

On October 31, 2018, the Authority's chief executive officer executed a ROD approving the portion of the Fresno to Bakersfield Locally Generated Alternative (F-B LGA) from just north of Poplar Avenue in Kern County up to and including the F Street Station (specifically, to the intersection of 34th Street and L Street in Bakersfield). As stated in the F-B LGA ROD, the Authority reserved the decision on the alignment to the south and the east of the F Street Station for the Bakersfield to Palmdale Project Section of the HSR project. Therefore, the portion of the

¹ The Council on Environmental Quality (CEQ) issued new regulations, effective September 14, 2020, updating the NEPA implementing procedures at 40 C.F.R. 1500-1508. However, because this project initiated the NEPA process before September 14, 2020, it is not subject to the new regulations. The Authority is relying on the regulations as they existed prior to September 14, 2020. Therefore, all citations to CEQ regulations in this environmental document refer to the 1978 regulations, pursuant to 40 C.F.R. 1506.13 (2020) and the preamble at 85 Fed. Reg. 43340.

F-B LGA from 34th Street and L Street in Bakersfield to Oswell Street that was previously analyzed in the *Fresno to Bakersfield Section Final Supplemental EIS*² was included in the Bakersfield to Palmdale Final EIR/EIS.

Table 1 provides a summary of major NEPA milestones and completion dates for the EIS Documents.

Table 1 Summary of Major NEPA Milestones

Milestone	Date
NOI	September 4, 2009
Public Scoping Meetings (3)	September 15–17, 2009
NOA Published and Issuance of Draft EIS and Section 4(f) Evaluation	February 28, 2020
Public Hearing to Receive Public Comment	April 23, 2020
Issuance of the Supplemental Draft EIS (limited to new information on biological resources)	February 26, 2021
Publication of Draft General Conformity Determination	May 13, 2021
NOA and Issuance of Final EIS/Section 4(f) Evaluation	June 25, 2021
Approval of Final General Conformity Determination	July 16, 2021
End of waiting period for Final EIS and Section 4(f) Evaluation	July 26, 2021

EIS = Environmental Impact Statement
 NEPA = National Environmental Policy Act
 NOA = Notice of Availability
 NOI = Notice of Intent

The Bakersfield to Palmdale Project Section will connect to the already-approved portions of the HSR system between Merced and Bakersfield, extending the approved HSR system from the southern Central Valley to the Antelope Valley. This decision document outlines all relevant information used by the Authority, as the NEPA lead agency, for approval of the Selected Alternative—Alternative 2 with the Refined CCNM Design Option, Palmdale Station, and the Avenue M Maintenance Site and MOWF. As described further in Section 4.0 Alternatives, the Authority considered the following alternatives: Alternatives 1, 2, 3, and 5, which share a common alignment except for three locations and begin immediately south of the previously approved Bakersfield F Street Station at the intersection of 34th and L Streets in Bakersfield and end approximately 1.1 miles south of the Palmdale station at Spruce Court in Palmdale. The Authority also considered the CCNM Design Option and the Refined CCNM Design Option, which are design variants considered to reduce impacts to the César E. Chávez National Monument/Nuestra Señora Reina de la Paz National Historic Landmark (La Paz).

As depicted in Figure 1 and described in further detail in Chapter 2, Alternatives, of the Final EIS, the Selected Alternative spans approximately 80 miles between the proposed Bakersfield and Palmdale stations. The alignment of the Selected Alternative begins immediately south of the F Street Station, at the intersection of 34th and L Streets, in the City of Bakersfield and ends at approximately 1.1 miles south of the Palmdale Station at Spruce Court in the City of Palmdale.

In making its decision, the Authority considered the information and analysis contained in the EIS Documents and the associated administrative record, information presented in the Fresno to Bakersfield Section Final Supplemental EIS (Authority 2019c), and input received from the public, tribes, and other agencies.

² California High-Speed Rail Authority. 2019. Fresno to Bakersfield Section Final Supplemental Environmental Impact Statement. Sacramento, CA. October 2019.

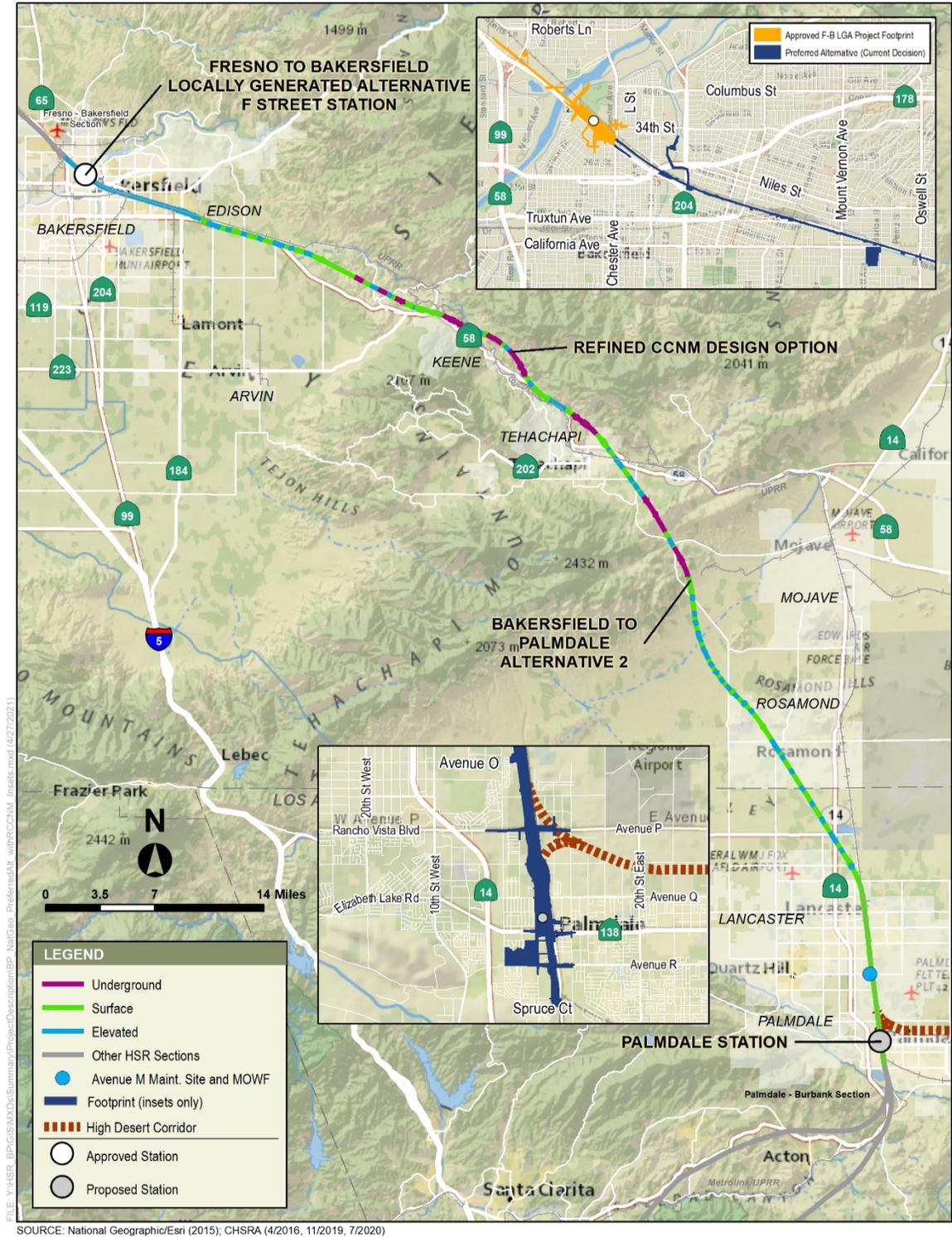


Figure 1 Selected Alternative

The Authority has prepared this ROD in accordance with the NEPA Assignment Memorandum of Understanding (MOU) dated July 23, 2019; the Council on Environmental Quality (CEQ) regulations implementing NEPA (40 C.F.R. 1505.2 and 1506.10), and FRA's Procedures for Considering Environmental Impacts (64 Fed. Reg. 28545, May 26, 1999), as modified by 78 Fed. Reg. 2713 (January 14, 2013) (FRA Environmental Procedures).

Specifically, this ROD:

- Provides background on the NEPA process leading to the Final EIS, including a summary of public involvement and agency coordination.
- States and reaffirms the project's Purpose and Need.
- Summarizes the process that led to the development of the alternatives for study in the Draft EIS and Final EIS.
- Discusses agency roles and responsibilities.
- Identifies the alternatives considered in the EIS Documents.
- Identifies Alternative 2 with the Refined CCNM Design Option, the Palmdale Station, and the Avenue M Maintenance Site and MOWF as the Selected Alternative.
- Identifies the Environmentally Preferable Alternative.
- Summarizes environmental benefits and adverse effects.
- Discusses and makes determinations required under other relevant laws and guidance, including:
 - The National Historic Preservation Act of 1966, as amended, 54 U.S.C. 306101-307106 et seq.
 - Section 4(f) of the Department of Transportation Act of 1966, 49 U.S.C. 303
 - Section 7 of the Endangered Species Act of 1973, 16 U.S.C. 1531-1544
 - Section 404 of the Clean Water Act, 33 U.S.C. 1251-1387
 - US Department of Transportation Order on Environmental Justice
 - FRA's General Conformity Determination pursuant to the Clean Air Act (CAA), 42 U.S.C. 7401-7671q
- Summarizes the comments received on the Final EIS and responds to substantive comments that have not been previously addressed.
- Imposes impact avoidance and minimization features (IAMF) and mitigation measures that will be implemented to avoid and minimize environmental harm and sets forth a binding monitoring and enforcement program for all such features and measures.
- Presents the Authority's Decision, determinations, and findings on the project and identifies and discusses the factors that were balanced by the Authority in making its decision.
- Summarizes the status of compliance with federal agency determinations and other environmental requirements.

This ROD also includes the following:

- Appendix A: General Conformity Determination for Air Quality, July 16, 2021
- Appendix B: U.S. Fish and Wildlife Service Biological Opinion, June 16, 2021
- Appendix C: Mitigation Monitoring and Enforcement Plan (MMEP)
- Appendix D: Comments Received Between the Publication of the Final EIS and the August 19, 2021 Board Meeting

- Appendix E: Errata
- Appendix F: State Historic Preservation Office Section 106 Concurrence and Memorandum of Agreement, June 22, 2021
- Appendix G: Section 4(f) Concurrence Letters

1.1 California High-Speed Rail System

The Authority is responsible for planning, designing, constructing, and operating the California HSR System. Its state statutory mandate is to develop an HSR system that coordinates with the state’s existing transportation network, which includes intercity rail and bus lines, regional commuter rail lines, urban rail and bus transit lines, highways, and airports.

The California HSR System will provide intercity, high-speed service on more than 800 miles of track throughout California, connecting the major population centers of Sacramento, the San Francisco Bay Area, the southern Central Valley, Los Angeles, the Inland Empire, Orange County, and San Diego, as shown in Figure 2. The Authority and FRA prepared three programmatic (Tier 1) EIR/EIS documents to select preferred alignments and station locations to advance for project-level analysis in Tier 2 EIR/EISs. See Chapter 1 (Project Purpose, Need, and Objectives) of the Final EIS for a detailed description of the HSR system and the history of Tier 1 documents. The HSR system will use state-of-the-art, electrically powered, high-speed, steel-wheel-on-steel-rail technology, including contemporary safety, signaling, and automatic train-control systems that will incorporate positive train control infrastructure and be compliant with the requirements of 49 C.F.R. Part 236 Subpart I, with trains capable of operating up to 220 miles per hour (mph) over a fully grade-separated, dedicated guideway alignment.

The Authority plans two phases of California HSR System development. The California HSR Program 2020 Business Plan (Authority 2020a) describes in detail how the California HSR System will be implemented and recognizes current budgetary and funding realities. A Revised Draft 2020 Business Plan was released for public review on February 9, 2021, approved by the Board on March 25, 2021, and submitted to the Legislature on April 12, 2021. The California HSR System Phase 1, as approved through Tier 1 decisions, has been divided into eight individual sections for site-specific, Tier 2 analysis. The Authority and the FRA defined HSR project sections such that they would have independent utility or independent significance (i.e., be usable even if later sections of the HSR system are not completed).

1.2 Bakersfield to Palmdale Project Section

With the completion of a programmatic review of the California HSR System in 2005, the Authority and the FRA, as joint lead agencies for NEPA, commenced the Tier 1 environmental review process for the Bakersfield to Palmdale Project Section in 2009. The Authority and FRA held scoping meetings for the project in September 2009. Public and agency involvement for the development of the Draft EIS started in 2010 and continued through publication of the Draft EIR/EIS and Revised Draft EIR/Supplemental Draft EIS. During this period from 2010 to 2018, public and agency involvement was focused on the development and refinement of feasible and practicable study alternatives to carry forward for environmental review and evaluation in the Draft EIS.

For the Bakersfield to Palmdale Project Section, the Authority has held more than 150 meetings, briefings, and conversations to date with the community stakeholders, businesses, local agencies, and elected officials to gather, confirm, and understand key community concerns so that these concerns are incorporated both into the development of alternatives and during the environmental process.



Figure 2 Statewide HSR System

At its October 16, 2018 meeting, the Authority Board concurred with Authority staff that Alternative 2 with the CCNM Design Option would be the Authority's Preferred Alternative for the Bakersfield to Palmdale Project Section. Resolution #HSRA 18-18 can be found on the Authority's website (<https://hsr.ca.gov/about/board/resolutions.aspx>). Through ongoing Section 106 consultation for La Paz after the Authority Board's action on October 16, 2018, the Authority developed the Refined CCNM Design Option, which is also analyzed in the EIR/EIS. Because the Refined CCNM Design Option avoids adverse effects at La Paz, Alternative 2 with the Refined CCNM Design Option is the Authority's Selected Alternative for the Bakersfield to Palmdale Project Section. This refinement to the Authority's Preferred Alternative is consistent with Resolution #HSRA 18-18, wherein the Authority Board directed Authority staff to "continue to consult and collaborate with the Cesar Chavez Foundation, and other consulting parties, regarding the CCNM Design Option."

The Draft EIS was released on February 28, 2020, for an initial 45-day public comment period. The Authority extended the public comment period by 15 days, resulting in a 60-day public comment period that closed on April 28, 2020. The Authority held a virtual public hearing on April 23, 2020, to receive oral testimony on the HSR project and the Draft EIR/EIS. The traditional in-person format of the public hearing was changed to a virtual public hearing held online and via telephone to comply with the Governor of California's directives and to protect public health during the COVID-19 pandemic. The Draft EIS presented the purpose and need for the project, a reasonable range of alternatives for rail alignment, station site, and maintenance facilities; the existing setting; alternative effects (both beneficial and adverse) from construction and operation; and project design features and mitigation measures to avoid, reduce, or eliminate adverse environmental effects.

Following public review of the Draft EIR/EIS, a Revised Draft EIR/Supplemental Draft EIS was circulated in February 2021. The Revised Draft EIR/Supplemental Draft EIS was generally limited to new information about certain federal and state candidate species under the federal Endangered Species Act (FESA) and the California Endangered Species Act.

The Authority received 130 comment letters on the Draft EIS and 122 comment letters on the Revised Draft EIR/Supplemental Draft EIS.

The Authority considered the information presented in the comments received and the Final EIR/EIS includes responses to all substantive comments and minor design refinements to the Bakersfield to Palmdale Project Section (B-P) Build Alternatives.

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2 AGENCY ROLES AND RESPONSIBILITIES

The Authority is the NEPA lead agency, pursuant to the NEPA Assignment MOU. As required by law and the NEPA Assignment MOU, FRA has retained the responsibility for making the project-level Clean Air Act general conformity determination (under 42 U.S.C. 7506) and conducting formal government-to-government tribal consultations. The STB, the BLM, and the USACE are NEPA cooperating agencies. The following subsections provide more information about the responsibilities and roles of these federal agencies.

2.1 Federal Railroad Administration

FRA's responsibilities for environmental review, consultation, and other actions required by applicable federal environmental laws, including NEPA, for the proposed project have been carried out by the Authority, acting on behalf of the State of California pursuant to 23 U.S.C. 327 and the NEPA Assignment MOU dated July 23, 2019, and executed by the FRA and the State of California.

As required by law and the NEPA Assignment MOU, FRA has retained responsibility for making air quality conformity determinations under the General Conformity Rule and the Clean Air Act (42 U.S.C. 7506) and for government-to-government consultation with Indian tribes. FRA issued the final air quality General Conformity Determination on July 16, 2021 (see Appendix A). FRA has carried out its government-to-government responsibilities, as described in the attached Section 106 Memorandum of Agreement.

The NEPA Assignment MOU also requires the Authority to consult with FRA prior to making any proposed constructive use determinations under Section 4(f) of the Department of Transportation Act of 1966 (49 U.S.C. 303); however, there are no such determinations associated with the Selected Alternative.

The FRA has authority over railroad safety under 49 U.S.C. 20103. As such, FRA may exercise certain regulatory authority over the project. FRA also administers certain grant funds provided to the Authority under the American Recovery and Reinvestment Act of 2009 and oversees the Authority's compliance with a grant agreement for the HSR system.

2.2 Surface Transportation Board

The STB has authority over construction and operation of new rail lines (49 U.S.C. 10901). As the STB explained in its June 13, 2013, decision authorizing construction of the 65-mile section of the California HSR System between Merced and Fresno (Docket No. FD_35724_0), 49 U.S.C. 10501(a)(2)(A) gives the STB jurisdiction over transportation by rail carrier in one state, as long as that intrastate transportation is carried out "as part of the interstate rail network." The STB determined that the California HSR System will be constructed as part of the interstate rail network in California. The STB therefore concluded that it has jurisdiction over the California HSR System.

The STB has participated as a cooperating agency in the environmental review process for the Bakersfield to Palmdale Project Section. Following completion of this process, the STB may adopt the Authority's EIS (or conduct additional review, as appropriate) and issue a separate ROD authorizing the project.

2.3 U.S. Bureau of Land Management

The BLM may issue rights of entry permits for pedestrian surveys and ground-disturbing investigations, such as geotechnical investigations or other information gathering activities. The Authority will obtain from the BLM all required land rights necessary for construction as well as future operations and maintenance needs.

The BLM has participated as a cooperating agency in the environmental review process for the Bakersfield to Palmdale Project Section. Following completion of this process, the BLM may grant or transfer land rights as appropriate to the Authority.

2.4 U.S. Army Corps of Engineers

The USACE is responsible for issuing permits under the CWA Section 404 (33 U.S.C. 1344) (Section 404) and the Rivers and Harbors Act Section 14 (33 U.S.C. 408) (Section 408). The USACE is required to comply with NEPA and issue its own NEPA decision before it can issue a permit under Section 404 or Section 408.

As a first step in project approval, the Authority, the FRA, the USACE, and the U.S. Environmental Protection Agency executed an MOU (NEPA/404/408 MOU) in November 2010. The MOU outlines a process to integrate the requirements of NEPA with the requirements of Section 404 and Section 408. The purpose of the MOU is to ensure the analysis underlying the EIS Documents for each California HSR System section is sufficient to support USACE's Preliminary Least Environmentally Damaging Practicable Alternative determination and for USACE to issue a NEPA decision.

Aquatic resources in the Bakersfield to Palmdale Project Section include state streambeds, lakes, and other waters of the state, which are regulated by the California Department of Fish and Wildlife (CDFW) and the State Water Resources Control Board. Aquatic resources were identified during the jurisdictional delineation investigations (see the *Bakersfield to Palmdale Project Section Aquatic Resources Delineation Report* [Authority 2016a]). The USACE determined that, although many features in these areas meet federal technical criteria that define wetlands and other waters, these features are not jurisdictional under the federal CWA due to their isolation. Because the waterbodies identified in the Bakersfield to Palmdale Project Section are all isolated, the USACE will not assert jurisdiction under Section 404 of the CWA over any areas that would otherwise be delineated as wetlands or waters of the U.S. Therefore, no Section 404 permits will be required for the portion of the Bakersfield to Palmdale Project Section from south of Oswell Street in Bakersfield to Spruce Court in Palmdale.

Aquatic resources for the portion of the project from the intersection of 34th Street and L Street to Oswell Street in Bakersfield are limited to one 0.37-acre retention/detention basin at 30th Street between San Dimas Street and State Route (SR) 204. Aquatic resources were identified during the jurisdictional delineation (see the *Fresno to Bakersfield Locally Generated Alternative Final Wetlands Report* [Authority 2017]). Based on the Preliminary Jurisdictional Determination letter dated June 1, 2017, the USACE determined this feature is a potential jurisdictional aquatic resource ("waters of the United States") regulated under Section 404 of the CWA. Therefore, a Section 404 permit may be required for impacts to this resource. In addition, there are no USACE civil works facilities or structures that will require modification within the Bakersfield to Palmdale Project Section; therefore, no Section 408 permits will be required.

2.5 U.S. Fish and Wildlife Service and the National Marine Fisheries Service

Concurrently with the NEPA process, the Authority initiated the FESA Section 7 (16 U.S.C. 1536) consultation process, pursuant to 50 C.F.R. Part 402. Section 7 of the FESA requires federal agencies to consult with USFWS and/or the National Marine Fisheries Service (NMFS), depending on the type of species or habitat affected, to ensure that actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of threatened or endangered fish, wildlife, or plant species or result in the destruction or adverse modification of designated critical habitat for any such species. Impacts associated with threatened and endangered species, including critical habitat and occupied habitat are addressed through a coordination process that is outlined under Section 7 of FESA. The Magnuson-Stevens Fisheries and Conservation Management Act (16 U.S.C. 1801 et seq.) requires federal agencies to consult with NMFS on activities that may adversely affect Essential Fish Habitat for species that are managed under federal fishery management plans in U.S. waters. Impacts associated with Essential Fish Habitat are addressed through a coordination process with NMFS that may be combined with FESA Section 7 consultation. For the Bakersfield to Palmdale Project Section, the Authority is only required to consult with the USFWS because there are no species present that would come under the jurisdiction of NMFS.

As the project may affect threatened or endangered species, the Authority prepared a Biological Assessment (BA) for the project and consulted with USFWS, as required. USFWS also issued a Biological Opinion, the details of which are discussed in Section 8.4.

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3 PURPOSE AND NEED

As established in the 2005 Final Program EIR/EIS for the Proposed California HSR System, the purpose of the California HSR System is to provide a reliable high-speed, electric-powered train system that links the major metropolitan areas of California, delivering predictable and consistent travel times. A further objective is to provide an interface with commercial airports, mass transit, and the highway network and to relieve capacity constraints of the existing transportation system as intercity travel demand in California increases, in a manner sensitive to and protective of California's unique natural resources (Authority and FRA 2005).

The purpose of this project is to implement the Bakersfield to Palmdale Project Section of the California HSR System, specifically the Selected Alternative (Alternative 2 with the Refined CCNM Design Option, the Palmdale Station, and the Avenue M Maintenance Site and MOWF). The project will provide the public with electric-powered HSR service that provides predictable and consistent travel times between major urban centers consistent with Proposition 1A³, connectivity to airports, mass transit, and the highway network connecting the San Joaquin Valley to the Antelope Valley; and that connects the northern and southern portions of the statewide HSR system. The Selected Alternative supports the purpose of the California HSR Project.

3.1 Alternatives Considered

This section summarizes the alternatives analysis process, the alternatives evaluated in the EIS Documents, and describes the Selected and Environmentally Preferable Alternatives.

3.2 Alternatives Analysis Process and Alternatives Considered but Eliminated from Detailed Study

The Authority and FRA undertook an extensive, public screening process to identify and refine alternatives for study in the project EIR/EIS. The potential alternatives considered, but eliminated from detailed study, were presented in the *Preliminary Alternatives Analysis Report* (Authority 2010a). After the 2010 *Preliminary Alternatives Analysis Report*, the 2012 *Supplemental Alternatives Analysis (SAA)* (Authority 2012) presented a refined range of alternatives addressing the SR 58/Soledad Canyon Corridor (Antelope Valley) alignment based on new information obtained since the previous study. Following the 2012 SAA, the Authority continued to refine the alternatives by responding to stakeholder, agency, and public comments; performing additional engineering and environmental review; and maintaining consistency with the Authority's design objectives. Building on the *Preliminary Alternatives Analysis Report* (Authority 2010a) recommendations, the *Supplemental Alternatives Analysis Report, Bakersfield to Palmdale Section High-Speed Rail Project EIR/EIS* (Authority 2016b) continued the evaluation process and recommended the four alternatives be analyzed in the EIR/EIS. In response to concerns expressed by Section 106 consulting parties between June 2017 and February 2019, the Authority developed design options to avoid or minimize adverse effects to La Paz. In 2019, the Authority issued the *Design Options Screening Report for the César E. Chávez/Nuestra Señora Reina de la Paz National Historic Landmark* (Authority 2019a) and the *Addendum to the Design Options Screening Report for the César E. Chávez/Nuestra Señora Reina de la Paz National Historic Landmark* (Authority 2019b), which evaluate 10 potential design options developed to avoid or minimize impacts on La Paz. This process resulted in the CCNM Design Option and the Refined CCNM Design Option.

³ The Safe, Reliable High-Speed Passenger Train Bond Act for the 21st Century, approved by the voters as Proposition 1A on November 4, 2008, authorized the California Transportation Commission, upon appropriation by the Legislature, to allocate funds for capital improvements to intercity rail lines, commuter rail lines, and urban rail systems that provide direct connectivity to the high-speed train system and its facilities, or that are part of the construction of the high-speed train system as set forth in Streets and Highways Code, Division 3, Chapter 20, Section 2704.04, subdivision (b), or that provide capacity enhancements and safety improvements. Section 2704.095 requires the California Transportation Commission to program and allocate the net proceeds received from the sale of \$950 million in bonds authorized under Proposition 1A for the High-Speed Passenger Train Bond Program.

The alternatives evaluated and recommended in the *Design Options Screening Report for the César E. Chávez/Nuestra Señora Reina de la Paz National Historic Landmark* (Authority 2019a) incorporated refinements that, when compared to the alternatives studied in the 2016 SAA, 2012 SAA, and 2010 *Preliminary Alternatives Analysis Report*, further avoided or minimized potential impacts on existing facilities, land uses, and environmental resources. The alternatives analysis process is further summarized in Chapter 2 of the Final EIS.

Potential alternatives considered over the course of project development either failed to adequately meet the project purpose and need/project objectives, failed to offer a substantial environmental advantage over other alternatives studied, and/or were deemed to not be feasible from a cost, technical, or engineering perspective. These potential alternatives were eliminated from analysis in the EIS Documents.

3.3 Alternatives Carried Forward for Study in the EIS

As a result of a comprehensive alternative analysis process, the EIS evaluated four alignment alternatives and two design options that could be used with any alternative: Alternatives 1, 2, 3, and 5; the CCNM Design Option; and the Refined CCNM Design Option (Figure 3). Alternative 2 is a single, continuous alignment that extends from immediately south of the previously approved Bakersfield F Street Station, at the intersection of 34th and L Streets in Bakersfield, and ends approximately 1.1 miles south of the Palmdale station at Spruce Court in Palmdale. Alternatives 1, 3, and 5 share a common alignment with Alternative 2 except in the community of Edison, the Mojave area, and in the City of Lancaster. The No Action Alternative was also analyzed in the EIS Documents. The alternatives analyzed in the EIS are the alternatives that the Authority identified as reasonable and feasible and capable of meeting the project's Purpose and Need. All alternatives would include a station in Palmdale; alternative station locations were not evaluated in the EIS Documents.

The following sections describe the four alternatives, two design options, and the maintenance facilities evaluated in the EIS Documents. All of these alternatives and options are described in detail in Chapter 2 of the Final EIS. As explained in the Final EIR/EIS, the Authority considered and incorporated a number of engineering and design refinements after the publication of the Draft EIR/EIS. The refinements were considered and incorporated for several reasons, including (1) in response to comments on the Draft EIR/EIS from agencies, stakeholders, and the public; (2) to further minimize environmental impacts or the necessary footprint area; and (3) to further improve safety of the design and reduce costs, where possible. Appendix 3.1-B of the Final EIR/EIS provides a description of the refinements and the resulting changes in environmental impacts.

3.3.1 Alternative 1

Alternative 1 would begin immediately south of the previously approved Bakersfield F Street Station tracks, at the intersection of 34th and L Streets in Bakersfield on a viaduct (approximately 60 feet in height). From Oswell Street to Morning Drive (SR 184), the alignment centerline would be on the north side of Edison Highway. East of Morning Drive, the Alternative 1 alignment would transition from the Edison Highway corridor to the SR 58 corridor, reaching the freeway corridor at Edison Road.

In the community of Edison, Alternative 1 would proceed eastward on an embankment or fill section (ranging between approximately 10 and 25 feet in height) along the existing SR 58 alignment to Towerline Road, where the relocated freeway would tie back into existing SR 58 as it heads southward away from Edison Highway. The HSR alignment would continue eastbound parallel to Edison Highway toward Caliente Creek. From Caliente Creek to Bealville Road, Alternative 1 would roughly follow the existing Tejon Ranch Conservancy easement boundary and begin to climb the Tehachapi Mountains at a 2.8 percent vertical grade.

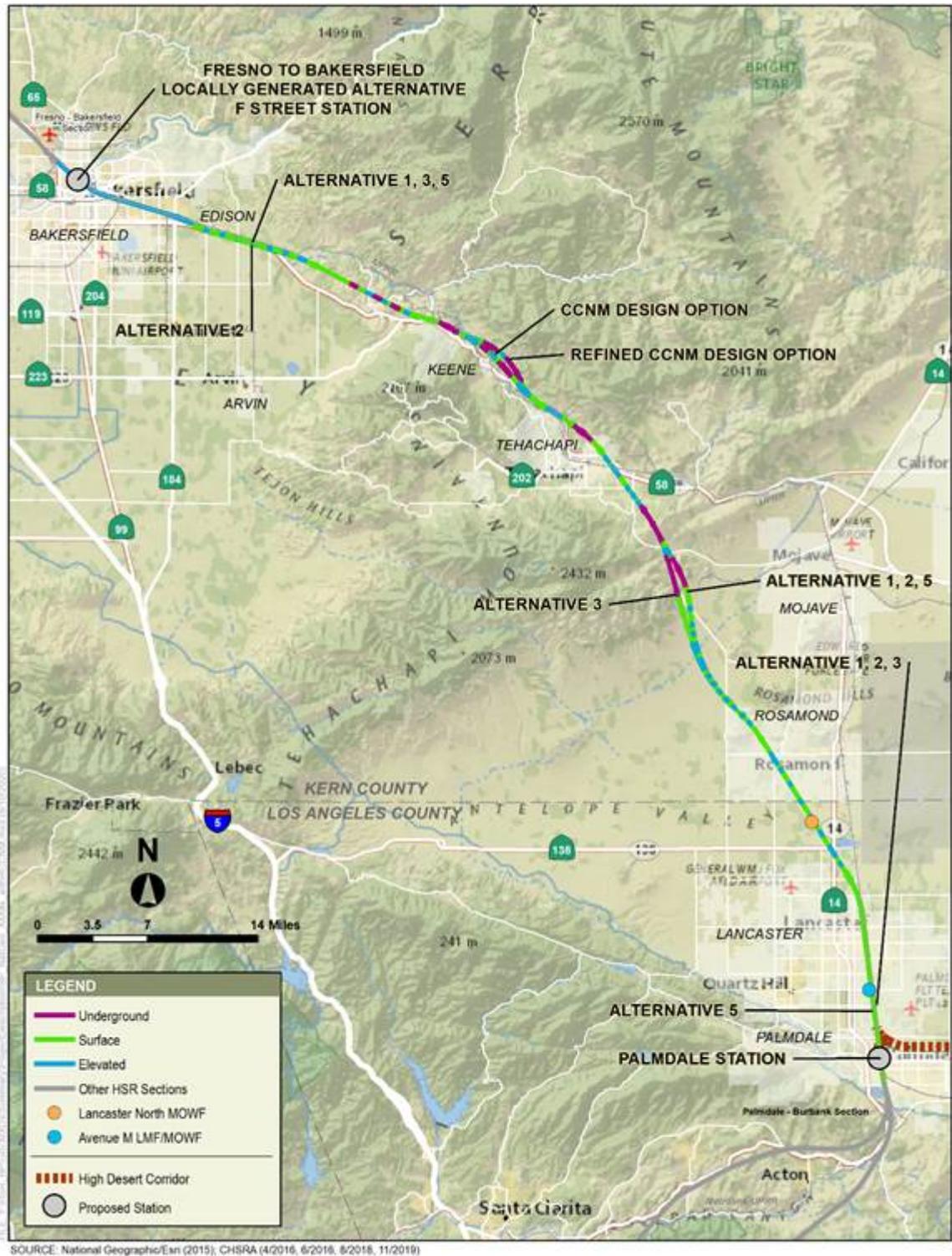


Figure 3 Bakersfield to Palmdale Project Section—Alignment Alternatives

Table 2 shows key differences between the various B-P Build Alternatives.

Table 2 Bakersfield to Palmdale Project Section Build Alternatives Differentiators

Community Area	Alternative 1	Alternative 2	Alternative 3	Alternative 5	CCNM Design Option	Refined CCNM Design Option
Entire Alignment						
Grade separations	59	52	58	59	N/A	N/A
Edison Area						
Relocation of State Route 58	Yes	No	Yes	Yes	N/A	N/A
Farther from key community resources (e.g., reduces impacts from noise, vibration, and access)	450 feet from Edison Middle School	610 feet from Edison Middle School	450 feet from Edison Middle School	450 feet from Edison Middle School	N/A	N/A
Additional visual impacts on Edison Middle School	No	Yes	No	No	N/A	N/A
Keene Area						
Reduces noise and visual impacts to La Paz	No	No	No	No	Yes	Yes
Mojave Area						
Additional tunnel miles	0 miles	0 miles	1 mile	0 miles	N/A	N/A
Greater avoidance of future mining areas	Yes	Yes	No	Yes	N/A	N/A
Lancaster Area						
Combines existing rail corridor (fewer residential and affordable housing displacements) ¹	155 rooms, 96 units	155 rooms, 96 units	155 rooms, 96 units	372 rooms, 132 units	N/A	N/A
Results in no impacts on Whit Carter Park	Yes	Yes	Yes	No	N/A	N/A
Avoids impacts to historic property (Village Grille)	Yes	Yes	Yes	No	N/A	N/A

Source: Table 8-2 in Chapter 8, Preferred Alternative and Station Sites, of the Final EIR/EIS, June 2021

¹ "Rooms" describes the number of rooms affected in motels that service as de-facto affordable housing, and "units" describes the number of affordable housing units affected.

La Paz = Nuestra Señora Reina de la Paz/César E. Chávez National Monument

N/A = not applicable

East of Bealville Road, the alignment would generally follow SR 58 south to the SR 58 interchange with Broome Road. The alignment would cross a canyon just north of Bealville Road on embankments ranging between approximately 30 and 150 feet in height.

East of the SR 58/Broome Road interchange, for a distance of almost 3 miles, Alternative 1 would include cut sections and fill sections. It would cross SR 58 three times on viaducts as the two facilities form a braided configuration within the Tehachapi Creek canyon.

Alternative 1 would pass through the mountains southeast of Tehachapi in an approximately 13,250-foot-long tunnel roughly following Tehachapi Willow Springs Road.

In the Lancaster area, Alternative 1 would be on an embankment or fill section that would be approximately 30 feet in height. Alternative 1 would pass over SR 138 and SR 14 near their

interchange and over other local roads on viaducts. The alignment then would enter the City of Lancaster at Avenue H, running parallel to the Sierra Highway/Union Pacific Railroad (UPRR) corridor through Lancaster and Palmdale. From Avenue H through the City of Lancaster, Alternative 1 would combine the proposed HSR and existing UPRR and Metrolink rail corridors into one combined corridor. Under Alternative 1, the new combined rail corridor would be as close as possible to the eastern edge of existing Sierra Highway and then widened approximately 220 feet to the east to accommodate all three rail systems.

In the Palmdale area, the alignment would begin a transition to the west at Avenue K. It would continue this transition to Avenue M, where the HSR alignment would be west of the existing UPRR/Metrolink right-of-way, which would remain in its existing location. The HSR alignment would then continue south, parallel to and along the western edge of the existing rail corridor, until the section terminus at approximately 1.1 miles south of the Palmdale Station at Spruce Court in the City of Palmdale.

3.3.2 Alternative 2

Alternative 2 would follow the same alignment from Bakersfield to Palmdale as Alternative 1 except through the community of Edison. Alternative 2 would vary from Alternative 1 between Edison Road and Towerline Road, where the HSR alignment would run along the south side of existing SR 58 on an elevated embankment ranging between 40 and 45 feet in height. Under Alternative 2, SR 58 would remain in its current alignment, but this alternative would require an elevated structure for the HSR spanning the SR 58/Edison Road interchange diagonally. Another elevated structure crossing back over SR 58 would be necessary just past Towerline Road, and three additional elevated structures would be needed to cross the HSR over existing north-south roads (Malaga Road, Comanche Drive, and Tejon Highway) spaced approximately 1 mile apart between Edison Road and Towerline Road. Alternative 2 is the only B-P Build Alternative that would not require the relocation of SR 58 in the Edison area.

3.3.3 Alternative 3

Alternative 3 would follow the same alignment from Bakersfield to Palmdale as Alternative 1 except along the southern base of the Tehachapi Mountains. Alternative 3 varies from Alternative 1 just south of Tehachapi in the vicinity of the CalPortland Cement Company quarry. Here, the alignment would travel closer to Tehachapi Willow Springs Road. The alignment would cross Tehachapi Willow Springs Road farther west, but still near the Cameron Canyon Road intersection.

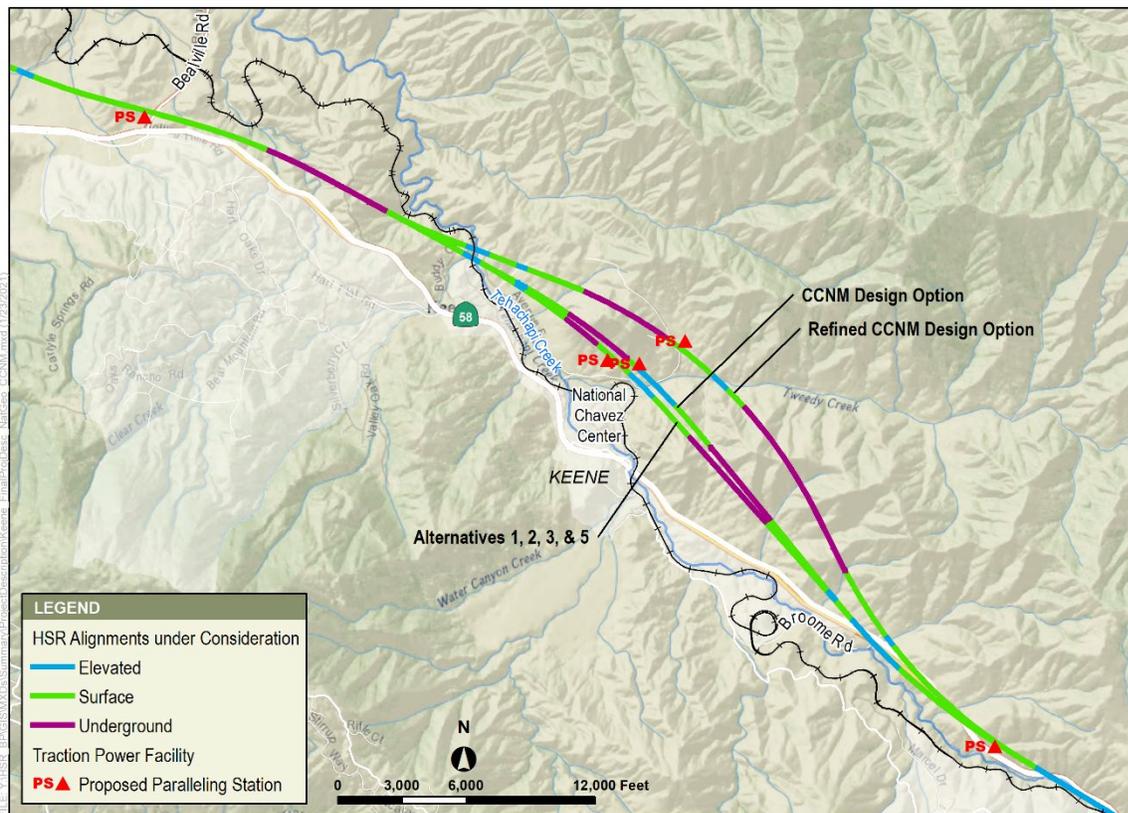
The two southernmost tunnels, while in the same general location as Alternative 1, would consist of one approximately 13,500-foot tunnel and another approximately 13,000-foot tunnel. This would contrast to Alternatives 1, 2, and 5, which would each include one approximately 12,700-foot tunnel and another approximately 9,500-foot tunnel. The longer tunnel lengths of Alternative 3 would create 10 million cubic yards of excess hauling material. South of Tehachapi, Alternative 3 also would split off in a more westerly direction than Alternative 1 until it reconnects at the common connection point of Alternative 1, approximately 17 miles south of Tehachapi.

3.3.4 Alternative 5

Alternative 5 would follow the same alignment from Bakersfield to Palmdale as Alternative 1 except in the City of Lancaster. Between Avenue H and Avenue M in the City of Lancaster, Alternative 5 would be situated west of the existing UPRR and Metrolink facilities, avoiding the need to relocate them. The exception to this would be the Lancaster Metrolink Station building and parking facilities. Sierra Highway would need to be relocated up to approximately 3,100 feet for approximately 8.5 miles. The highway would be relocated west of the HSR alignment except for where it reconnects to the existing Sierra Highway at Avenue G to the north and Avenue P-14 to the south.

3.3.5 César E. Chávez National Monument Design Option

The CCNM Design Option's termini are identical for all of the alignment alternatives (Figure 4). The CCNM Design Option's northern terminus would be north of SR 58 at Buddy Court, and its southern terminus would be northwest of Marcel Drive and SR 58. Similar to the alignment alternatives, the CCNM Design Option would generally follow SR 58 south to the southern terminus somewhat northeast of the alignment alternatives. The CCNM Design Option would also include cut sections, fill sections, tunnels, and viaducts within the Keene area. The cut sections in this area would range between 0 and 225 feet in height, while the fill sections would range between approximately 0 and 110 feet in height. The CCNM Design Option would also pass through two tunnels approximately 3,320 feet and 4,300 feet in length in this area. The viaducts would span the UPRR alignment and Tehachapi Creek, an access road, Tweedy Creek, another access road, and SR 58 near Broome Road, on structures ranging from approximately 0 to 160 feet in height. At its closest to La Paz, the CCNM Design Option would be approximately 850 feet northeast of La Paz, compared to 400 feet for the alignment alternatives.



Source: California High-Speed Rail Authority, 2020

Figure 4 Keene Area Detail Map, showing Refined CCNM and CCNM Design Options

3.3.6 Refined CCNM Design Option

Similar to the CCNM Design Option, the Refined CCNM Design Option would begin 180 feet east of Bealville Road in Keene and would begin at grade for 1.15 miles (6,072 feet) and then continue underground for about 1.04 miles (5,491 feet) northeast of the alignment alternatives. The Refined CCNM Design Option would transition to at-grade for 0.81 mile (4,278 feet) and cross an access road and the UPRR on a 0.17-mile-long (898-foot) viaduct. The Refined CCNM Design Option would then continue east at grade for 0.30 mile (1,584 feet), cross over an existing access road on a 0.06-mile-long (317-foot) viaduct, then transition back to at grade for 0.59 mile (3,115 feet) where the Refined CCNM Design Option would transition underground for 0.80 mile (4,224

feet). The Refined CCNM Design Option would then emerge where it would pass La Paz. The Refined CCNM Design Option would be 0.53 mile (2,693 feet) north of La Paz at its closest when it emerges from the tunnel.

While passing La Paz, the Refined CCNM Design Option would be at grade for 0.57 mile (3,009 feet) at a distance ranging from 0.53 mile (2,693 feet) to 0.73 mile (3,860 feet) from the boundary of La Paz before crossing a 0.13-mile (686-foot) viaduct over Tweedy Creek and a local access road. The Refined CCNM Design Option would travel at grade for approximately 0.25 mile (1,320 feet) before going underground in a 1.7-mile-long (8,976-foot-long) tunnel. The Refined Design Option would then transition to at-grade for 0.71 mile (3,749 feet) before crossing over an access road for 0.06 mile (317 feet) and back to at-grade for 1.71 miles (9,029 feet). The Refined CCNM Design Option would then go over SR 58 and Tehachapi Creek on a 0.89-mile-long (4,699-foot-long) viaduct, back to at-grade for 0.87 mile (4,594 feet) before entering a tunnel for 1.68 miles (8,870 feet). The Refined CCNM Design Option would emerge from the tunnel north of the City of Tehachapi at-grade for 1.48 miles (7,814 feet) before finally ending in a 0.13-mile-long (686-foot-long) viaduct, where it would tie back into the B-P Build Alternatives at SR 58 in the City of Tehachapi. A paralleling station would be required for the Refined CCNM Design Option. In addition, a 100-foot communications pole would be co-located with HSR facilities.

To further avoid anticipated audible adverse effects of the Refined CCNM Design Option, an approximately 1,700-foot berm would be constructed to the same height as the catenary for the track. The berm would be an average of 80 feet in height from the existing ground to minimize project noise to a level that is considered to have no impact, per FRA guidelines. Additionally, areas of ground disturbance would be recontoured and revegetated to minimize the visual effects associated with the earthwork required to construct the project.

3.3.7 Maintenance Facilities

The following three potential double-ended maintenance facility⁴ sites were evaluated for the Bakersfield to Palmdale Project Section.

3.3.7.1 Lancaster North A

This site is on the west side of SR 14 and north of W Avenue D, between W Avenue B and W Avenue C. It crosses 35th Street W, Avenue B-12, and 32nd Street W, all of which are unimproved roads. A combined light maintenance facility (LMF) with an MOWF could be accommodated on the Lancaster North A site.

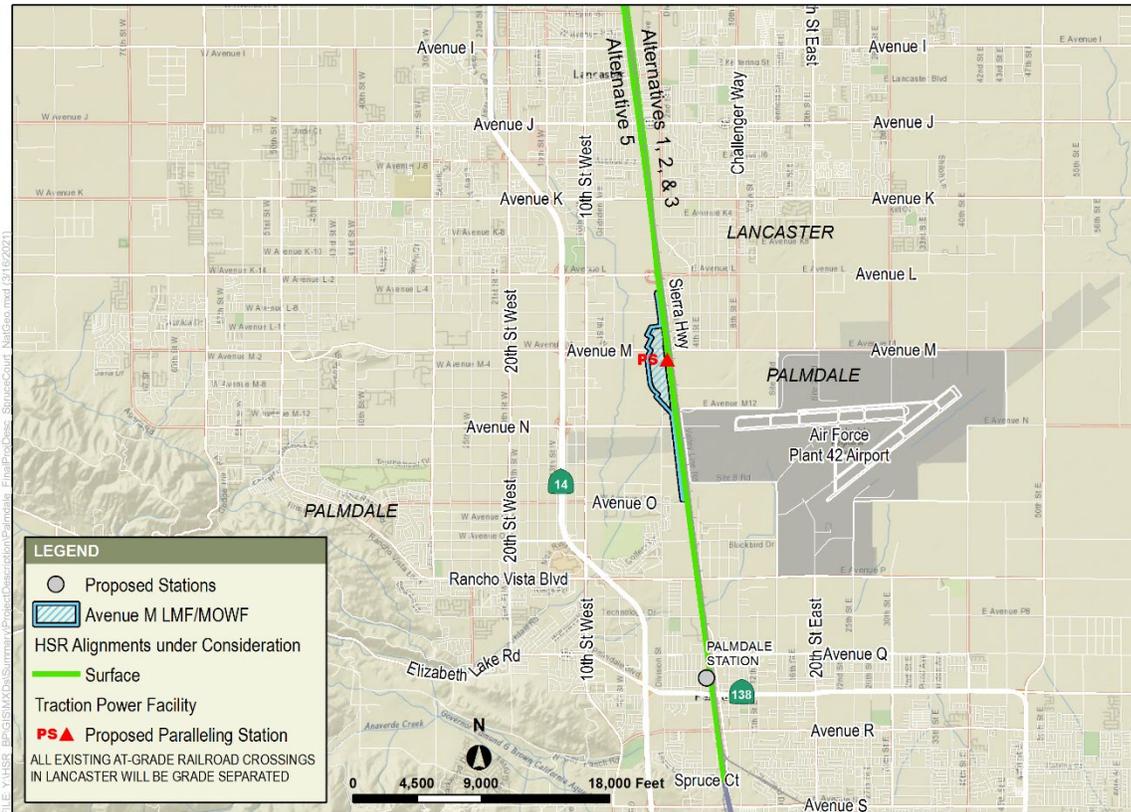
3.3.7.2 Lancaster North B

This site is intended as a maintenance-of-way-only site to accompany the Avenue M LMF site. The potential site is in the same place as Lancaster North A. Whereas Lancaster North A is proposed to accommodate an LMF/MOWF joint facility, Lancaster North B (at approximately 84 acres) would have a much smaller footprint because it would accommodate only an MOWF, including lead tracks.

3.3.7.3 Avenue M Maintenance Site and MOWF

This maintenance site and MOWF is on the west side of the HSR alignment and to the west of existing Sierra Highway at Avenue M in the Cities of Lancaster and Palmdale, respectively (Figure 5). The actual site is between W Avenue L-4 and Avenue O, which are both two-lane, paved roadways where access to the site can be gained and future utilities could be built to service the site. A combined LMF/MOWF could be accommodated here.

⁴ Yards are facilities that reassemble inbound train cars into outbound trains.



Source: California High-Speed Rail Authority, 2020

Figure 5 Palmdale Area Detail Map, showing Avenue M Maintenance Site and Maintenance-of-Way Facility

3.4 Description of the Selected Alternative

The Authority has identified Alternative 2 with the Refined CCNM Design Option, the Palmdale Station, and the Avenue M Maintenance Site and MOWF. The Selected Alternative extends from immediately south of the previously approved Bakersfield F Street Station, at the intersection of 34th and L Streets in Bakersfield, and ends approximately 1.1 miles south of the Palmdale station to Spruce Court in Palmdale. Figure 1 shows the Selected Alternative.

From the F Street Station in Bakersfield, the alignment runs from Oswell Street to Morning Drive (SR 184), with the Alternative 2 centerline on the north side of Edison Highway on a viaduct. East of Morning Drive, the alignment transitions from the Edison Highway corridor to the SR 58 corridor, reaching the freeway corridor at Edison Road. With Alternative 2, SR 58 would remain in its current alignment, but this alternative would require an elevated structure for the HSR tracks spanning the SR 58/Edison Road interchange diagonally. This would require another elevated structure crossing back over SR 58 just past Towerline Road and three additional elevated structures to cross the HSR over existing north-south roads (i.e., Malaga Road, Comanche Drive, and Tejon Highway) spaced approximately 1 mile apart between Edison and Towerline Roads.

The Alternative 2 alignment would continue eastbound parallel to Edison Highway toward Caliente Creek. From Caliente Creek to Bealville Road, Alternative 2 would continue southeast through Keene before beginning to climb the Tehachapi Mountains at a 2.8 percent vertical grade. The alignment would include a viaduct over Caliente Creek and a combination of cuts, fills, tunnels, and viaducts before reaching and passing underneath Bealville Road. East of Bealville Road, the alignment would generally follow SR 58 north of the freeway to the SR 58 interchange

with Broome Road. Between Bealville Road and Broome Road, the alignment would include three tunnels and five viaducts. The viaducts would span the UPRR, Tehachapi Creek, Avenue E, and Woodford-Tehachapi Road northeast of La Paz, and SR 58 at Broome Road, crossing SR 58 three more times as the two facilities form a braided configuration within the Tehachapi Creek canyon. Under the Refined CCNM Design Option, the viaduct would be 2,693 feet north of La Paz at its closest when it emerges from the tunnel.

As SR 58 turns south approaching the City of Tehachapi, the alignment would continue on an easterly path, along the edge of the city's future development area, through a 6,500-foot tunnel. The alignment would then curve farther south and pass to the east of the city, crossing over SR 58 near Arabian Drive before crossing the Tehachapi Valley on a straight alignment through the mountains southeast of Tehachapi in a 12,700-foot tunnel that roughly follows Tehachapi Willow Springs Road. As the alignment begins the 2.8 percent descending grade into the northern portion of Antelope Valley, a portion of Tehachapi Willow Springs Road would be realigned to the west near the Cameron Canyon Road intersection. This would place the HSR alignment east of Tehachapi Willow Springs Road, where it would cross the Pacific Crest Trail (PCT) and the Garlock Fault.

The alignment would pass just west of the existing CalPortland Cement Company limestone quarry in a 9,500-foot tunnel. A cover extending 1,700 feet from the northern terminus of Tunnel 9 would be constructed to protect the HSR infrastructure from potential damage from flyrock (see Section 4.10). The alignment would then continue southeast past the east side of Willow Springs International Raceway, where it would proceed across the Antelope Valley through Rosamond toward the north end of the City of Lancaster. The alignment would pass over SR 138 and SR 14 near their interchange and then would enter the City of Lancaster at Avenue H, running parallel to the Sierra Highway/UPRR corridor through Lancaster and Palmdale. Alternative 2 would require a realignment of the UPRR corridor to the east. Therefore, Alternative 2 would align east of Sierra Highway and west of the UPRR corridor.

In the Lancaster area, from Avenue H through the City of Lancaster, Alternative 2 would combine the HSR, UPRR, and Metrolink rail corridors into one corridor. Under Alternative 2, the new combined rail corridor would match the current western extent of the existing rail right-of-way and widen the corridor to the east as necessary to accommodate all three rail systems and their respective separation requirements. This alternative would require the relocation of all the UPRR and Metrolink facilities in the corridor from north of Avenue H to approximately Avenue L. The Lancaster Metrolink station building and parking facilities, however, would not need to be relocated. The alternative would create separate rights-of-way for the UPRR and Metrolink rail corridors to the east of the HSR right-of-way.

To avoid airspace restrictions from the U.S. Air Force Plant 42 Airport to the south, the alignment would begin a transition to the west at Avenue K. The alignment would continue to Avenue M, where it would be west of the existing UPRR/Metrolink right-of-way, which would remain in its existing location. The HSR alignment would then continue south, parallel to and along the westerly side of the existing rail corridor. The westerly transition of the alignment, from Avenue K to Avenue O, would require the relocation of approximately 4.2 miles of Sierra Highway to the west. The highway relocation would vary between 500 feet and 2,900 feet west of its existing location. This would provide a separation of 500 to 2,800 feet between the rail corridor and the highway until the section terminus at the Palmdale Station, at the Palmdale Transportation Center.

The Authority studied three alternative locations for maintenance facilities in the Draft EIS. Based on the evaluation of these alternatives, the Authority has identified the Avenue M Maintenance Site and MOWF in the City of Lancaster as part of the Selected Alternative for the Bakersfield to Palmdale Project Section. The Authority is reserving its decision on the location of the LMF site at this time. The Avenue M site has been chosen as the preferred Maintenance Site and MOWF location, because (1) the site satisfies the Authority's requirement for maintenance facilities to have freight rail access for delivery of materials, (2) the southern location of the MOWF at Avenue M rather than at either of the Lancaster North sites would improve connectivity to the Palmdale

Station and HSR project sections to the south of Palmdale, and (3) the Avenue M footprint area is of sufficient size to accommodate an LMF in the future.

3.5 Environmentally Preferable Alternative

The CEQ NEPA regulations require that the ROD identify all alternatives that were considered, "...specifying the alternative or alternatives which were considered to be environmentally preferable" (40 C.F.R. 1505.2).

In determining an environmentally preferable alternative, the Authority considered all B-P Build Alternatives as well as the No Action Alternative. The Authority weighed and balanced the physical environmental effects associated with the Build Alternatives as well as those associated with the No Action Alternative. The Authority determined that the adverse environmental effects associated with the Selected Alternative were less substantial than the environmental consequences associated with the No Action Alternative in terms of air quality and traffic, and thus identified an action alternative as environmentally preferable. The Authority identified the environmentally preferable alternative by balancing the adverse and beneficial impacts of the alternatives on the human and natural environment. There was no single determining factor in identifying the environmentally preferable alternative because of the multitude of issues considered and the varied input received from stakeholders on each of the four B-P Build Alternatives. Furthermore, many impacts on the natural environment and community resources would be the same, or very similar, across all four B-P Build Alternatives and, therefore, do not always provide enough meaningful information to distinguish between the relative merits of the alternatives. Due to the similarity of the four B-P Build Alternatives, to identify an environmentally preferable alternative, various differentiators were identified based on stakeholder, agency, and community input:

- In the community of Edison, compared to Alternatives 1, 3, and 5 (which all have the same alignment in Edison), Alternative 2 would not require relocation of SR 58. This would result in fewer impacts on access and also would reduce the construction time period, which in turn would reduce the duration of construction-related impacts (e.g., noise, vibration, air pollution emissions). In addition, with its location south of SR 58, Alternative 2 is farther from key community resources, including Edison Middle School, low-income housing, and agricultural packing houses. This would reduce impacts related to noise, vibration, and access. However, because Alternative 2 would be on an elevated structure, it would have a greater effect on visual quality in the Edison area.
- In the Mojave area, compared to Alternatives 1, 2, and 5 (which all have the same alignment in the Mojave area), Alternative 3 would require an additional mile of tunnel. Alternative 3 would affect more areas permitted for future mining (e.g., CalPortland Cement Company's Mojave cement plant) compared to Alternatives 1, 2, and 5.
- In Lancaster, Alternatives 1, 2, and 3 (which all have the same alignment in Lancaster), would combine existing rail facilities into a narrower corridor while also providing room for any expansion needed by UPRR and Metrolink. This would eliminate the need to realign Sierra Highway in Lancaster. As a result, Alternatives 1, 2, and 3 would have fewer residential and commercial displacements in the downtown area. Furthermore, Alternatives 1, 2, and 3 would affect fewer motels that serve as de-facto affordable housing in this area.
- In the community of Keene, compared to Alternatives 1, 2, 3, and 5 and the CCNM Design Option, the Refined CCNM Design Option would be located farther from La Paz and would have reduced noise and visual impacts. The Refined CCNM Design Option would not be visible from many vantage points in La Paz and would include a landscaped berm to match the natural setting to minimize visual contrast with the landscape. This would reduce visual impacts overall compared to the B-P Build Alternatives and the CCNM Design Option. In addition, the Refined CCNM Design Option would include a noise barrier at least 12 feet in height along a 0.57-mile at-grade section and the 0.13-mile bridge structure over Tweedy Creek to reduce noise exposure to La Paz staff and visitors.

Alternative 2 would also have the fewest temporary road closures in agricultural areas, the fewest severe operational noise impacts prior to mitigation, the fewest residential and business displacements, the lowest acreage of Important Farmland conversion, the lowest impact on overall habitat for special-status plant species, and the least impact on overall habitat for special-status wildlife species.

Table 8-A-1 in Appendix 8-A and Section 8.3.1.2 in the Final EIS provide a detailed comparison of the various criteria evaluated for the B-P Build Alternatives.

As described in Section 8.3 of the Final EIS, and in accordance with 40 C.F.R. 1505.2, Alternative 2 with the Refined CCNM Design Option, the Palmdale Station, and the Avenue M Maintenance Site and MOWF is the Environmentally Preferable Alternative. When compared to Alternatives 1, 3, 5, and the CCNM Design Option, Alternative 2 with the Refined CCNM Design Option would result in fewer impacts on historic properties, Section 4(f) properties, downtown areas, schools, EJ communities, and mining activities. Alternative 2 with the Refined CCNM Design Option would also result in fewer construction-related impacts, such as noise, vibration, hauling traffic, and air pollution emissions, because it does not require the relocation of SR 58, has fewer miles of tunnel construction, and has the fewest number of grade separations with local roadways.

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4 SUMMARY OF POTENTIAL EFFECTS

Construction and operation of the Selected Alternative has the potential to affect a variety of environmental and social resources. Impacts on these resources could be adverse or beneficial. NEPA impact determination requires consideration of both context and intensity. Chapter 3 of the Final EIS includes a full discussion of the potential impacts of the Bakersfield to Palmdale Project Section, organized by resource area. To fully understand the potential range of impacts of the Selected Alternative, the Final EIS analyzed all reasonably foreseeable environmental impacts resulting from construction and operation of the project. In determining that the Selected Alternative will not result in impacts on these resources, implementation of IAMFs, mitigation measures, and best management practices (BMP) are presumed and will be required as part of project implementation as described further in Section 6.

Some resource sections do not have adverse impacts under NEPA and have been excluded in the following sections: Electromagnetic Interference and Electromagnetic Fields; Geology, Soils, Seismicity, and Paleontology; and Safety and Security.

The following sections summarize the adverse and the beneficial impacts that may occur with construction and operation of the Selected Alternative.

4.1 Transportation

As discussed in Section 3.2, Transportation of the Final EIS, potential construction-related impacts from the Selected Alternative will include access and circulation disruptions that are equivalent in context and intensity to any of the Build Alternatives.

During operations, the Selected Alternative, as well as the other Build Alternatives, will not result in adverse impacts to alternative transportation modes (i.e., transit, bicycles, and pedestrians) and will not interfere with freight rail or aviation operations. In addition, the project will not result in adverse impacts to studied intersections or roadway segments. The majority of the Selected Alternative footprint (i.e., the rail alignments) will not result in significant or adverse impacts to the 70 intersections and 53 roadway segments evaluated in the Final EIS. Permanent road closures will occur on some low-volume roads, so there is little traffic that will be rerouted because of the Selected Alternative. Furthermore, very few intersections or roadway segments operate at or near capacity under existing conditions, so the potential for impacts is limited. The Palmdale Station would impact 6 intersections and 3 roadway segments in the RSA due to the volume of traffic being drawn to the station, and improvements at several locations in the City of Palmdale are available for consideration to address these impacts under NEPA.

The Bakersfield Station—F Street (Locally Generated Alternative) will affect 11 intersections and 2 roadway segments. Improvements will be required to mitigate these impacts.

Additionally, the Selected Alternative will provide the following operation benefits:

- Reduction of vehicle trips on freeways, which will improve freeway level of service
- Reduction of vehicle miles traveled, which will reduce highway maintenance
- New grade-separated roadways, which will improve safety

To minimize potential effects on transportation, the Authority will implement numerous strategies and design features (set forth in IAMFs) that will avoid or minimize effects during construction, such as the adoption of a construction transportation plan and contractor requirements to avoid or minimize circulation and emergency access impacts due to road closures. In addition to these IAMFs, the Authority will require numerous mitigation measures that will further minimize and/or compensate for adverse effects of the Selected Alternative. These mitigation measures include use of flaggers, temporary traffic control officers along earthwork haul routes, and intersection and roadway improvements to address traffic delay impacts, provided that the Authority can enter into a Memorandum of Understanding with the City of Palmdale whereby the City assumes right-of-way and maintenance responsibilities for improvements within the City's jurisdiction.

4.2 Air Quality and Global Climate Change

As discussed in Section 3.3, Air Quality and Global Climate Change of the Final EIS, construction of the Selected Alternative will result in temporary construction increases in emissions of ozone precursors (volatile organic compounds and nitrogen oxides). Without mitigation, these emissions are expected to cause exceedances of the applicable air quality criteria thresholds in the Antelope Valley Air Quality Management District (AVAQMD), East Kern Air Pollution Control District (EKAPCD), and San Joaquin Valley Air Pollution Control District (SJVAPCD).

Construction of the Selected Alternative, as well as any of the other Build Alternatives, will cause exceedances of the applicable air quality criteria thresholds during construction. The exceedance of the nitrogen oxide threshold will be 254 tons per year for the Selected Alternative compared to 279 tons per year for Alternative 5 and 213 tons per year for Alternative 1. The exceedance of the volatile organic compounds threshold will be 25 tons per year for the Selected Alternative compared to 27 tons per year for Alternative 5 and 20 tons per year for Alternative 1. Some years under all alternatives have slightly higher emissions under the Refined CCNM Design Option. Implementation of mitigation measures will offset emissions through the Voluntary Emission Reduction Agreement Program (in the SJVAPCD), the Emission Banking Certificate program (in the EKAPCD), and the Air Quality Investment Program (in the AVAQMD) to bring the Selected Alternative into compliance with SJVAPCD, EKAPCD, and AVAQMD air quality plans.

Construction of the Selected Alternative, as well as any of the other Build Alternatives, will also generate direct and indirect greenhouse gas emissions during construction that could contribute to global climate change. However, these emissions will be temporary and will be offset from the emissions benefit that will occur during the operations period. As a result, the Selected Alternative will not result in global climate change impacts from greenhouse gas emissions.

The Selected Alternative, as well as any of the other Build Alternatives, will avoid localized impacts from asbestos and lead-based paint exposure, impacts from guideway/alignment construction, impacts to schools and other sensitive receptors during station construction, and impacts from concrete batch plants. In addition, the Selected Alternative will avoid localized cumulative impacts during construction.

In addition to adhering to general BMPs and required air quality management and GHG reduction strategies, the Authority will implement numerous strategies and design features (set forth in IAMFs) and mitigation measures to address the air quality impacts associated with construction of the Selected Alternative. The Authority will incorporate exhaust emissions requirements for construction equipment into contract specifications. The Authority will require that all heavy-duty off-road construction diesel equipment used during the construction phase uses the cleanest reasonably available equipment (including newer equipment or tailpipe retrofits). The contractor will document efforts undertaken to locate newer equipment (such as, in order of priority, Tier 4, Tier 3, or Tier 2 equipment) or tailpipe retrofit equivalents. All on-road trucks used to haul construction materials, including fill, ballast, rail ties, and steel, will consist of an average fleet mix of equipment model year 2010 or newer, but no less than the average fleet mix for the current calendar year as set forth in California Air Resources Board's EMFAC2014 database. Furthermore, the Authority will enter into an agreement through the Voluntary Emission Reduction Agreement Program with the SJVAPCD), will participate in the Emission Banking Certificate program with the EKAPCD, and will participate in the Air Quality Investment Program with AVAQMD to cover the portion of the Project approved and funded for construction within the San Joaquin Valley Air Basin and the Mohave Desert Air Basin, which will offset all emissions to net-zero. The Authority's existing VERA agreement with SJVAPCD commits to offsetting actual emissions from construction to net zero. Agreements with AVAQMD and EKAPCD would also commit to offsetting actual emissions from construction to net zero to the extent that offsets are available.

Operation of the Selected Alternative, as well as any of the other Build Alternatives, will provide statewide and regional air quality benefits. This will result in a permanent net benefit to air quality during operations because it will lower emissions of mobile source air toxics, greenhouse gases, volatile organic compounds, nitrogen oxide, sulfur dioxide, carbon monoxide, and particulate

matter smaller than or equal to 10 microns and 2.5 microns in diameter by diverting trips from travel modes with higher emissions (e.g., commercial air flights and automobile trips) to HSR, which has lower emissions. Therefore, the Selected Alternative will not result in exceedances of *de minimis* thresholds or SJVAPCD, EKAPCD, or AVAQMD thresholds.

4.3 Noise and Vibration

As discussed in Section 3.4, Noise and Vibration of the Final EIS, the Selected Alternative will have construction impacts related to noise for rail corridor, roadway, substation and power utility facilities for the Selected Alternative and any other Build Alternative. Construction vibration impacts will occur during rail corridor construction for the Selected Alternative and any other Build Alternative. The Selected Alternative (as well as the other Build Alternatives) will not have construction-related noise impacts due to construction of the maintenance-of-way facilities.

Operation of the Selected Alternative will generate noise levels above ambient levels from train pass-bys, resulting in adverse impacts from the exposure of sensitive receptors to severe noise without mitigation. The Selected Alternative results in the least amount of severe noise impacts to sensitive receptors out of all of the B-P Build Alternatives. With implementation of the Selected Alternative, residences and nonresidential sensitive receptors will experience severe noise impacts prior to mitigation. After mitigation, no operational vibration impacts will occur under the Selected Alternative or under any Build Alternative.

The Selected Alternative will have no operational impacts related to noise effects on wildlife and domestic animals, or traffic noise. Equestrian users of the PCT may experience impacts related to operational train noise prior to mitigation. The Selected Alternative will result in operational noise impacts on sensitive receptors from HSR stationary facilities, prior to mitigation.

To avoid or to minimize potential noise effects associated with operation, the Authority will adhere to all applicable state and federal regulations, including Federal Highway Administration and FRA guidelines for emissions of noise from transportation sources and for the abatement of excessive noise emissions.

Additionally, the Authority has developed project-specific design strategies that will further reduce the potential for adverse effects associated with operation of the Selected Alternative to levels below those that will be achieved through regulatory compliance alone. However, even with implementation of regulatory requirements and these project-specific design strategies, the Selected Alternative still has the potential to result in adverse impacts. To further reduce project-related operation noise, the Authority has developed mitigation measures that include sound barriers, building sound insulation, and noise easements; requiring preparation of and adherence to a construction noise mitigation and monitoring program; conducting subsequent noise and vibration environmental analysis during and following final design; ensuring that train vehicle procurement meets pertinent federal noise regulations for locomotives and rail cars; and ensuring station, maintenance-of-way facilities, and traction power substations are designed to reduce noise. Additionally, the Authority will implement horse startle effect warning signage along the PCT.

4.4 Public Utilities and Energy

As discussed in Section 3.6, Public Utilities and Energy of the Final EIS, construction of the Selected Alternative (or any of the Build Alternatives) will require the temporary shutdown of utility lines, such as water, sewer, electricity, telecommunications, fuel/petroleum, or gas, to safely move or extend these lines, which could interrupt utility services.

During construction, the potential for accidental disruption of utility systems, including overhead utility lines (e.g., telephone and cable television) and buried utility lines (e.g., water, sewer, and natural gas pipelines), is low due to the established practices of utility identification and notification. In addition, California Government Code Section 4216 establishes required procedures for identifying buried utilities prior to initiating excavation to help avoid accidental disruption of utility services.

Construction activities will use water to prepare concrete, to increase the water content of soil to optimize compaction for dust control, to reseed disturbed areas, for earthwork, and for tunnel construction and excavation. Whereas Alternative 3 will result in the most construction water use, the Selected Alternative will use less water than existing demand. Because there will be a decrease in water demand, sufficient water supplies will be available; the Selected Alternative will not require the construction or expansion of a water treatment facility and will not require new or expanded entitlements.

Construction activities, such as grading and excavation, could redirect stormwater runoff and increase the volume and rate of stormwater runoff through soil compaction during ground-disturbing activities.

During operation, increased demand for public utilities may take place to operate the HSR system. The operation and maintenance of the Selected Alternative (or any of the Build Alternatives) will result in permanent relocation of one substation and extension of utilities, as well as reduced access to existing utilities in the project footprint. The Selected Alternative will conflict with 383 existing utilities, resulting in the lowest number of existing utility impacts out of the Build Alternatives. The Selected Alternative will implement standard engineering and utility access practices, which will avoid and minimize impacts related to reduced access to existing utilities in the HSR right-of-way; will implement regulatory requirements that will avoid and minimize impacts from upgrade or construction of power lines; and will not result in impacts from water demand, wastewater, waste generation, or hazardous waste generation during operation. Operation of the Selected Alternative will decrease automobile VMT and airplane flights statewide, which will reduce energy consumption, but will increase electricity demand.

The Authority has developed BMPs and IAMFs that will avoid or minimize adverse effects to utilities associated with the construction and operation of the Selected Alternative. These IAMFs include notification of planned utility outages, identifying utility lines prior to construction, implementation of on-site stormwater retention practices, incorporating utility and design elements that minimize electricity consumption, and implementation of the Authority's adopted sustainability policy that establishes project design and construction requirements to avoid and minimize energy consumption, relocation of impacted irrigation infrastructure, and relocation or abandonment of oil wells encountered during construction. Additionally, the Authority will implement mitigation measures that will require the reconfiguration or relocation of one impacted substation.

4.5 Biological and Aquatic Resources

As discussed in Section 3.7, Biological and Aquatic Resources of the Final EIS, the Selected Alternative will reduce adverse impacts on biological resources or wetlands after IAMFs and mitigation measures are implemented.

The Selected Alternative will have the fewest impacts of the Build Alternatives to special-status plant species habitat, permanent impacts to special-status wildlife species habitat, and permanent impacts to federal and state threatened/endangered species habitat. Additionally, the impacts from the Selected Alternative are mostly attributable to built features (i.e., irrigation ditches and ponds).

The Selected Alternative will have no impacts on critical habitat. Other resource impacts are described below:

- **Riparian habitat** will be temporarily and permanently affected during construction of the Selected Alternative. Restoration of riparian habitat shortly after construction disturbance will mitigate construction period impacts. Compensatory mitigation will mitigate permanent impacts.
- The Selected Alternative may disturb **special-status plant species** populations, but will have the lowest impact on overall habitat for special-status plant species of all the Build Alternatives. Measures to mitigate impacts on special-status plant species include developing and implementing a plan to address monitoring, salvage, relocation, and propagation of

special-status plant species during and after construction; the purchase of credits from an existing mitigation bank; and/or conducting a special-status plant re-establishment program within the same watershed or in proximity to the impact area. Mitigation measures and compliance with the FESA Section 7 Biological Opinion and the CDFW Incidental Take Permit will mitigate temporary and permanent impacts on special-status plant species.

- The Selected Alternative may permanently impact **jurisdictional waters and wetlands** consisting of 59.8 acres of permanent impacts to wetlands and other waters and 11.0 acres of temporary impacts. Although the Selected Alternative could cause disturbances to aquatic resources, they will be considered minimal after IAMFs and mitigation measures have been implemented to reduce and offset these impacts.
- The Selected Alternative may permanently impact **special-status wildlife species** populations, but will have the lowest impact on overall suitable habitat for special-status wildlife species of all the Build Alternatives. Measures to mitigate impacts on special-status wildlife populations include implementation of a Habitat Mitigation Plan, buffers for nests and dens, and compensation through habitat replacement or monetary contributions to an offsite mitigation bank, among others. Mitigation measures and compliance with the FESA Section 7 Biological Opinion and the CDFW Incidental Take Permit will mitigate impacts on special-status wildlife species.
- The Selected Alternative will result in permanent and temporary direct and indirect impacts on **wildlife movement corridors**. Project design elements will reduce effects of the project on wildlife movement corridors, and the implementation of wildlife crossings of the selected alignment, wildlife rescue measures, wildlife height requirements for fencing, the installation of wildlife jump-outs, and the implementation of lighting minimization measures for operations will further reduce project effects.

To minimize potential effects on biological resources, the Authority will implement numerous IAMFs that will avoid or minimize effects and will comply with all requirements of biological permits and authorizations. These IAMFs include designated areas for staging, access, and construction; biological monitors; bird-safe design features, and the establishment of protocols to further avoid or minimize impacts. In addition to these IAMFs, the Authority will require numerous mitigation measures that will further minimize and/or compensate for adverse effects of the Selected Alternative. These include broad mitigation strategies designed to minimize impacts through the establishment of environmentally sensitive areas and nondisturbance zones; installing wildlife exclusion fencing; conducting pre-construction surveys; and implementation of off-site habitat restoration, enhancement, and preservation strategies, including the acquisition of conservation easements and the purchase credits from an agency-approved mitigation bank. Additional mitigation measures have been developed to minimize potential effects on specific special-status species or groups of species.

4.6 Hydrology and Water Resources

As discussed in Section 3.8, Hydrology and Water Resources of the Final EIS, construction activities from the Selected Alternative will result in hydrology and water quality impacts on existing drainage patterns, and result in a redirection of stormwater runoff, decreased infiltration, and an increase in the volume and rate of stormwater runoff during storm events prior to mitigation. However, the Selected Alternative will have the least amount of net increases in impervious surfaces among the Build Alternatives. In limited reaches of this project section, tunnel construction may interfere with the groundwater flow systems which could result in the loss or reduction in water available to streams, seeps, springs, and water supply wells.

The Authority will implement IAMFs, BMPs, and mitigation measures to reduce these impacts. These measures include, but are not limited to, project design features for stormwater management and flood protection, preparation of a SWPPP, a construction site BMP field manual, a CMP, an SPCC plan, and a hazardous materials and waste plan; implementation of construction BMPs; delineation of equipment staging areas and traffic routes; reuse or disposal of construction spoils to reduce impacts on surface water quality during construction; erosion and

sedimentation controls; dewatering plans; probing ahead of the tunnel face during tunneling; construction methods to reduce inflow of groundwater into the tunnel; tunnel waterproofing; groundwater modeling; groundwater monitoring; tunnel inspections; implementation of an AMMP; and biological monitoring during construction activities within or adjacent to aquatic resources.

Operation of the Selected Alternative will result in impacts on existing drainage patterns, surface water quality, and groundwater recharge; changes in stormwater runoff; and a redirection of stormwater runoff, decreased infiltration, and an increase in the volume and rate of stormwater runoff during storm events prior to mitigation. During operation and maintenance activities, anticipated pollutants associated with a railway facility include heavy metals, nutrients, sediments, organic compounds, trash and debris, and oil and grease. The placement of piers within floodplain crossings and abutments near waterways also has the potential to cause localized scour. The Authority will implement design measures to reduce increases in floodplain water surface elevation) and compliance with the requirements set forth in USEO 11988 and the FEMA regulations during operation of the Selected Alternative. The Authority will also implement treatment BMPs to capture and treat stormwater runoff to remove pollutants of concern. The Selected Alternative will also be designed to collect and convey stormwater runoff to infiltration/detention basins or a nearby stormwater collection system, or dispersed in a nonerosive manner. The Authority will implement mitigation measures that require erosion control measures at piers and/or bridge abutments to minimize scour and siltation, and design of piers in channels to allow hydraulically smooth flow and to minimize erosion.

4.7 Socioeconomic and Communities

As discussed in Section 3.12, Socioeconomics and Communities of the Final EIS, the construction and operation of the Selected Alternative will have adverse effects on socioeconomics and communities related to community cohesion; displacement and relocation of residential and commercial properties, agricultural businesses, and community facilities; access disruption; changes in property and sales tax revenue and agricultural revenue; and temporary physical deterioration. The Selected Alternative will have the fewest residential and commercial displacements out of the Build Alternatives. In addition, with its location south of SR 58, the Selected Alternative is farther from key community resources, including Edison Middle School, low-income housing, and agricultural packing houses. Furthermore, the Selected Alternative will affect fewer motels that serve as de-facto affordable housing in Lancaster.

The Selected Alternative will incorporate mitigation measures and IAMFs to reduce project effects on socioeconomics and communities. These IAMFs will include transportation, noise, and air quality controls; context-sensitive design; and relocation assistance and benefits to displaced residents, businesses, and agricultural operations. The incorporation of IAMFs will minimize or avoid socioeconomic impacts of the Selected Alternative on community displacements and relocations. Mitigation measures include consultation with property owners and outreach as well as modifying design to ensure property access for remaining parcels.

The Selected Alternative will result in benefits related to socioeconomics and communities. The Selected Alternative will generate temporary and permanent gains in sales tax revenues because of project spending during construction and operation of the HSR system. During operations, the B-P Build Alternatives will provide circulation and economic benefits, and revenue losses anticipated during construction will not be expected to result in long-term economic changes to the regional economy in affected jurisdictions. Employment growth from construction and operation of Selected Alternative would be a benefit for the region, as it would provide jobs in areas with unemployed workers. These benefits will reduce the likelihood of physical deterioration in communities along the alignment.

4.8 Station Planning, Land Use, and Development

As discussed in Section 3.13, Station Planning, Land Use, and Development of the Final EIS, construction of the Selected Alternative will result in the temporary alteration of existing land use patterns, the permanent conversion of existing and planned land uses to transportation uses, and potential disruptions to planned developments.

Construction of the B-P Build Alternatives and the Selected Alternative will result in the temporary alteration of existing land use patterns and the permanent conversion of existing and planned land uses to transportation uses. The Selected Alternative will temporarily use the least amount of land outside the permanent footprint during construction and will permanently convert the least amount of land than all other Build Alternatives except for Alternative 5.

The Bakersfield Station—F-B LGA from the intersection of 34th and L Street to Oswell Street will not cause substantial changes in the long-term pattern or intensity of land use that will be inconsistent with adjacent land uses.

However, the Authority will implement IAMFs pertaining to noise and air quality controls; context-sensitive design; and relocation assistance and benefits to displaced residents, businesses, and agricultural operations. The incorporation of IAMFs will minimize or avoid impacts of Selected Alternative on station planning, land use, and development. The Authority will also implement mitigation measures pertaining to land use, air quality, noise and vibration, aesthetics, socioeconomics and communities, and parks and recreation that will help avoid and/or reduce potential temporary land use and development effects.

4.9 Agricultural Farmland and Forest Land

As discussed in Section 3.14, Agricultural Farmland and Forest Land of the Final EIS, construction of the Selected Alternative (as well as any of the other B-P Build Alternatives) will require the temporary use of Important Farmland for construction staging areas and other construction-related activities, permanent conversion of Important Farmland to a nonagricultural use (i.e., transportation), and will result in the creation of remnant parcels (which are too small to economically farm). However, among the Build Alternatives, the Selected Alternative only results in a temporary use of 2 more acres of Important Farmland than in the other Build Alternatives. Overall, among the Build Alternatives, the Selected Alternative will result in the least direct and indirect permanent conversion of Important Farmland and parcels under Williamson Act Contract, including conversion that may occur through the creation of remnant parcels. Construction and operation of any of the B-P Build Alternatives (not including the CCNM Design Option or Refined CCNM Design Option) has the potential to interfere with aerial spraying activities and generate wind-induced effects, but these effects will not permanently convert Important Farmland to nonagricultural use.

The Authority has developed IAMFs and BMPs that will avoid or minimize the Selected Alternative's impacts on Important Farmland (refer to Appendix C for details). However, even with adherence to these IAMFs, the Selected Alternative will still result in the permanent conversion of Important Farmland to a nonagricultural use. Therefore, through an existing agreement with the California Department of Conservation, the Authority funds the California Farmland Conservancy Program's work to identify suitable agricultural land for mitigation of impacts as well as the purchase of agricultural conservation easements from willing sellers. This agreement provides for the purchase of agricultural conservation easements to preserve Important Farmland (i.e., Prime, Unique, or Farmlands of Statewide or Local Importance) in an amount commensurate with the quantity and quality of converted farmlands. Because the Selected Alternative will require the lowest acreage of permanent conversion of Important Farmland compared to the other Build Alternatives, the Selected Alternative will require the lowest amount of mitigation for agricultural land.

The Authority will implement mitigation that will offset and minimize the permanent construction impacts that result from direct conversion of Important Farmland and indirect conversion of Important Farmland through the creation of remnant parcels. Because the mitigation will not create new farmland (e.g., convert natural land to agriculture), the Selected Alternative will not avoid permanent conversion of Important Farmland from construction of the Bakersfield to Palmdale Project Section.

4.10 Parks, Recreation, and Open Space

As discussed in Section 3.15, Parks, Recreation, and Open Space, of the Final EIS, the Selected Alternative will result in impacts on four parks and recreation facilities (the Pacific Crest Trail, R. Rex Parris High School, Dr. Robert C. St. Clair Parkway, and Weill Park) during construction. During operations, the Selected Alternative will result in the permanent acquisition of the entire R. Rex Parris High School property and 0.29 acres at Dr. Robert C. St. Clair Parkway. As identified in the Final EIS, the F-B LGA between the intersection of 34th and L Streets to Oswell Street in Bakersfield will result in the permanent acquisition of approximately 0.10 acre at Weill Park.

Under the Selected Alternative (and Build Alternatives 1 and 5) the PCT will be realigned to reduce the number of trail crossings under the proposed HSR viaduct. The proposed PCT realignment will require a permanent easement for the trail and maintenance easement from the property owner. The realignment of the PCT will also minimize visual/aesthetic impacts associated with the Selected Alternative by reducing the contrasting urban appearance of the project with the natural environment near the PCT.

Construction and operation of all B-P Build Alternatives, the CCNM Design Option, and the Refined CCNM Design Option will be near La Paz, which is considered a parks and recreation resource. During construction, users of the La Paz activity center could experience short-term air quality, noise, and visual impacts associated with construction activities, including grading and equipment operations. No land from La Paz will be in the temporary impact area. With the Refined CCNM Design Option, an approximately 1,700-foot berm will be located at the same level as the catenary for the track. The berm would be an average of 80 feet in height from the existing ground, reducing visual impacts. Additionally, areas of ground disturbance would be recontoured and revegetated to minimize the visual effects associated with the earthwork required to construct the project. The alteration to the views will be minimal, distant, and low within the viewsheds, only visible from a few locations within the historic property, and will not reduce the isolation of the setting. Therefore, the Refined CCNM Design Option will avoid visual impacts to La Paz.

Operation of the Selected Alternative (as well as all of the B-P Build Alternatives) will place the HSR alignment immediately adjacent to the PCT. Therefore, trail users will have views of the trains, and noise from passing trains will be perceptible.

The Selected Alternative (as well as all of the B-P Build Alternatives) will require the permanent acquisition of a minor amount of land for column footings from the existing Dr. Robert C. St. Clair Parkway.

The Authority will implement IAMFs that will reduce impacts on parks and recreation facilities. These IAMFs will include design features to provide access to parks and recreational facilities for a range of travel modes (e.g., bicycle, pedestrian, vehicle) and to preserve user experience of recreational facilities near HSR infrastructure. IAMFs specific to transportation, noise, and air quality will also minimize indirect impacts on park facilities related to park access, construction-related noise, and fugitive dust. These IAMFs will minimize most impacts on park and recreation facilities. Additional mitigation for the permanent acquisition of park property will consist of offering compensation or land (or both) for the taking of parkland, consulting with the property owner regarding specific conditions of the impacts, and by working with relevant jurisdictions to establish appropriate compensation and relocation/realignment of a resource.

Mitigation for temporary and permanent effects on the PCT will reduce temporary trail closures and detours on the PCT by development and implementation of a Trail Facilities Plan, visual/aesthetic impacts will be minimized by reducing the contrasting urban appearance of the project with the natural environment near the PCT, and startle impacts on equestrian users would be reduced by providing advance warning signage ahead of the PCT crossing under the HSR viaduct.

4.11 Aesthetics and Visual Quality

As discussed in Section 3.16, Aesthetics and Visual Quality of the Final EIS, construction of the Selected Alternative will involve temporary impacts related to creation of new sources of light, glare, and dust. The Selected Alternative (as well as the remainder of the B-P Build Alternatives) will represent a visual change, with the degree of change dependent on the surrounding environment. The Selected Alternative (as well as the remainder of the B-P Build Alternatives) will result in adverse changes to visual quality in some areas, either by blocking scenic views or by visual intrusion of the HSR, guideways, associated road crossings, and other project structures that will be out of character or scale with the surroundings. However, the Selected Alternative results in the least operational impacts to key viewpoints. Where the HSR features will be compatible with the existing environment or where no sensitive viewers are located, such as most locations in the Tehachapi Mountains, the Selected Alternative will not have an adverse effect. Implementation of the Refined CCNM Design Option to any of the B-P Build Alternatives reduces the visual effects at four viewpoints in the Tehachapi Mountains and will eliminate adverse effects at La Paz.

Other than the differences discussed above, the Selected Alternative will have comparable impacts to Aesthetics and Visual Quality as the other Build Alternatives.

To avoid or reduce other visual impacts of the Selected Alternative, the Authority has developed BMPs and similar strategies as IAMFs (refer to Appendix C of this ROD for details). These IAMFs include adherence to design strategies that will avoid, minimize, and reduce adverse effects on aesthetic and visual resources.

However, to further reduce potential adverse visual effects associated with construction of the Selected Alternative, the Authority has developed mitigation measures that require contractors to minimize and/or screen construction areas and minimize or avoid nighttime light disturbance. These mitigation measures also require the Authority to engage with local communities to help inform the design of elevated guideways so that they are more visually harmonious with the local context. Landscape treatments, screening, and other plantings after construction will also enhance visual quality, along with mitigation measures to ensure the prompt treatment of graffiti on new infrastructure.

4.12 Cultural Resources

As discussed in Section 3.17, Cultural Resources of the Final EIS, the Selected Alternative will affect prehistoric and historic-era archaeological resources and historic built environment resources and may affect presently unknown or undiscovered cultural resources. All B-P Build Alternatives will result in direct adverse effects on the Big Creek Hydroelectric System Historic District in Bakersfield, which is a historic architectural (or built) property. The adverse changes to the Big Creek Hydroelectric System Historic will be fully mitigated per the mitigation described in the final paragraph of this section and by coordination with Southern California Edison regarding their towers and interpretive signage.

All B-P Build Alternatives and the CCNM Design Option will also result in direct adverse effects on La Paz. The Selected Alternative includes the Refined CCNM Design Option, which was developed in 2019 specifically to minimize impacts to La Paz. Under the Selected Alternative, none of the characteristics of La Paz that qualify it for inclusion in the NRHP will be affected in a manner that will diminish the integrity of the property's location, design, materials, workmanship, feeling, or association. Therefore, the Selected Alternative will not result in an adverse effect on La Paz. Although the setting outside of La Paz will be altered, the alteration will be minimal, distant, natural in appearance, low on the horizon, and only visible from a few locations within the historic property, and it will not make the setting any less isolated. With the inclusion of the contoured vegetated berm and sound barrier, audible and visual effects will be avoided. As such, the undertaking will result in no adverse effect to La Paz, with conditions.

To avoid or reduce cultural resources impacts of the Selected Alternative, the Authority has developed BMPs and similar strategies as IAMFs (refer to Appendix C of this ROD for details).

These include requirements for additional surveys, training sessions for construction personnel to be able to identify cultural resources, a monitoring plan, a discovery plan, procedures if unanticipated discoveries are made during ground-disturbing activities, and plans to protect and to avoid or minimize damage to historic properties. Additionally, the Selected Alternative will incorporate mitigation measures concerning both archaeological resources and built environment resources. Mitigation measures include phased identification of archaeological and built environment resources, allowing for the potential discovery of previously unidentified resources once access to all properties within the construction area is secured. Surveys for such resources will be conducted on all properties that have not been subject to prior surveys before construction begins.

4.13 Regional Growth

As discussed in Section 3.18, Regional Growth, of the Final EIS, the Selected Alternative will not induce substantial unplanned employment or population growth or land use consumption.

Regional growth effects related to construction of the Selected Alternative will result in approximately 156,900 direct, indirect, and induced jobs. These jobs will account for an additional 0.7 percent of the total jobs projected in the RSA at the peak of construction, which will not be substantial in the context of the RSA's overall economy. Of these jobs, approximately 17,000 will be direct jobs in the construction sector, which will represent 10.7 percent of the projected construction jobs in the RSA at the peak of construction. The Authority has been implementing a variety of programs to help local residents gain skills to compete for available HSR jobs, as well as the Community Benefits Agreement, which requires contractors to commit 30 percent of all construction dollars to hiring small businesses. The emphasis on job training for local workers and contract requirements to use small businesses should provide employment opportunities for construction workers in the RSA. Additionally, because construction activities will be temporary, it is unlikely that construction workers from outside the RSA who work on the project will relocate their families to communities in the RSA. Thus, the construction of the Selected Alternative will not induce substantial unplanned employment or population growth or land use consumption. Therefore, construction of the proposed improvements for the Selected Alternative will not result in substantial regional growth effects.

Furthermore, it is anticipated that housing constructed in these communities to accommodate such population growth will be consistent with the adopted land use plans, policies, and regulations of local governments. Therefore, the Selected Alternative will not induce substantial unplanned population growth or land use consumption.

4.14 Cumulative Impacts

As discussed in Section 3.19, Cumulative Impacts, of the Final EIS, adherence to IAMFs and/or mitigation measures will avoid or minimize most impacts associated with construction and operation of the Selected Alternative, as well as the other Bakersfield to Palmdale Alternatives. However, when combined with other past, present, and reasonably foreseeable projects, the construction of the Selected Alternative (as well any of the Bakersfield to Palmdale Alternatives) will, even with adherence to mitigation measures, contribute to cumulative impacts in air quality and greenhouse gases, socioeconomics and communities, agriculture and farmlands, and cultural resources, and the operation of the Selected Alternative will, even with adherence to mitigation measures, contribute to cumulative impacts in noise.

Construction of the Selected Alternative, in combination with cumulative projects, has the potential to increase emissions of carbon monoxide, for which the RSA is in nonattainment under federal ambient air quality standards for all B-P Build Alternatives. Even with the purchase of emissions offsets, mitigation would not reduce carbon monoxide emissions below thresholds. Therefore, the Selected Alternative, in combination with cumulative projects, will result in a cumulative impact under NEPA.

Construction of the Selected Alternative, in combination with cumulative projects, will result in permanent disruption or division of communities and permanent displacement and relocation of

residents, businesses, and community facilities in the RSA. Cumulative Mitigation Measure CUM-SO-MM#1, Coordination with Cumulative Construction Project Sponsors, will require HSR project sponsors to coordinate construction schedules and potential closures, detours, and other elements of construction with other entities, including local or regional governments, to minimize cumulative effects to the extent feasible. However, cumulative impacts to community cohesion will occur under all B-P Build Alternatives, but the number of residents, businesses, and community facilities displaced will vary. Even though the Selected Alternative will result in the fewest displacements, it will have a cumulative impact under NEPA because, in combination with other projects, the proposed improvements will permanently disrupt established patterns of interaction among community residents and directly displace residents, businesses, and community facilities.

Construction of the Selected Alternative, in combination with cumulative projects, will result in the conversion of Important Farmland and parcels under Williamson Act contracts. The Selected Alternative includes a project-level mitigation measure to address the loss of Important Farmland. However, mitigation would not create new farmland (i.e., convert natural land to agriculture) and therefore would not address the permanent net loss of Important Farmland. No additional mitigation is available to reduce this cumulative impact. Cumulative impacts will occur under all B-P Build Alternatives, but the number of acres of Important Farmland that will be converted to other uses will vary. The Selected Alternative will have the smallest incremental impact, as it will result in the conversion of 565 acres of Important Farmland (522 acres from project construction and an additional 43 acres converted due to parcel severance), 621 of which are zoned for agriculture use and 86 of which are under a Williamson Act contract. Because the Selected Alternative will permanently convert Important Farmland, Important Farmland under a Williamson Act contract, and Important Farmland zoned for agricultural use to nonagricultural use, the project will have a cumulative impact under NEPA.

Operation of the Selected Alternative, in combination with cumulative projects, will result in cumulative noise impacts. Cumulative noise impacts will occur under all B-P Build Alternatives, but the number of sensitive receptors affected varies. The Selected Alternative will result in the smallest incremental noise impacts, as it will severely affect sensitive receptors. Nonetheless, the Selected Alternative will result in a cumulative impact.

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5 MITIGATION COMMITMENTS AND MONITORING

Consistent with 40 C.F.R. 1505.2(c), all practicable means to avoid or minimize environmental harm caused by the Selected Alternative have been identified and incorporated as IAMFs. Further means to reduce and/or compensate for environmental impacts have been identified and included as mitigation measures included in the MMEP, provided as Appendix C. The Authority will monitor the implementation of environmental commitments in the MMEP consistent with the NEPA Assignment MOU and with CEQ regulations and guidance.

The MMEP describes mitigation measures that will avoid, minimize, or compensate for reasonably foreseeable environmental impacts that result from constructing and operating the Bakersfield to Palmdale Project Section of the California HSR System. Pursuant to its responsibilities under the NEPA Assignment MOU, these measures were developed by the Authority in consultation with appropriate agencies, as well as with input received from the public.

The Selected Alternative also incorporates many IAMFs that are identified in the Final EIR/EIS. The Authority, as part of the EIR/EIS, identified these IAMFs to avoid and minimize potential Project impacts. The Authority will apply these IAMFs and BMPs to avoid impacts in several resource areas. Regulatory requirements (such as hazardous material disposal and various mandatory safety strategies) provide additional assurance that impacts on the environment will not occur or will be minimized to the fullest extent practicable. The applicable regulatory requirements and the IAMFs that are part of the Selected Alternative are described in more detail in the MMEP. The IAMFs are a condition of project approval and must be implemented by the Authority during design, construction, and operation of the Selected Alternative approved by this ROD.

All IAMFs and mitigation measures are included in Appendix C of this ROD. The Authority is required to comply with all mitigation measures adopted with this ROD. The MMEP, as incorporated into this ROD, is a formal commitment by the Authority to carry out all of the measures identified therein as a condition of Project approval. Therefore, in designing, constructing, and operating the Selected Alternative, the Authority is required to adhere to and provide appropriate funding for all IAMFs and mitigation measures in the MMEP

The Authority will implement an Environmental Management System consisting of strategic planning, policies, and procedures; organizational structure; staffing and responsibilities; milestones; schedule; and resources devoted to achieving the Authority's environmental commitments. The Environmental Management System will also track the implementation of environmental requirements and compliance reports. This system will rely on data from the design-build contractor, regional consultants, permitting activities, monitoring, inspections, and other compliance activities. This database will be managed by the Authority. Agency partners, including FRA, will receive regular updates from meetings and reports that will demonstrate compliance and progress relevant to their regulatory requirements.

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6 SUMMARY OF COMMENTS ON THE FINAL EIS AND RESPONSES

During the 30-day waiting period following publication of the Final EIS and through the August 19, 2021 Board meeting, the Authority received 61 comment submittals. Staff reached out to individual commenters throughout the waiting period and until the Board meeting and provided responses. All substantive comments the Authority received during the waiting period and until the Board meeting referenced issues that were previously addressed in detail in Volume 4 of the Final EIS or by the Authority staff's responses to the individual commenters providing the requested specific information and therefore do not require any further response here. No issues were identified in the comments that were not previously addressed.

The range and types of comments received during the waiting period included concerns and questions on the following topics:

- General opposition to the project
- General support of the project
- Property appraisal process
- Project impacts to specific properties along the Selected Alternative
- Requests for copies of the environmental document(s) or supporting technical studies
- Request for an extension on the comment period

The range and types of comments received during the August 18 and 19, 2021 Board meeting included concerns and questions on the following topics:

- Level of design
- Safety of the rail passengers and economic impacts at CalPortland Cement Company
- Request for extension of comment period
- Wildlife movement and habitat connectivity
- Impacts to communities, including concerns related to noise, vibration, and relocations

Summaries of and responses to all correspondence received are included in Appendix D, Comments Received Between the Publication of the Final EIS and the August 19, 2021 Board Meeting, of this ROD.

In issuing this ROD, the Authority has considered all comments received on the Final EIR/EIS, as well as the comments previously received on the Draft EIR/EIS and Revised Draft EIR/Supplemental Draft EIS.

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7 CORRECTIONS TO FINAL EIS

As a part of the California High-Speed Rail Authority's review of the Bakersfield to Palmdale Project Section Final Environmental Impact Report/Environmental Impact Statement (EIR/EIS), several minor corrections and clarifications were identified. Corrections are identified in Appendix E of this document. The corrections and clarifications are not considered significant new information, and do not change the analysis or conclusions of the EIS. These corrections and clarifications address items already covered in the Final EIS. These clarifications do not trigger the need to prepare a supplement, per the Council on Environmental Quality National Environmental Policy Act (NEPA) regulations (40 Code of Federal Regulations [C.F.R.] 1502.9(c)(1)). The errata described within Appendix E of this ROD are herewith corrected in the Final EIS and associated technical reports for the Bakersfield to Palmdale Project Section of the California High-Speed Rail System.

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8 DECISION

The Authority finds that Alternative 2 with the Refined CCNM Design Option, the Palmdale Station, and the Avenue M Maintenance Site and MOWF, identified in the Final EIS as the Preferred Alternative, is the Selected Alternative. In making this finding, the Authority concludes that, among the alternatives considered, the Selected Alternative best fulfills the Purpose and Need and objectives for the project while balancing impacts on the natural and human environment. The specific limits of the Selected Alternative are from the intersection of 34th Street and L Street in Bakersfield in the north to Spruce Court in Palmdale in the south.

In reaching this decision, the Authority considered the physical and operational characteristics and potential environmental consequences associated with the B-P Build Alternatives. In reaching this decision, the Authority, as lead agency, consulted with the cooperating agencies and considered the Draft EIR/EIS, Revised Draft EIR/Supplemental Draft EIS, and Final EIR/EIS, including the analysis of the No Action Alternative, all action alternatives, and all public and agency comments received during the review periods.

The cooperating agencies may issue their own decision documents, as appropriate, consistent with their statutory and regulatory responsibilities.

8.1 Section 106

Section 106 of the National Historic Preservation Act (16 U.S.C. 470f) requires that any federal agency having direct or indirect jurisdiction over a proposed federal or federally assisted undertaking take into account the effect of the undertaking on any district, site, building, structure, or other object that is listed or eligible for listing on the NRHP. The FRA, the SHPO, the Authority, and the Advisory Council on Historic Preservation executed the Section 106 PA on July 22, 2011 and extended the PA by executing a First Amendment on July 21, 2021. The Section 106 PA sets forth numerous requirements intended to ensure appropriate treatment of historic resources during ground-disturbing activities associated with project construction. The Section 106 PA also provides protocols for how and when formal eligibility determinations will be made. Eligibility determinations will be made by the appropriate agency based on information presented in the appropriate, completed state site record forms. Moreover, the Section 106 PA sets forth requirements for tribal monitoring of construction activities to help ensure protection of cultural resources that may be encountered. Adherence to the terms of the Section 106 PA will fulfill all obligations under Section 106.

In accordance with the Section 106 PA, an MOA for the treatment of adverse effects on historic properties in the Bakersfield to Palmdale Project Section of the California HSR System was executed by the SHPO and the Authority on June 22, 2021. Consulting parties include: BLM, National Park Service, Los Angeles County Department of Regional Planning, Cesar Chavez Foundation/National Chavez Center, National Parks Conservation Association, National Trust for Historic Preservation, Southern California Edison, Picayune Rancheria of Chukchansi Indians, San Manuel Band of Mission Indians, Santa Rosa Rancheria Tachi-Yokut Tribe, Table Mountain Rancheria, Tejon Indian Tribe, Tule River Tribe, Barbareño/Ventureño Band of Mission Indians, Fernandefío Tataviam Band of Mission Indians, and the Kern Valley Indian Community.

The MOA summarizes the results of the Section 106 process and the treatment measures for both above- and below-ground cultural resources.

The assessment of adverse effects required under Section 106 of the National Historic Preservation Act was documented in the Section 106 Finding of Effect Report and Section 106 Addendum Finding of Effect Report that the SHPO approved in June 2020, March 2021, respectively. The SHPO concurrence letters are provided in Appendix F to this ROD.

8.2 Section 4(f)

Projects that are undertaken by an operating administration of the U.S. Department of Transportation (DOT) or that may receive federal funding and/or discretionary approvals from such an operating administration must demonstrate compliance with Section 4(f) of the DOT Act

of 1966. Section 4(f) protects publicly owned lands that are parks, recreational areas, and wildlife refuges. Section 4(f) also protects historic sites (including archaeological resources) of national, state, or local significance that are on public or private land.

Under the NEPA Assignment MOU, the Authority has been delegated the power to make determinations under Section 4(f). The NEPA Assignment MOU stipulates that the Authority must consult with the FRA prior to making any constructive use determination, but otherwise delegates all responsibilities under Section 4(f) to the Authority. As further detailed below, there is no constructive use determination associated with the Bakersfield to Palmdale Project Section.

As described in Chapter 4 of the Draft EIR/EIS, Section 4(f) properties were considered throughout the planning and alternatives development and analysis process to avoid and minimize impacts on resources protected by Section 4(f). During this process, options were developed to address concerns specific to Section 4(f) resources such as Weill Park, La Paz, the PCT, and Big Creek Hydroelectric System Historic District (BCHSHD), where several design options were developed that will minimize or avoid adverse Section 4(f) resource impacts. The Final EIR/EIS contains the Authority's evaluation of whether the Bakersfield to Palmdale alternatives will result in any of the following "uses" of properties protected under Section 4(f):

- Permanent use (which encompasses permanent easements or temporary easements that exceed limits for temporary occupancy)
- Temporary occupancy
- Constructive use

Impacts were then evaluated to see if the criteria for a *de minimis* impact determination were met and appropriate coordination with officials having jurisdiction over each resource was conducted. Thirty-eight (38) Section 4(f) properties are present in the Selected Alternative's RSA for recreational and cultural resources. Of the 38 properties evaluated, one park (Weill Park) was determined to have a *de minimis* impact, one recreation resource (PCT) was determined to have a *de minimis* impact, and one historic resource, the residence at 332 W Lancaster Boulevard) was determined to have a *de minimis* impact. Another historic resource, the BCHSHD, was determined to have a permanent use. The remaining properties did not have a Section 4(f) use. The Authority issued its Draft Section 4(f) Evaluation in the Draft EIR/EIS and finalized that Section 4(f) Evaluation in the Final EIR/EIS. The analysis and information in the Section 4(f) Evaluation included with the Final EIR/EIS is incorporated herein by reference.

8.2.1 Measures to Minimize Harm/Mitigation

The Authority developed measures to minimize harm to the Section 4(f) resources (discussed under Table 2, below) during project planning to avoid or minimize impacts, as well as mitigation measures to compensate for unavoidable project impacts as described in Tables 4-11, 4-12, and 4-13 in the Final EIR/EIS. The measures identified in these tables are now incorporated into the Selected Alternative. The Authority is continuing ongoing coordination, as appropriate, with the officials with jurisdiction over the Section 4(f) properties. During the Authority's consideration of its decision and during final design, the Authority, in consultation with the officials with jurisdiction, may identify and implement additional measures to further reduce potential impacts to Section 4(f) properties.

8.2.2 Section 4(f) Determination

Section 4(f) requires the selection of an alternative that avoids the use of a Section 4(f) property if that alternative is deemed feasible and prudent and the use does not qualify for a finding of *de minimis* impact. After making a Section 4(f) determination and identifying measures to minimize harm, if there is more than one alternative that results in the use of a Section 4(f) property, the Authority must also compare the alternatives to determine which alternative has the potential to cause the least overall harm in light of the preservationist purpose of the statute.

As described in Chapter 4 of the Draft and Final EIR/EIS and the Fresno to Bakersfield Section Final Supplemental EIS, the Authority finds that the impacts on the two park/recreational resources, Weill Park and the PCT, will be *de minimis*. The City of Bakersfield, the official with

jurisdiction over Weill Park, concurred in writing with this finding on September 12, 2018 (see Appendix G). The U.S. Forest Service, the official with jurisdiction over PCT, concurred in writing with this finding on February 17, 2021 (see Appendix G). Because of this determination, no mitigation is necessary for Weill Park.

The Authority has made a permanent use determination under Section 4(f) for the Big Creek Hydroelectric System Historic District (BCHSHD). As described in Chapter 4 of the Draft and Final EIR/EIS, the Authority came to this determination after undertaking an evaluation to conclude that there are no feasible or prudent avoidance alternatives to the Selected Alternative, the Selected Alternative includes all possible planning to minimize harm to the 4(f) property resulting from such use, and the Selected Alternative causes the least overall harm in light of Section 4(f)'s preservation purpose.

Among all of the B-P Build Alternatives, the Selected Alternative would result in the least overall harm to resources protected by Section 4(f) because they would not result in the permanent use of Whit Carter Park or the removal of the Denny's Restaurant #30 (Village Grille) that would take place under Alternative 5. Thus, the Selected Alternative would cause the least overall harm to Section 4(f) resources.

8.3 General Conformity Determination

As part of the environmental review of the Bakersfield to Palmdale Project Section, the Authority conducted and FRA approved a general conformity evaluation pursuant to 40 C.F.R. Part 51, Subpart W, and 40 C.F.R. Part 93, Subpart B. The Authority conducted the general conformity evaluation following all regulatory criteria and procedures and in coordination with the U.S. Environmental Protection Agency, the SJVAPCD, the EKAPCD, the AVAQMD, and the California Air Resources Board. As a result of this review, the FRA found that project-generated emissions will be fully offset (for construction phase) or less than zero (for operational phase), considering the following commitments:

- Prior to commencement of construction of the Bakersfield to Palmdale Project Section, the Authority will enter into a Voluntary Emission Reduction Agreement with the SJVAPCD, EKAPCD, and AVAQMD.
- The Authority has committed to fully offset all construction emissions (to net zero) for every year of construction.

Therefore, the FRA has concluded that the proposed project, as designed, conforms to the purpose of the approved State Implementation Plan and is consistent with all applicable general conformity requirements. The Final General Conformity Determination is included with this ROD as Appendix A.

8.4 Section 7 Endangered Species Findings

The proposed action (construction and operation of the Selected Alternative) is in compliance with Section 7 of FESA. Because the proposed action is likely to have an impact on threatened or endangered species subject to USFWS jurisdiction, the Authority prepared a Biological Assessment (BA) for the project and consulted with USFWS, as required under Section 7 of FESA. After evaluating the potential effects of the proposed action, but prior to implementation of IAMFs and/or mitigation, the Authority determined that the Bakersfield to Palmdale Project Section may affect, and is likely to adversely affect, the following species:

- Kern mallow (*Eremalche kernensis*)
- Bakersfield cactus (*Opuntia basilaris* var. *treleasei* [*O. treleasei*])
- San Joaquin adobe sunburst (*Pseudobahia peirsonii*)
- Kern primrose sphinx moth (*Euproserpinus euterpe*)
- Blunt-nosed leopard lizard (*Gambelia sila*)
- Desert tortoise (*Gopherus agassizii*)
- Least Bell's vireo (*Vireo bellii pusillus*)

- Tipton kangaroo rat (*Dipodomys nitratoides nitratoides*)
- San Joaquin kit fox (*Vulpes macrotis mutica*)

The Authority submitted the BA, which evaluated direct, indirect, and cumulative effects of the project on federally listed species and their designated critical habitat, to the USFWS on April 28, 2020, and requested the initiation of formal Section 7 Consultation. The Authority's informal and formal Section 7 consultation with USFWS has been ongoing and was instrumental in scoping the biological resource analysis for the EIS Documents, as well as for the BA.

Following USFWS review and additional consultation and coordination, USFWS issued a Biological Opinion for the Bakersfield to Palmdale Project Section on June 16, 2021 (provided as Appendix B to this ROD). In the BO, USFWS concurred with the determinations made by the Authority that the Selected Alternative for the Bakersfield to Palmdale Project Section, as proposed, is not likely to jeopardize the continued existence of the nine listed wildlife and plant species above that occur in the action area. Consistent with Section 7 requirements, the Biological Opinion also stipulates several reasonable and prudent measures to avoid or minimize potential incidental take of the six animal species. The Authority will implement the measures identified in the USFWS BO.

Because the Selected Alternative does not encounter marine or anadromous fish habitat within the project footprint, the Selected Alternative would not affect any marine or anadromous fish species or habitat. There is no essential fish habitat in the Selected Alternative footprint. Therefore, the Authority was not required to consult with the NMFS under Section 7 of the ESA or the Magnuson-Stevens Fishery Conservation and Management Act. The proposed action complies with the Magnuson-Stevens Act.

8.5 Wetlands Finding

In addition to NEPA and other environmental laws, the federal lead agency is also required to make findings pursuant to Executive Order 11990, Protection of Wetlands, and the U.S. DOT Wetlands Order, DOT Order 5660.1A.

Aquatic resources in the Bakersfield to Palmdale Project Section include state streambeds and lakes and other waters of the state, which are regulated by the CDFW and the State Water Resources Control Board. Aquatic resources were identified during the jurisdictional delineation (see the *Bakersfield to Palmdale Project Section Aquatic Resources Delineation Report* [Authority 2016a]). In 2017, the USACE concurred with the Authority's determination that, although many features in these areas meet federal technical criteria that define wetlands and other waters, these features are not jurisdictional under the CWA due to their isolation. Because the waterbodies identified in the Bakersfield to Palmdale Project Section are all isolated, the USACE is not asserting jurisdiction under Section 404 of the CWA over any areas that would otherwise be delineated as wetlands or waters of the U.S.

Aquatic resources for the portion of the project from the intersection of 34th Street and L Street to Oswell Street in Bakersfield are limited to one 0.37-acre retention/detention basin at 30th Street between San Dimas Street and SR 204. Aquatic resources were identified during the jurisdictional delineation (see the *Fresno to Bakersfield Locally Generated Alternative Final Wetlands Report* [Authority 2017]). Based on the Preliminary Jurisdictional Determination letter dated June 1, 2017, the USACE determined this feature is a potential jurisdictional aquatic resource ("waters of the United States") regulated under Section 404 of the CWA. Therefore, a Section 404 permit may be required for impacts to this resource.

Based upon USACE findings and the Authority's evaluation, the Authority determines that the project is consistent with Executive Order 11990 and DOT Order 5660.1A.

8.6 Floodplains Finding

DOT Order 5620.2 implements Executive Order 11988, Floodplain Management. These orders state that the federal lead agency may not approve an alternative involving a significant encroachment on floodplains unless the agency can make a finding that the proposed

encroachment is the only practicable alternative. The major purposes of Executive Order 11988 are to avoid federal support for floodplain development; to prevent uneconomic, hazardous, or incompatible use of floodplains; to restore and preserve the natural and beneficial floodplain values; and to be consistent with the standards and criteria of the National Floodplain Insurance Program.

As indicated in Section 3.8, Hydrology and Water Resources, of the Final EIR/EIS, the Authority, as the federal lead agency under the NEPA Assignment MOU, concludes that the Selected Alternative will not result in any substantial adverse impacts on natural and beneficial values of the floodplains, will not result in a substantial change in flood risks or damage, and will not have a substantial potential for interruption or termination of emergency service and evacuation routes. Design of the Selected Alternative includes effective measures to avoid or to minimize the potential for exposure of HSR passengers and employees to flooding; new or additional exposure to flooding risks and hazards from the failure of a levee or dam will not occur. Based upon these findings, the Authority determines that the project is consistent with requirements of Executive Order 11988.

8.7 Environmental Justice Finding

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, and the DOT Order on Environmental Justice require that each federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations (“environmental justice communities”).

The Bakersfield to Palmdale alternatives, including the Selected Alternative, will result in adverse effects on all populations, including low-income or minority populations residing along the project corridor, primarily within the community of Edison, City of Bakersfield, City of Lancaster, and City of Palmdale. For the Selected Alternative, the Authority has held more than 150 meetings, briefings, and outreach activities to date with community stakeholders, businesses, local agencies, and elected officials in environmental justice communities to gather, confirm, and understand key community concerns so that these concerns are considered both in the development of alternatives and during the environmental process. As discussed in Chapter 5 of the Final EIR/EIS, the Selected Alternative may result in disproportionately high and adverse effects on minority or low-income populations related to the following during construction:

- Residential and/or business displacement and relocation (portions of Lancaster and Palmdale)⁵

The Selected Alternative may also result in disproportionately high and adverse effects on minority or low-income populations related to the following during operation:

- Noise (portions of Bakersfield, Edison, Palmdale, and Lancaster)⁶
- Visual/Community cohesion (portions of Edison)⁷
- Residential and/or business displacements and relocation (portions of Bakersfield)⁸

The Selected Alternative will include the application of IAMFs and all practicable mitigation measures that reduce but may not eliminate disproportionate adverse effects on low-income and

⁵ Effects would be limited to identified parcels in the census block groups or neighborhoods identified in Chapter 5 of the Final EIR/EIS, with most such displacements occurring in Palmdale and Lancaster.

⁶ Effects would be limited to identified sensitive receptors located in portions of the census block groups identified in Chapter 5 of the Final EIR/EIS.

⁷ Effects would be limited to portions of the census block groups identified in Chapter 5 of the Final EIR/EIS, with most community cohesion effects occurring in two neighborhood portions of Edison.

⁸ Effects would be limited to portions of the census block groups identified in Chapter 5 of the Final EIR/EIS, with most displacements occurring in portions of Bakersfield.

minority populations (see the MMEP, Appendix C). With compliance with the Uniform Act, it is expected that most displaced businesses would relocate within relatively close proximity (e.g., within the same or adjacent community or city) to their current locations. If most displaced businesses and residents are able to relocate within relatively close proximity to their current location, then this impact will not be disproportionately high and adverse. The project includes various mitigation measures that address relocation through locating suitable replacement properties and facilities and additional outreach to affected minority and low-income populations, such as, but not limited to, facilitated community workshops. The Authority will continue to consider community input received from impacted low-income or minority communities in determining whether changing circumstances or new information could result in additional practicable measures, if any, to reduce effects within the Bakersfield to Palmdale Project Section.

The Authority also considered the potential offsetting benefits associated with the Selected Alternative. The HSR project would result in beneficial effects to all populations, including low-income and minority populations: sales tax gains, regional employment, regional transportation, transportation safety, and regional air quality. Some benefits such as sales tax gains would be particularly concentrated in the vicinity of the Bakersfield and Palmdale HSR station sites and the maintenance facilities, which are in or near areas where most of the Selected Alternative's low-income and minority populations live.

Other alternatives have been evaluated as described in Chapter 2, Alternatives, of the Final EIR/EIS. The Authority, as NEPA lead agency, has determined none would have fewer adverse effects on environmental justice communities and satisfy the need for the project. For example, alternatives that were eliminated from consideration generally had more tunnel miles, higher capital costs, more relocation impacts and displacements, and greater effects on cultural and Section 4(f) resources. Therefore, the Authority, as NEPA lead agency, has determined that no other alternatives to the B-P Build Alternatives are practicable that would have fewer adverse effects on protected populations while also satisfying the purpose of the HSR project.

The Authority, as NEPA lead agency, also has determined that there is a substantial need, based on the overall public interest and a great public benefit (as described in Section 1.2.4, Statewide and Regional Need for the High-Speed Rail System in the Bakersfield to Palmdale Project Section Vicinity, of the Final EIR/EIS), for an HSR system that connects the Los Angeles area to the San Francisco Bay Area (of which the connection with the Bakersfield to Palmdale Project Section is an indispensable part).

The approximately 80-mile-long Bakersfield to Palmdale Project Section is an essential component of the statewide HSR system. The Bakersfield to Palmdale Project Section would provide the cities of Bakersfield, Lancaster, and Palmdale, as well as other communities in the vicinity of the proposed HSR stations, with access to a new transportation mode, bridge a statewide passenger rail gap, and contribute to increased mobility throughout California, filling the statewide need for intercity passenger rail transportation connectivity.

9 CONCLUSION

The Authority, as the federal lead agency, and as authorized by the NEPA Assignment MOU, has reached a decision that most closely aligns with its statutory mission and the responsibilities assigned to it by FRA pursuant to NEPA Assignment, considering economic, environmental, technical, and other factors and based on the information contained in the Final EIR/EIS and the project record.

For the Bakersfield to Palmdale Project Section, the Authority approves Alternative 2 with the Refined CCNM Design Option, the Palmdale Station, and the Avenue M Maintenance Site and MOWF, with the specific limits extending from the intersection of 34th Street and L Street in Bakersfield in the north to Spruce Court in Palmdale in the south. The Authority has selected this alternative because (1) it best satisfies the Purpose, Need, and Objectives for the proposed action and (2) minimizes impacts on the natural and human environment by using an existing transportation corridor where practicable and incorporating mitigation measures. Accordingly, Alternative 2 with the Refined CCNM Design Option, the Palmdale Station, and the Avenue M Maintenance Site and MOWF with a specific limit of between the intersection of 34th Street and L Street in Bakersfield in the north to Spruce Court in Palmdale in the south has been selected and approved for project implementation.

Signed by Brian P. Kelly on September 3, 2021

Brian P. Kelly, Chief Executive Officer
California High-Speed Rail Authority

Date

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APPENDIX A: GENERAL CONFORMITY DETERMINATION FOR AIR QUALITY, JULY 16, 2021

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California High-Speed Rail Authority

Bakersfield to Palmdale Project

Section

FINAL

General Conformity

Determination

JULY 2021



California High-Speed Rail System, Bakersfield to Palmdale Section
Final General Conformity Determination

Prepared by:

U.S. Department of Transportation
Federal Railroad Administration

This Final General Conformity Determination has been prepared by the Federal Railroad Administration (FRA), pursuant to Section 176(c) of the Federal Clean Air Act, 42 U.S.C. 7506(c)(1), and its implementing regulations (“General Conformity Rule”). Specifically, this Final General Conformity Determination documents FRA’s finding that the California High-Speed Rail System, Bakersfield to Palmdale Section will comply with the General Conformity Rule, provided that the nitrogen oxides (NO_x) and volatile organic compound (VOC) emissions caused by the construction of the Project, will be offset through a Voluntary Emission Offset Agreement (VERA) with the San Joaquin Valley Unified Air Pollution Control District.

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Date of Approval

Marlys Osterhues
Chief of Environment and Project Engineering Division
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Appendix

Appendix A: Final General Conformity Determination Comments and Responses

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ACRONYMS AND ABBREVIATIONS

AIA	air impact assessment
AQMD	Air Quality Management District
Authority	California High-Speed Rail Authority
AVAQMD	Antelope Valley Air Quality Management District
CAA	Clean Air Act
CaIIEEMod	California Emissions Estimator Model
CARB	California Air Resources Board
CCNM	César E. Chávez National Monument
CEQA	California Environmental Quality Act
C.F.R.	Code of Federal Regulations
CO	carbon monoxide
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
EKAPCD	Eastern Kern Air Pollution Control District
EMFAC2014	EMission FACtors 2014
EMMA	Environmental Mitigation Management and Assessment
FRA	Federal Railroad Administration
GAMAQI	Guide for Assessing and Mitigating Air Quality Impacts
GHG	greenhouse gas
HP	horsepower
HS	hydrogen sulfide
HSIPR	High-Speed Intercity Passenger Rail
HSR	high-speed rail
IAMFs	Impact Avoidance and Minimization Features
LMF	Light Maintenance Facility
MDAB	Mojave Desert Air Basin
MOWF	Maintenance-of-Way Facility
Mph	miles per hour
MPO	metropolitan planning organizations
NAAQS	National Ambient Air Quality Standards
O ₃	ozone
PM _{2.5}	particulate matter less than 2.5 microns in diameter
PM ₁₀	particulate matter less than 10 microns in diameter
RoadMod	Road Construction Emissions Model
ROD	Record of Decision

SIP	State Implementation Plan
SJVAB	San Joaquin Valley Air Basin
SJVAPCD	San Joaquin Valley Air Pollution Control District
SO _x	sulfur oxide
USEPA	United States Environmental Protection Agency
VERA	Voluntary Emissions Reduction Agreement
VHT	vehicle hours traveled
VMT	vehicle miles traveled

EXECUTIVE SUMMARY

The California High-Speed Rail (HSR) System will provide intercity, high-speed service on more than 800 miles of guideway throughout California, connecting the major population centers of Sacramento, the San Francisco Bay Area, the southern Central Valley, Los Angeles, the Inland Empire, Orange County, and San Diego. The Bakersfield to Palmdale HSR Section (“Project” or “Action”), which is the focus of this General Conformity Determination, is a critical link connecting the Merced to Fresno, and Bakersfield to Palmdale HSR sections to the Palmdale to Los Angeles HSR sections.¹

The General Conformity Rule, as codified in Title 40 Code of Federal Regulations (CFR) Part 93, Subpart B, establishes the process by which federal agencies determine conformance of proposed projects that are federally funded or require federal approval with applicable air quality standards. This determination must demonstrate that a Proposed Action would not cause or contribute to new violations of air quality standards, exacerbate existing violations, or interfere with timely attainment or required interim emissions reductions towards attainment. The California High-Speed Rail Authority (Authority), as the Action proponent, is receiving federal grant funds through the Federal Railroad Administration’s (FRA) High-Speed Intercity Passenger Rail program. The Action may also receive FRA safety approvals. Because of the federal funding and potential safety approvals; the Action is subject to the General Conformity Rule; and because construction-phase emissions (without mitigation) would exceed General Conformity emission thresholds, the Action is not exempt and must demonstrate conformity.

FRA prepared a Draft General Conformity Determination, pursuant to 40 CFR part 93, subpart B, which establishes the process for complying with the General Conformity requirements of the Clean Air Act. FRA published a notice in the Federal Register on May 13, 2021 advising the public of the availability of the Draft Conformity Determination for a 30-day review and comment period. The Draft Conformity Determination was published at <http://www.regulations.gov>, Docket No. FRA-2021-0046. The comment period of the Draft Conformity Determination closed on June 14, 2021. FRA received one comment regarding *Coccidioides immitis*, or more commonly known as the Valley Fever fungus, and a letter of support from the San Joaquin Valley Air District. Both letters were responded to in Appendix A of this Final General Conformity Determination.

This Final General Conformity Determination documents FRA’s finding that the Action complies with the General Conformity Rule and that it conforms to the purposes of the area’s approved State Implementation Plan and is consistent with all applicable requirements. The Final General Conformity Determination is available at <http://www.regulations.gov>, Docket No. FRA-2021-0046, and on FRA’s website at <https://railroads.dot.gov/environment/environmental-reviews/clean-air-act-california-general-conformity-determinations>. This Final General Conformity Determination is based on the Impact Avoidance and Minimization Measures and Mitigation Measures that were described in Section 3.3.8 of the EIR/EIS and that will be implemented for the Action. This compliance is demonstrated herein as follows:

- The operation of the Action would result in a reduction of regional emissions of all applicable air pollutants and would not cause a localized exceedance of an air quality standard; and
- Whereas emissions generated during the construction of the Action would exceed General Conformity thresholds for two pollutants, these emission increases would be offset through a Voluntary Emission Reduction Agreement (VERA) with the San Joaquin Valley Air Pollution Control District (SJVAPCD), the Air Quality Investment Program in the Antelope Valley Air Quality Management District (AVAQMD), and the Emission Banking Certificate Program in the Eastern Kern Air Pollution Control District (EKAPCD).

¹ As part of its first phase, the California HSR system is currently planned as seven distinct sections from San Francisco in the north to Los Angeles and Anaheim in the south.

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1 INTRODUCTION

This document is the Final General Conformity Determination for the Bakersfield to Palmdale Section of the California High-Speed Rail (HSR) System (“Project” or “Federal Action”) and is required by the implementing regulations of Section 176 of the Clean Air Act (CAA). Section 176(c)(1) of the CAA prohibits federal agencies from engaging in, supporting, or providing financial assistance for licensing, permitting or approving any activities that do not conform to an approved CAA implementation plan. That approved plan may be a federal, state or tribal implementation plan.

The CAA defines nonattainment areas as geographic regions that have been designated as not meeting one or more of the National Ambient Air Quality Standards (NAAQS). The CAA requires that each state prepare a State Implementation Plan (SIP) for each nonattainment area, and a maintenance plan be prepared for each former non-attainment area that subsequently demonstrated compliance with the standards. The SIP is a state’s plan for how it will meet the NAAQS by the deadlines established by the CAA.

The General Conformity Rule is codified in Title 40 Code of Federal Regulations (C.F.R.) Part 93, Subpart B, “Determining Conformity of General Federal Actions to State or Federal Implementation Plans.” Conformity is defined as “upholding an implementation plan’s purpose of eliminating or reducing the severity and number of violations of the NAAQS and achieving expeditious attainment of such standards.” 40 C.F.R. Part 93 also establishes the process by which federal agencies determine conformance of proposed projects that are federally funded or require federal approval. This determination must demonstrate that the Proposed Action would not cause or contribute to new violations of air quality standards, exacerbate existing violations, or interfere with timely attainment or required interim emissions reductions towards attainment. Since the Action is receiving federal funds through grants with the Federal Railroad Administration (FRA) and may also receive safety approvals from FRA, it is an action that may be subject to the General Conformity Rule.

This Final General Conformity Determination is being issued after the release of the Bakersfield to Palmdale Final Environmental Impact Report/Environmental Impact Statement (EIR/EIS), which was prepared in accordance with the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA). Because the analysis used for the EIR/EIS also generated the information necessary for the General Conformity Determination, specific analysis may be incorporated herein by reference.

1.1 Regulatory Status of Study Area

By way of background, in addition to the regulations covering the General Conformity Rule, on November 24, 1993, the U.S. Environmental Protection Agency (EPA) promulgated final transportation conformity regulations to address transportation plans, programs, and projects developed, funded or approved under title 23 U.S. Code or the Federal Transit Act, 49 U.S. Code 1601 et seq. (40 C.F.R. Part 93 Subpart A). These regulations have been revised several times since they were first issued. While the transportation conformity regulations do not apply to this Action (see Section 1.2), many of the transportation planning documents developed under those regulations are helpful in understanding the regional air quality and planning status of the study area.

The Bakersfield to Palmdale Project Section passes through three air quality management districts and two air basins: the San Joaquin Valley Air Pollution Control District (SJVAPCD), the Eastern Kern Air Pollution Control District (EKAPCD), and the Antelope Valley Air Quality Management District (AVAQMD). The SJVAPCD and the San Joaquin Air Basin encompass the same area; the EKAPCD and the AVAQMD are both located within the Mojave Desert Air Basin.

Planning documents for pollutants for which the study area is classified as a federal nonattainment or maintenance area are developed by the SJVAPCD, EKAPCD, AVAQMD, and the California Air Resources Board (CARB), and approved by USEPA. Table 1 lists the planning documents relevant to the proposed Action’s study area.

Table 1 Planning Documents Relevant to Action's Study Area

Type of Plan	Status
San Joaquin Valley Air Pollution Control District	
1-Hour Ozone (O ₃) Attainment Plan	On March 8, 2010, the USEPA approved the San Joaquin Valley's 2004 Extreme Ozone Attainment Plan for the 1-hour O ₃ standard. However, effective June 15, 2005, the USEPA revoked the federal 1-hour O ₃ standard for areas, including SJVAB. ¹ Due to subsequent litigation, the USEPA withdrew its plan approval in November 2012, and the SJVAPCD and CARB withdrew this plan from consideration. SJVAPCD adopted a revised plan in September 2013 and is currently seeking CARB's approval.
8-Hour O ₃ Attainment Plan	On May 5, 2010, the USEPA reclassified the 8-hour O ₃ nonattainment status of San Joaquin Valley from "serious" to "extreme." The reclassification requires the state to incorporate more stringent requirements, such as lower permitting thresholds and implementing reasonably available control technologies at more sources. ¹ The 2007 Ozone Plan contained a comprehensive and exhaustive list of regulatory and incentive-based measures to reduce emissions of O ₃ and particulate matter precursors throughout the San Joaquin Valley. On December 18, 2007, the SJVAPCD Governing Board adopted the plan with an amendment to extend the rule adoption schedule for organic waste operations. On January 8, 2009, the USEPA found that the motor vehicle budgets for the years 2008, 2020, and 2030 from the 2007 8-hour Ozone Plan were not adequate for transportation conformity purposes. ²
Particulate Matter, 10 microns or less in diameter (PM ₁₀) Maintenance Plan	On September 25, 2008, the USEPA redesignated the San Joaquin Valley to attainment for the PM ₁₀ NAAQS and approved the 2007 PM ₁₀ Maintenance Plan. ³
Particulate Matter, 2.5 microns or less in diameter (PM _{2.5}) Attainment Plan	The 2018 Plan for the 1997, 2006, and 2012 PM _{2.5} Standard, approved by the District Governing Board on November 15, 2018, will bring the San Joaquin Valley into attainment of the USEPA's 1997 annual PM _{2.5} standard, 2006 24-hour PM _{2.5} standard, and 2012 annual PM _{2.5} standard as expeditiously as practicable. ⁴ The plan provides measures designed to reduce emissions such that the valley will attain the federal standards as soon as possible.
Carbon Monoxide (CO) Maintenance Plan	On July 22, 2004, CARB approved an update to the State Implementation Plan that shows how 10 areas, including the SJVAB, will maintain the CO standard through 2018. On November 30, 2005, the USEPA approved and promulgated the implementation plans and designation of areas for air quality purposes. ⁵
Eastern Kern Air Pollution Control District	
2017 Ozone Attainment Plan	On July 27, 2017, the EKAPCD adopted the 2017 Ozone Attainment Plan for the Eastern Kern County nonattainment area. The Plan demonstrates that the air quality improvement was achieved due to successful implementation of ozone control strategies contained in the region's SIP. It also demonstrates that significant ozone precursor emission reductions that have been impacted in the region are permanent and enforceable. A maintenance plan is also included to ensure that the region would not experience exceedance. The Plan requests a redesignation in accordance with the Federal Clean Air Act. ⁶

Type of Plan	Status
Antelope Valley Air Quality Management District	
Western Mojave Desert Ozone Attainment Plan	The Western Mojave Desert non-attainment area, which includes the AVAQMD, was designated non-attainment for the NAAQS for ozone by the USEPA on April 15, 2004. The USEPA designated the Western Mojave Desert area as non-attainment area for the 8-hour ozone NAAQS. The AVAQMD is included in the Western Mojave Desert non-attainment area and has adopted state and federal attainment plans for the region within its jurisdiction. The 2007 Western Mojave Desert Ozone Attainment Plan includes the latest planning assumptions regarding population, vehicle activity, and industrial activity and addresses all existing and forecasted ozone precursor-producing activities within the Antelope Valley through the year 2020. The document includes updates to the necessary information to allow general and transportation conformity findings to be made within the Antelope Valley. ⁷
Antelope Valley Ozone Attainment Plan	The 2004 Antelope Valley Ozone Attainment Plan includes AVAQMD's review and update of all elements of the Air Quality Management Plan that had been previously prepared by the South Coast Air Pollution Control District, when that District had jurisdiction of the Antelope Valley. The Plan indicates Antelope Valley will also show significant progress toward attainment of the CAAQS for the ozone standard. The document also includes the latest planning assumptions regarding population, vehicle activity, and industrial activity and addresses all existing and forecasted ozone precursor-producing activities within the Antelope Valley. ⁸

- Sources: ¹ San Joaquin Valley Air Pollution Control District, 2004
² San Joaquin Valley Air Pollution Control District, 2007a
³ San Joaquin Valley Air Pollution Control District, 2007b
⁴ San Joaquin Valley Air Pollution Control District, 2018
⁵ California Air Resources Board, 2004
⁶ Eastern Kern Air Pollution Control District, 2017
⁷ Antelope Valley Air Quality Management District, 2008
⁸ Antelope Valley Air Quality Management District, 2004

AVAQMD = Antelope Valley Air Quality Management District
 CARB = California Air Resources Board
 CO = carbon monoxide
 EKAPCD = Eastern Kern Air Pollution Control District
 NAAQS = National Ambient Air Quality Standards
 O₃ = ozone
 PM₁₀ = particulate matter smaller than or equal to 10 microns in diameter
 PM_{2.5} = particulate matter smaller than or equal to 2.5 microns in diameter
 SJVAB = San Joaquin Valley Air Basin
 SJVAPCD = San Joaquin Valley Air Pollution Control District
 USEPA = U.S. Environmental Protection Agency

1.2 General Conformity Requirements

On November 30, 1993, USEPA promulgated final General Conformity regulations at 40 C.F.R. Part 93 Subpart B for all federal activities except highways and transit programs covered by Transportation Conformity. The regulations in Subpart B were subsequently amended in March of 2010. The Action requires approval by FRA, and because the Action will not be funded or require approval(s) under Title 23 U.S. Code or the Federal Transit Act, 49 U.S. Code 1601 et seq., the General Conformity requirements are applicable, rather than transportation conformity. In general terms, unless a project is exempt under 40 C.F.R. § 93.153(c) or is not on the agency's presumed-to-conform list pursuant to 40 C.F.R. § 93.153(f), a General Conformity Determination is required where a federal action in a nonattainment or maintenance area causes an increase in the total of direct and indirect emissions of the relevant criteria pollutants and precursor pollutants that are equal to or exceed certain *de minimis* rates.

The General Conformity regulations incorporate a stepwise process, beginning with an applicability analysis. According to USEPA's General Conformity Guidance: Questions and Answers (USEPA 1994) (USEPA Guidance), before any approval is given for a federal action to go forward, the federal agency must apply the applicability requirements found at 40 C.F.R. §

93.153 to the federal action and/or determine on a pollutant-by-pollutant basis, whether a determination of General Conformity is required. During the applicability analysis, the federal agency determines the following:

- Whether the action will occur in a nonattainment or maintenance area;
- Whether one or more of the specific exemptions apply to the action;
- Whether the federal agency has included the action on its list of presumed-to-conform actions;
- Whether the total direct and indirect emissions are below or above the *de minimis* levels; and/or
- Where a facility has an emissions budget approved by the State or Tribe as part of the SIP or TIP, the federal agency determines that the emissions from the proposed action are within the budget (USEPA 2010).

The USEPA Guidance states that the applicability analysis can be (but is not required to be) completed concurrently with any analysis required under NEPA. The applicability analysis for this Action is described in Section 8.0.

If through the applicability analysis process the responsible federal agency determines that the General Conformity regulations do not apply to the federal action, no further analysis or documentation is required. If, however, the General Conformity regulations do apply to the federal action, the responsible federal agency must conduct a conformity evaluation in accordance with the criteria and procedures in the implementing regulations; publish a Final determination of General Conformity for public review; and then publish the final determination of General Conformity.

To make a conformity determination, the federal agency must demonstrate conformity by one or more of several prescribed methods. These methods include:

- Demonstrating that the direct and indirect emissions are specifically identified in the relevant implementation plan;
- Obtaining a written statement from the entity responsible for the implementation plan that the total indirect and direct emissions from the action, along with other emissions in the area, will not exceed the total implementation plan emission budget; or
- Fully offsetting the total direct and indirect emissions by reducing emissions of the same pollutant in the same nonattainment or maintenance area.

2 DESCRIPTION OF THE FEDERAL ACTION REQUIRING CONFORMITY EVALUATION

In accordance with applicable General Conformity regulations and guidance, when a General Conformity Determination is necessary, the FRA conducts a General Conformity evaluation for the specific federal action associated with the preferred alternative for a project or program (USEPA 1994), and FRA must issue a positive conformity determination before the federal action is approved. Each federal agency is responsible for determining conformity of those proposed actions over which it has jurisdiction. This Final General Conformity Determination is related only to those activities included in the federal action pertaining to the Action, which is the Action's potential approval through a NEPA Record of Decision (ROD). The Action is described further in Section 3.0 below.

General Conformity requirements only apply to federal actions proposed in nonattainment areas (i.e., areas where one or more NAAQS are not being achieved at the time of the proposed action and requiring SIP provisions to demonstrate how attainment will be achieved) and in maintenance areas (i.e., areas recently reclassified from nonattainment to attainment and requiring SIP provisions to demonstrate how attainment will be maintained).

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3 CALIFORNIA HIGH SPEED RAIL PROJECT

3.1 California High Speed Rail System

The Authority, a state governing board formed in 1996, is responsible for planning, designing, constructing, and operating the HSR System. Its mandate is to develop a high-speed rail system connecting the state's major population centers and coordinating with the state's existing transportation network, which includes intercity rail and bus lines, regional commuter rail lines, urban rail and bus transit lines, highways, and airports.

The HSR System will provide intercity, high-speed service on more than 800 miles of railroad throughout California, connecting the major population centers of Sacramento, the San Francisco Bay Area, the southern Central Valley, Los Angeles, the Inland Empire, Orange County, and San Diego. It will use state-of-the-art, electrically powered, high-speed, steel-wheel-on-steel-rail technology, including contemporary safety, signaling, and automated train-control systems, with trains capable of operating up to 220 miles per hour (mph) over a fully grade-separated, dedicated guideway alignment.

FRA is responsible for oversight and regulation of railroad safety and is also charged with the implementation of the High-Speed Intercity Passenger Rail (HSIPR) financial assistance program. As part of the HSIPR Program, FRA is providing partial funding for the environmental analysis and documentation required under NEPA, CEQA and other related environmental laws. Pursuant to U.S. Code (U.S.C.) Title 23 Section 327, under the NEPA Assignment Memorandum of Understanding (MOU) between FRA and the State of California, effective July 23, 2019, the Authority is the federal lead agency for environmental reviews for all Authority Phase 1 and Phase 2 California HSR System projects. The FRA maintains responsibility to perform Clean Air Act Conformity determinations under the NEPA Assignment MOU. The Authority and the FRA have agreed to collaborate on the development of conformity determinations. As part of this collaboration, the Authority has provided the FRA this Final General Conformity Determination and supporting information, as well as the Authority's proposed approach for achieving general conformity. The FRA will make the ultimate general conformity determination. In addition to its involvement in the environmental analysis and documentation, FRA is also providing partial funding for the final design and construction of the initial construction section of the HSR System, which includes activities analyzed in this Final Conformity Determination.

In April 2012, FRA and the Authority published the Final EIR/EIS for the Merced to Fresno Section of the HSR System. The Authority certified the EIR and adopted the project in May, while the FRA issued its ROD in September 2012. The Merced to Fresno Section is within the San Joaquin Valley Air Basin (SJVAB) and a General Conformity Determination was prepared as part of the environmental process to comply with the CAA. It is worth noting that the Merced to Fresno General Conformity Determination includes the Authority's commitment to offset all emissions to net zero through a Voluntary Emissions Reduction Agreement (VERA) between the Authority and the SJVAPCD.

Although the Authority considers the Bakersfield to Palmdale section of the HSR System independent of the other HSR System sections for purposes of NEPA and CEQA analysis, certain construction activities within the Merced to Fresno Section, as well as within the Fresno to Bakersfield and San Jose to Merced Sections, may occur concurrently with Bakersfield to Palmdale Section construction activities. Therefore, estimates of these cumulative emissions within the SJVAPCD, EKAPCD, and AVAQMD have been presented in Section 13.0 of this document. These emissions estimates have been included in this document in the interest of the full disclosure of construction emissions that may occur in the SJVAPCD, EKAPCD, and AVAQMD from other sections of the HSR Project; each of these sections will undergo separate conformity determinations at a later date.

3.2 California High Speed Rail System – Bakersfield to Palmdale Section

The purpose of the Bakersfield to Palmdale Section of the HSR System is to implement the California HSR System between Bakersfield and Palmdale, providing the public with electric-

powered high-speed rail service that provides predictable and consistent travel times between major urban centers and connectivity to airports, mass transit systems, and the highway network in the south San Joaquin Valley and Mojave Desert, and to connect the northern and southern portions of the HSR System.

The Bakersfield to Palmdale Section would be approximately 80 miles in length and would traverse valley, mountain, and high desert terrain, as well as urban, rural, and agricultural lands. From the north, this section would begin at the Bakersfield Station and travel south and southeast through the Tehachapi Mountains, then descend into the Antelope Valley where it would terminate at the Palmdale Station in the south. This section includes a potential Light Maintenance Facility (LMF) and a Maintenance-of-Way Facility (MOWF) in the Lancaster area.

The Bakersfield to Palmdale Project Section would include surface, underground, and elevated track types with varying profiles. Surface tracks would be built on concrete or ballast material (a thick bed of angular rock) placed on compacted soil. To the extent practicable, fill material for the rail bed would be obtained from on-site excavations. Underground tracks would be in areas with cut slopes and retaining walls or tunnels. Although tunnels are underground and hidden from sight, their approaches have deep open excavations and extensive portal facilities necessary for maintenance and safety. Elevated tracks would be on retained fill (earth), embankments, or structures and would consist of cast-in-place, reinforced-concrete columns supporting the box girders and bridge deck.

The EIR/EIS for the Bakersfield to Palmdale Project Section examines alignment alternatives, stations, LMF, and MOWF sites within the general Railway corridor. The following alternatives are considered: Alternative 1, Alternative 2, Alternative 3, and Alternative 5. The following stations are considered: the Bakersfield Station and the Palmdale Station. The EIR/EIS also considers the César E. Chávez National Monument Design Option (CCNM Design Option), which would result in only a minimal change in construction emissions due to the additional 124 feet of track required for the design, and the Refined CCNM Design Option, which would be anticipated to result in slightly higher emissions due to the additional 2,006 feet of track required for the design. Total emissions would be 0.028 percent higher with the CCNM Design Option. The Refined CCNM option would increase the length of the line by 0.45 percent and would require additional off-haul associated with additional earthwork activities. Emission estimates presented in this Final General Conformity Determination for each Bakersfield to Palmdale Project Section (B-P) Build Alternative would be applicable with or without the CCNM Design Option, due to rounding, and the difference would be within the margin of error of the model estimates. Emission estimates for each B-P Alternative with the Refined CCNM Design Option are identified in this Final General Conformity Determination.

4 AIR QUALITY CONDITIONS IN THE STUDY AREA

4.1 Meteorology and Climate

Air quality is affected by both the rate and location of pollutant emissions, and by meteorological conditions that influence movement and dispersal of pollutants in the atmosphere. Atmospheric conditions, such as wind speed, wind direction, and air temperature gradients, along with local topography, provide the link between air pollutant emissions and local air quality levels. Elevation and topography can affect localized air quality.

The Action traverses two air basins. The northern section of the Action is in the SJVAB, which encompasses the southern third of California's Central Valley. The southern section of the Action is on the western edge of the Mojave Desert Air Basin (MDAB).

4.1.1 San Joaquin Valley Air Basin

The SJVAB is approximately 250 miles long and is shaped like a narrow bowl. The sides and southern boundary of the bowl are bordered by mountain ranges. The valley's weather conditions include frequent temperature inversions; long, hot summers; and stagnant, foggy winters, all of which are conducive to the formation and retention of air pollutants (SJVAPCD 2011).

The SJVAB is typically arid in the summer months with cool temperatures and prevalent tule fog (i.e., a dense ground fog) in the winter and fall. The average high temperature in the summer months is in the mid-90s and the average low in the winter is in the high 40s. January is typically the wettest month of the year with an average of about 2 inches of rain. Wind direction is typically from the northwest with speeds around 30 mph (Western Regional Climate Center 2011).

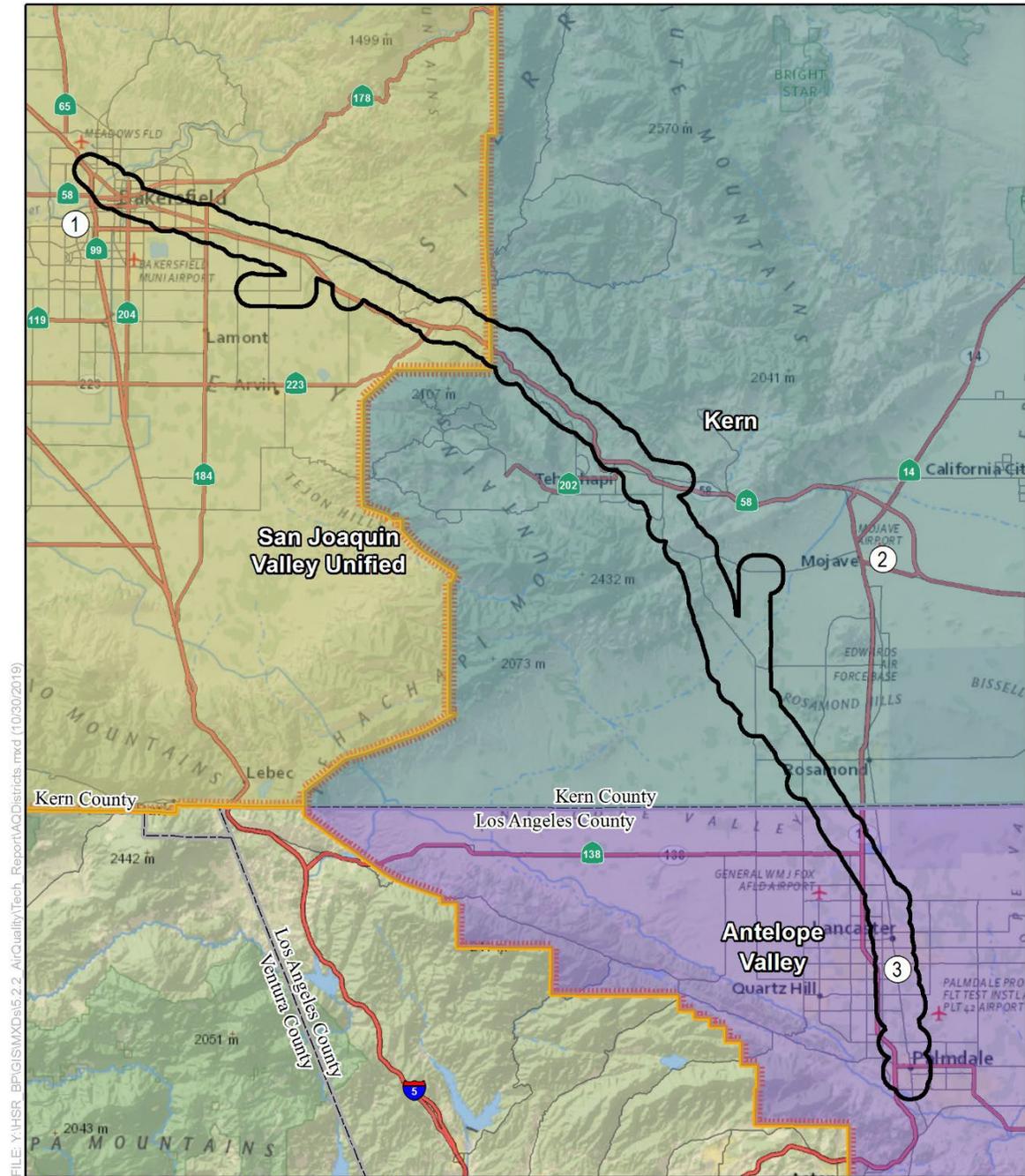
4.1.2 Mojave Desert Air Basin

The MDAB is separated from populated valleys and coastal areas to the west by several mountain ranges. These valleys and coastal areas are the major source of ozone precursor emissions affecting ozone exceedances within the Kern County part of the Mojave Desert. Surrounding mountain ranges contain a limited number of passes serving as "transportation corridors." Air quality in Kern County is primarily influenced by the Tehachapi Pass corridor with some influence through Soledad Canyon (EKAPCD 2003).

During the summer the MDAB is generally influenced by a Pacific Subtropical High cell that sits off the coast, inhibiting cloud formation and encouraging daytime solar heating. Most desert moisture arrives from infrequent warm, moist, and unstable air masses from the south. The MDAB averages between 3 and 7 inches of precipitation per year (from 16 to 30 days with at least 0.01 inch of precipitation). The MDAB is classified as a dry-hot desert climate, with portions classified as dry-very hot desert, to indicate at least 3 months have maximum average temperatures over 100.4-degrees Fahrenheit (AVAQMD 2011). Predominant surface wind flow patterns are southerly and westerly, transporting air pollution from the SJVAB through the Tehachapi Mountains and over the San Gabriel and San Bernardino Mountains (CARB 2015).

4.2 Ambient Air Quality in the Study Area

CARB maintains ambient air monitoring stations for criteria pollutants throughout California. The stations closest to the B-P Build Alternative alignments are the 43301 Division Street station in the City of Lancaster; the 923 Poole Street station in Mojave; and the 5558 California Avenue station in Bakersfield. These stations monitor NO₂, O₃, PM₁₀, PM_{2.5}, and CO. The land uses in the region range from urban and residential to rural and agricultural, and these stations represent these land use types. Air quality standards, primarily for O₃ and particulate matter, have been exceeded in the SJVAPCD, the EKAPCD, and the AVAQMD because of existing industrial, mobile, and agricultural sources. The four monitoring station locations are shown on Figure 1.



FILE: Y:\HSR_BP\GIS\WXDs\5.2.2_AirQuality\Tech_Report\AQDistricts.mxd (10/30/2019)

SOURCE: Esri/National Geographic (2014, 2015); CHSRA (10/2019)

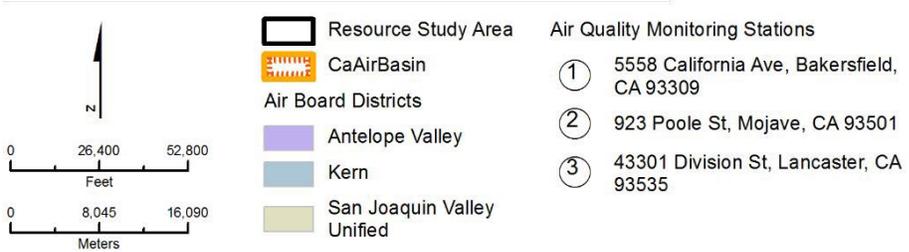


Figure 1 Air Quality Monitoring Stations Closest to Action

A brief summary of the monitoring data includes the following:

- Monitored data from 2017 through 2019 do not exceed either the state or federal standards for CO. The Mojave and Bakersfield stations were not monitored for CO during 2017 through 2019; therefore, CO data from the 2000 S Union Avenue, Bakersfield, monitoring site is included.
- O₃ values for the region exceed the state and national 8-hour O₃ standards for all three stations for years 2017 through 2019. O₃ values for the region also exceed the state 1-hour O₃ standard for all stations for every year from 2017 through 2019 except in 2019 at the 923 Poole Street station in Mojave.
- The PM₁₀ values for the region exceed the national 24-hour PM₁₀ standard for the Lancaster and Mojave stations for the year 2019. The state 24-hour PM₁₀ concentrations were exceeded at all stations for all years. However, the number of days over the state standard was not available.
- The PM_{2.5} values for the region exceed the national 24-hour PM_{2.5} standard for the Lancaster station for 2018, the Bakersfield station for 2018, and the Bakersfield station for 2017 through 2019.
- SO₂ values were not monitored at any of the three stations or the additional station at 2000 S Union Avenue in Bakersfield between 2017 and 2019.

Table 2 lists the three monitoring stations nearest to the Action and ambient criteria pollutant concentrations for 2017, 2018, and 2019.

Table 2 Ambient Critical Pollutant Concentration Data at Air Quality Monitoring Stations Closest to the Action

Air Pollutant	Standard/Exceedance	43301 Division Street, Lancaster			923 Poole Street, Mojave			5558 California Avenue, Bakersfield		
		2017	2018	2019	2017	2018	2019	2017	2018	2019
Carbon Monoxide (CO) ¹	Year Coverage	NM	NM	NM	NM	NM	NM	NM	NM	NM
	Max. 1-hour Concentration (ppm)	1.3	1.2	1.4	1.8	1.9	1.2	1.8	1.9	1.2
	Max. 8-hour Concentration (ppm)	0.9	1.0	0.9	1.2	1.3	1.0	1.2	1.3	1.0
	Number of Days>Federal 1-hour Std of >35 ppm	0	0	0	0	0	0	0	0	0
	Number of Days>Federal 8-hour Std of >9 ppm	0	0	0	0	0	0	0	0	0
	Number of Days>California 8-hour Std of >9 ppm	0	0	0	0	0	0	0	0	0
Ozone (O ₃)	Year Coverage ²	98%	96%	91%	99%	99%	99%	99%	100%	98%
	Max. 1-hour Concentration (ppm)	0.109	0.125	0.096	0.097	0.111	0.085	0.122	0.107	0.097
	Max. 8-hour Concentration (ppm)	0.087	0.105	0.081	0.086	0.095	0.077	0.104	0.098	0.088
	Number of Days>Federal 8-hour Std of >0.070 ppm	43	48	13	35	53	10	85	60	24
	Number of Days>California 1-hour Std of >0.09 ppm	10	5	N/A	1	8	0	11	8	N/A
	Number of Days>California 8-hour Std of >0.07 ppm	43	49	N/A	37	56	N/A	87	34	N/A
Nitrogen Dioxide (NO ₂)	Year Coverage	87%	97%	N/A	NM	NM	NM	97%	97%	N/A
	Max. 1-hour Concentration (ppm)	46.5	47.6	50.0	NM	NM	NM	66.0	61.5	67.0
	Annual Average (ppm)	N/A	8	8	NM	NM	NM	12	12	12
	Number of Days>Federal 1-hour Std of >100 ppm	0	0	0	NM	NM	NM	97%	97%	N/A

Air Pollutant	Standard/Exceedance	43301 Division Street, Lancaster			923 Poole Street, Mojave			5558 California Avenue, Bakersfield		
		2017	2018	2019	2017	2018	2019	2017	2018	2019
Sulfur Dioxide (SO ₂)	Year Coverage	NM	NM	NM	NM	NM	NM	NM	NM	NM
	Max. 24-hour Concentration (ppm)	NM	NM	NM	NM	NM	NM	NM	NM	NM
	Annual Average (ppm)	NM	NM	NM	NM	NM	NM	NM	NM	NM
	Number of Days>California 24-hour Std of >0.04 ppm	NM	NM	NM	NM	NM	NM	NM	NM	NM
Respirable Particulate Matter (PM ₁₀)	Year Coverage	NM	NM	NM	NM	NM	NM	98%	95%	NM
	Max. 24-hour Concentration (µg/m ³) ³	82.4	89.3	165.0	93.4	93.1	248.0	143.6	142.0	116.0
	Number of Days>Federal 24-hour Std of >150 µg/m ³	0	0	2	0	0	2	0	0	0
	Number of Days>California 24-hour Std of >50 µg/m ³	NM	NM	NM	10	19	N/A	16	13	N/A
	Annual Average ³ (µg/m ³)	26.3	25.2	NA	25.3	26.7	N/A	42.6	42.1	N/A
Fine Particulate Matter (PM _{2.5})	Year Coverage	97%	99%	N/A	95%	94%	N/A	94%	93%	N/A
	Max. 24-hour Concentration (µg/m ³)	26.6	40.4	13.6	26.9	39.0	19.8	101.8	95.8	59.1
	State Annual Average (µg/m ³)	7.3	7.2	N/A	NM	NM	NM	15.9	15.7	N/A
	Number of Days>Federal 24-hour Std of >35 µg/m ³	0	1	0	0	2	0	28	36	N/A
	Annual Average ³ (µg/m ³)	7.2	7.2	6.1	5.5	7.1	6.5	15.6	17.6	11.9

Sources: California Air Resources Board and U.S. Environmental Protection Agency, 2020

¹ CO data for the 923 Poole Street, Mojave, and 5558 California Avenue, Bakersfield, monitoring sites are from the 2000 S Union Avenue, Bakersfield, monitoring site.

² Coverage is for the 8-hour standard.

³ Coverage is for the national standard.

> = greater than

µg/m³ = micrograms per cubic meter

N/A = not available

NM = not monitored

PM₁₀ = particulate matter smaller than or equal to 10 microns in diameter

PM_{2.5} = particulate matter smaller than or equal to 2.5 microns in diameter

ppm = parts per million

Std = standard

4.3 Study Area Emissions

4.3.1 San Joaquin Valley Air Pollution Control District

CARB maintains an annual emission inventory for select counties and air basins in the state. The inventory for the SJVAB comprises of data submitted to CARB by the SJVAPCD plus estimates for certain source categories, which are provided by CARB staff. The 2012 inventory data (the most recent data provided by the CARB) for the SJVAB is summarized in Table 3. Note that Table 3 shows tons per day, while the emissions estimates for the Proposed Action are shown in tons per year.

Table 3 Estimated Annual Average Emissions for the SJVAPCD (tons per day)

Source Category	TOG	ROG	CO	NO _x	SO _x	Particulate Matter	PM ₁₀	PM _{2.5}
Stationary Sources								
Fuel Combustion	18.82	3.60	23.76	29.17	4.30	6.0	5.53	5.31
Waste Disposal	457.38	20.98	0.5	0.29	0.12	0.56	0.15	0.11
Cleaning and Surface Coatings	23.34	20.31	0.01	0.0	0.0	0.1	0.1	0.1
Petroleum Production and Marketing	130.88	33.59	0.61	0.27	0.14	0.23	0.16	0.15
Total Industrial Processes	16.72	15.68	0.83	6.71	3.36	16.54	8.03	3.16
Total Stationary Sources	647.15	94.16	25.70	36.44	7.92	23.44	13.97	8.82
Stationary Sources Percentage of Total	36.7	26.3	2.8	11.2	76.2	4.4	5.0	11.7
Areawide Sources								
Solvent Evaporation	53.11	47.59	--	--	--	--	--	--
Miscellaneous Processes	969.01	128.58	186.76	13.25	1.27	488.35	250.24	59.99
Total Areawide Sources	1,022.12	176.16	186.76	13.25	1.27	488.35	250.24	59.99
Areawide Sources Percentage of Total	57.9	49.2	20.6	4.0	12.2	92.4	88.9	71.4
Mobile Sources								
On-Road Motor Vehicles	53.22	48.51	437.65	177.87	0.67	10.78	10.77	6.73
Other Mobile Sources	41.62	39.02	252.45	97.60	0.53	5.89	6.61	6.09
Total Mobile Sources	94.84	87.53	690.10	275.47	1.20	16.66	17.38	12.81
Mobile Sources Percentage of Total	5.4	24.4	76.5	84.7	11.5	3.2	6.2	16.9
Grand Total	1,764.1	357.9	902.6	325.2	10.4	528.5	281.6	75.6

Source: California Air Resources Board, 2015

CO = carbon monoxide

NO_x = nitrogen oxides

PM_{2.5} = particulate matter smaller than or equal to 2.5 microns in diameter

PM₁₀ = particulate matter smaller than or equal to 10 microns in diameter

ROG = reactive organic gas

SO_x = sulfur oxides

TOG = total organic gas

In the SJVAPCD, mobile source emissions account for over 65 percent of the basin's ROG and NO_x emission inventory. Area sources account for over 90 percent and over 50 percent of the basin's particulate and total VOC emissions, respectively, and stationary sources account for over 75 percent of the basin's sulfur oxide (SO_x) emissions.

4.3.2 Eastern Kern County Air Pollution Control District

Emission inventory data for the EKAPCD for 2012 (the most recent data the CARB provides) is summarized in Table 4. In the EKAPCD, mobile source emissions account for more than 74 percent of the ROG and 56 percent of the NO_x emission inventory. Area sources made up more than 64 percent of the particulate emissions, where stationary sources made up 88 percent of SO_x emissions. Note that Table 4 shows tons per day, whereas the emissions estimates for the Proposed Action are shown in tons per year.

Table 4 Estimated Annual Average Emissions for the EKAPCD (tons per day)

Source Category	TOG	ROG	CO	NO _x	SO _x	Particulate Matter	PM ₁₀	PM _{2.5}
Stationary Sources								
Fuel Combustion	0.52	0.12	0.56	2.46	0.23	0.40	0.37	0.36
Waste Disposal	7.30	0.05	--	--	0.00	0.00	0.00	0.00
Cleaning and Surface Coatings	0.85	0.77	--	--	--	0.00	0.00	0.00
Petroleum Production and Marketing	0.20	0.20	--	--	--	--	--	--
Industrial Processes	0.11	0.09	6.79	15.43	2.25	5.69	3.67	1.55
Total Stationary Sources	8.98	1.22	7.35	17.89	2.48	6.09	4.04	1.91
Stationary Sources Percentage of Total	44	12	13	50	88	23	25	29
Areawide Sources								
Solvent Evaporation	1.14	1.21	--	--	--	--	--	--
Miscellaneous Processes	1.85	0.30	1.37	0.26	0.01	17.09	8.26	1.40
Total Areawide Sources	3.26	1.51	1.37	0.26	0.01	17.09	8.26	1.40
Areawide Sources Percentage of Total	16	14	2	1	0	64	52	21
Mobile Sources								
On-Road Motor Vehicles	2.59	2.37	23.53	9.70	0.03	0.54	0.54	0.35
Other Mobile Sources	5.71	5.48	24.90	7.85	0.31	3.13	3.06	3.02
Total Mobile Sources	8.30	7.85	48.44	17.55	0.34	3.67	3.06	3.37
Mobile Sources Percentage of Total	40	74	85	49	12	14	19	50
Grand Total	20.54	10.59	57.15	35.70	2.83	26.85	15.90	6.68

Source: California Air Resources Board, 2015

CO = carbon dioxide

NO_x = nitrogen oxides

PM_{2.5} = particulate matter smaller than or equal to 2.5 microns in diameter

PM₁₀ = particulate matter smaller than or equal to 10 microns in diameter

ROG = reactive organic gas

SO_x = sulfur oxides

TOG = total organic gas

4.3.3 Antelope Valley Air Quality Monitoring District

Emission inventory data for the AVAQMD for 2012 (the most recent data the CARB provides) is summarized in Table 5. In the AVAQMD, mobile source emissions account for more than 91 percent and 69 percent of the CO and NO_x emission inventory, respectively. Area sources made up more than 55 percent of the particulate emissions, whereas stationary sources made up 45 percent of particulate emissions. Mobile sources were 64 percent of the SO_x emissions. Stationary sources made up 43 percent of the area-wide ROG emissions. Note that Table 5 shows tons per day, whereas the emissions estimates for the Proposed Action are shown in tons per year.

Table 5 Estimated Annual Average Emissions for the AVAQMD (tons per day)

Source Category	TOG	ROG	CO	NO _x	SO _x	Particulate Matter		
						PM ₁₀	PM _{2.5}	
Stationary Sources								
Fuel Combustion	0.36	0.17	1.35	5.09	0.02	3.24	1.36	0.57
Waste Disposal	2.88	0.06	0.00	0.00	0.00	0.54	0.16	0.02
Cleaning and Surface Coatings	5.21	3.36	--	--	--	0.21	0.20	0.19
Petroleum Production and Marketing	13.82	3.11	--	--	--	--	--	--
Industrial Processes	0.19	0.11	0.00	0.01	0.00	17.57	8.46	2.00
Total Stationary Sources	22.46	6.82	1.36	5.09	0.03	21.56	10.81	2.79
Stationary Sources Percentage of Total	63	43	2	28	21	45	43	49
Areawide Sources								
Solvent Evaporation	3.89	3.39	--	--	--	--	--	--
Miscellaneous Processes	3.78	0.74	3.67	0.50	0.02	26.43	13.52	2.28
Total Areawide Sources	7.67	4.13	3.67	0.50	0.02	26.43	13.52	2.28
Areawide Sources Percentage of Total	21	26	6	3	14	55	53	40
Mobile Sources								
On-Road Motor Vehicles	3.19	2.84	41.25	9.54	0.05	--	0.65	0.33
Other Mobile Sources	2.36	2.22	11.57	2.84	0.04	0.32	0.31	0.30
Total Mobile Sources	5.54	5.06	52.81	12.37	0.09	0.32	0.97	0.63
Mobile Sources Percentage of Total	16	32	91	69	64	1	4	11
Grand Total	35.68	16.01	57.84	17.97	0.14	48.31	24.66	5.70

Source: California Air Resources Board, 2015

CO = carbon dioxide

NO_x = nitrogen oxides

PM_{2.5} = particulate matter smaller than or equal to 2.5 microns in diameter

PM₁₀ = particulate matter smaller than or equal to 10 microns in diameter

ROG = reactive organic gas

SO_x = sulfur oxides

TOG = total organic gas

4.4 Action Study Area Designations

The study area defined in the EIR/EIS for the Action and for this Final General Conformity Determination includes the SJVAPCD, EKAPCD, and AVAQMD. Under the federal criteria, the SJVAPCD is currently designated as nonattainment for 8-hour O₃, the 1997 annual PM_{2.5} standard (annual standard of 15 micrograms per cubic meter [$\mu\text{g}/\text{m}^3$]) and 24-hour standard (65 $\mu\text{g}/\text{m}^3$), and the 2006 24-hour PM_{2.5} standard (35 $\mu\text{g}/\text{m}^3$). The SJVAPCD is a maintenance area for PM₁₀, and the Bakersfield urbanized area is a maintenance area for CO. The SJVAPCD is in attainment for the NO₂ and SO₂ NAAQS. The SJVAPCD is unclassified for the lead NAAQS. The EKAPCD is currently designated nonattainment for federal 8-hour O₃. The western portion of the district is currently designated nonattainment for PM₁₀. The EKAPCD is an attainment/unclassifiable area for the PM_{2.5}, CO, and lead NAAQS. The EKAPCD is unclassified for the federal NO₂ and SO₂ standards. Under the federal criteria, the AVAQMD is currently designated as nonattainment for 8-hour O₃. The AVAQMD is an attainment/unclassified area under the NAAQS for CO, NO₂, SO₂, and lead. The AVAQMD is unclassified for the PM₁₀ and PM_{2.5} NAAQS.

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5 RELATIONSHIP TO NEPA

The Final Bakersfield to Palmdale EIR/EIS identifies reasonable foreseeable environmental impacts of the Action, both adverse and beneficial, identifies appropriate measures to mitigate adverse impacts, and identifies the agencies' preferred alternative. The EIR/EIS was prepared to comply with both NEPA and CEQA.

The General Conformity regulations establish certain procedural requirements that must be followed when preparing a General Conformity evaluation and are similar but not identical to those for conducting an air quality impact analysis under NEPA regulations. NEPA requires that the air quality impacts of the proposed Action's implementation be analyzed and disclosed. For purposes of NEPA, the air quality impacts of the Action were determined by identifying the Action's associated incremental emissions and air pollutant concentrations and comparing them, respectively, to emissions thresholds and state and national ambient air quality standards. The air quality impacts of the Action under future Build conditions were also compared in the EIR/EIS to the future No-Build conditions for NEPA purposes (they were also compared to existing conditions). The General Conformity Determination process and general findings are discussed in Sections 3.3.2.1, 3.3.4.5, 3.3.6.3, 3.3.7.1, and 3.3.9.2 of the EIR/EIS.

In order to appropriately identify and offset, where necessary, the emissions resulting from the Bakersfield to Palmdale section of the HSR system, the FRA is issuing this Final General Conformity Determination. The Authority shall enter into agreements with the SJVAPCD (VERA), EKAPCD (Emission Banking Certificate Program), and the AVAQMD (Air Quality Investment Program) to offset emissions, as necessary, resulting from the Bakersfield to Palmdale Section as described in Section 12.2.

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6 AVOIDANCE AND MITIGATION MEASURES TO REDUCE EMISSIONS TO BE INCORPORATED IN THE ACTION

In order to reduce impacts on the environment, the construction of the Action will include impact avoidance and minimization features and mitigation measures that will be implemented as part of the Action to minimize, avoid, and mitigate air quality impacts. These Impact Avoidance and Minimization Features (IAMF) and mitigation measures will be included components of the Action. The IAMFs and mitigation measures required by the ROD will be included in the Mitigation Monitoring and Enforcement Program that will be issued concurrently with the Authority's ROD and that would be enforceable commitments undertaken by the Authority. Construction of the Action is anticipated to occur through a design/build contract. The Authority will include all of the IAMFs and required mitigation measures in the construction contract, which will create a binding and enforceable contractual commitment to implement these design features and mitigation measures.

The Authority will be responsible for implementing and overseeing a mitigation monitoring program to ensure that the contractor meets all air quality IAMFs and mitigation measures.

- **AQ-IAMF#1: Fugitive Dust Emissions**—During construction, the Contractor shall employ the following measures to minimize and control fugitive dust emissions. The Contractor shall prepare a fugitive dust control plan for each distinct construction segment. At a minimum, the plan shall describe how each measure would be employed and identify an individual responsible for ensuring implementation. At a minimum, the plan shall address the following components unless alternative measures are approved by the applicable air quality management district.
 - Cover all vehicle loads transported on public roads to limit visible dust emissions, and maintain at least 6 inches of freeboard space from the top of the container or truck bed.
 - Clean all trucks and equipment before exiting the construction site using an appropriate cleaning station that does not allow runoff to leave the site or mud to be carried on tires off the site.
 - Water exposed surfaces and unpaved roads at a minimum three times daily with adequate volume to result in wetting of the top 1 inch of soil but avoiding overland flow. Rain events may result in adequate wetting of top 1 inch of soil thereby alleviating the need to manually apply water.
 - Limit vehicle travel speed on unpaved roads to 15 miles per hour (mph).
 - Suspend any dust-generating activities when average wind speed exceeds 25 mph.
 - Stabilize all disturbed areas, including storage piles that are not being used on a daily basis for construction purposes, by using water, a chemical stabilizer/suppressant, hydro mulch or by covering with a tarp or other suitable cover or vegetative ground cover, to control fugitive dust emissions effectively. In areas adjacent to organic farms, the Authority would use non-chemical means of dust suppression.
 - Stabilize all on-site unpaved roads and off-site unpaved access roads, using water or a chemical stabilizer/suppressant, to effectively control fugitive dust emissions. In areas adjacent to organic farms, the Authority would use non-chemical means of dust suppression.
 - Carry out watering or presoaking for all land clearing, grubbing, scraping, excavation, land leveling, grading, cut and fill, and demolition activities.
 - For buildings up to 6 stories in height, wet all exterior surfaces of buildings during demolition.
 - Limit or expeditiously remove the accumulation of mud or dirt from adjacent public streets at a minimum of once daily, using a vacuum type sweeper.

- After the addition of materials to or the removal of materials from surface or outdoor storage piles, apply sufficient water or a chemical stabilizer/suppressant.
- **AQ-IAMF#2: Selection of Coatings**—During construction, the Contractor shall use:
 - Low-volatile organic compound (VOC) paint that contains less than 10 percent of VOC contents (VOC, 10%).
 - Super-compliant or Clean Air paint that has a lower VOC content than that required by San Joaquin Valley Unified Air Pollution Control District Rule 4601, Eastern Kern Air Pollution Control District Rule 410, and Antelope Valley Air Quality Management District Rule 1113, when available. If not available, the Contractor shall document the lack of availability; recommend alternative measure(s) to comply with by San Joaquin Valley Unified Air Pollution Control District Rule 4601, Eastern Kern Air Pollution Control District Rule 410, and Antelope Valley Air Quality Management District Rule 1113; or disclose absence of measure(s) for full compliance and obtain concurrence from the Authority.
- **AQ-IAMF#3: Renewable Diesel**—During construction, the Contractor would use renewable diesel fuel to minimize and control exhaust emissions from all heavy-duty diesel-fueled construction diesel equipment and on-road diesel trucks. Renewable diesel must meet the most recent ASTM D975 specification for Ultra Low Sulfur Diesel and have a carbon intensity no greater than 50% of diesel with the lowest carbon intensity among petroleum fuels sold in California. The Contractor would provide the Authority with monthly and annual reports, through the Environmental Mitigation Management and Application (EMMA) system, of renewable diesel purchase records and equipment and vehicle fuel consumption. Exemptions to use traditional diesel can be made where renewable diesel is not available from suppliers within 200 miles of the project site. The construction contract must identify the quantity of traditional diesel purchased and fully document the availability and price of renewable diesel to meet project demand.
- **AQ-IAMF#4: Reduce Criteria Exhaust Emissions from Construction Equipment**—Prior to issuance of construction contracts, the Authority would incorporate the following construction equipment exhaust emissions requirements into the contract specifications:
 1. All heavy-duty off-road construction diesel equipment used during the construction phase would meet Tier 4 engine requirements.
 2. A copy of each unit's certified tier specification and any required CARB or air pollution control district operating permit would be made available to the Authority at the time of mobilization of each piece of equipment.
 3. The contractor would keep a written record (supported by equipment-hour meters where available) of equipment usage during project construction for each piece of equipment.
 4. The contractor would provide the Authority with monthly reports of equipment operating hours (through the Environmental Mitigation Management and Assessment [EMMA] system) and annual reports documenting compliance.
- **AQ-IAMF#5: Reduce Criteria Exhaust Emissions from ON-Road Construction Equipment**—Prior to issuance of construction contracts, the Authority would incorporate the following material-hauling truck fleet mix requirements into the contract specifications:
 1. All on-road trucks used to haul construction materials, including fill, ballast, rail ties, and steel, would consist of a fleet mix of equipment model year 2010 or newer, but no less than the average fleet mix for the current calendar year as set forth in the CARB's EMFAC 2014 database.
 2. The contractor would provide documentation to the Authority of efforts to secure such a fleet mix.

3. The contractor would keep a written record of equipment usage during project construction for each piece of equipment and provide the Authority with monthly reports of VMT (through EMMA) and annual reports documenting compliance.
- **AQ-IAMF#6: Reduce the Potential Impact of Concrete Batch Plants**—Prior to construction of any concrete batch plant, the contractor would provide the Authority with a technical memorandum documenting consistency with the Authority’s concrete batch plant siting criteria and utilization of typical control measures. Concrete batch plants would be sited at least 1,000 feet from sensitive receptors, including places such as daycare centers, hospitals, senior care facilities, residences, parks, and other areas where people may congregate. The concrete batch plant would implement typical control measures to reduce fugitive dust such as water sprays, enclosures, hoods, curtains, shrouds, movable and telescoping chutes, central dust collection systems, and other suitable technology, to reduce emissions to be equivalent to the USEPA AP-42 controlled emission factors for concrete batch plants. The contractor would provide to the Authority documentation that each batch plant meets this standard during operation.
 - **AQ-MM#1: Offset Project Construction Emissions through Off-Site Emission Reduction Programs**—The Authority and SJVAPCD have entered into a contractual agreement to mitigate (by offsetting) to net zero the project’s actual emissions from construction equipment and vehicle exhaust emissions of volatile organic compound (VOC), NO_x, particulate matter (PM₁₀), and PM_{2.5}. The agreement will provide funds for the SJVAPCD’s Emission Reduction Incentive Program [1] (SJVAPCD 2011) to fund grants for projects that achieve emission reductions, with preference given to highly affected communities, thus offsetting project-related impacts on air quality. To lower overall cost, funding for the VERA program to cover estimated construction emissions for any funded construction phase will be provided at the beginning of the construction phase. At a minimum, mitigation/offsets will occur in the year of impact, or as otherwise permitted by 40 Code of Federal Regulations (C.F.R.) Part 93 Section 93.163.

The Authority shall also enter into an agreement with the Antelope Valley Air Quality Management District (AVAQMD) and Eastern Kern Air Pollution Control District (EKAPCD) to mitigate (by offsetting) to net zero the project’s actual emissions from construction equipment and vehicle exhaust emissions of VOC, NO_x, PM₁₀ and PM_{2.5}. In the AVAQMD, the Authority shall participate in the Air Quality Investment Program, which funds stationary- and mobile-source emission reduction strategies. In the EKAPCD, the Authority shall provide an application for the Emission Banking Certificate Program.

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7 REGULATORY PROCEDURES

The General Conformity regulations establish certain procedural requirements that must be followed when preparing a General Conformity evaluation. This section addresses the major applicable procedural issues and specifies how these requirements are met for the evaluation of the Federal Action. The procedures required for the General Conformity evaluation are similar but not identical to those for conducting an air quality impact analysis pursuant to NEPA regulations. It is anticipated, however, that the Final General Conformity Determination will be published concurrent with the Authority's ROD for the Federal Action. This Final General Conformity Determination is being released for public and agency review pursuant to 40 C.F.R. § 93.156.

The Authority identified the appropriate emission estimation techniques and planning assumptions in close consultation with the state entities charged with regulating air pollution in the SJVAB and MDAB.

7.1 Use of Latest Planning Assumptions

The General Conformity regulations require the use of the latest planning assumptions for the area encompassing the Federal Action, derived from the estimates of population, employment, travel, and congestion most recently approved by the area's metropolitan planning organization (MPO) (40 C.F.R. § 93.159(a)).

The traffic data used in the air quality analysis (see EIR/EIS, Section 3.2) are consistent with the most recent estimates made by the MPOs for traffic volume growth rates, including forecast changes in vehicle miles traveled (VMT) and vehicle hours traveled (VHT). The Authority developed these estimates based on the MPO's traffic assignment models using the baseline and future population, employment, and travel and congestion information available at the time the analysis was prepared. These assumptions are consistent with those in the current conformity determinations for the region's Transportation Plan and TIP.

7.2 Use of Latest Emission Estimation Techniques

The General Conformity regulations require the use of the latest and most accurate emission estimation techniques available, unless such techniques are inappropriate (40 C.F.R. § 93.159(b)). Operational phase vehicular emission factors were estimated by using the CARB emission factor program, Emission FACTors 2014 (EMFAC2014). Parameters were set in EMFAC2014 for each individual county to reflect conditions within each county, and statewide parameters were used to reflect statewide conditions. Operational phase aircraft emissions were estimated using the Federal Aviation Administration's Aviation Environmental Design Tool. In addition, electrical demands caused by propulsion of the trains, and of the trains at terminal stations and in storage depots and maintenance facilities were estimated using average emission factors for each kilowatt-hour required from CARB statewide emission inventories of electrical and cogeneration facilities data along with USEPA eGRID2012 (released October 20, 2015) electrical generation data. The energy estimates used for the propulsion of the HSR system include the use of regenerative braking power. Operation of the Bakersfield to Palmdale Project Section HSR stations and the LMF and co-located MOWF were determined using the California Emissions Estimator Model (CalEEMod).

Emissions from regional building demolition and construction of the at-grade rail segments, elevated rail segments, retained-fill rail segments, electrical substations, train stations, LMF/MOWF, and roadways and roadway overpasses were calculated using emission factors from CalEEMod. CalEEMod uses emission factors from the OFFROAD 2011 model. The OFFROAD 2011 model provides the latest emission factors for off-road construction equipment and accounts for lower fleet population and growth factors as a result of the economic recession and updated load factors based on feedback from engine manufacturers. The use of emission rates from the OFFROAD models reflects the recommendation of CARB to capture the latest off-road construction assumptions. OFFROAD 2011 default load factors (the ratio of average equipment horsepower utilized to maximum equipment horsepower) and useful life parameters

were used for emission estimates. Mobile-source emission burdens from worker vehicle trips and truck trips were also calculated using CalEEMod.

Construction exhaust emissions from equipment, fugitive dust emissions from earthmoving activities, and emissions from worker vehicle trips, deliveries, and material hauling were calculated and compiled in CalEEMod for each year of construction.

Action-specific data, including construction equipment lists and the construction schedule, were used for construction associated with the alignment/guideway. Action-specific data were not available for the nonlinear construction associated with the stations and LMF/MOWF buildings. Therefore, the CalEEMod default settings were used in these instances only.

Mobile-source emission burdens from worker trips and truck trips were estimated using CalEEMod.

7.3 Major Construction-Phase Activities

Action-specific data, including construction equipment lists and the construction schedule, were used for construction associated with the alignment/guideway. Calculations were performed for each year of construction.

Major activities were grouped into the following categories (described in more detail in Section 9.0 of this report):

- Mobilization
- Site preparation including demolition, land clearing, and grubbing
- Earthmoving
- Roadway crossings
- Elevated structures
- Track laying – elevated, at-grade, and retained fill
- Traction power supply station
- Switching station
- Paralleling station
- LMF/MOWF
- Bakersfield Station
- Palmdale Station
- Hauling emissions, including truck and rail
- Demobilization

7.4 Emission Scenarios

The General Conformity regulations require that the evaluation reflect certain emission scenarios (40 C.F.R. §93.159(d)). Specifically, these scenarios generally include the evaluation of the direct and indirect emissions from a proposed Action for the following years: (1) for nonattainment areas, the attainment year specified in the SIP or if the SIP does not specify an attainment year, the latest attainment year possible under the CAA, and for maintenance areas, the farthest year for which emissions are projected in the approved maintenance plan; (2) the year during which the total of direct and indirect emissions for the Federal Action are projected to be the greatest on an annual basis; and (3) any year for which the applicable SIP specifies an emissions budget. Both the operational and construction phases of the Action have to be analyzed, and the following applies to the proposed Action.

Emissions generated during the operational phase of the HSR would meet the emission requirements for the years associated with Items 1 and 3 because the emissions generated during the operational phase of the proposed Action would be less than those emitted in the No-Build scenario. In addition, microscale analyses conducted for the EIR/EIS demonstrate that the operational phase of the HSR would not cause or exacerbate a violation of the NAAQS for all applicable pollutants. The microscale CO modeling results for 2016 and 2040 are presented in the *Bakersfield to Palmdale Project Section Final Air Quality and Global Climate Change*

Technical Report (Authority 2018b). Bakersfield Station data are included in the *Fresno to Bakersfield Section Final EIR/EIS* (Authority and FRA 2014) and technical reports.

- Emissions generated during HSR's construction phase, which would include the year with the greatest amount of total direct and indirect emissions, may be subject to General Conformity regulations because regional emissions would increase and, as such, have the potential to cause or exacerbate an exceedance of an NAAQS. Therefore, analyses were conducted to estimate the amounts of emissions that would be generated during the construction phase (for comparison with the General Conformity applicability rates) and the potential impacts of these emissions on local air quality levels. Emissions generated at the construction sites (e.g., tailpipe emissions from the on-site heavy-duty diesel equipment and fugitive dust emissions generated by vehicles traveling within the construction sites) and on the area's roadways by vehicles traveling to and from these sites (by vehicles transporting materials and the workers traveling to and from work) were considered.
- Air quality dispersion modeling would be required for this conformity analysis to estimate the Action's localized impacts on PM_{2.5} and CO concentrations if the annual emissions of the pollutants generated during construction were to exceed the General Conformity *de minimis* thresholds.

Annual emissions were estimated for each year of the proposed Action's construction period. These emissions, which are the maximum values for the Action, are described in more detail in Section 10.0 of this report.

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8 APPLICABILITY ANALYSIS

The first step in a General Conformity evaluation is an analysis of whether the requirements apply to a proposed federal action in a nonattainment or a maintenance area. Unless exempted by the regulations or otherwise presumed to conform, a federal (non-Transportation) action requires a General Conformity Determination for each pollutant where the total of direct and indirect emissions caused by the federal action would equal or exceed an annual *de minimis* emission rate.

8.1 Attainment Status of Action Area

USEPA and CARB designate each county (or portions of counties) within California as attainment, maintenance, or nonattainment based on the area's ability to meet ambient air quality standards. Regions are designated as attainment for a criteria pollutant when the concentration of that pollutant is below the ambient air standard. If a criteria pollutant concentration is above the ambient air standard, the area is in nonattainment for that pollutant. Areas previously designated as nonattainment that subsequently demonstrated compliance with the ambient air quality standards are designated as a maintenance area. Table 6 summarizes the federal (under NAAQS) and state (under CAAQS) attainment status for each of the air basins for which the Action would be located.

8.1.1 Attainment Status: San Joaquin Valley Air Basin

Under the federal criteria, the SJVAPCD is currently designated as nonattainment for 8-hour O₃, the 1997 annual PM_{2.5} standard (annual standard of 15 micrograms per cubic meter [µg/m³]) and 24-hour standard (65 µg/m³), and the 2006 24-hour PM_{2.5} standard (35 µg/m³). The SJVAPCD is a maintenance area for PM₁₀, and the Bakersfield urbanized area is a maintenance area for CO. The SJVAPCD is in attainment for the NO₂ and SO₂ NAAQS. The SJVAB is unclassified for the lead NAAQS.

Under the state criteria, the SJVAPCD is currently designated as nonattainment for 1-hour O₃, 8-hour O₃, PM₁₀, and PM_{2.5}. The SJVAPCD is an attainment/unclassified area for the state CO standard and an attainment area for the state NO₂, SO₂, and lead standards. The SJVAPCD is an unclassified area for the state hydrogen sulfide standard and visibility-reducing particle standard, and is classified as an attainment area for sulfates and vinyl chloride (SJVAPCD 2013a).

8.1.2 Attainment Status: Antelope Valley Air Quality Management District

Under the federal criteria, the AVAQMD is currently designated as nonattainment for 8-hour O₃. The AVAQMD is an attainment/unclassified area under the NAAQS for CO, NO₂, SO₂, and lead. The AVAQMD is unclassified for the PM₁₀ and PM_{2.5} NAAQS.

Under the state criteria, the AVAQMD is currently designated as nonattainment for O₃ (classified as extreme nonattainment) and PM₁₀. The AVAQMD is an attainment/unclassified area for state PM_{2.5}, CO, NO₂, SO₂, and lead standards. The AVAQMD is an unclassified area for the state hydrogen sulfide standard, visibility-reducing particle standard, and particulate sulfate standard (AVAQMD 2014).

8.1.3 Attainment Status: Eastern Kern Air Pollution Control District

The EKAPCD is currently designated nonattainment for federal 8-hour O₃. The western portion of the district is currently designated nonattainment for PM₁₀. The EKAPCD is an attainment/unclassifiable area for the PM_{2.5}, CO, and lead NAAQS. The EKAPCD is unclassified for the federal NO₂ and SO₂ standards.

Under the state criteria, the EKAPCD is currently designated as nonattainment for 1-hour O₃, 8-hour O₃, and PM₁₀. The EKAPCD is in attainment for the state NO₂, SO₂, and lead standards, and is an unclassified area for the PM_{2.5} and CO state standards (EKAPCD 2012).

Table 6 Federal and State Attainment Status

Pollutants	Federal Classification	State Classification
San Joaquin Valley Air Pollution Control District		
O ₃ : 1-Hour	No Federal Standard	Nonattainment (Severe)
O ₃ : 8-Hour	Nonattainment (Extreme)	Nonattainment
PM ₁₀	Attainment/Maintenance	Nonattainment
PM _{2.5}	Nonattainment	Nonattainment
CO	Urban portion of Fresno County and Kern County: Maintenance Remaining basin: Attainment	Attainment/Unclassified
NO ₂	Attainment/Unclassified	Attainment
SO ₂	Attainment/Unclassified	Attainment
Lead	No Designation/Classification	Attainment
Antelope Valley Air Quality Management District		
O ₃ : 1-Hour	No Federal Standard	Nonattainment (Extreme)
O ₃ : 8-Hour	Nonattainment (Severe)	Nonattainment (Extreme)
PM ₁₀	Attainment/Unclassified	Nonattainment
PM _{2.5}	Attainment/Unclassified	Unclassified
CO	Attainment	Attainment
NO ₂	Attainment/Unclassified	Attainment/Unclassified
SO ₂	Attainment/Unclassified	Attainment/Unclassified
Lead	Attainment	Attainment
Eastern Kern Air Pollution Control District		
O ₃ : 1-Hour	No Federal Standard	Moderate Nonattainment
O ₃ : 8-Hour	Nonattainment	Nonattainment
PM ₁₀	Attainment/Unclassified (EKAPCD) Nonattainment (Kern River/Cummings Valleys), Attainment Maintenance (Indian Wells Valley)	Nonattainment
PM _{2.5}	Attainment/Unclassified	Unclassified
CO	Attainment/Unclassified	Unclassified
NO ₂	Unclassified	Attainment
SO ₂	Unclassified	Attainment
Lead	Attainment/Unclassified	Attainment

Sources: U.S. Environmental Protection Agency, 2013; San Joaquin Valley Air Pollution Control District, 2013a; Antelope Valley Air Quality Management District, 2016; Eastern Kern Air Pollution Control District, 2012c

CO = carbon monoxide

EKAPCD = Eastern Kern Air Pollution Control District

NO_x = nitrogen oxides

O₃ = ozone

PM_{2.5} = particulate matter smaller than or equal to 2.5 microns in diameter

PM₁₀ = particulate matter smaller than or equal to 10 microns in diameter

SO₂ = sulfur dioxide

9 CONSTRUCTION ACTIVITIES CONSIDERED

As shown in Section 3.3.6.3 of the EIR/EIS, the results of the regional analyses conducted for the proposed Action demonstrate that emissions generated during the operational phase would be less than those emitted in the No-Build and existing conditions scenarios and that the microscale analyses demonstrate that the Action would not cause or exacerbate a violation of the NAAQS for these pollutants. As such, no further analysis of the operational period emissions is necessary for this General Conformity determination. Section 9.0 will focus on the emissions generated from the construction period emissions for the Bakersfield to Palmdale Project.

The analysis conducted for the EIR/EIS to estimate potential air quality impacts caused by on-site (e.g., demolition activities, construction equipment operations, and truck movements) and off-site (e.g., motor vehicle traffic effects due to truck trips) construction-phase activities included the following:

- Estimation of emissions generated by the construction activities (e.g., deconstruction, concrete and steel construction), including fugitive dust emissions and emissions released from diesel-powered equipment and trucks based on the hours of operation of each piece of equipment;
- Identification of heavily traveled truck routes to estimate the cumulative effects of on-site construction activity emissions and off-site traffic emissions;
- An on-site dispersion modeling analysis of the major construction areas;
- An off-site dispersion modeling analysis of the roadway intersections/interchanges adjacent to the construction areas using traffic data that include construction-related vehicles and background traffic; and
- A comparison of the on-site and off-site modeling results to the applicable NAAQS for the applicable pollutants.

Emission rates for these activities were estimated based on the following:

- The number of hours per day and duration of each construction activity;
- The number and type of construction equipment to be used;
- Horsepower (HP) and utilization rates (hours per day) for each piece of equipment;
- The quantities of construction/demolition material produced and removed from each site; and
- The number of truck trips needed to remove construction/demolition material, and to bring the supply materials to each site.

The following is a discussion of the major activities considered, the timing of these activities, and the procedures used to estimate emission rates.

A full description of construction analysis methodology can be found in Section 6.9 of the *Bakersfield to Palmdale Section Air Quality and Global Climate Change Technical Report* for this Action (Authority 2018b).

Construction activities associated with proposed Action would result in criteria pollutant and greenhouse gas (GHG) emissions. Construction emissions for the proposed Action are quantified and analyzed in Section 3.3.6.3 of the EIR/EIS. The analysis assumed that project construction would occur from 2018 to 2026. The construction schedule has since been revised. See Section 2.8 in Chapter 2 of the EIR/EIS for additional details on the revised construction schedule. Although the schedule has been updated, the analysis is still valid as the equipment quantities and annual emission rates would remain unchanged. While separate projects for purposes of planning the HSR system, construction of the Bakersfield to Palmdale Section would overlap with the construction period for the Merced to Fresno Project Section and Fresno to Bakersfield Project Section, thereby adding to the cumulative air quality impacts within the SJVAB. In addition, construction of the Bakersfield to Palmdale Project Section would overlap with the

construction period for the Palmdale to Burbank Project Section, thereby adding to the cumulative air quality impacts within the MDAB. The cumulative emissions that could result from potential concurrent construction activities are presented in Section 13 of the General Conformity Report.

9.1 Site Preparation

9.1.1 Demolition

This analysis assumed that demolition of existing structures along the HSR alignment and near HSR stations would take place from December 2020 through August 2021. Demolition emissions were calculated with CalEEMod using the project-specific equipment list. In addition to the fugitive dust emissions resulting from the destruction of existing buildings, emissions were estimated for worker trips, construction equipment exhaust, and truck-hauling exhaust.

9.1.2 Land Grubbing

Land grubbing refers to the site preparation activities for HSR alignment construction. Emissions from land grubbing were estimated using the OFFROAD 2011 emission factors as well as a site-specific equipment list. This analysis assumed that land grubbing would take place at four staging areas from December 2020 to August 2021. Fugitive dust from land-grubbing activities includes that from worker trips, construction equipment exhaust, and truck-hauling exhaust.

9.2 Earth Moving

The earthmoving activities include grading, trenching, and cut/fill activities for the HSR alignment construction. This analysis assumed that earthmoving would occur at four locations from March 2018 to October 2020. The emissions associated with the earthmoving activities were estimated using CalEEMod with OFFROAD 2011 emission factors, in conjunction with the site-specific equipment list. Fugitive dust from land-grubbing activities includes that from worker trips, construction equipment exhaust, and truck-hauling exhaust.

The construction area used in CalEEMod was the total area to be cleared based on the length of the alignment. Although the track widths vary along the alignment, it was conservatively assumed that a width of 120 feet would be graded along the entire length of the alignment. This width accounts for the widest portion of the alignment (four tracks wide) plus a buffer on each side.

Earthwork is the disturbance of soil or earth by any means, including excavation (including subsurface), tunneling, drilling, infilling, stockpiling, dumping of soil or sand, and construction/reconstruction of any track, embankment, or drainage channel. Earthwork would be performed in such a manner as to achieve a balanced condition where the quantity of soil or earthen materials removed through excavation would be roughly equal to the quantity of material being placed in embankments. The adjustment of the ratio of excavation to embankment to achieve this balance would be performed by variations in cut-slope ratios, embankment widths, and embankment slope ratios during construction as existing ground conditions are revealed. It is intended that cut material and tunnel spoils would be stored and processed on-site and used as fill materials if deemed suitable by the site geotechnical engineer. It is not anticipated that any excavated materials would need to be exported to off-site locations for the B-P Build Alternatives.

9.3 HSR Alignment Construction

This analysis assumed that the HSR alignment construction would occur from 2020 to 2026, and includes the following construction phases and operation of a concrete batch plant:

- Constructing structures for the elevated rail
- Laying elevated rail and at-grade rail
- Constructing the retaining wall for the retained-fill rail
- Laying retained-fill rail

9.3.1 Rail Type and Alignment Alternatives

The four B-P Build Alternatives differ in total length, location, width, and percentage of at-grade/elevated/retained fill. Table 3.3-5 of the EIR/EIS summarizes the total length of at-grade rail, elevated rail, and retained-fill rail for each B-P Build Alternative. The CCNM Design Option would add 124 feet to the length of each B-P Build Alternative and the Refined CCNM Design Option would add 2,006 feet to the length of each B-P Build Alternative. Due to rounding, the total length in miles would not change with the CCNM Design Option. Emissions from construction of the track were determined using CalEEMod. Equipment counts, horsepower, hours of operation, and load factors used in CalEEMod are included in the *Bakersfield to Palmdale Project Section Air Quality and Global Climate Change Technical Report* (Authority 2018b).

9.3.2 Concrete Batch Plants

Concrete would be required for the construction of bridges used to support the elevated sections of the HSR alignment, for construction of the station platform, and for construction of the retaining wall used to support the retained-fill sections of the alignment. To provide enough concrete on-site, it is estimated that batch plants would operate in the Action vicinity (i.e., within 0.5 mile) during construction of the Action. Because the locations of the concrete batch plants are unknown, fugitive dust emissions associated with the plants were estimated based on the total amount of concrete required and on emission factors from Chapter 11.12 of AP-42 (USEPA 2006). Emissions from on-road truck trips associated with transporting material to and from the concrete batch plants were included in materials-hauling emissions calculations.

9.3.3 Material Hauling

Emissions from the exhaust of trucks used to haul materials (including concrete slabs) to the construction site were calculated using heavy-duty truck emission factors from EMFAC2014 and anticipated travel distances of haul trucks within the SJVAB and MDAB. Ballast materials could potentially be hauled by rail within the air basins. Locomotive emission factors from *Emission Factors for Locomotives* (USEPA 2009b) and the travel distance by rail to the Action site were used to estimate rail emissions.

Based on active permitted quarry locations, ballast materials are expected to be available within the SJVAB and MDAB (California Department of Conservation 2016). Therefore, for the regional emission analysis, emissions from ballast materials-hauling were calculated using the distance traveled within the Action air districts. Emissions from ballast materials hauling by trucks and locomotives outside the Action air districts were estimated based on the travel distances and transportation method (by rail or by truck) from the locations where ballast materials would be available. Rail emission factors using the USEPA guidance (USEPA 2009b) were used to estimate the locomotive emissions. Construction materials would likely be delivered from supply facilities within the SJVAB and the MDAB.

9.4 Train Station Construction

Emissions from HSR station construction would be the result of mass site grading, building construction, and architectural coatings. Where applicable, emissions resulting from worker trips, vendor trips, and construction equipment exhaust were included. Paving activities associated with surface parking lots were included. For the purposes of this analysis, it was assumed that construction of the Palmdale Station would begin in 2018² and be completed by 2021. CalEEMod was used to estimate emissions from construction phases of the Palmdale Station.

² This schedule is presented for analysis purposes only; the resulting data remains valid because the equipment quantities and annual emission rates would remain unchanged.

9.5 Maintenance Facilities Construction

Emissions associated with construction of the LMF and MOWF are expected as a result of mass site grading, asphalt paving, building construction, and architectural coatings. These activities would occur during maintenance activities.

Fugitive dust from construction of the maintenance-of-way facility includes that from worker trips, construction equipment exhaust, and truck-hauling exhaust. Emissions from track construction were estimated using CalEEMod.

9.6 Roadway Crossing Construction

The B-P Build Alternatives would include the relocation and expansion of freeway segments, local roads, and overpasses, as well as reconstruction of several intersections. Fugitive dust and exhaust emissions from these construction activities were estimated using the Sacramento Metropolitan Air Quality Management District's Road Construction Emissions Model. Roadway demolition emissions are included in the CalEEMod analysis using the Action-specific equipment list.

For purposes of this analysis, it was assumed that roadway Action construction would begin in January 2020³ and be completed by June 2022 (a total of 28 months), and that each type of roadway Action would be constructed independently at staggered intervals during the 28-month period.

Based on Action-specific data, a simplified construction schedule was used to estimate construction emissions. The representative Action roadway length for each scenario was estimated by averaging all anticipated Action roadway lengths within that designated scenario.

³ This schedule is presented for analysis purposes only; the resulting data remains valid because the equipment quantities and annual emission rates would remain unchanged.

10 ESTIMATED EMISSIONS RATES AND COMPARISON TO DE MINIMIS THRESHOLDS – BAKERSFIELD-PALMDALE

Construction activities associated with the HSR alternatives would result in criteria pollutant emissions. Construction emissions for the four Bakersfield to Palmdale alternatives are quantified and analyzed in this section.

10.1 Construction Impacts within the SJVAPCD

Total annual estimated emissions generated within the SJVAPCD during the proposed Action’s construction period, as presented in the HSR EIR/EIS, are provided in Table 7. As shown in the table, direct emissions from the construction phase of the Bakersfield to Palmdale Project Section within the SJVAPCD would exceed the GC applicability thresholds for VOC and NO_x in certain calendar years in which construction would take place. The maximum estimated annual values of each pollutant, by non-attainment or maintenance area, and the percentage of the 2012 estimated emission rates in the SJVAPCD (see Table 3) for the Bakersfield to Palmdale construction are as follows:

- NO_x: 177 tons per year (tpy)(0.15%)
- VOCs: 17 tpy (0.01%)
- PM_{2.5}: 9 tpy (0.03%)
- PM₁₀: 15 tpy (0.02%)
- CO: 90 tpy (0.03%)

Table 7 Estimated Annual Average Emissions for the SJVAPCD

Pollutants	Emissions (Tons/Year)											Conformity Applicability Thresholds (tons/year)
	2018	2019	2020	2021	2022	2022 with Refined CCNM Option	2023	2023 with Refined CCNM Option	2024	2025	2026	
Alternative 1												
NO _x	55*	2	104*	156*	133*	142*	107*	110*	51*	25*	15*	10
VOCs	5	1	11*	16*	14*	14*	11*	11*	7	4	2	10
PM _{2.5}	3	1	5	8	7	7	6	6	3	2	1	100
PM ₁₀	4	1	7	13	12	12	11	11	6	2	1	100
CO ¹	7	1	25	69	68	68	60	60	12	5	3	100
Alternative 2												
NO _x	0	0	134*	151*	121*	136*	76*	78*	31*	15*	15*	10
VOCs	0	0	13*	15*	13*	13*	8	8	4	2	2	10
PM _{2.5}	0	0	6	8	8	8	5	5	2	1	1	100
PM ₁₀	0	0	10	15	13	13	10	10	6	1	1	100
CO ¹	0	0	29	86	83	84	48	48	7	3	3	100
Alternative 3												
NO _x	0	0	145*	168*	151*	160*	84*	87*	51*	15*	15*	10
VOCs	0	0	15*	17*	16*	16*	9	9	7	2	2	10
PM _{2.5}	0	0	6	9	8	8	4	4	3	1	1	100
PM ₁₀	0	0	8	11	11	11	6	6	4	1	1	100
CO ¹	0	0	31	90	89	89	22	22	12	3	3	100

Pollutants	Emissions (Tons/Year)											Conformity Applicability Thresholds (tons/year)
	2018	2019	2020	2021	2022	2022 with Refined CCNM Option	2023	2023 with Refined CCNM Option	2024	2025	2026	
Alternative 5												
NO _x	0	0	155*	177*	161*	170*	128*	131*	50*	32*	13*	10
VOCs	0	0	15*	17*	16*	16*	13*	13*	6	5	2	10
PM _{2.5}	0	0	7	9	8	8	7	7	3	2	1	100
PM ₁₀	0	0	10	11	11	11	9	9	4	2	1	100
CO ¹	0	0	42	90	90	90	85	85	12	7	3	100

Source: California High-Speed Rail Authority, 2020

Values marked with an asterisk (*) exceed applicability thresholds

¹ Bakersfield urbanized maintenance area only

² The emissions presented in this table reflect the impact of the Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule, per the California Air Resource Board's "EMFAC Off-Model Adjustment Factors to Account for the SAFE Vehicles Rule Part One" issued on November 20, 2019. https://ww3.arb.ca.gov/msei/emfac_off_model_adjustment_factors_final_Final.pdf.

CCNM = César E. Chávez National Monument

CO = carbon monoxide

NO_x = nitrogen oxide

PM₁₀ = particulate matter smaller than or equal to 10 microns in diameter

PM_{2.5} = particulate matter smaller than or equal to 2.5 microns in diameter

VOC = volatile organic compound

10.2 Construction Impacts within the EKAPCD

Total annual estimated emissions generated within the EKAPCD during the proposed Action's construction period, as presented in the HSR EIR/EIS, are provided in Table 8. As shown in the table, construction emissions for Bakersfield to Palmdale Project Section within the EKAPCD would exceed the GC applicability thresholds for NO_x in some construction years. The maximum estimated annual values of each pollutant, by non-attainment or maintenance area, and the percentage of the 2012 estimated emission rates in the EKAPCD (see Table 4) for the Bakersfield to Palmdale construction are as follows:

- NO_x: 279 tpy (2.14%)
- VOCs: 27 tpy (0.70%)
- PM_{2.5}: 14 tpy (0.57%)
- PM₁₀: 22 tpy (0.38%)
- CO: 540 tpy (2.591%)

Table 8 Estimated Annual Average Emissions for the EKAPCD

Pollutants	Emissions (Tons/Year)											Conformity Applicability Thresholds (tons/year)
	2018	2019	2020	2021	2022	2022 with Refined CCNM Option	2023	2023 with Refined CCNM Option	2024	2025	2026	
Alternative 1												
NO _x	33	60*	172*	207*	177*	213*	121*	131*	56*	32	20	50
VOCs	3	6	17	20	18	18	15	16	7	5	3	50
PM _{2.5}	2	3	8	11	10	10	9	9	3	2	1	N/A
PM ₁₀	4	5	13	18	16	16	15	15	7	2	1	70

Pollutants	Emissions (Tons/Year)											Conformity Applicability Thresholds (tons/year)
	2018	2019	2020	2021	2022	2022 with Refined CCNM Option	2023	2022 with Refined CCNM Option	2024	2025	2026	
CO	18	35	161	392	381	384	346	346	155	29	17	N/A
Alternative 2												
NO _x	0	0	152*	254*	185*	222*	114*	124*	33	20	20	50
VOCs	0	0	15	25	19	19	12	12	4	2	2	50
PM _{2.5}	0	0	7	13	10	10	7	7	3	1	1	N/A
PM ₁₀	0	0	14	22	18	18	14	14	7	1	1	70
CO	0	0	149	521	486	489	287	288	33	16	16	N/A
Alternative 3												
NO _x	0	0	184*	277*	233*	269*	132*	142*	57*	20	20	50
VOCs	0	0	17	27	24	24	13	13	7	3	2	50
PM _{2.5}	0	0	7	13	12	12	7	7	3	1	1	N/A
PM ₁₀	0	0	10	17	16	16	10	10	5	1	1	70
CO	0	0	161	534	521	524	137	138	57	17	17	N/A
Alternative 5												
NO _x	0	0	187*	279*	232*	268*	183*	193*	54*	41	17	50
VOCs	0	0	18	27	24	24	19	19	7	6	2	50
PM _{2.5}	0	0	9	14	12	12	10	10	3	3	1	N/A
PM ₁₀	0	0	12	18	15	15	12	12	4	3	1	70
CO	0	0	127	540	522	525	491	492	54	37	14	N/A

Source: California High-Speed Rail Authority, 2020

Values marked with an asterisk (*) exceed applicability thresholds

¹ The emissions presented in this table reflect the impact of the Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule, per the California Air Resource Board's "EMFAC Off-Model Adjustment Factors to Account for the SAFE Vehicles Rule Part One" issued on November 20, 2019. https://ww3.arb.ca.gov/msei/emfac_off_model_adjustment_factors_final_Final.pdf.

CCNM = César E. Chávez National Monument

CO = carbon monoxide

NO_x = nitrogen oxide

PM₁₀ = particulate matter smaller than or equal to 10 microns in diameter

PM_{2.5} = particulate matter smaller than or equal to 2.5 microns in diameter

VOC = volatile organic compound

10.3 Construction Impacts within the AVAQMD

Total annual estimated emissions generated within the AVAQMD during the proposed Action's construction period, as presented in the HSR EIR/EIS, are provided in Table 9. As shown in the table, emissions from the construction phase of the Bakersfield to Palmdale Project Section within the AVAQMD would exceed the GC applicability thresholds for NO_x in certain construction years. The maximum estimated annual values of each pollutant, by non-attainment or maintenance area, and the percent of the 2012 estimated emission rates in the AVAQMD (see Table 5) for the Bakersfield to Palmdale construction are as follows:

- NO_x: 177 tpy (2.70%)
- VOCs: 17 tpy (0.29%)
- PM_{2.5}: 9 tpy (0.43%)
- PM₁₀: 11 tpy (0.12%)
- CO: 380 tpy (1.80%)

Table 9 Estimated Annual Average Emissions for the AVAQMD

Pollutants	Emissions (Tons/Year)									Conformity Applicability Thresholds (tons/year)
	2018	2019	2020	2021	2022	2023	2024	2025	2026	
Alternative 1										
NO _x	0	12	69*	72*	63*	50*	17	12	10	25
VOCs	0	2	7	7	6	5	2	2	1	25
PM _{2.5}	0	1	3	3	3	3	1	2	1	N/A
PM ₁₀	0	1	5	5	4	4	2	2	1	N/A
CO	0	7	68	175	169	150	17	11	8	N/A
Alternative 2										
NO _x	0	0	95*	132*	122*	81*	56*	38*	10	25
VOCs	0	0	9	12	12	9	7	5	1	25
PM _{2.5}	0	0	4	6	6	4	3	2	1	N/A
PM ₁₀	0	0	6	8	7	5	4	3	1	N/A
CO	0	0	96	132	122	81	56	38	10	N/A
Alternative 3										
NO _x	0	0	46*	84*	88*	35*	17	10	10	25
VOCs	0	0	3	8	9	3	2	1	1	25
PM _{2.5}	0	0	2	4	5	1	1	1	1	N/A
PM ₁₀	0	0	3	6	6	2	1	1	1	N/A
CO	0	0	53	232	239	39	17	8	8	N/A
Alternative 5										
NO _x	0	0	155*	177*	161*	128*	50*	32*	13	25
VOCs	0	0	16	17	16	13	6	5	2	25
PM _{2.5}	0	0	7	9	8	7	3	1	1	N/A
PM ₁₀	0	0	10	11	11	9	4	1	1	N/A
CO	0	0	177	380	378	357	50	29	11	N/A

Source: California High-Speed Rail Authority, 2020

Values marked with an asterisk (*) exceed applicability thresholds

¹ The emissions presented in this table reflect the impact of the Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule, per the California Air Resource Board's "EMFAC Off-Model Adjustment Factors to Account for the SAFE Vehicles Rule Part One" issued on November 20, 2019. https://ww3.arb.ca.gov/msei/emfac_off_model_adjustment_factors_final_Final.pdf.

CCNM = César E. Chávez National Monument

CO = carbon monoxide

NO_x = nitrogen oxide

PM₁₀ = particulate matter smaller than or equal to 10 microns in diameter

PM_{2.5} = particulate matter smaller than or equal to 2.5 microns in diameter

VOC = volatile organic compound

11 REGIONAL EFFECTS

As shown in Section 3.3-6.3 of the EIR/EIS, the total regional emissions for all of the applicable pollutants are lower during the operations phase of the Action than under No-Build conditions (and will therefore not exceed the *de minimis* emission thresholds). As such, only emissions generated during the construction phase were compared to the conformity threshold levels to determine conformity compliance. Based on the results shown in Table 7, Table 8, and Table 9, regional construction-phase emissions, compared to the General Conformity applicability rates, are summarized below.

11.1 Construction Impacts within the SJVAPCD

- Annual estimated VOC emissions are greater than the applicability rate of 10 tons per year in years 2020 through 2023 for Alternative 1, Alternative 2, and Alternative 5 and in years 2020 through 2022 for Alternative 3.
- Annual estimated CO emissions are less than the applicability rate of 100 tons per year in all years for all Action Alternatives.
- Annual estimated NO_x emissions are greater than the applicability rate of 10 tons per year in years 2018 and 2020 through 2026 for Alternative 1, and 2020 through 2026 for Alternative 2, Alternative 3, and Alternative 5.
- Annual estimated PM₁₀ emissions are less than the applicability rate of 100 tons per year in all years for all Action Alternatives.
- Annual estimated PM_{2.5} emissions are less than the applicability rate of 10 tons per year in all years for all Action Alternatives.
- There are no applicable thresholds for SO₂ annual emissions.

11.2 Construction Impacts within the EKAPCD

- Annual estimated VOC emissions are less than the applicability rate of 50 tons per year in all years for all Action Alternatives.
- Annual estimated NO_x emissions are greater than the applicability rate of 50 tons per year in years 2019 through 2025 for Alternative 1 and in years 2020 through 2024 for Alternative 2, Alternative 3, and Alternative 5.
- Annual estimated PM₁₀ emissions are less than the applicability rate of 70 tons per year in all years for all Action Alternatives.
- There are no applicable thresholds for CO, SO₂, and PM_{2.5} annual emissions.

11.3 Construction Impacts within the AVAQMD

- Annual estimated VOC emissions are less than the applicability rate of 25 tons per year in all years for all Action Alternatives.
- Annual estimated NO_x emissions are greater than the applicability rate of 25 tons per year in years 2020 through 2023 for Alternative 1 and Alternative 3 and in years 2020 through 2025 for Alternative 2 and Alternative 5.
- There are no applicable thresholds for CO, SO₂, PM₁₀, and PM_{2.5} annual emissions.

As such, a General Conformity Determination is required for this Action for VOC, and NO_x for the years during construction where the emissions would exceed the *de minimis* thresholds and do not meet any of the exceptions cited in 40 C.F.R. § 93.154(c). This Final Conformity Determination identified the Authority's commitment to reduce VOC and NO_x emissions through emissions offsets using a VERA with the SJVAPCD, the Air Quality Investment Program with the AVAQMD, and the Emission Banking Certificate Program in the EKAPCD, explained in Section 12.2 below.

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12 GENERAL CONFORMITY EVALUATION

For federal actions subject to a General Conformity evaluation, the regulations delineate several ways an agency can demonstrate conformity (40 C.F.R. § 93.158). This section summarizes the findings that were used to make the determination for the Action.

12.1 Conformity Requirements of Proposed Action

Based on the results shown in Table 7, Table 8, and Table 9, conformity determinations are required for construction-phase emissions for:

- **VOC**—Because annual estimated emissions are greater than the applicability rate of 10 tons per year in years 2020 through 2023 for Alternative 1, Alternative 2, and Alternative 5 and in years 2020 through 2022 for Alternative 3 in the SJVAPCD
- **NO_x**—Because annual estimated emissions are greater than the applicability rate of 10 tons per year in years 2018 and 2020 through 2026 for Alternative 1, and 2020 through 2026 for Alternative 2, Alternative 3, and Alternative 5 in the SJVAPCD; greater than the applicability rate of 50 tons per year in years 2019 through 2025 for Alternative 1 and in years 2020 through 2024 for Alternative 2, Alternative 3, and Alternative 5 in the EKAPCD; and greater than the applicability rate of 25 tons per year in years 2020 through 2023 for Alternative 1 and Alternative 3 and in years 2020 through 2025 for Alternative 2 and Alternative 5 in the AVAQMD

12.2 Compliance with Conformity Requirements

To support this General Conformity Determination, the FRA demonstrates herein that the VOC and NO_x emissions caused by the construction of the proposed Action will not result in an increase in regional VOC and NO_x emissions. This will be achieved by offsetting the VOC and NO_x emissions generated by construction of the HSR in a manner consistent with the General Conformity regulations.

The offsets are anticipated to be accomplished through a VERA between the Authority and the SJVAPCD, the Air Quality Investment Program with the AVAQMD, and the Emission Banking Certificate Program in the EKAPCD. The requirements for the VERA, the Air Quality Investment Program, and the Emission Banking Certificate Program would be implemented as part of the Action as described in the mitigation measure from the EIR/EIS:

AQ-MM#1: Offset Project Construction Emissions through Off-Site Emission Reduction Programs

In 2014, the Authority and the San Joaquin Air Pollution Control District (SJVAPCD) entered into a contractual agreement through a Memorandum of Understanding and a Voluntary Emission Reduction Agreement (VERA). The VERA mitigates (by offsetting) to net zero the project's actual emissions from construction equipment and vehicle exhaust emissions of volatile organic compound (VOC), NO_x, particulate matter (PM₁₀), and PM_{2.5}. The agreement will provide funds for the SJVAPCD's Emission Reduction Incentive Program (SJVAPCD 2011) to fund grants for projects that achieve emission reductions, with preference given to highly affected communities, thus offsetting project-related impacts on air quality. To lower overall cost, funding for the VERA program to cover estimated construction emissions for any funded construction phase will be provided at the beginning of the construction phase. At a minimum, mitigation/offsets will occur in the year of impact, or as otherwise permitted by 40 Code of Federal Regulations (C.F.R.) Part 93 Section 93.163.

The Authority shall also enter into an agreement with the Antelope Valley Air Quality Management District (AVAQMD) and Eastern Kern Air Pollution Control District (EKAPCD) to mitigate (by offsetting) to net zero the project's actual emissions from construction equipment and vehicle exhaust emissions of VOC, NO_x, PM₁₀ and PM_{2.5}. In the AVAQMD, the Authority shall participate in the Air Quality Investment Program, which funds stationary- and mobile-source

emission reduction strategies. In the EKAPCD, the Authority shall provide an application for the Emission Banking Certificate Program.

12.3 Consistency with Requirements and Milestones in Applicable SIP

The general conformity regulations state that notwithstanding the other requirements of the rule, a federal action may not be determined to conform unless the total of direct and indirect emissions from the federal action is in compliance or consistent with all relevant requirements and milestones in the applicable SIP (40 C.F.R. § 93.158(c)). This includes but is not limited to such issues as reasonable further progress schedules, assumptions specified in the attainment or maintenance demonstration, prohibitions, numerical emission limits, and work practice standards. This section briefly addresses how the construction emissions for the Action were assessed for SIP consistency for this evaluation.

12.3.1 Applicable Requirements from USEPA

The USEPA has already promulgated requirements to support the goals of the Clean Air Act with respect to the NAAQS. Typically, these requirements take the form of rules regulating emissions from significant new sources, including emission standards for major stationary point sources and classes of mobile sources as well as permitting requirements for new major stationary point sources. Since states have the primary responsibility for implementation and enforcement of requirements under the Clean Air Act and can impose stricter limitations than the USEPA, the USEPA requirements often serve as guidance to the states in formulating their air quality management strategies.

12.3.2 Applicable Requirements from CARB

In California, to support the attainment and maintenance of the NAAQS, CARB is primarily responsible for regulating emissions from mobile sources. In fact, the USEPA has delegated authority to the CARB to establish emission standards for on-road and some non-road vehicles separate from the USEPA vehicle emission standards, although the CARB is preempted by the Clean Air Act from regulating emissions from many non-road mobile sources, including marine craft. Emission standards for preempted equipment can only be set by the USEPA.

12.3.3 Applicable Requirements from SJVAPCD

To support the attainment and maintenance of the NAAQS in the SJVAB, the SJVAPCD is primarily responsible for regulating emissions from stationary sources. As noted above, SJVAPCD develops and updates its Air Quality Management Plan (AQMP) regularly to support the California SIP. While the AQMP contains rules and regulations geared to attain and maintain the NAAQS, these rules and regulations also have the much more difficult goal of attaining and maintaining the California ambient air quality standards.

12.3.4 Applicable Requirements from EKAPCD

On July 27, 2017, the EKAPCD adopted the 2017 Ozone Attainment Plan for the East Kern County nonattainment area. The Plan demonstrates that the air quality improvement was achieved due to successful implementation of ozone control strategies contained in the region's SIP. It also demonstrates that significant ozone precursor emission reductions that have been impacted in the region are permanent and enforceable. A maintenance plan is also included to ensure that the region would not experience exceedance. The Plan requests a redesignation in accordance with the Federal Clean Air Act (EKAPCD 2017).

12.3.5 Applicable Requirements from AVAQMD

Under CEQA, the AVAQMD is a commenting agency on air quality within its jurisdiction. The CEQA and Federal Conformity Guidelines, released in 2011, are intended to assist persons preparing environmental analysis or review documents for any project within the jurisdiction of the District by providing background information and guidance on the preferred analysis approach. The guidelines include annual and daily GHG emission thresholds of significance for project-generated GHGs and criteria pollutants within the jurisdiction of the AVAQMD (AVAQMD 2011).

12.3.6 Consistency with Applicable Requirements for the Authority

The Authority already complies with, and will continue to comply with, a myriad of rules and regulations implemented and enforced by federal, state, regional, and local agencies to protect and enhance ambient air quality in the SJVAB and MDAB.

In particular, due to the long persistence of challenges to attain the ambient air quality standards in the SJVAB and MDAB, the rules and regulations promulgated by CARB and SJVAPCD are among the most stringent in the U.S.

The Authority will continue to comply with all existing applicable air quality regulatory requirements for activities over which it has direct control and will meet in a timely manner all regulatory requirements that become applicable in the future.

These are appropriate USEPA, CARB, and SJVAPCD rules that are standard practice and BMPs for construction in the SJVAPCD and include control of emissions, exhaust---such as:

- SJVAPCD Rule 2201, New and Modified Stationary Source Review: Rule 2201 applies to new or modified stationary sources and requires that sources not increase emissions above the specified thresholds. If the post-Action stationary source has the potential to emit equal emissions or exceed the offset threshold levels, offsets will be required (SJVAPCD 2006). Stationary sources at the station (such as natural gas heaters) would need to be permitted by the SJVAPCD and would have to comply with best available control technology requirements. Stationary sources such as exterior washing, welding, material storage, cleaning solvents, abrasive blasting, painting, oil/water separation, and wastewater treatment and combustion would require permits. Permits would need to be obtained for equipment associated with these activities from the SJVAPCD and would need to comply with best available control technology requirements.
- SJVAPCD Rule 2280, Portable Equipment Registration requires portable equipment used at project sites for less than 6 consecutive months must be registered with SJVAPCD. The district will issue the registrations 30 days after the receipt of the application (SJVAPCD 1996).
- SJVAPCD Rule 2303, Mobile Source Emission Reduction Credits: The Action may qualify for SJVAPCD vehicle emission reduction credits if it meets the specific requirements of Rule 2303 for any of the following categories (SJVAPCD 1994):
 - Zero-Emission Transit Buses
 - Zero-Emission Vehicles.
 - Retrofit Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles.
 - Retrofit Heavy-Duty Vehicles
- SJVAPCD Rule 4201 and Rule 4202, Particulate Matter Concentration and Emission Rates apply to operations that emit or may emit dust, fumes, or total suspended particulate matter. Particulate emissions from the Action must be less than the specified emissions limit (SJVAPCD 1992a, 1992b).
- SJVAPCD Rule 4301, Fuel Burning Equipment limits the emissions from fuel-burning equipment whose primary purpose is to produce heat or power by indirect heat transfer. The Action will comply with the emission limits (SJVAPCD 1992c).
- Fugitive dust regulations are applicable to outdoor fugitive dust sources. Operations, including construction operations, must control fugitive dust emissions in accordance with SJVAPCD Regulation VIII (SJVAPCD 2004). According to Rule 8011, the SJVAPCD requires the implementation of control measures for fugitive dust emission sources. The Action would also implement the mandatory control measures listed on pages 77 and 78 of the *Guide for Assessing and Mitigating Air Quality Impacts* (GAMAQI) (SJVAPCD 2015) to reduce fugitive dust emissions. These measures are not considered mitigation measures because they are required by the regulation.

Many of the control measures required by the SJVAPCD are the same or similar to the control measures listed in the Statewide Program EIR/EIS. The SJVAPCD Rule 8011 requirements are listed below:

- All disturbed areas, including storage piles, which are not being actively used for construction purposes, will be effectively stabilized for dust emissions using water or a chemical stabilizer/suppressant, or covered with a tarp or other suitable cover or vegetative ground cover.
- All onsite unpaved roads and offsite unpaved access roads will be effectively stabilized for dust emissions using water or a chemical stabilizer/suppressant.
- All land clearing, grubbing, scraping, excavation, land leveling, grading, cut and fill, and demolition activities will be effectively controlled of fugitive dust emissions by utilizing an application of water or by presoaking.
- With the demolition of buildings up to six stories in height, all exterior surfaces of the building will be wetted during demolition.
- All materials transported offsite will be covered or effectively wetted to limit visible dust emissions, and at least six inches of freeboard space from the top of the container will be maintained.
- All operations will limit or expeditiously remove the accumulation of mud or dirt from adjacent public streets at the end of each workday. The use of dry rotary brushes is expressly prohibited except where preceded or accompanied by sufficient wetting to limit the visible dust emissions. Use of blower devices is expressly forbidden.
- Following the addition of materials to, or the removal of materials from, the surface of outdoor storage piles, piles will be effectively stabilized of fugitive dust emissions utilizing sufficient water or a chemical stabilizer/suppressant.
- Within urban areas, trackout will be immediately removed when it extends 50 or more feet from the site and at the end of each workday.
- Any site with 150 or more vehicle trips per day will prevent carryout and trackout.

For projects in which construction related activities would disturb equal to or greater than one acre of surface area, the District recommends a demonstration of receipt of a District approved Dust Control Plan or Construction Notification form, before issuance of the first grading permit, be made a condition of approval.

- SJVAPCD Rule 9510, Indirect Source Review: In December 2005, the SJVAPCD adopted the Indirect Source Rule (Rule 9510) to meet the SJVAPCD's emission reduction commitments in the PM₁₀ and Ozone Attainment Plans (SJVAPCD 2005). Indirect Source Review regulation applies to any transportation project in which construction emissions equal or exceed two tons of NO_x or PM₁₀ per year. Construction of the HSR alignment (specifically, onsite off-road construction exhaust emissions) would be subject to Indirect Source Review. Accordingly, the Authority would have to submit an Air Impact Assessment (AIA) application to the SJVAPCD with commitments to reduce construction exhaust NO_x and PM₁₀ emissions by 20 percent and 45 percent, respectively. Operation of the HSR would be exempt under Sections 4.1 and 4.2 of Rule 9510.
- SJVAPCD CEQA Guidelines: The SJVAPCD prepared the GAMAQI to assist lead agencies and project applicants in evaluating the potential air quality impacts of projects in the SJVAB (SJVAPCD 2015). The GAMAQI provides SJVAPCD-recommended procedures for evaluating potential air quality impacts during the CEQA environmental review process. The GAMAQI provides guidance on evaluating short-term (construction) and long-term (operational) air emissions (Appendix F). The most recent version of the GAMAQI was adopted March 2015 and was used in this evaluation and contains guidance on the following:

- Criteria and thresholds for determining whether a project may have a significant adverse air quality impact.
 - Specific procedures and modeling protocols for quantifying and analyzing air quality impacts.
 - Methods to mitigate air quality impacts.
 - Information for use in air quality assessments and environmental documents that will be updated more frequently, such as air quality data, regulatory setting, climate, and topography.
- EKAPCD Rule 402, Fugitive Dust: The purpose of Rule 402 is to prevent, reduce, and mitigate ambient concentrations of anthropogenic fugitive dust emissions to an amount sufficient to attain and maintain the NAAQS and CAAQS. Controlling fugitive dust when visible emissions are detected may not prevent all PM₁₀ emissions, but will substantially reduce ambient concentrations (EKAPCD 2014).
 - EKAPCD CEQA Guidelines: The EKAPCD adopted the *Guidelines for Implementation of the California Environmental Quality Act of 1970, As Amended*, in 1996 (EKAPCD 2012b). The guidelines include thresholds for criteria air pollutants and guidance on implementation of mitigation measures.
 - AVAQMD Rule 403, Fugitive Dust: The provisions of this rule include actions to prevent, reduce or mitigate fugitive dust particulate matter entrained in the ambient air as a result of man-made sources. The rule limits actions that would result in a source of dust that causes 20 percent opacity or greater during an observation of three minutes or more in any one hour. It also limits PM₁₀ concentrations to under 50 micrograms per cubic meter.
 - AVAQMD Rule 109, Recordkeeping for VOC Emissions: The provisions of this rule shall apply to an owner or operator of a stationary source within the District conducting operations, which include the use of adhesives, coatings, solvents, and/or graphic arts materials, when records are required to determine a District rule's applicability or source's exemption from a rule, rule compliance, or specifically as a Permit to Operate or Permit to Construct condition (AVAQMD 2010).

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13 ESTIMATED EMISSION RATES AND COMPARISON TO *DE MINIMIS* THRESHOLDS – CUMULATIVE ANALYSIS

The study area for cumulative air quality impacts is the SJVAB and the MDAB. While separate projects for purposes of planning the HSR System, construction of the Bakersfield to Palmdale Section would overlap with the construction period for the Merced to Fresno Section and Fresno to Bakersfield Section, thereby adding to the cumulative air quality impacts within the SJVAB. In addition, construction of the Bakersfield to Palmdale Section would overlap with the construction period for the Palmdale to Burbank Section, thereby adding to the cumulative air quality impacts within the MDAB.

For purposes of full disclosure of the potential impacts, the cumulative emissions that could result from potential concurrent construction activities are presented here. As the analysis demonstrates, even where concurrent construction will take place, there would be no new pollutants exceeding the *de minimis* thresholds. In addition, construction period emissions would be offset as a result of the VERA between the Authority and the SJVAPCD, the Air Quality Investment Program with the AVAQMD, and the Emission Banking Certificate Program in the EKAPCD.

The total annual estimated emissions generated within the SJVAB during construction of the Merced to Fresno Section are provided in Table 10 and the total annual estimated emissions generated within the SJVAB during construction of the Merced to Fresno Section are provided in Table 11. The total annual estimated emissions generated within the SJVAB during the construction of the combined Merced to Palmdale sections (Merced to Fresno, Fresno to Bakersfield, plus Bakersfield to Palmdale) are provided in Table 12. As shown in this table, the combined annual construction emissions of the three sections would exceed the thresholds for NO_x in the years 2014 through 2026, VOCs in the years 2014 through 2023, and PM₁₀ in the year 2015.

These values are the peak on-site emissions during each analysis year plus maximum annual off-site emissions. The maximum estimated annual values of each pollutant, by non-attainment or maintenance area, and the percent of the 2012 estimated emission rates in the SJVAB (see Table 3) for the combined (Merced to Palmdale) construction are as follows:

- NO_x: 928 tpy (0.78%)
- VOCs: 54 tpy (0.04%)
- PM_{2.5}: 42 tpy (0.15%)
- PM₁₀: 84 tpy (0.08%)
- CO: 99 tpy (0.03%)

For the Merced to Fresno segment of the HSR system, construction emission rates were estimated in the EIR/EIS for each of the six alternatives/options previously under consideration for the Merced to Fresno Section. However, only those values associated with the Preferred Alternative are included in this Conformity Determination. These values represent the Preferred Alternative with the Avenue 21 wye option, because that option has the highest estimated emissions. If the Avenue 24 wye option is selected, the estimated emission rates will be lower than those presented in this determination.

Portions of the San Jose to Merced and Sacramento to Merced sections of the HSR would also be constructed within the SJVAB. It is possible that the schedule for construction of these sections could overlap with construction of the Merced to Fresno, Fresno to Bakersfield, and Bakersfield to Palmdale sections, contributing to the cumulative annual emissions totals of HSR construction in the SJVAB. Portions of the Palmdale to Burbank sections of the HSR would also be constructed within the MDAB. It is possible that the schedule for construction of this section could overlap with construction of the Bakersfield to Palmdale Section, contributing to the cumulative annual emissions totals of HSR construction in the MDAB.

Table 10 Estimated Annual Average Emissions for the Merced to Fresno Section

	Emissions (Tons/Year)												Conformity Applicability Thresholds (tons/year)
	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	
NO _x	169*	110*	115*	32*	13*	49*	15*	7	4	0	0	0	10
VOCs	15*	11*	8	2	2	11*	2	1	5	0	0	0	10
PM _{2.5}	8	6	4	2	1	3	1	0	2	0	0	0	100
PM ₁₀	13	9	6	4	1	6	2	1	9	0	0	0	100
CO ¹	29	22	11	4	2	5	4	1	1	0	0	0	100

Source: California High-Speed Rail Authority, 2014

Values marked with an asterisk (*) exceed applicability thresholds

¹ Fresno urbanized maintenance area only

CO = carbon monoxide

NO_x = nitrogen oxide

PM₁₀ = particulate matter smaller than or equal to 10 microns in diameter

PM_{2.5} = particulate matter smaller than or equal to 2.5 microns in diameter

VOC = volatile organic compound

Table 11 Estimated Annual Average Emissions for the Fresno to Bakersfield Section

	Emissions (Tons/Year)												Conformity Applicability Thresholds (tons/year)
	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	
NO _x	622*	818*	549*	161*	71*	4	2	80*	1	0	0	0	10
VOCs	24*	43*	34*	9	4	0	0	4	0	0	0	0	10
PM _{2.5} ¹	20	36	29	12	10	7	0	2	0	0	0	0	100
PM ₁₀	51	75*	62	16	15	9	3	4	0	0	0	0	100
CO: Fresno ¹	31	75	66	12	4	1	1	9	0	0	0	0	100
CO: Bakersfield ¹	30	65	58	15	4	1	2	9	0	0	0	0	100

Source: California High-Speed Rail Authority, 2014

Values marked with an asterisk (*) exceed applicability thresholds

¹ Fresno and Bakersfield urbanized maintenance areas only

CO = carbon monoxide

NO_x = nitrogen oxide

PM₁₀ = particulate matter smaller than or equal to 10 microns in diameter

PM_{2.5} = particulate matter smaller than or equal to 2.5 microns in diameter

VOC = volatile organic compound

Table 12 Estimated Annual Average Emissions for the Merced to Palmdale Section

	Emissions (Tons/Year)													Conformity Applicability Thresholds (tons/year)
	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	
NO _x	791*	928*	664*	193*	139*	113*	204*	366*	274*	193*	57*	41*	20*	10
VOCs	39*	54*	42*	11*	11*	17*	20*	32*	29*	19*	7	6	2	10
PM _{2.5}	28	42	33	14	14	13	10	16	14	10	3	3	1	100
PM ₁₀	64	84*	68	20	20	20	19	27	27	15	7	3	1	100
CO: Fresno ¹	60	97	78	16	6	6	5	10	1	0	0	0	0	100
CO: Bakersfield ¹	30	65	58	15	11	2	44	99	90	85	12	7	3	100

Sources: California High-Speed Rail Authority, 2014, 2020

Values marked with an asterisk (*) exceed applicability thresholds

¹ Fresno and Bakersfield urbanized maintenance areas only

CO = carbon monoxide

NO_x = nitrogen oxide

PM₁₀ = particulate matter smaller than or equal to 10 microns in diameter

PM_{2.5} = particulate matter smaller than or equal to 2.5 microns in diameter

VOC = volatile organic compound

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14 REPORTING AND PUBLIC COMMENTS

To support a decision concerning the Federal Action, the FRA issued a Draft General Conformity Determination for public and agency review for a 30-day period as required by 40 C.F.R §§93.155 and 93.156. In developing the analysis underlying this general conformity determination, the Authority has consulted with the SJVAPCD, EKAPCD, and AVAQMD on a variety of technical and modeling issues. The Authority has also consulted with USEPA and CARB on the overall approach to general conformity.

14.1 Availability of Final General Conformity Determination

FRA will provide copies of this Final General Conformity Determination to the appropriate regional offices of USEPA, CARB, SJVAPCD, EKAPCD, and AVAQMD. The Final General Conformity Determination is available at <http://www.regulations.gov>, Docket No. FRA-2021-0046, and on FRA's website at <https://railroads.dot.gov/environment/environmental-reviews/clean-air-act-california-general-conformity-determinations>.

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15 FINDINGS AND CONCLUSIONS

As part of the environmental review of the proposed Action, FRA conducted a General Conformity evaluation pursuant to 40 C.F.R. Part 93 Subpart B. The General Conformity regulations apply at this time to this Federal Action because the Action is located in an area that is designated as an extreme nonattainment area for the 8-hour ozone standard, nonattainment for PM_{2.5}, and a (partial) maintenance area for PM₁₀ and CO. The FRA conducted the General Conformity evaluation following all regulatory criteria and procedures and in coordination with USEPA, SJVPCD, EKAPCD, AVAQMD, and CARB. As a result of this review, the FRA concluded, based on the fact that Action-generated emissions will either be fully offset (for construction phase) or less than zero (for operational phase), that the proposed Action's emissions can be accommodated in the SIP for the SJVAB. FRA has determined that the proposed Action as designed will conform to the approved SIP, based on:

- A commitment from the Authority that construction-phase NO_x and VOC emissions will be offset consistent with the applicable federal regulations through a VERA with the SJVAPCD, the Air Quality Investment Program in the AVAQMD, and the Emission Banking Certificate Program in the EKAPCD.
- The SJVAPCD, EKAPCD, and AVAQMD will seek and implement the necessary emission reduction measures, using Authority funds.
- The SJVAPCD, EKAPCD, and AVAQMD will serve in the role of administrator of the emissions reduction projects and verifier of the successful mitigation effort.

Therefore, FRA concludes that the proposed Action, as designed, conforms to the purpose of the approved SIP and is consistent with all applicable requirements.

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17 PREPARER QUALIFICATIONS

Amy Fischer, Senior Air Quality Scientist, Ms. Fischer has a B.S. in Environmental Policy Analysis from the University of Nevada, Reno. With 20 years of experience, Amy Fischer serves as a senior air quality and greenhouse gas emissions specialist qualified to conduct analyses for a variety of infrastructure projects. Ms. Fischer is the technical lead on air quality and climate change impact analyses documents and oversees the research, and preparation of technical reports. She is skilled in air quality assessment models including: The California Emissions Estimator Model (CalEEMod), Emission Factor models (EMFAC/OFFROAD), Road Construction Estimator Model (RoadMod) and Line Dispersion Models (CALINE).

Tin Cheung, Senior Air Quality Scientist, Mr. Cheung graduated with a bachelor's degree in Environmental Studies and Geography from the University of California at Santa Barbara. He is a Senior Air Quality Scientist with 23 years of experience in the preparation of air quality and noise studies. He has worked on a multitude of small and large projects and is extremely proficient in quantitative computer models which include USEPA's AERMOD air pollutant dispersion model, the California Emissions Estimator Model (CalEEMod), CARB's EMFAC emission factor model, SMAQMD's Road Construction Emissions Model, Caline4 roadway air pollutant dispersion model and numerous other air quality and noise models.

Matthew Long, MEng, MPP, Senior Environmental Scientist, prepared the greenhouse gas analyses for this project. Matthew holds a Master's Degree in Environmental Science from the Yale School of Forestry and Environmental Studies and a Master's Degree in Public Policy from the Luskin School of Public Affairs at UCLA. He also has over 9 years of professional consulting experience providing CEQA/NEPA analysis for large infrastructure projects, including electrical transmission projects, flood control projects, and commercial-scale renewable energy development projects. Recently, Mr. Long provided management support and revised the Geology and Soils and Noise analyses for the BLM's LUPA and Final EIS for the Desert Renewable Energy Conservation Plan.

Cara Carlucci, Planner, Ms. Carlucci holds a B.S. in City & Regional Planning with a minor in Real Property Development from California Polytechnic State University, San Luis Obispo. At LSA, she provides planning and technical assistance to project managers on a variety of planning and environmental documents including environmental assessments, initial studies, and environmental impact reports. She has contributed to the CEQA air quality analysis for residential, commercial, and infrastructure projects, as well as stand-alone air quality impact studies.

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APPENDIX A: FINAL GENERAL CONFORMITY DETERMINATION COMMENTS AND RESPONSES

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/ Comment

PUBLIC SUBMISSION

Comment from Antje Lauer

Posted by the **Federal Railroad Administration** on May 21, 2021

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Comment

Have you considered testing the soil that you disturb for the presence of *Coccidioides immitis*, the Valley fever fungus? Graded soil left behind after construction is completed bears a risk for the public to contract coccidioidomycosis when fugitive dust emerges from these sites during the dry season or when the trains rush by. We have seen the spike in Valley fever incidence in the Lancaster area (Northern Los Angeles County), after numerous large scale solar plants were built, and the soil was left bare of any protection. Bakersfield is in the highly endemic area of the pathogen. Just educating the workers about the risk of contracting Valley fever (as required by law) and moistening the soil during construction is only a short term strategy to reduce the risk of contracting coccidioidomycosis on site during the construction process. Dust emerging from these disturbed sites can be carried by the wind to places far away and poses a risk for the general public living close by and further away that should not be underestimated. There are labs that perform soil testing for *Coccidioides*. If the pathogen is detected, the soil should be revegetated to reduce the risk of dust emerging from these sites. You can contact me if you like to learn more.

Thanks for reading my comment.

Sincerely,

Antje Lauer (Professor and Microbiologist, CSU Bakersfield)

Attachments 1

[Download \(https://downloads.regulations.gov/FRA-2021-0046-0003/attachment_1.pdf\)](https://downloads.regulations.gov/FRA-2021-0046-0003/attachment_1.pdf)

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Combining Forces - The Use of Landsat TM Satellite Imagery, Soil Parameter Information, and Multiplex PCR to Detect *Coccidioides immitis* Growth Sites in Kern County, California

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Abstract

Coccidioidomycosis is a fungal disease acquired through the inhalation of spores of *Coccidioides* spp., which afflicts primarily humans and other mammals. It is endemic to areas in the southwestern United States, including the San Joaquin Valley portion of Kern County, California, our region of interest (ROI). Recently, incidence of coccidioidomycosis, also known as valley fever, has increased significantly, and several factors including climate change have been suggested as possible drivers for this observation. Up to date details about the ecological niche of *C. immitis* have escaped full characterization. In our project, we chose a three-step approach to investigate this niche: 1) We examined Landsat-5-Thematic-Mapper multispectral images of our ROI by using training pixels at a 750 m × 750 m section of Sharktooth Hill, a site confirmed to be a *C. immitis* growth site, to implement a Maximum Likelihood Classification scheme to map out the locations that could be suitable to support the growth of the pathogen; 2) We used the websoilsurvey database of the US Department of Agriculture to obtain soil parameter data; and 3) We investigated soil samples from 23 sites around Bakersfield, California using a multiplex Polymerase Chain Reaction (PCR) based method to detect the pathogen. Our results indicated that a combination of satellite imagery, soil type information, and multiplex PCR are powerful tools to predict and identify growth sites of *C. immitis*. This approach can be used as a basis for systematic sampling and investigation of soils to detect *Coccidioides* spp.

Citation: Lauer A, Talamantes J, Castañón Olivares LR, Medina LJ, Baal JDH, et al. (2014) Combining Forces - The Use of Landsat TM Satellite Imagery, Soil Parameter Information, and Multiplex PCR to Detect *Coccidioides immitis* Growth Sites in Kern County, California. PLoS ONE 9(11): e111921. doi:10.1371/journal.pone.0111921

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Competing Interests: The authors have the following interest: This study was partly funded by Chevron (Research Experience Vitalizing Science Undergraduate Program [REVS-UP]) at CSUB. There are no patents, products in development or marketed products to declare. This does not alter the authors' adherence to all the PLOS ONE policies on sharing data and materials, as detailed online in the guide for authors.

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Introduction

Valley fever research has predominantly focused on the medical and epidemiological aspects of *Coccidioides immitis* and *Coccidioides posadasii*, the fungi that cause coccidioidomycosis ([1,2], and references therein). *Coccidioides* spp. can have a complete life cycle as soil dwelling organisms but if the soil is disturbed, their arthroconidia can become air-borne and are able to infect a host via the respiratory tract. About 60% of infected patients report no symptoms [3]; about 25% exhibit severe flu-like symptoms, such as cough, sputum, fever, and muscle aches; the remaining 15% become very ill with pneumonia-like symptoms (e.g. pleurisy and heavier sputum) requiring medication and bed rest. In a small number of cases (about 0.5–1%), the disease disseminates beyond the lungs to e.g. the skin, bones, and/or meninges of the brain, and the disease can be fatal. Certain sectors of the population seem to

be more susceptible to infection, such as the very young, persons newly arrived to the endemic areas (since immunity develops with infection), field-, and construction workers, and those with impaired immune systems [4].

Coccidioides spp. are endemic in the southern part of the San Joaquin Valley in California, southern California, the southern part of Arizona, New Mexico and Texas, most of northern Mexico, and some areas in Guatemala, Honduras, Venezuela, northeastern Brazil, Argentina, and Paraguay [5,6]. Given its geographic distribution, it is evident that *C. posadasii* is able to flourish in desert regions of the Americas (besides California), in contrast to its close relative *C. immitis* which seems to be restricted to areas in California. Of the two fungal species, it is *C. immitis* which afflicts the San Joaquin Valley portion of Kern County, California [7,8] which is the Region of Interest (ROI) of this study. However, population genomic sequencing of *Coccidioides* spp.

revealed recent hybridization between both species [9], and nothing is known about the distribution and ecology of these hybrids.

It is reasonable to expect that climatic fluctuations might affect the rate at which humans become infected [4]. For example, an extended drought might decimate less heat tolerant, non-sporeforming soil microorganisms that had acted as natural antagonists to the pathogen in its natural environment. A wetter than-normal rainy season could help *Coccidioides* spp. bloom, and windy spells might facilitate the dispersal of its arthroconidia. The “grow and blow” hypothesis has first been introduced by Comrie and Glueck [10]. It has long been surmised that *Coccidioides* spp. are generally poor competitors [11], but that they are more heat-resistant than competing microorganisms – thus, it can be expected that hot summers might favor its presence or dominance. Indeed, anecdotal evidence to these effects is well documented in the literature [12–20]. There have been a number of attempts at demonstrating this connection quantitatively with various degrees of success [10,11,21–25]. Yet, despite extensive study, there is currently no ecologically consistent link identified between the environment and coccidioidomycosis rates [26]. The predicted warming of the climate in California will add another piece of the puzzle in the already complicated interrelationships of environmental factors that might support or suppress the growth of pathogens with environmental reservoirs [27,28]. However, occasionally, the pathogen was detected in other regions, such as the recent detection of *Coccidioides immitis* in soils of Eastern WA [29].

There also have been several attempts to characterize the ecological niche of *Coccidioides* spp. in more detail [4,31–33], but we still do not have a complete description of this niche. To date, Fisher et al. [31] present the most comprehensive review of this subject. We need to direct attention to a few fundamental points about what is known in regards to this niche. First, it is important to realize that *C. immitis* and *C. posadasii* do not grow in disturbed soils [4,30,31] such as cultivated fields, gardens, etc. Second, whereas it was initially thought that *Coccidioides* spp. ecological niche corresponds to the Lower Sonoran Life Zone (as defined and described by Merriam [34]), or similar environments [14,35,36]. Later research [30] showed that this is not quite correct, and indeed more recent works [31,32,37,38] suggested that the fungus’s niche corresponds more closely with thermic and hyperthermic soils in which temperatures can reach or exceed 22°C in 50 cm depth. Fisher et al. [31] described sites where *Coccidioides* spp. were suspected to have been present because humans or animals were reported to have been infected at these sites. Fisher et al. [31] also made the general observations that the vegetation at those sites ranged from sparse to relatively thick cover in lower Sonoran Deserts, Chaparral-upper Sonoran brush and grasslands, as well as Mediterranean savannas and forested foothills. Furthermore, they stated that the temperature regimes, climate conditions in general, and soil textures are the only indicative variables of the presence of *Coccidioides* spp. Microbial diversity in soils is highly influenced by the habitat’s chemical and physical parameters. But biotic soil factors such as plant and microeukaryote diversity influence fungal and bacterial soil communities as well through root exudation (additional available nutrients), microbial antagonism (antibiotic production) and synergism, as well as through selective grazing by microeukaryotes [32,39–40]. It is currently being discussed that the pathogen is in fact not very competitive as a soil saprophyte because it has lost the ability to produce a variety of enzymes that are involved in important biodegradation processes of soil organic matter, which might explain the difficulty to detect it in bulk soil [41].

There are few published data available about the distribution of *C. immitis* growth sites in Kern County, California [42] most probably because it has been very difficult in the past to isolate and identify *Coccidioides* spp. from soil and dust samples [4,14,30]. Recently, first attempts using molecular biological techniques to identify *C. immitis* in bulk soil samples from Kern County, predominantly around Bakersfield, have been performed [32]. Based on that study, it appeared that *C. immitis* is likely to be found in the Bakersfield area at locations that are non-agricultural and have about equal parts of sand, clay, and silt (clay loam), a pH between 7.8 and 8.5, an available water capacity of about 0.15–0.2 cm/cm, a water content of about 30% (1/3 bar), an available water supply (0–25 cm) of 4–5 cm, and a Cation Exchange Capacity (CEC7) of over 20 milliequivalents per 100 grams.

The idea of using remote sensing (RS) techniques to piece together environmental characteristics, environmental change, and their relationship to disease transmission has been used extensively in connection with other diseases such as malaria [43], cholera [44], and African trypanosomiasis [45]. Even though the ecological niche of *C. immitis* is not well characterized, we present here a RS technique that allows the mapping of sites around Bakersfield, California, where the pathogen is suspected to grow based on data obtained in a previous study by Lauer et al. [32]. Our method utilized a location well-known for being a *C. immitis* growth site (Sharktooth hill [STH], Bakersfield, California) as a basis, and then examined satellite images of the ROI to find all locations with similar spectral signatures. This is similar to characterizing the growth sites by the vegetation that tends to grow in the same environment as *C. immitis*, using the vegetation type as a marker. This is reasonable because the vegetation type closely reflects the co-variation of the relevant physical and chemical parameters such as clay and sand content, temperature, pH, nutrients, water content, etc., and also affects the development of the microbial diversity in the soils [46].

To validate our approach, we investigated if a combination of remote sensing and soil parameter information can predict locations which might be suitable to support the growth of *C. immitis*, followed by a molecular biological approach to detect the fungus in these soils with a culture independent polymerase chain reaction (PCR) based method [32,47].

Material and Methods

No specific permissions were required for the soil sampling. Our field study did also not involve endangered or protected species.

Multispectral image analysis

Landsat-5 Thematic Mapper (TM) L1G corrected multispectral images were downloaded from the United States Geological Survey archive (<http://EarthExplorer.usgs.gov>). The satellite relayed a continuous data stream which was then framed into individual scenes each 23.92 sec (see, e.g., <http://landsat.gsfc.nasa.gov/about/wrs.html>). The images for path 42, rows 35 and 36: Worldwide Reference System to cover our ROI were downloaded, and then the two images were mosaicked. Most of the analysis that is presented here was performed on a spatial subset of this mosaicked image. This subset corresponds to an area approximately one million hectares that covers the San Joaquin Valley portion of Kern County. Our work mainly focused on a multispectral image taken on April 20, 2008 at 10:23 PM local time. This image was chosen because it was obtained at a date (during spring) where microbial activity and biomass in the soil is generally considered high, because of supportive environmental parameters, such as moderate temperatures and increased water

Table 1. Location and description of sampling sites used as test data for the remote sensing approach.

sampling sites and year sampled	coordinates	soil type (map unit symbol)	GS or AS of the pathogen	rodent activity*
Bakersfield city				
1. CSUB Children Center ('08, '09)	119° 06' 29.0'' W, 35° 20' 57.0'' N	Wasco sandy loam (243)	AS	yes
2. Belle Terrace/P Str. ('11)	119° 00' 37.2'' W, 35° 20' 49.8'' N	Kimberlina Urban land, Cajon-complex (180)	GS	no
3. Belle Terrace/Gay Str. ('11)	118° 59' 22.7'' W, 35° 20' 40.0'' N	Kimberlina Urban land, Cajon-complex (180)	GS	yes
4. Marella Way ('11)	118° 63' 15.0'' W, 35° 21' 40.0'' N	Kimberlina Urban land, Cajon-complex (180)	NS	no
5. Flood Plain CSUB ('08, '09)	119° 06' 05.0'' W, 35° 21' 16.0'' N	River Wash (229)	AS	no
SW Bakersfield				
6. Bike Path West ('08, '09)	119° 15' 06.0'' W, 35° 18' 20.0'' N	Cajon sandy loam (125)	NS	yes
7. Lake Webb ('08, '09)	119° 16' 27.0'' W, 35° 13' 53.0'' N	Zalvidea sandy loam (240)	AS	no
8. Cole's Levee Rd. I ('08, '09, '11)	119° 13' 60.0'' W, 35° 14' 08.0'' N	Garces loam (180)	GS	yes
9. Cole's Levee Rd. II ('11)	119° 13' 65.3'' W, 35° 14' 09.7'' N	Garces loam (180)	GS	yes
10. Olen Avenue ('11)	119° 14' 50.0'' W, 35° 14' 72.0'' N	Garces loam (180)	GS	yes
11. Valley Street Field ('08, '09)	118° 52' 18.0'' W, 35° 24' 29.0'' N	Delano sandy loam (139)	AS	no
NE Bakersfield				
12. Across CALM ('11)	118° 53' 14.1'' W, 35° 25' 50.3'' N	Chanac Clay Loam (130)	GS	yes
13. Ant Hill Oil Field ('08, '09, '11)	118° 51' 25.0'' W, 35° 23' 50.0'' N	Chanac Clay Loam (131)	GS	yes
14. Round Mt. Rd. I ('08, '09)	118° 52' 20.0'' W, 35° 27' 10.0'' N	Xeric Torriorthents-Calcic Haploxerept association (174)	AS	yes
15. Round Mt. Rd. II ('08, '09)	118° 53' 30.0'' W, 35° 28' 42.0'' N	Xeric Torriorthents-Calcic Haploxerept association (174)	NS	yes
16. Sharktooth hill I	118° 55' 03.4'' W, 35° 27' 44.5'' N	Chanac Pleito Premier Association (305)	nd	yes
17. Sharktooth hill 2	118° 54' 37.0'' W, 35° 28' 20.0'' N	Pleito Trigo Chanac Complex (205)	GS	yes
18. Sharktooth hill 3	118° 54' 33.0'' W, 35° 28' 21.3'' N	Pleito Trigo Chanac Complex (205)	GS	yes
NW Bakersfield				
19. Acari Rd. ('11)	119° 15' 26.8'' W, 35° 23' 16.1'' N	Garces silt loam (156)	NS	no
20. Elementary Lne. ('11)	119° 15' 16.1'' W, 35° 25' 20.5'' N	Panoche clay loam (211)	GS	no
21. Beech Str. ('11)	119° 15' 43.5'' W, 35° 26' 39.6'' N	Garces silt loam (156)	GS	yes
Wasco				
22. Gun Club Rd.('11)	119° 29' 54.0'' W, 35° 39' 34.9'' N	Garces silt loam (156)	NS	yes
23. McCoy Rd. ('11)	119° 31' 34.3'' W, 35° 37' 24.8'' N	Garces silt loam (156)	NS	yes
Arvin				
24. Di Giorgio Rd. ('11)	118° 57' 28.7'' W, 35° 15' 06.6'' N	Garces loam (180)	GS	yes
25. Bear Mt. Rd. ('11)	118° 57' 05.9'' W, 35° 12' 30.0'' N	Garces loam (180)	GS	yes

Growth sites (GS), accumulation sites (AS) and negative sites (NS) were determined by multiplex PCR results, nd: not determined.

* Proof of rodent activity was observed in the immediate neighborhood of the sampling site. Soil disturbing activity was also observed by burrowing owls, coyotes, kit foxes, spiders or large ants at some locations. The dominant rodents observed were ground squirrels, kangaroo rats and hares.

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content. Furthermore, this image had 0% cloud cover. Our analysis started by defining a 25 pixel ×25 pixel area centered at latitude 35° 28' 20.29'' N, and longitude 118° 54' 37.04'' W. This location is at STH, an area where *C. immitis* has been repeatedly detected ([30,31,48], this study). These 625 pixels were used to train the algorithm, and thus, they define a spectral class which is referred to in what follows as the "STH-vegetation class". To implement the Maximum Likelihood Classification (MLC) method distributed (Richards & Jia, 2006), TM bands 1 (0.45–0.52 μm, blue-green), 2 (0.52–0.60 μm, green), 3 (0.63–0.69 μm, red), 4 (0.76–0.90 μm, near infrared), 5 (1.55–1.75 μm, mid infrared), and 7 (2.08–2.35 μm, mid infrared) were used. Band 6 (10.40–12.50 μm, thermal infrared) was not used in our MLC scheme because the resolution was 60 m instead of the 30 m (as it is for the other bands). However, this band was used to compute surface temperatures as described in more detail below. Our MLC scheme then entailed computing, for each of the pixels in the ROI, the

probability that it belonged to the STH-vegetation class. This probability was assumed to be normally distributed [49], and thus is given by

$$p(x) = \frac{1}{(2\pi)^{N/2} |\Sigma|^{1/2}} e^{-\frac{1}{2} (x-m)^T \Sigma^{-1} (x-m)}$$

where \mathbf{x} is a vector location in pixel space, $N = 6$ is the dimensionality of pixel space, Σ the covariance matrix of the distribution, and \mathbf{m} is the mean position of the spectral class. (\mathbf{m} and Σ are computed from the training pixels). A threshold value was set at p_0 , meaning that if a pixel had a probability $p \geq p_0$ of being in the STH-vegetation class, then the pixel was put into this

Kern County 4-20-2008

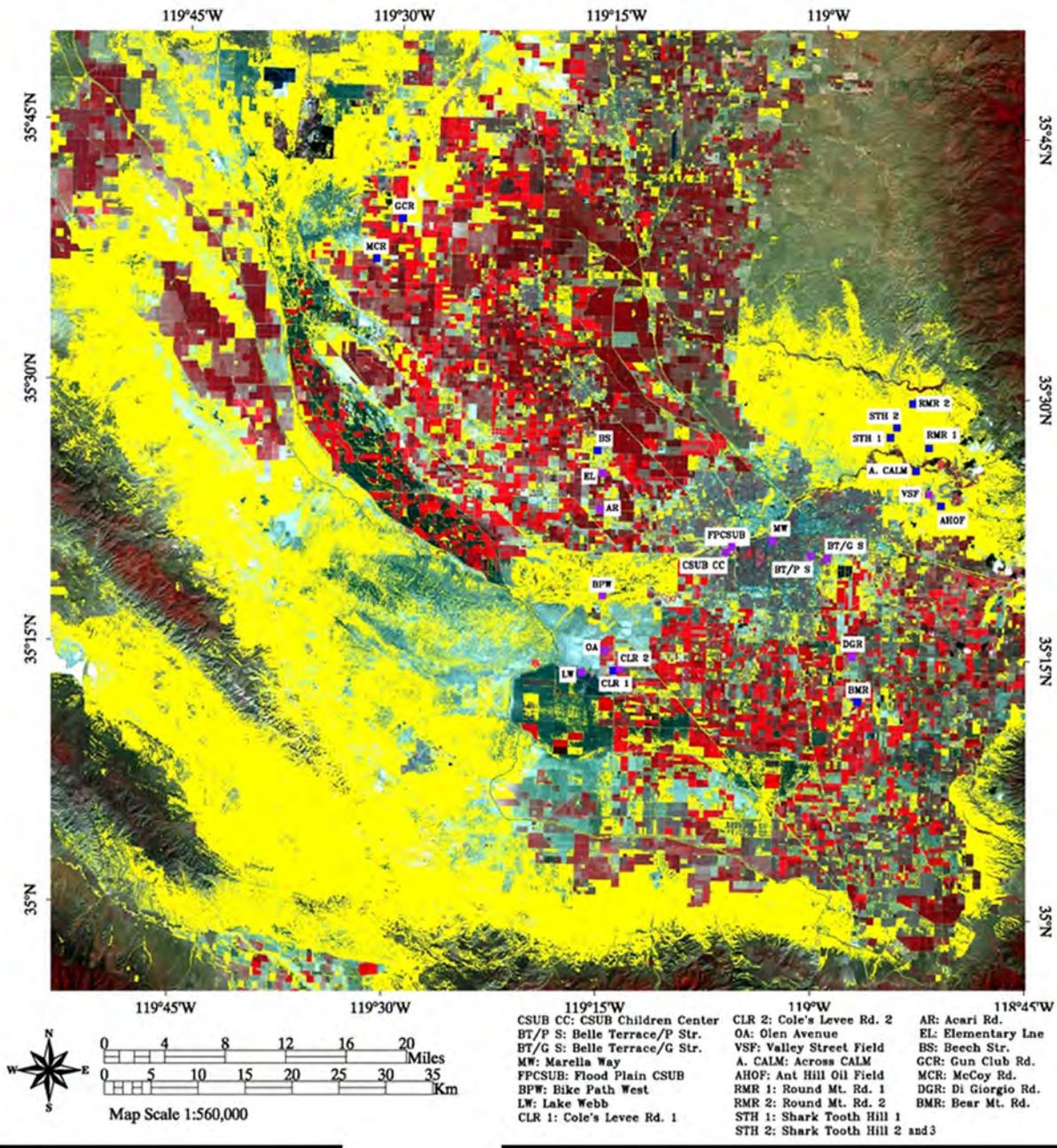


Figure 1. False color image of the ROI on April 20, 2008. Yellow pixels indicate locations in the STH-vegetation class, $p_0=0.95$ and $f=0.32$. doi:10.1371/journal.pone.0111921.g001

spectral class. Otherwise ($p < p_0$) the pixel was simply left unclassified. Clearly, as the parameter p_0 decreased, the fraction f of pixels in the ROI which belong to the STH-vegetation class increased. This is because pixels which are less and less like the training pixels get included into this class.

It was also investigated how much p_0 needed to be reduced from 1 until the sites which tested positive for *C. immitis* came into the STH-vegetation class. This served to calibrate the method and as a validation step. Clearly, if the *C. immitis*-positive sites get included in the STH-vegetation class for $p_0 \lesssim 1$, then our method is robust.

However, if our *C. immitis*-positive sites remain unclassified until $p_0 \gtrsim 0$, then our spectral class is poorly defined.

Lastly, we determined the area (km²) that was characterized by vegetation that belonged into the STH-vegetation class over the sampling period and until early 2014 using landsat images and the software ENVI 5.1+IDL 8.3.

Surface temperatures

Surface temperature variations across the ROI were of interest as well. In addition to utilizing a vegetation class to assess potential

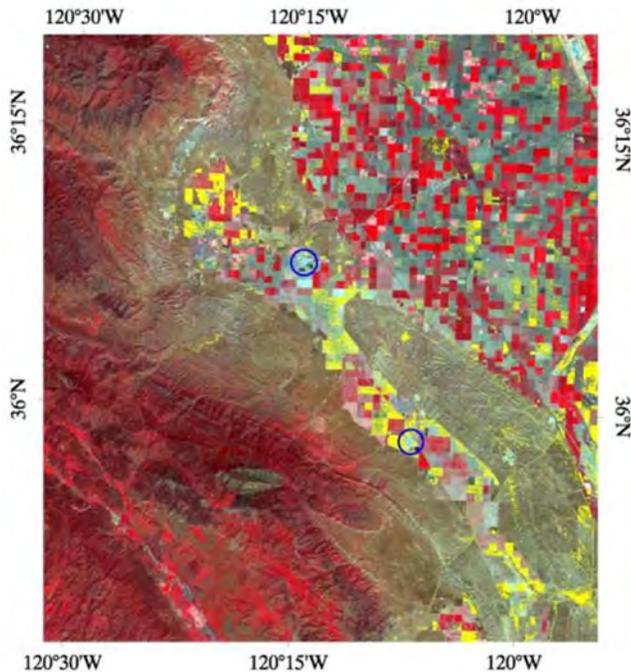


Figure 2. False color image of two San Joaquin Valley prisons. STH-vegetation class pixels are shown in yellow. The circles indicate the location of the prisons. Upper left: Pleasant Valley State Prison in Fresno County, California. Lower right: Avenal State Prison in Kings County, California. Images were taken on April 20, 2008. Maximum Likelihood Classification scheme was used with $p_0 = 0.95$. doi:10.1371/journal.pone.0111921.g002

sites for *C. immitis* growth, surface temperature variations across the ROI may also help to characterize the niche of this fungus. Landsat-5 TM-6 is an infrared band. This band (from the same April 20, 2008 image) was used as follows to examine the thermal landscape of our ROI. The same area in STH was taken as training pixels, and their average \bar{x} and standard deviation σ were computed. Then, a simple parallelepiped method [49] was used to find other locations in the ROI with similar values. Thus, all pixels whose value was in the ranges $(x - n\sigma, x + n\sigma)$, $n = 1, 2, 3$ were put into this spectral class, and we referred to this as the “STH-thermal” class. All other pixels were left unclassified. The image’s digital numbers were converted to temperatures by applying the procedure described in the National Aeronautics and Space Administration’s Landsat 7 Science Data Users Handbook (<http://landsathandbook.gsfc.nasa.gov/>). See also Chander & Markham [50] for details. As a result, a map was obtained where the surface temperature was close to STH at the time the image was taken.

Weather data

Precipitation data for the Southern San Joaquin Valley was obtained from the California Data Exchange Center (http://cdec.water.ca.gov/snow_rain.html). The cumulative monthly precipitation (inches) over time was assembled from 5 stations (Calaveras Big Trees [CVT], Hetch Hetchy [HTH], Yosemite HQ [YSV], North Fork RS [NFR], and Huntington Lake [HNT]). A more detailed analysis of the weather data for Bakersfield in particular was not the focus of this study.

Physical and chemical soil parameters

To determine physical and chemical soil parameters of all soil samples, the websoilsurvey database of the United States Department of Agriculture (<http://websoilsurvey.nrcs.usda.gov/>) was used. Furthermore, all sampling sites were characterized by using the soil series extent mapping tool from the website of the Center of Environmental Informatics (CEI) (http://www.cei.psu.edu/cei_wp/). Thus, through agricultural and environmental support tools available from the USDA and CEI websites, our sampling sites were further characterized in regard to land use and vegetation. Additional geological information was obtained as well, such as the distribution of certain soil types and series in California. By using the soil series extent mapping tool, our soil samples were linked to known soil series and soil groups that are characteristic for the Southern San Joaquin Valley and beyond.

Soil sampling sites

Soil physical and chemical parameters that could likely support the growth of the pathogen based on results of the study by Lauer et al. [32] were used to choose 13 new sites that were investigated in winter and spring 2011 (Jan–Apr). Additionally, two sites that were found to be strong growth sites of the pathogen in 2008/2009 were also investigated again in 2011. Six sites where the pathogen was not detected were included in this study as well. Sampling sites included in this study were all non-agricultural silt, clay or sandy loams that differed in regard to physical and chemical parameters. All sites were located within the Central Valley Portion of Kern County. Overall, 23 sites were investigated in this study by satellite imagery and multiplex PCR. Two additional sites from STH were investigated by satellite imagery only (reference sites). Based on information from the USDA websoilsurvey database, the soils belonged to 13 different soil map units. Samples were taken each month in 2008, 2009 and 2011 (some sites were not sampled in 2011) from three different depths (0–2 cm, 5–7 cm, and 18–20 cm), placed on ice during transport to the lab, and frozen at -80°C when not processed immediately. See table 1 for detailed information about all sites, including exact location, soil type, observed rodent activity and indication of the presence or absence of *C. immitis*. Also see the first column of table two for the year they were investigated. Our sampling sites were not chosen based on Landsat imagery. They were chosen mainly based on the percentage of clay in the soil as indicated by the USDA websoilsurvey database. About 30% of clay had been indicative of a potential *C. immitis* positive site based on previous research [32]. After results from the multiplex PCR approach became available, we evaluated if sites where *C. immitis* was detected correlate with sites indicated by Landsat imagery to fall into STH vegetation sites.

DNA extraction and multiplex Polymerase Chain Reaction (PCR)

DNA was extracted from well-mixed soil samples (two replicates) using the MoBio PowerSoil DNA Isolation Kit (MoBio Laboratories, Solana Beach, CA) following the manufacturer’s protocol. The multiplex PCR approach developed by Greene et al. [47] and optimized for the detection of *C. immitis* from soil DNA by Lauer et al. [32] was used to determine the presence of fungi in general and specifically *C. immitis* in all soil samples with two primer pairs. Primer pair ITSC1A/ITS C2 (18S ribosomal intertranscribed spacer [ITS] region, 223 bp), which is specific for *C. immitis*, was used in combination with primer pair RDS478/RDS482 (18S ribosomal gene, 650 bp) which amplifies 18S rDNA from all fungi. The ITS region was chosen due to its high

Table 2. Probability that the sites fall in the STH-vegetation class, as predicted by Landsat data.

sampling sites and year sampled	$P_0 = 0.90$			$P_0 = 0.95$			
	4/20/08	4/23/09	4/26/10	4/29/11	4/20/08	4/26/10	4/29/11
Bakersfield city							
1. CSUB Children Center ('08, '09)	N	N	N	N	N	N	N
2. Belle Terrace/P. Str. ('11)	Y	N	N	N	N	N	N
3. Belle Terrace/Gay Str. ('11)	N	N	Y	N	N	N	N
4. Marella Way ('11)	N	N	N	N	N	N	N
5. Flood Plain CSUB ('08, '09)	N	N	N	N	N	N	N
SW Bakersfield							
6. Bike Path West ('08, '09)	N	N	N	N	N	N	N
7. Lake Webb ('08, '09)	N	N	N	N	N	N	N
8. Cole's Levee Rd. I ('08, '09, '11)	Y	Y	Y	Y	Y	Y	Y
9. Cole's Levee Rd. II ('11)	Y	Y	Y	Y	Y	Y	Y
10. Olen Avenue ('11)	N	N	N	N	N	N	N
11. Valley Street Field ('08, '09)	N	N	N	N	N	N	N
NE Bakersfield							
12. Across CALM ('11)	Y	Y	N	N	Y	Y	N
13. Ant Hill Oil Field ('08, '09, '11)	Y	Y	Y	N	Y	Y	N
14. Round Mt. Rd. I ('08, '09)	Y	Y	Y	N	Y	Y	N
15. Round Mt. Rd. II ('08, '09)	Y	Y	N	N	Y	Y	N
16. Sharktooth hill 1	Y	Y	Y	Y	Y	Y	Y
17. Sharktooth hill 2	Y	Y	Y	Y	Y	Y	Y
18. Sharktooth hill 3 ('11)	Y	Y	Y	Y	Y	Y	Y
NW Bakersfield							
19. Acari Rd. ('11)	N	N	N	N	N	N	N
20. Elementary Lne. ('11)	N	N	N	N	N	N	N
21. Beech Str. ('11)	N	Y	N	Y	N	Y	Y
Wasco							
22. Gun Club Rd. ('11)	Y	Y	Y	Y	Y	Y	Y
23. McCoy Rd. ('11)	Y	Y	Y	Y	Y	Y	Y
Arvin							
24. Di Giorgio Rd. ('11)	N	Y	N	N	N	Y	N
25. Bear Mt. Rd. ('11)	Y	N	N	N	Y	N	N
Fraction of area covered by class (%)	35	42	24	28	32	39	26

(Y = in class [indicated in bold], N = not in class).
 nd* = not determined in this study.
 nd** = not determined in this study, but confirmed as growth site by Swatek (1970).
 growth site* = sites where *C. immitis* was detected at least twice in a deeper soil layer during the late winter/spring (February-May).
 accumulation site* = the pathogen could only be detected on the surface of the sampling site and never in a deeper soil layer over a several year period.
 negative site* = the pathogen could not be detected in any of the soil samples using the multiplex PCR method as described in this study.
 doi:10.1371/journal.pone.0111921.t002

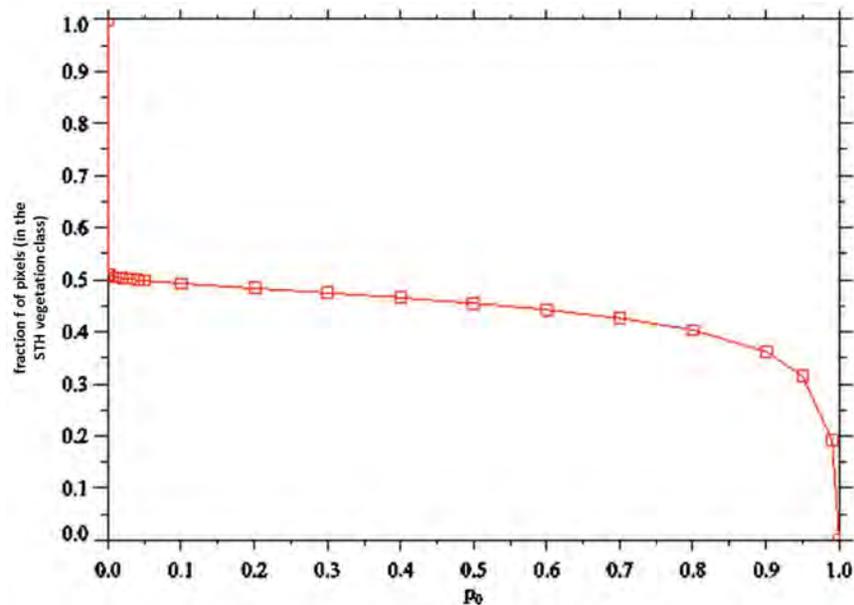


Figure 3. Plot of the fraction f of pixels in the STH-vegetation class vs. the threshold value p_0 . Pixels whose probability of being in the STH-vegetation class is $p < p_0$ are left unclassified. Pixels with $p \geq p_0$ are put in the class. In this plot, $f = 0.51$ for $p_0 = 10^{-4}$, and $f = 1.0$ for $p_0 = 10^{-5}$. doi:10.1371/journal.pone.0111921.g003

nucleotide variability. Amplified ITS fragments were extracted from the 2% Agarose Gel, extracted with the Zymo Clean Gel DNA Recovery kit (ZymoResearch, Irvine, CA), and subsequently sequenced to confirm the presence of *C. immitis*. Extracted DNA from a *C. immitis* isolate (M39), obtained from the Laboratory of Medical Mycology at the Universidad Nacional Autónoma de México was used as positive control. Negative controls and positive controls were included in all PCR's to detect contamination and to verify the amplification of a PCR product of the desired size.

Sites where *C. immitis* was detected at least twice in a deeper soil layer during the late winter/spring (February–May) when the soil is moist and the soil temperature increased were referred to as 'growth sites' of the pathogen in this study, assuming that the soil parameters likely supported the growth of the fungus and thus, the pathogen could be detected consecutively over a several year period in the same location, over several growth seasons. Based on the definition provided by Fisher et al. [31], growth sites are sites where physical, chemical, and biological conditions are suitable for completion of the entire growth cycle required by the organism. Thus, it could be assumed that if the pathogen finds supportive environmental conditions, it would likely expand into deeper soil layers, and not just remain on the surface which can be more hostile due to desiccation and increased uv-radiation. In fact, the majority of the soil samples that contained the pathogen in deeper soil layers also contained the pathogen in surface layers. To the contrary, sites were termed 'accumulation sites' in this study when the pathogen could only be detected occasionally on the surface of the sampling site and never in a deeper soil layer over a several year period. This made it likely that arthroconidia had been transported to this location by the wind, but the pathogen was never able to complete its life cycle because of non-supportive environmental conditions. 'Accumulation sites' were also never positive in consecutive years in contrast to 'growth sites'. Fisher et al. [31] defined 'accumulation sites' as sites where arthroconidia of *Coccidioides* may have been deposited on or near the soil surface after being transported from growth sites by wind, water,

organisms, or anthropogenic means. We are aware that we did not investigate the activity of the pathogen in the soil or verify its growth, and that finding the pathogen in the surface layer of the soil does not mean that it cannot grow there at all. Therefore, we have to consider that some of our results might have been false negatives.

Results

Remote Sensing Approach

A false color map of our ROI for April 28, 2008 was generated and is presented in figure 1, with indication of all sampling sites. Sites which were similar in vegetation to site STH, a confirmed growth site of *C. immitis*, were indicated in yellow, whereas sites that are characterized by different vegetation types appeared in various shades of green and red (agricultural fields, housing developments with gardens, higher elevated mountain slopes etc.). Results by Landsat imagery indicated large areas west of Bakersfield as potential growth sites of the pathogen, in addition to the STH area east of Bakersfield. The city of Taft southwest of Bakersfield was completely surrounded by vegetation that is similar to the vegetation type that characterizes STH. Landsat imagery furthermore indicated small pockets of potential growth sites of *C. immitis* scattered throughout the Southern San Joaquin Valley and around and within the city of Bakersfield. Overall, the yellow colors indicate that about 15% of the landscape visible in the satellite image was covered with vegetation that has the same reflection pattern as the STH vegetation.

We also applied Landsat imagery to an area northwest of Bakersfield where two prisons are located near the cities of Avenal and Coalinga (Kings County and Fresno County) (Fig. 2). In this area, the incidence of coccidioidomycosis has been observed to be large among prison inmates, so one might hypothesize that *C. immitis* could be present in the neighboring environments. And indeed, yellow areas in the immediate neighborhood of the prisons, as presented by Landsat imagery, indicated the presence of potential growth sites of the pathogen.

Table 3. Probability that the sites fall in the STH-thermal class, as predicted by Landsat data.

sampling sites and year sampled	n = 3			n = 2				
	4/20/08	4/23/09	4/26/10	4/29/11	4/20/08	4/23/09	4/26/10	4/29/11
Bakersfield city								
1. CSUB Children Center ('08, '09)	N	N	N	N	N	N	N	N
2. Belle Terrace/P Str. ('11)	N	N	Y	Y	N	N	N	Y
3. Belle Terrace/Gay Str. ('11)	N	Y	Y	N	N	Y	Y	N
4. Marella Way ('11)	N	N	N	N	N	N	N	N
5. Flood Plain CSUB ('08, '09)	N	N	N	N	N	N	N	N
SW Bakersfield								
6. Bike Path West ('08, '09)	N	Y	Y	Y	N	N	N	N
7. Lake Webb ('08, '09)	N	N	N	N	N	N	N	N
8. Cole's Levee Rd. I ('08, '09, '11)	N	Y	Y	Y	N	Y	N	Y
9. Cole's Levee Rd. II ('11)	N	Y	Y	N	N	Y	Y	N
10. Olen Avenue ('11)	N	N	N	N	N	N	N	N
11. Valley Street Field ('08, '09)	N	N	Y	N	N	N	N	N
NE Bakersfield								
12. Across CALM ('11)	Y	N	Y	N	Y	N	N	N
13. Ant Hill Oil Field ('08, '09, '11)	Y	Y	Y	N	Y	Y	N	N
14. Round Mt. Rd. I ('08, '09)	Y	Y	Y	N	Y	Y	Y	N
15. Round Mt. Rd. II ('08, '09)	Y	Y	Y	N	Y	Y	N	N
16. Sharktooth hill 1	Y	Y	Y	Y	Y	Y	Y	Y
17. Sharktooth hill 2	Y	Y	Y	N	Y	Y	N	N
18. Sharktooth hill 3 ('11)	Y	Y	Y	N	Y	Y	N	N
NW Bakersfield								
19. Acari Rd. ('11)	N	N	N	N	N	N	N	N
20. Elementary Lne. ('11)	N	N	N	N	N	N	N	N
21. Beech Str. ('11)	N	Y	Y	N	N	Y	Y	N
Wasco								
22. Gun Club Rd. ('11)	N	N	Y	Y	N	N	Y	Y
23. McCoy Rd. ('11)	Y	Y	Y	Y	Y	N	Y	Y
Arvin								
24. Di Giorgio Rd. ('11)	Y	Y	Y	Y	N	Y	Y	Y
25. Bear Mt. Rd. ('11)	N	N	N	N	N	N	N	N
Fraction of area covered by class (%)	35	42	24	28	32	39	22	26

(Y = in class [indicated in bold], N = not in class).
 nd* = not determined in this study.
 nd** = not determined in this study, but confirmed as growth site by Swatek (1970).
 doi:10.1371/journal.pone.0111921.t003

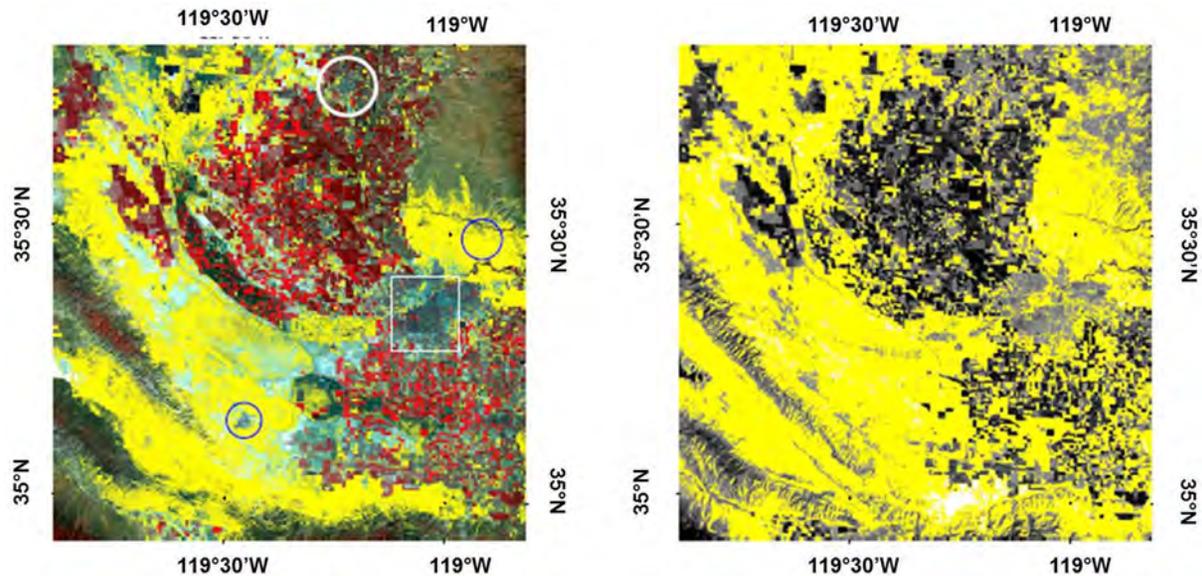


Figure 4. Left: False color image of the ROI on April 20, 2008. Yellow pixels indicate locations in the STH-vegetation class. $p_0=0.95$ and $f=0.32$. The square denotes the location of the city of Bakersfield, the circle on the top indicates the city of Delano, the circle on the right indicates the location of STH, and the circle on the left indicates the location of the city of Taft. **Right:** Spectral class comparison. STH-thermal class is shown in yellow for the same April 20, 2008 image. Parallelepiped scheme was used with thresholds $\bar{x} \pm 2\sigma$, with $\bar{x} (=36.4^\circ\text{C})$ the average surface temperature on the STH training pixels, and $\sigma (=1.9^\circ\text{C})$ the corresponding standard deviation.
doi:10.1371/journal.pone.0111921.g004

Overall, 4 false color maps were generated for our ROI showing results for April 2008 to April 2011 (one for each April, see Table 2). For each satellite picture we obtained one STH vegetation profile. Therefore, it did not matter if variation in the vegetation occurred. The April profiles were considered the most definitive for our work, because in early spring, the climate (soil and air temperature and humidity) still support the growth of the vegetation, and grasses and herbs which are characteristic for the STH-vegetation profile have not dried up yet, compared to the summer months. A validation of our approach is shown in figure 3. In this figure, the corresponding plot of f vs. p_0 is presented. This figure also presents the dependence of the fraction f on p_0 . It can be pointed out that when p_0 drops from 1, f changes from zero to 0.36 at $p_0=0.90$, but then increases slowly with decreasing p_0 until $p \approx 0.04$, where $f \approx 0.50$, and jumps to $f=1$ for $p_0=10^{-5}$. Most likely, this is due to the STH-vegetation class being quite distinct from all other possible spectral classes in the ROI, with a large distance (in pixel space) from those classes. Otherwise, discrete increases in f with decreasing p_0 would be expected as other surface types get merged into the STH-vegetation class.

As a further consistency check, we also wanted to examine the extent to which the STH-vegetation and STH-thermal classes overlapped and if growth sites of the pathogen could be predicted by soil thermal data (tables 2 and 3, figure 4). Thus, we obtained the STH-thermal class by implementing a parallelepiped scheme as described before (see methods). For $n=1$, only sites 13, 14, 16 and 21 were included in the STH-thermal class (April 2008, data not shown). Sites 8, 9, 12–18, 21, and 22–24 were added when $n=2$. Site 11 was included when $n=3$. Site 25 (one of the strongest growth sites of the pathogen) was never included. Figure 4 (right) shows our results for $n=2$. We present this figure here because site 8, which we identified as a strong growth site of the pathogen, came into the STH-thermal class for this value of n (but site 8 was not in the class for $n=1$). By evaluating the agreement between satellite imagery (STH-vegetation class and

STH-thermal class, data from 4 consecutive years), we found that both data sets disagreed in 12% (sites 6, 11 and 25). Almost all sites that fell into the STH-vegetation class also fell into the STH-thermal class (see tables 2 and 3).

Soil series and soil parameters

By using the soil series extent mapping tool, we found that the soil series and soil groups in which the pathogen was detected around Bakersfield, California, belonged to the Garces (Natravid, sites CLR, Bear Mt. Rd.), Chanac (Haploxerept, site AHOF), and Pleito (Haploxeroll, sites STH1 and 2 and 3) series. These soil series are not restricted to the Southern San Joaquin Valley. See figure 5 for a distribution of these soil series in California. Soils that belonged to the Chanac soil series can also be found in western Arizona and southern Nevada. All soils were of mixed mineralogy, had a superactive cation exchange capacity, and were thermic soils with predominantly fine loamy particles. Soils that belonged to these soil series are among the dominant soils in the Southern San Joaquin Valley, especially Kern County and Kings County, but can also be found in northern and western California. The use of software such as the USDA websoilsurvey database, as well as tools available at the Center of Environmental Informatics (CEI) have been found to be very valuable in obtaining information about physical and chemical parameters of soils that could support the growth of *C. immitis*. Detailed information about soil type, landform, dominant parent material of the soil, as well as soil physical and chemical parameters are listed for all sampling sites in table 4. Using these tools, information about land use, vegetation, mean annual soil temperatures, and geographic setting was accessed as well and is summarized in table S1 in file S1.

Detection of *C. immitis* by multiplex PCR

In addition to the two growth sites of the pathogen that were detected in 2008 and 2009 (Cole's Levee Rd. [CLR], Ant Hill Oil

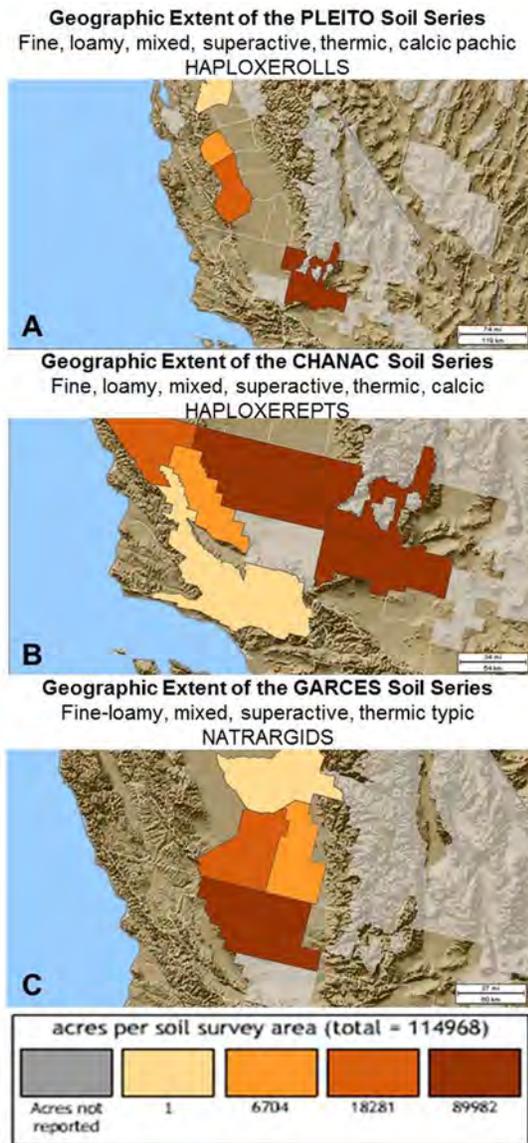


Figure 5. Extend of soil series in the San Joaquin Valley, CA, which can support the growth of *C. immitis*. A: Pleito (brown: SE and NE Kern County, dark orange: W Fresno County, light orange: W Merced County, tan: San Joaquin County) B: Chanac (brown: SE, NE and NW Kern County, dark orange: San Luis Obispo County [Paso Robles area], light orange: San Luis Obispo County, [Carrizo Plains]), and C: Garces soil series (brown: NW Kern County, dark orange: Kings County, light orange: W Tulare County, tan: E Fresno Area), Center for Environmental Informatics at Pennsylvania State University (CEI), <http://www.cei.psu.edu/soiltool/semtool.html>. doi:10.1371/journal.pone.0111921.g005

Field [AHOF], see [32]), we were able to detect additional “hot spots” of the pathogen in 2011. These sites were located within Bakersfield city, in the southwest, northeast and northwest of Bakersfield, and near Arvin, California (see table 1). Sites where the pathogen was detected more than once in a deeper soil layer were considered growth sites, whereas sites where the pathogen was detected occasionally in the surface layer only were considered accumulation sites. Sites where *C. immitis* was never detected were considered negative sites and included areas within Bakersfield city, an area northwest of Bakersfield, and 2 sites near Wasco, California. Fungal DNA could be detected in all soil samples. Of

all sites investigated in 2011 (two growth sites investigated in 2008/09 [CLR and AHOF], and 14 new sites, out of 16 sites altogether for 2011), 4 sites (25%) were found negative, and 12 sites (75%) were confirmed as growth sites of the pathogen. No new accumulation sites were discovered in 2011. The site at Bear Mt. Road was the strongest growth site of *C. immitis* for the 2011 sampling set (positive for *C. immitis* from Jan–Apr). For an example of multiplex PCR results, see figure 6.

Correlation between Landsat imagery and multiplex PCR results

By comparing results obtained by satellite imagery (STH-vegetation class) and multiplex PCR, we found that in ~74% (17 out of 23 tested sites) the satellite imagery results and the results obtained by multiplex PCR agreed at least in one year out of four years ($p_0 = 0.90$). When $p_0 = 0.95$, the agreement was ~70% (16 sites). When satellite imagery based on STH-thermal class was compared with multiplex PCR results, we found that both methods agreed only in 61% ($n = 3$) or 65% ($n = 2$) (table 5). Tables 2 and 3 show the probability that the sites fall in the ‘*C. immitis* growth area’ based on Landsat data in comparison to results obtained by multiplex PCR. We set Red, Green and Blue (RGB) to TM bands 4, 3, and 2 respectively. With this choice, the different depths of red indicated different plant associations. These maps were the result of implementing the MLC method with $p_0 = 0.90$ and $p_0 = 0.95$. Two of the three sites at STH listed in table 1 were confirmed growth sites of *C. immitis*. STH site 2 was confirmed as a growth site by Frank Swatek (Fisher FS, personal communication based on [30]), and STH site 3 was confirmed as a growth site by multiplex PCR in this study. Sampling site 8 (Cole’s Levee Rd. I), which was determined as a strong growth site of the pathogen by multiplex PCR in every year, became included in the ‘*C. immitis* growth area’ based on Landsat data when p_0 was reduced to 0.95. Sampling site 7 (Lake Webb, accumulation site, located less than 1 mile west of CLR) was added when p_0 was reduced to 0.10. Sampling sites 1, 5, 6, and 11, (near Children Center, Flood Plain, Bike Path West, and Valley Street Field) never got added for $p_0 > 10^{-5}$. This was consistent with results obtained by multiplex which confirmed the absence of the pathogen (site 6, negative site), or which detected the pathogen occasionally in surface samples only (sites 1, 5 and 11). Sites, 1, 5 and 11 were termed accumulation sites, where the arthroconidia had been likely transported to by the wind, and where the presence of the pathogen could not be detected in deeper layers by multiplex PCR. We interpret this to mean that STH was quite representative of the *C. immitis* ecological niche within our ROI. However, in some occasions the prediction made by satellite imagery to indicate soils that could potentially harbor the pathogen could not be confirmed by multiplex PCR. Of all 25 sites included in this study, only sites 8 and 9 (Cole’s Levee Rd. I and II) fell in the STH-vegetation class in each year when $p_0 = 0.90$. These sites were confirmed as positive for *C. immitis* by multiplex PCR. Other sites that were confirmed as growth sites of the fungus by our culture independent approach fell in this class at least on one occasion out of four when $p_0 = 0.90$ (sites 2, 3 [Belle Terrace/P Str. and Belle Terrace/Gay Str.], 12 [Across CALM], 13 [AHOF], 21 [Beech Str.], 24 [Di Giorgio Rd.], and 25 [Bear Mt. Rd.]). These sites were still included in the STH-vegetation site when p_0 was increased to $p_0 = 0.95$, with the exception of site 25. Of all sites that were found to be *C. immitis* growth sites by multiplex PCR, two sites were never indicated as a potential growth site by the MLC method (site 10 [Olen Ave.] and site 20 [Elementary Lne.]), but the pathogen was present in soil samples from both sites as

Table 4. Detailed physical and chemical information obtained from the USDA websoilsurvey database for all sites included in this study.

soil parameters	sampling sites					
	Elementary Lne.	across CALM Ant Hill Oil Field	Bear Mt. Rd. Di Georgio Rd. Olen Ave. Cole's Levee Rd.	Sharktooth hill	Belle Terrace/Gay Str. Belle Terrace/P Str. Marella Way	McCoy Rd. Gun Club Rd. Acari Rd. Beech Str.
soil type	Panoche clay loam	Chanac clay loam	Garces loam	Pleito-Trigo-Chanac complex	Kimberlina-Urban land Cajon complex	Garces silt loam
landform	alluvial fans	fan remnants	Alluvium derived from granitoid	Fan remnants, stream terraces	alluvial fans	ridges on basin floors
parent material	alluvium derived from igneous and sedimentary rock	alluvium derived from mixed	alluvium derived from granitoid	Alluvium derived from mixed	alluvium derived from igneous and sedimentary rock	alluvium derived from granite
(map unit symbols)	211	130/131	180	205	180	156
Physical parameters						
Surface texture	clay loam	clay loam	clay loam	clay loam	loamy sand	silt loam
% clay	31	31	25.5	30	12	26.8
% sand	35.4	35.4	38	33.5	71.3	34.2
% silt	33.6	33.6	36.5	36.5	16.7	39.1
Available water capacity (cm/cm)	0.17	0.17	0.21	0.16	0.12	0.11
Available water supply (0–25 cm)	4.25	4.25	5.04	3.69	2.64	2.7
Organic matter	0.25	0.75	0.98	1.5	0.75	0.06
Water content (15 bar)	18.9	18.2	16.7	17.2	8.7	16.2
Water content (1/3 bar)	32	30.1	30.9	27.8	17.7	30.2
Sat. hydraulic conductivity (Ksat) (micrometers/s)	9	9	8.37	2.82	28	0.8362
Chemical parameters						
pH	7.9	7.9	8.5	7.8	7.5	8.9
CaCO ₃	3	3	3	0	3	3
Cation Exchange Capacity (CEC7)	15	24.4	20.6	24.3	7.5	13.1
Gypsum	0	0	0	0	0	0
Sodium adsorption ratio (SAR)	0	0	2	0	0	14
Electrical conductivity (EC)	1	0	5	0.5	1	10.2

Indicated in cursive are the parameters which seemed to be most important to distinguish *C. immitis* growth sites from negative sites. doi:10.1371/journal.pone.0111921.t004

confirmed by multiplex PCR (see Discussion). Furthermore, two sites that were indicated as potential growth sites of the pathogen by Landsat imagery at all times when $p_0=0.90$, could not be confirmed by multiplex PCR to harbor the pathogen. These sites were located near Wasco, California (NW of Bakersfield), (sites 22 [Gun Club Rd.] and 23 [McCoy Rd.]).

Changes in extend of areas (km²) that fell into the STH-vegetation class were observed for the sampling period until early 2014 and are displayed in table S2 in file S1. The year with the highest precipitation (2011) had the lowest area of vegetation that belonged into the STH-vegetation class in comparison to the years 2008 and 2009 which were characterized by a significantly reduced amount of precipitation and showed an increased area of vegetation that belonged into the STH-vegetation class (see figure S1).

Discussion

The purpose of our study was to identify soil types in Kern County that could support the growth of *C. immitis* by combining Landsat imagery (based on vegetation and soil temperature), and soil parameter information (from 25 sites) with a culture independent PCR-based method to detect the pathogen. We showed that satellite imagery, combined with soil parameter information, can provide a map of locations within our ROI, where *C. immitis* might reasonably be expected to be found. We were able to verify the presence of the pathogen by a multiplex PCR method in about 74% ($p=0.90$), when soil samples were investigated over a 4 year period. However, for about a quarter of our sites (26%), results obtained by Landsat imagery and multiplex PCR did not correlate. The reasons for this observation could be multifold. Some main factors to be considered are: 1) The amount of *Coccidioides* DNA extracted from the soil might have been under the detection limit of our PCR based methods (sites 22 and

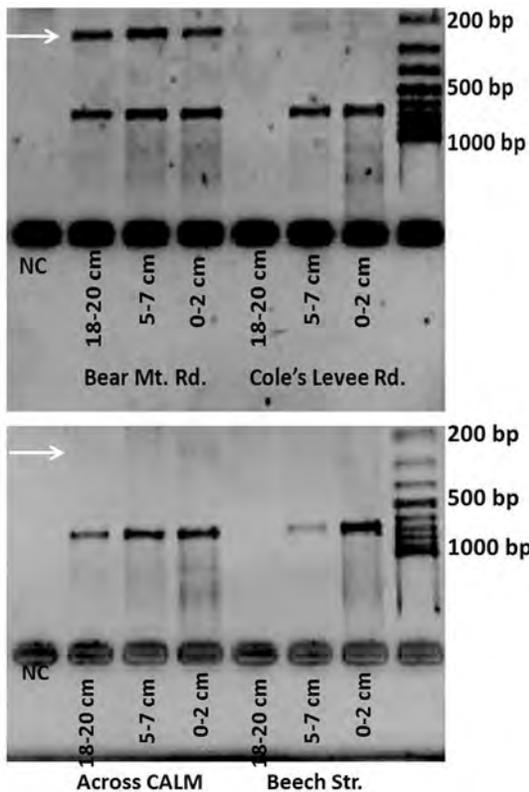


Figure 6. Example of multiplex PCR results. White arrows point on a 223 bp fragment that represents *C. immitis*. Site Bear Mt. Rd. shows the strongest ITS amplicons in all soil layers, whereas sites Cole's Levee Rd. and site Across CALM gave a weaker signal in some soil layers, and site Beech Str. was negative. NC = negative control. Bands that indicate the presence of the pathogen in the 2% Agarose gel were confirmed to origin from *C. immitis* by sequencing.
doi:10.1371/journal.pone.0111921.g006

23), or 2) the resolution of the satellite imagery might not have been detailed enough (site 10, a small site of only 10 m²), and 3) the distribution of *Coccidioides* in the soil might have been spotty, and the positive site was missed (sites that were not positive for the

pathogen in all sampling years). A closer look at sites where satellite imagery and soil parameter data indicated potential growth sites for *C. immitis* also revealed that these sites were not uniform in regard to plant coverage, distribution, and diversity, thus, generating microhabitats for soil microorganisms that most likely would be quiet distinct, especially in and around the rhizosphere [32]. Other factors, such as fluctuation in climate and pollution of the soil might have had an impact on our analyses as well. Furthermore, it has to be considered that *C. immitis* might be able to persist in soils that have been converted to agricultural fields for an unknown amount of time, but its arthroconidia might never germinate and grow into vegetative hyphae. These sites could be termed dormant sites (e.g. site 20, an orchard with young almond trees). To assess these impacts on our results was not the focus of our work, but we are aware of these limitations. In previous research we have investigated the limitation of the multiplex PCR approach to detect *C. immitis*, (see [33] for results of primer efficiency). Briefly, we found that the sensitivity of the diagnostic PCR (ITS primer pair) was reduced compared to the primer pair that amplifies 18S rDNA fragments of all fungi (RDS primer pair).

In previous work [23–25], it was suggested that some environmental fluctuations are a fundamental link missing from coccidioidomycosis statistical modeling schemes. One important aspect to investigate is whether fluctuations in the STH-vegetation class can provide this connection, and be statistically linked to the observed variations in incidence of valley fever. In this regard, one effect to consider is the extent to which this RS approach continues to be valid through the seasons. In the spring, when plants are blooming, the different vegetation types have different spectral signatures. As the weather dries and plants wither, the spectral signatures of the relevant vegetation types may become less distinct. Thus, the vegetation on STH may not be as good a marker for *C. immitis* in the fall, as it is in the spring. The implicit assumption in this study is that the STH environment is the only type of environment which harbors *C. immitis* within the San Joaquin Valley area of Kern County. We presented in this paper arguments to support this assumption; nevertheless, it would be useful to find more similarly suitable test sites to further corroborate our findings, or to find slightly different ecotypes that support *C. immitis*, beside of those detected in this study.

Table 5. Agreement between multiplex PCR and MLC for the STH-vegetation class and the STH-thermal class to predict growth sites of *C. immitis* (to agree a prediction by either multiplex PCR or MLC must be confirmed at least once for the four years by the other method).

	STH-vegetation class	
	$p_0=0.90$	$p_0=0.95$
multiplex PCR and MLC agree	17 (74%)	16 (70%)
multiplex PCR predicts growth site and MLC disagrees	2 (9%)	3 (13%)
MLC predicts growth site and multiplex PCR disagrees	4 (17%)	4 (17%)
	STH-thermal class	
	n = 3	n = 2
multiplex PCR and MLC agree	14 (61%)	15 (65%)
multiplex PCR predicts growth site and MLC disagrees	3 (13%)	4 (17.5%)
MLC predicts growth site and multiplex PCR disagrees	6 (26%)	4 (17.5%)

From altogether 25 sites, only 23 were considered, because no multiplex PCR results were obtained for STH sites I and II.
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We also observed changes in the extent of the STH-vegetation class over time. A comparative analysis of precipitation between 2008 and 2011 (up to early 2014) suggest that years with a reduced precipitation (drought) favor plants of the STH-vegetation class, but other factors likely play a role as well, such as development and changes in land use (see figure S1 and table S1 in File S1), which was not assessed in this study.

Compared to the STH-vegetation class data, the STH-thermal data showed considerably more variation for the four different years, as expected. The vegetation on a certain day in each year may be very similar, but soil temperatures might be more variable in different years (data for $n=2$ and $n=3$ can be seen in table 3, no data is shown for $n=1$). Other strong growth sites of the pathogen (sites 8, 9, and 13) were also not consistently included in all years, not even with $n=3$. It should also be noted that sites 6 (negative site) and 11 (accumulation site) were never included into the STH-vegetation class by satellite imagery, but were included in the STH-thermal class when $n=3$. We concluded therefore, that the STH-thermal classes alone might not be sensitive enough to predict growth sites of *C. immitis*. Site 25 was never included (thermal class) maybe because of the limited resolution of the satellite imagery, as discussed earlier. It is important to keep in mind that the TM-6 image tells us surface temperatures. It may very well be that what matters is the temperature below the surface [31]. For our ROI, all landcovers were similar on the macroscale; therefore, apparent temperatures were appropriate for comparison purposes.

To improve the value of satellite imagery data, the actual spectral reflectance profiles of various soil components could be included to complement the satellite data (for details see <http://www.africasoils.net/data/lds-description>) in future studies. A time series analysis could also be considered, if feasible. Phenology development throughout the year can make the analysis more specific to a particular vegetation type. Niche modeling rather than automated classification could be considered as well to obtain a richer output that indicates variables of importance. However, a large dataset would be necessary that would include presence and also absence data of the pathogen in a certain type of soil at a certain time with presence or absence of a certain type of vegetation. Furthermore, it should be considered that broad band signatures over larger geographic areas and ecotones might not be precise enough to be useful in predicting growth sites of a pathogen, especially when the pathogen could be adapted to grow in a variety of different ecosystems.

Our results indicated that strong growth sites of the pathogen were likely associated with 3 different USDA soil map units (180, 131, and 205), which were all loamy sands. Several sites around Bakersfield, California, that fell into one of these map units were indeed growth sites of *C. immitis*, as confirmed by multiplex PCR, and were similar in vegetation compared to the STH area. These types of soils are not restricted to the Southern San Joaquin Valley, but can be found in other areas of California as well. One could hypothesize that with a drier and warmer climate, as it is predicted for California in the near future [51,52], *C. immitis* might be able to expand its current range. In our study, we focused on soil samples from only one County, the above mentioned Kern County in the Southern San Joaquin Valley of California, a highly endemic area for *C. immitis*. The soil types investigated here did not comprise all types that can be found in our ROI. Even though Kern County is a hot spot of *C. immitis* with the highest incidence of coccidioidomycosis documented for as long as incidence data is

recorded in California, we cannot conclude that soils that predominate in this area are the ones that also predominantly support the growth of the pathogen. A more rigorous sampling framework should be attempted in the future that would include locations beyond Kern County covering as wide a range of habitats as possible to correctly determine growth sites of *C. immitis*, as well as determining sites that are not supporting the growth of the pathogen. Developing such a sampling plan should include stratification, replicate sampling, and determination of important chemical and physical soil parameters, including investigations in other countries where coccidioidomycosis occurs would be of value as well. The ultimate goal would then be to generate a U.S. or America-wide database of occurrence and absence of *Coccidioides* spp. Such a database could be useful for characterizing the ecological niche for both *Coccidioides* species, and could indicate a variety of supporting ecosystems, as well as being an advisory public health tool, to reduce incidence of coccidioidomycosis in Kern County and elsewhere.

In conclusion, the combination of the methods used in our research can be used to generate maps that indicate potential growth sites of *C. immitis*, and thus serve as a tool to further investigate the ecological niche occupied by the pathogen in the Southern San Joaquin Valley and beyond in more detail. Recent advances in computer processing and geographic information system and global positioning system technologies facilitate integration of remote sensing data, such as environmental parameters with disease incidence data, so that models for disease surveillance and control can be developed [53,54].

Supporting Information

Figure S1 Cumulative monthly precipitation (inches) over time for the Southern San Joaquin Valley, assembled from 5 stations (Calaveras Big Trees [CVT], Hetch Hetchy [HTH], Yosemite HQ [YSV], North Fork RS [NFR], and Huntington Lake [HNT]) obtained from the California Data Exchange Center at http://cdec.water.ca.gov/snow_rain.html.

(TIF)

File S1 Supporting tables. Table S1. Detailed soil series descriptions of sites which were found to be growth sites of *C. immitis*. **Table S2.** Extend of STH-vegetation class in our ROI between 2008 and 2011 based on satellite imagery.

(DOCX)

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Author Contributions

Conceived and designed the experiments: AL JT. Performed the experiments: AL JT LM JB KC NS. Analyzed the data: AL JT. Contributed reagents/materials/analysis tools: LC KE. Wrote the paper: AL JT LC KE.

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SS-IAMF#2: SAFETY AND SECURITY MANAGEMENT PLAN

Sixty days after receiving from the Authority a construction notice-to-proceed, the Contractor shall provide the Authority with a technical memorandum documenting how the following requirements, plan, programs and guidelines were considered in design, construction and eventual operation to protect the safety and security of construction workers and users of the HSR. The Contractor shall be responsible for implementing all construction-related safety and security plans and the Authority shall be responsible for implementing all safety and security plans related to HSR operation.

- Workplace worker safety is generally governed by the Occupational Health and Safety Act of 1970, which established the OSHA. OSHA establishes standards and oversees compliance with workplace safety and reporting of injuries and illnesses of employed workers. In California, OSHA enforcement of workplace requirements is performed by California Occupational Safety and Health Administration (Cal OSHA). Under Cal OSHA regulations, as of July 1, 1991, every employer must establish, implement, and maintain an injury and illness prevention program.
- The Authority has adopted a Safety and Security Management Plan to guide the safety and security activities, processes, and responsibilities during design, construction and implementation phases of the project to protect the safety and security of construction workers and the public. A Systems Safety Program Plan (SSPP) and a System Security Plan would be implemented prior to the start of revenue service to guide the safety and security of the operation of the high-speed rail system.
- Prior to Construction, the Contractor shall provide the Authority with a Safety and Security Management Plan documenting how they would implement the Authority's safety and security requirements within their project scope.
- Implement site-specific health and safety plans and site-specific security plans to establish minimum safety and security guidelines for contractors of, and visitors to, construction projects. Contractors would be required to develop and implement site-specific measures that address regulatory requirements to protect human health and property at construction sites.
- Preparation of a Valley Fever action plan that includes: A) information on causes, preventative measures, symptoms, and treatments for Valley Fever to individuals who could potentially be exposed through construction activities (i.e., construction workers, monitors, managers, and support personnel); B) continued outreach and coordination with California Department of Public Health; C) coordination with county departments of public health to ensure that the above referenced information concerning Valley Fever is readily available to nearby residents, schools, and businesses and to obtain area information about Valley Fever outbreaks and hotspots; and D) provide a qualified person dedicated to overseeing implementation of the Valley Fever prevention measures to encourage a culture of safety of the contractors and subcontractors. The Valley Fever Health and Safety (VFHS) designee shall coordinate with the county Public Health Officer and oversee and manage the implementation of Valley Fever control measures. The VFHS designee is responsible for ensuring the implementation of measures in coordination with the county Public Health Officer. Medical information would be maintained following applicable and appropriate confidentiality protections. The VFHS in coordination with the county Public Health Officer would determine what measures would be added to the requirements for the Safety and Security Management Plan regarding preventive measures to avoid Valley Fever exposure. Measures shall include, but are not limited to the following: A) train workers and supervisors on how to recognize symptoms of illness and ways to minimize exposure, such as washing hands at the end of shifts; B) provide washing facilities nearby for washing at the end of shifts; C) provide vehicles with enclosed, air conditioned cabs and make sure workers keep the windows closed; D) equip heavy equipment cabs with high efficiency particulate air (HEPA) filters; and E) make NIOSH approved respiratory protection with particulate filters as recommended by the CDPH available to workers who request them.

- System safety program plans incorporate FRA requirements and are implemented upon Authority approval. FRA's SSPPs requirements would be determined in FRA's new System Safety Regulation (49 CFR 270).
- Rail systems must comply with FRA requirements for tracks, equipment, railroad operating rules and practices, passenger safety, emergency response, and passenger equipment safety standards found in 49 CFR Parts 200-299.
- The HSR *Urban Design Guidelines* (Authority 2011) require implementing the principles of crime prevention through environmental design. The contractor shall consider four basic principles of crime prevention through environmental design during station design and site planning: territoriality (design physical elements that express ownership of the station or site); natural surveillance (arrange physical features to maximize visibility); improved sightlines (provide clear views of surrounding areas); and access control (provide physical guidance for people coming and going from a space). The HSR design includes emergency access to the rail right-of-way, and elevated HSR structure design includes emergency egress points.
- Implement fire/life safety and security programs that promote fire and life safety and security in system design, construction, and implementation. The fire and life safety program is coordinated with local emergency response organizations to provide them with an understanding of the rail system, facilities, and operations, and to obtain their input for modifications to emergency response operations and facilities, such as evacuation routes. The Authority would establish fire/life safety and security committees throughout the HSR section.
- Implement system security plans that address design features intended to maintain security at the stations within the track right-of-way, at stations, and onboard trains. A dedicated police force would ensure that the security needs of the HSR system are met.
- The design standards and guidelines require emergency walkways on both sides of the tracks for both elevated and at-grade sections and the provision of appropriate space as defined by fire and safety codes along at-grade sections of the alignment to allow for emergency response access.
- Implement standard operating procedures and emergency operating procedures, such as the FRA-mandated Roadway Worker Protection Program to address the day-to-day operation and emergency situations that would maintain the safety of employees, passengers, and the public.

RESPONSE TO B-P GCD COMMENT ON VALLEY FEVER

Thank you for the comment and additional information regarding *Coccidioides immitis* (a.k.a., the Valley Fever fungus). This action for which FRA has requested comment is FRA's Draft General Conformity Determination. The General Conformity Determination documents FRA's evaluation of the potential emissions associated with the proposed Bakersfield to Palmdale Section of the California High-Speed Rail (HSR) System, consistent with relevant requirements of the Clean Air Act and implementing regulations. Fugitive dust is responsible for particulate matter pollution. However, FRA's analysis of the potential emissions from the Bakersfield to Palmdale Section found that construction period emissions would not exceed the General Conformity de minimis threshold for particulate matter pollution. Operation of the project would result in an overall reduction of regional emissions of all applicable air pollutants and would not cause a localized exceedance of an air quality standard. The general conformity analysis does not require soil testing for pathogens such as the Valley Fever fungus.

Nonetheless, in considering this comment, FRA consulted with the California High-Speed Rail Authority regarding fugitive dust that contains the Valley Fever fungus. As a part of the environmental impact report (EIR)/environmental impact statement (EIS) prepared to meet the requirements of the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA), the Authority reviewed the potential of Valley Fever occurrence in the San Joaquin Valley, specifically in the area where HSR construction and operations would occur. As described in its Final EIR/EIS, the Authority, in coordination with the FRA, U.S. Environmental Protection Agency and the California Department of Public Health, has included impact avoidance and minimization features (IAMF) as part of the project to incorporate additional best practices to minimize exposure to those at risk from construction activities disturbing naturally occurring *Coccidioides* spores. Specifically, the Authority will prepare a Valley Fever action plan **SS-IAMF#2: Safety and Security Management Plan**, and measures that mitigate the production and exposure of fugitive dust **AQ-IAMF#1: Fugitive Dust Emissions**. These IAMFs would also reduce risk to the general public of Valley Fever spreading through fugitive dust emissions because these IAMFs would limit the amount of fugitive dust released as a result of construction.

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June 14, 2021

Andrea Martin
Federal Railroad Administration
Office of Railroad Policy and Development
770 L Street Suite 620
Sacramento, CA, 95814

Project: Draft General Conformity Determination for the Bakersfield to Palmdale Project Section

District CEQA Reference No: 20210507

Dear Andrea Martin:

The San Joaquin Valley Unified Air Pollution Control District (District) has reviewed the Draft General Conformity Determination (DGCD) for the project referenced above from the Federal Railroad Administration (FRA). The project consists of implementation of the Bakersfield to Palmdale section of the High Speed Rail system that will total approximately 80 miles in length (Project). The Project is located in Kern County and Los Angeles County. The District offers the following comments:

1) Voluntary Emissions Reduction Agreement (VERA)

The Draft General Conformity Determination states, “Air Quality Mitigation Measure #1 (AQ-MM#1) of the Draft General Conformity Determination indicates that the High-Speed Rail Authority (HSRA) has entered into a Memorandum of Understanding (MOU) with the District by offsetting to net zero the Project’s actual construction emissions of VOC, NOx, PM10, and PM2.5.”

The District appreciates the HSRA ongoing commitment to working with the District and appreciates FRA’s reference of the mitigation measure AQ-MM#1 in the general conformity determination for air quality. The District and HSRA had entered into an MOU on June 19, 2014, which establishes the framework for fully mitigating to net zero construction emissions of NOx, VOC, PM10, and PM2.5 for the entire High-Speed Train Project throughout the San Joaquin Valley Air Basin, which includes this Bakersfield to Palmdale section. For reference, the District has attached a copy of the MOU to this letter.

Samir Sheikh

Executive Director/Air Pollution Control Officer

Northern Region
4800 Enterprise Way
Modesto, CA 95356-8718
Tel: (209) 557-6400 FAX: (209) 557-6475

Central Region (Main Office)
1990 E. Gettysburg Avenue
Fresno, CA 93726-0244
Tel: (559) 230-6000 FAX: (559) 230-6061

Southern Region
34946 Flyover Court
Bakersfield, CA 93308-9725
Tel: (861) 392-5500 FAX: (861) 392-5585

To date, the District and HSRA have worked closely to ensure construction air quality emissions of NOx, VOC, PM10, and PM2.5 are mitigated in accordance with the MOU. This MOU requires the HSRA to enter into a VERA with the District for any segment, or portion located in the San Joaquin Valley Air Basin that has been approved for construction by the HSRA, or any other applicable state or federal entity. The MOU applies to the above referenced Project. Therefore, the District recommends that the HSRA enter in a VERA with the District to fully mitigate to net zero Project construction emissions.

2) **District Comment Letter**

The District recommends that a copy of the District's comments be provided to the HSRA.

If you have any questions or require further information, please contact Eric McLaughlin by e-mail at Eric.McLaughlin@valleyair.org or by phone at (559) 230-5808.

Sincerely,

Brian Clements
Director of Permit Services



John Stagnaro
Program Manager

Enclosure: Memorandum of Understanding between District and HSRA

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MEMORANDUM OF UNDERSTANDING

This Memorandum of Understanding ("MOU") is entered into by the California High-Speed Rail Authority ("Authority") and the San Joaquin Valley Unified Air Pollution Control District ("District"). Authority and District are collectively referred to herein as the "Parties" with each being a "Party".

RECITALS

WHEREAS, District is an air pollution control district formed by the counties of Fresno, Kings, Madera, Merced, San Joaquin, Stanislaus and Tulare, and the Valley portion of Kern, pursuant to California Health and Safety Code section 40150, et seq.; and

WHEREAS, District is responsible for developing and implementing air quality control measures within the District Boundaries as depicted in Exhibit A ("District Boundaries" or "San Joaquin Valley Air Basin") attached hereto and incorporated herein, including air quality control measures for stationary sources, transportation sources, and indirect sources; and

WHEREAS, despite the best efforts of District, air quality within District Boundaries remains impaired such that the San Joaquin Valley Air Basin is not in attainment of federal Clean Air Act standards for ozone and its precursors NOx and VOCs (extreme nonattainment) and PM2.5 and is in Attainment/Maintenance status for PM10 (NOx, VOC, PM10 and PM2.5 collectively, "Criteria Pollutants"); and

WHEREAS, emissions of Criteria Pollutants from the Authority's planned high-speed rail construction within District Boundaries would exacerbate that non-attainment status and could threaten that Attainment/Maintenance status; and

WHEREAS, the San Joaquin Valley Air Basin is unique meteorologically in that it is surrounded on three sides by mountain ranges, including to the west which significantly limits the ability of ocean weather patterns and winds to refresh air in the basin; and

1 **WHEREAS**, the Authority, in partnership with the Federal Railroad
2 Administration ("FRA"), is developing a high-speed train system ("HST System"), which
3 includes construction of guide-way segments, and ancillary facilities such as a Heavy
4 Maintenance Facility, stations, and overpasses for California pursuant to the California
5 High-Speed Rail Act (Public Utilities Code section 18500 *et seq.*) ("Rail Act") and the
6 Safe, Reliable High-Speed Passenger Train Bond Act for the 21st Century (codified at
7 Streets and Highways Code section 2704 *et seq.*) ("Bond Act") that would serve the
8 San Francisco Bay Area, Sacramento, Central Valley, Los Angeles and San Diego
9 through various station-to-station segments ("Segments") (as depicted in Exhibit B);
10 and

11 **WHEREAS**, the HST System includes segments or portions thereof that will be
12 constructed, if and when funding can be secured, within the boundaries of the San
13 Joaquin Valley ("SJV") including the following: Merced to San Jose (portion), Merced to
14 Fresno (all), Fresno to Bakersfield (all), Bakersfield to Palmdale (portion), and
15 Sacramento to Merced (portion), collectively referred to as "HST SJV District Portion";
16 and

17 **WHEREAS**, the Authority completed Program-level Environmental Impact
18 Statements/Reports ("EIS/EIR") in 2005, 2008, 2010 and 2012 pursuant to the National
19 Environmental Policy Act ("NEPA") and California Environmental Quality Act ("CEQA")
20 evaluating impacts of the HST System, and selecting preferred route corridors; and

21 **WHEREAS**, a project level Final EIS/EIR ("MF FEIR") for the Merced to Fresno
22 Segment ("MF Segment") was approved and certified via Resolution 12-19 ("MF FEIR
23 Resolution") and the MF Segment approved and CEQA findings made via Resolution
24 12-20 ("MF Segment Resolution") by the Authority's Board of Directors in May 2012
25 and FRA's associated Record of Decision ("ROD") issued on September 2012; and

26 **WHEREAS**, construction of a portion of the MF Segment (from approximately
27 Madera to downtown Fresno) is anticipated to commence in 2014 with connections to
28 the San Francisco Bay Area and Los Angeles Basin expected after year 2028; and

1 **WHEREAS**, the Authority found in the MF FEIR and MF FEIR Resolution that
2 construction of the MF Segment would cause significant air quality impacts from
3 construction emissions of Criteria Pollutants because the San Joaquin Valley Air Basin
4 is in non-attainment for Criteria Pollutants; and

5 **WHEREAS**, the Authority has included in the MF Segment Resolution, and in
6 the Draft EIR/EIS for the Fresno-Bakersfield Segment (and anticipates so including in
7 the draft environmental documents for other Segments of the HST SJV District Portion)
8 various requirements and mitigation measures to reduce significant construction
9 emissions associated with the HST SJV District Portion (such as using the cleanest
10 construction and hauling fleet as reasonably practicable, as detailed in MF FEIR AQ-
11 MM#1 and #2); and

12 **WHEREAS**, nevertheless, Criteria Pollutant(s) emitted during HST construction
13 within the District Boundaries would still exacerbate and/or threaten the existing non-
14 attainment and maintenance status for Criteria Pollutants within the District Boundaries;
15 and

16 **WHEREAS**, during the public process leading up to the MF FEIR, the District
17 recommended in writing that the Authority enter into a Voluntary Emission Reduction
18 Agreement ("VERA") with the District as an additional mitigation measure (because of
19 the emissions offsets VERA implementation would achieve) for construction emission
20 impacts the MF FEIR concluded would occur in the MF Segment; and

21 **WHEREAS**, the MF Segment Resolution committed the Authority to entering
22 into a VERA with the District for the MF Segment as a mitigation measure to
23 accomplish net-zero MF Segment construction emissions of Criteria Pollutants
24 because of the San Joaquin Air Basin's difficult air quality challenge (*i.e.*, its non-
25 attainment status), which VERA now has been drafted for the funded Madera-to-
26 Fresno portion of the MF Segment and is near ready for execution ("Madera-to-Fresno
27 VERA"); and

28

1 **WHEREAS**, the Authority understands that any significant HST construction
2 emissions air quality impacts from Criteria Pollutants within the District Boundaries
3 could be mitigated through various measures, including emissions offsets to net zero
4 through entry into VERAs, which approach would address the District's view that any
5 net HST construction emissions of Criteria Pollutants within the District Boundaries are
6 impacts that must be fully mitigated; and

7 **WHEREAS**, the District has developed Incentive Programs around several core
8 principles, including cost-effectiveness, integrity, effective program administration,
9 excellent customer service, the efficient use of District resources, fiscal transparency
10 and public accountability; and

11 **WHEREAS**, the District's Incentive Programs involve the District using monies
12 (such as grant funds and project-proponent-provided monies via a VERA) to fund
13 (usually on a percentage basis) the purchase and use by third parties of newer
14 equipment that emits fewer Criteria Pollutants to replace older, less-clean-burning
15 equipment (such as farm tractors), which the District administers through Individual
16 Incentive Program Funding Agreements ("IIPFAs"); and

17 **WHEREAS**, the District's IIPFAs require the user of the new equipment to use
18 the new equipment for a minimum number of hours (based on the user's historical use
19 of the replaced equipment) over a specified number of years, and require permanent
20 destruction of the replaced equipment; and

21 **WHEREAS**, the IIPFAs, because of their requirements, result in reductions of
22 Criteria Pollutants that get assigned to the project proponent providing the funding to
23 offset emissions by that project proponent ("Criteria Pollutant VERA Offsets"); and

24 **WHEREAS**, the Criteria Pollutant VERA Offsets, because of the requirements of
25 and protections in the IIPFAs, are secured and certified to the Authority by the District
26 ("Secured Criteria Pollutant VERA Offsets") upon execution of each IIPFA; and

27 **WHEREAS**, the District's Incentive Programs are regularly audited by
28 independent outside agencies including professional accountancy corporations on

1 behalf of the federal government, the California Air Resources Board ("ARB"), the
2 California Department of Finance and the California Bureau of State Audits; and

3 **WHEREAS**, the District has determined that with appropriate funding from
4 Authority, the District can source, secure and certify Criteria Pollutant VERA Offsets as
5 necessary for construction of the HST SJV District Portion.

6 **AGREEMENT**

7 **NOW THEREFORE**, the Authority and the District hereby agree as follows:

8 1. **Offset of Construction Emissions of Criteria Pollutants**

9 (i) The Authority shall fully offset all HST SJV District Portion-related HST
10 construction emissions from Criteria Pollutants by achieving surplus, quantifiable and
11 enforceable emissions reductions of Criteria Pollutants.

12 (ii) For the purpose of this MOU, "fully offset" or "net zero" means that the
13 total amount of all Criteria Pollutants emission reductions secured by the offset
14 reduction measures is equal to, or greater than, the total amount of actual Criteria
15 Pollutant HST construction emissions within the HST SJV District Portion, minus the
16 projected emissions of Criteria Pollutants that would have occurred in the locations of
17 the HST District Portion construction in the absence of HST construction as may be
18 feasible and technically calculable for specific facilities HST might replace (as individual
19 VERAs may include). "Surplus" emission reductions are reductions that are not
20 otherwise required by existing laws or regulations.

21 (iii) In order to fully offset such construction-related air emissions from the
22 HST SJV District Portion, upon each Segment in the HST SJV District Portion having
23 been approved for construction by the Authority and any applicable state or federal
24 entity, having secured funding for construction, and having approved or certified
25 associated environmental review reports and/or statements as required by applicable
26 law ("Certified Environmental Document"), the Authority and District shall enter into a
27 VERA substantially in the form of the Madera-to-Fresno VERA to cover the portion of
28 the Segment approved and funded for construction within District Boundaries prior to

1 the commencement of construction of said portion. Notwithstanding the above, nothing
2 in this MOU shall prevent the Authority from commencing any construction if, despite
3 the Authority's best efforts, timely entry into the associated VERA did not occur; in such
4 event, the Parties shall work cooperatively to accomplish entry into the VERA in time
5 for emissions offsets to occur in a timely manner to satisfy applicable law such as
6 contemporaneous offset timing requirements established by the U.S. Environmental
7 Protection Agency for general conformity.

8 2. **VERA Implementation**

9 (i) Upon entering into a VERA, the Authority shall provide the District with a
10 meaningful amount of Air Quality Mitigation Funds (as a deposit) as may be specified in
11 each VERA, which the District shall place in a District trust or escrow account until
12 committed in an executed and Authority-approved IIPFA. Such Funds are intended to
13 fund equipment replacement and/or retrofit to achieve Criteria Pollutant VERA Offsets
14 and to fund the District's administrative expenses to implement the VERA, as may be
15 specified in each VERA. The Authority acknowledges that the District will require
16 availability of a meaningful amount of such Funds prior to soliciting and negotiating
17 IIPFAs to accomplish Criteria Pollutant VERA Offsets on the Authority's behalf as part
18 of any individual VERA. The District acknowledges that construction of the HST SJV
19 District Portion is not fully funded, and future funding sources and availability can affect
20 how individual VERAs get funded and the provisions and terms in such VERAs. The
21 total estimated amount of Air Quality Mitigation Funds necessary for each VERA are
22 based on (a) the total tonnage of Criteria Pollutants estimated to be emitted during the
23 HST construction covered by each VERA, as estimated within a Certified
24 Environmental Document or some subsequent estimate based on more then-up-to-
25 date construction information and (b) District's cost per ton per the then-applicable rate
26 contained in District Rule 9510 as set forth in each VERA.

27 (ii) Upon receipt of a meaningful amount of such Funds as relates to an
28 individual VERA and upon the Authority's written notice to proceed from its Contract

1 Manager to the District based on relative certainty of a likely construction start date for
2 the HST construction covered by the relevant VERA, the District will commence
3 negotiating and executing (after Authority limited review and approval) and funding
4 (from the Funds in trusUescrow) IIPFAs to achieve Secured Criteria Pollutant VERA
5 Offsets on behalf of the Authority in a timely manner to satisfy applicable law or
6 general conformity regulations requiring emission reductions to be achieved
7 contemporaneous to the actual emissions to be offset. The Authority will continue to
8 fund the trusUescrow account, and District will continue to negotiate and execute
9 additional IIPFAs to create additional Secured Criteria Pollutant VERA Offsets until
10 sufficient Secured Criteria Pollutant VERA Offsets have been funded to accomplish full
11 offset to net zero for that VERA.

12 (iii) Upon execution of each IIPFA, District shall issue to the Authority a Secured
13 Criteria Pollutant VERA Offsets Receipt, by which the District ensures to the Authority
14 that such associated offsets listed in the Receipt have been secured with no further
15 involvement or funding by the Authority.

16 (iv) Through periodic reporting to each other, the Authority will monitor the actual
17 emissions resulting from construction and the District will monitor and match such
18 actual emissions to the total offsets stated in Secured Criteria Pollutant VERA Offsets
19 Receipts issued to date. The District shall certify in writing to the Authority when the
20 total Secured Criteria Pollutant VERA Offsets listed in all Receipts issued fully offset
21 the actual construction emissions of Criteria Pollutant(s) from the HST Segment portion
22 covered by the associated VERA.

23 **3. Refunds**

24 When total offsets stated in Secured Criteria Pollutant VERA Offsets Receipts
25 equal or exceed total actual construction emissions of Criteria Pollutants for the HST
26 construction covered in a VERA, the District shall, upon Authority written request,
27 refund the Authority any remaining Air Quality Mitigation Funds which are not
28

1 encumbered through IIPFAs. The District shall have a reasonable period of time to
2 refund the unencumbered Air Quality Mitigation Funds.

3 **4. Transfer of Segment Excess Emission Reductions**

4 If total offsets stated in Secured Criteria Pollutant VERA Offsets Receipts
5 exceed total construction emissions of Criteria Pollutants for the HST construction
6 covered in a VERA, the Authority shall be credited with such excess emission ("VERA
7 Excess Emission Reduction" or "Excess"). Such VERA Excess Emission Reductions
8 shall be transferred to any other then-existing or future Authority-District VERA. If there
9 is no existing VERA and likely will not be a future VERA in time for the Authority to get
10 value for the Excess, the Authority may transfer the Excess to a third-party developer.

11 **5. District Rule 9510-Indirect Source Review**

12 Authority acknowledges that it is required to comply with all applicable laws that
13 may be in effect as the HST SJV District Portion is implemented, such as the District's
14 current Rule 9510 (including its requirement to submit an Air Impact Assessment
15 Application). The Authority acknowledges that it is subject to all applicable provisions
16 of District Rule 9510 that are in effect at the time of submitting an Air Impact
17 Assessment Application, but the District anticipates that Criteria Pollutant Offsets to be
18 accomplished through VERAs as contemplated by this MOU will satisfy the emissions
19 reductions requirements of current Rule 9510.

20 **6. Term of MOU**

21 This MOU shall be effective upon the date it is signed. The Parties acknowledge
22 that construction of the HST SJV District Portion could span one or more decades. The
23 Parties agree to work cooperatively together over that time period to evaluate any
24 amendments necessary to this MOU to reflect any relevant circumstances that may
25 change, including but not limited to changing state and federal law requirements
26 related to air quality, changes (positive or negative) in the Clean Air Act attainment
27 status of the San Joaquin Air Basin for Criteria Pollutants or other pollutants, changing
28 and evolving HST funding, and changing state and federal law requirements related to

1 the HST System. This MOU shall be terminated by its terms when total offsets stated in
2 Secured Criteria Pollutant VERA Offsets Receipts equal or exceed total actual
3 construction emissions of Criteria Pollutants for the HST SJV District Portion.

4 7. **Exhibits.** The Exhibits to this MOU are fully incorporated and are a part
5 of this MOU, and are:

- 6 A. District Boundaries Map
- 7 B. HST System and Segment Map

8 8. **Miscellaneous.** The Recitals set forth above are hereby incorporated into
9 the terms of this MOU. Counterpart and facsimile/computer image signatures shall be
10 treated as originals. Notices under this MOU shall be given in writing to the persons
11 and addresses listed in the then-most-current VERA. This MOU contains all
12 understandings between the Parties as to the matters covered herein and incorporates,
13 integrates and supersedes any different or other oral or written understandings
14 between the Parties as to the matters covered herein. This MOU was prepared equally
15 by both Parties.

16 IN WITNESS WHEREOF, the Authority and District have executed this MOU
17 and agree that it shall be effective as of the date first written above.

18 **AUTHORITY**

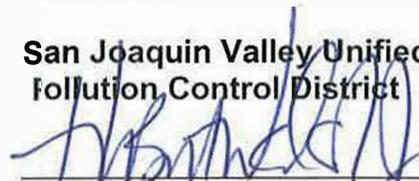
19 **High Speed Rail Authority**

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21 _____
22 Jeff Morales
23 Chief Executive Officer

DISTRICT

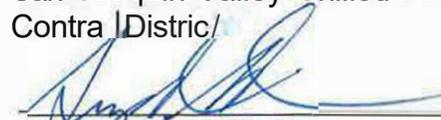
24 **San Joaquin Valley Unified Air
25 Pollution Control District**

26 

27 _____
28 Hub Walsh
Governing Board Chair

Recommended for approval:

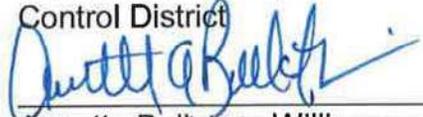
San Joaquin Valley Unified Air Pollution
Control District



Seve Cadredin
Executive Director/APCO

Approved as to legal form:

San Joaquin Valley Unified Air Pollution
Control District



Annette Ballatore-Williamson
~~Interim~~ District Counsel

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EXHIBIT A: District Boundaries/San Joaquin Valley Air Basin

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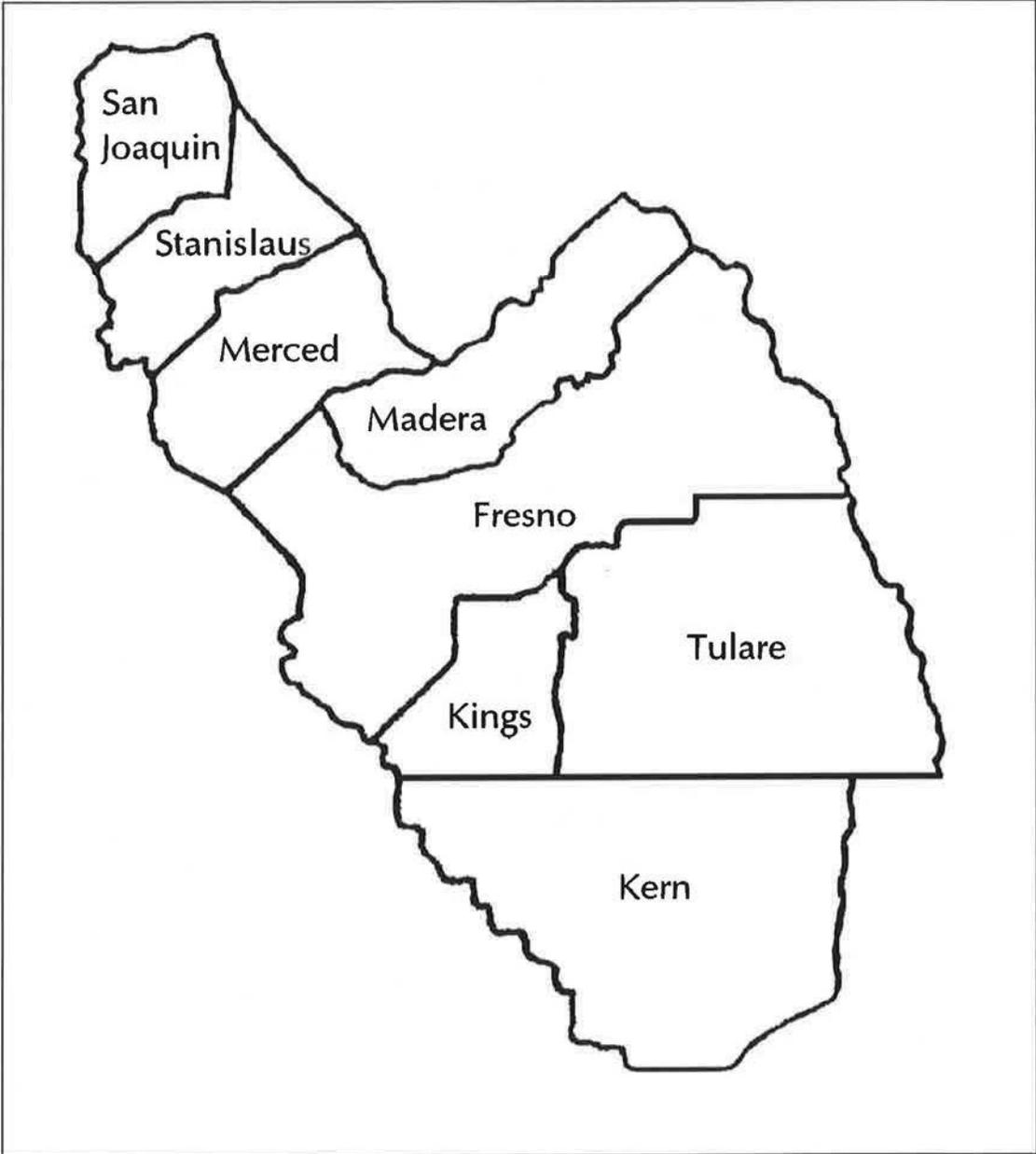


EXHIBIT B: Segments/Corridors of the HST System

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San Joaquin Valley Unified Air Pollution Control District
Meeting of the Governing Board
June 19, 2014

**APPROVE MEMORANDUM OF UNDERSTANDING AND VOLUNTARY
EMISSION REDUCTION AGREEMENT WITH THE CALIFORNIA HIGH-SPEED
RAIL AUTHORITY FOR THE PURPOSE OF MITIGATING AIR QUALITY
IMPACTS**

Attachment B:

Voluntary Emission Reduction Agreement
No. 20140105
(56 pages)

STANDARD AGREEMENT

STD. 213 (NEW 06/03)

AGREEMENT NUMBER HSR14-12
REGISTRATION NUMBER

1. This Agreement is entered into between the State Agency and the Contractor named below

STATE AGENCY'S NAME

California High-Speed Rail Authority

CONTRACTOR'S NAME

San Joaquin Valley Unified Air Pollution Control District

2 The term of this Agreement is: June 1, 2014 (or upon DGS approval, whichever is later) through July 31, 2028.

3 The maximum amount of this Agreement is: \$1,705,472 ("Agreement Funding Maximum").
One Million, Seven Hundred and Five Thousand, Four Hundred and Seventy-Two Dollars

4 The parties agree to comply with the terms and conditions of the following exhibits which are by this reference made a part of the Agreement:

Exhibit A - Scope of Work and its Attachments A-1 to A-8 (Attachment A-4 includes a budget)	39	Pages
Exhibit B - Budget Detail and Payment Provisions	1	Page
Exhibit C - General Terms and Conditions	4	Pages
Exhibit D - Special Terms and Conditions	3	Pages
Exhibit E - Supplemental Terms and Conditions for Contracts Using Federal Funds	7	Pages

IN WITNESS WHEREOF, this Agreement has been executed by parties hereto (additional signatures on following page 9.)

CONTRACTOR

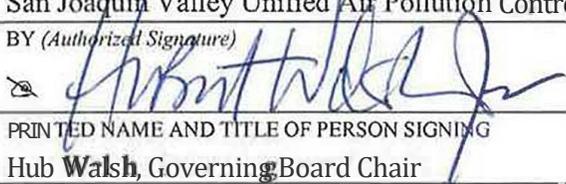
California Department of General Services Use Only

CONTRACTOR'S NAME (If other than an individual, state whether a corporation, partnership, etc.)

San Joaquin Valley Unified Air Pollution Control District

BY (Authorized Signature)

DATE SIGNED (Do not type)



6/20/14

PRINTED NAME AND TITLE OF PERSON SIGNING

Hub Walsh, Governing Board Chair

ADDRESS

1990 E. Gettysburg Avenue, Fresno, CA 93726

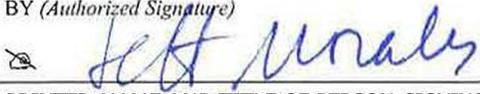
STATE OF CALIFORNIA

AGENCY NAME

California High-Speed Rail Authority

BY (Authorized Signature)

DATE SIGNED (Do not type)



5-29-14

PRINTED NAME AND TITLE OF PERSON SIGNING

Jeff Morales, Chief Executive Officer

ADDRESS

770 L Street, Suite 800, Sacramento, CA 95814

D Exempt per:

ADDITIONAL SIGNATURE PAGE FOR VERA BETWEEN CALIFORNIA HIGH-SPEED RAIL
AUTHORITY AND SAN JOAQUIN VALLEY AIR POLLUTION CONTROL DISTRICT FOR
CONSTRUCTION PACKAGE 1A/1B (MADERA TO FRESNO)

June 2014

HSRA AGREEMENT NUMBER: HSR14-12
DISTRICT AGREEMENT NUMBER: 20140105

The following authorized representatives of the District, by their signatures, recommend and approve this Agreement for execution by the District's Governing Board. **Recommended for approval:**

San Joaquin Valley Unified Air Pollution
Control District

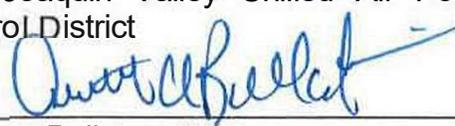


Seyed Sadredin
Executive Director/APCO

Date: JUN 16 2014

Approved as to legal form:

San Joaquin Valley Unified Air Pollution
Control District



Annette Ballatore-Williamson
District Counsel

Date: JUN 16 2014

Approved as to accounting form:

San Joaquin Valley Unified Air
Pollution Control District



Mehri Barati
Director of Administrative Services

Date: JUN 16 2014

**EXHIBIT A
SCOPE OF WORK**

**VOLUNTARY EMISSION REDUCTION AGREEMENT (District No. 20140105)
FOR THE MADERA-FRESNO PORTION OF THE MERCED-FRESNO HIGH SPEED
RAIL SEGMENT**

This Voluntary Emission Reduction Agreement ("Agreement" or "VERA") is entered into between the CALIFORNIA HIGH-SPEED RAIL AUTHORITY ("Authority") and the SAN JOAQUIN VALLEY UNIFIED AIR POLLUTION CONTROL DISTRICT ("District" or "Contractor"). Authority and District are each a "Party" and collectively are the "Parties". As used herein, "Agreement" or "VERA" includes the Standard Agreement cover page (STD 213), this Exhibit A (Scope of Work) and Exhibits B to E inclusive.

RECITALS

WHEREAS, District is an air pollution control district formed by the counties of Fresno, Kings, Madera, Merced, San Joaquin, Stanislaus and Tulare, and the Valley portion of Kern, pursuant to California Health and Safety Code section 40150, et seq.; and

WHEREAS, District is responsible for developing and implementing air quality control measures within the District Boundaries as depicted in Attachment A-1 ("District Boundaries") attached hereto and incorporated herein, including air quality control measures for stationary sources, transportation sources, and indirect sources; and

WHEREAS, the Authority, in partnership with the Federal Railroad Administration ("FRA"), is developing an electrified high-speed train ("HST") system ("System"), which includes construction of guide-way segments, and ancillary facilities such as maintenance facilities, electrical overhead catenary, stations, and overpasses for California pursuant to the California High-Speed Rail Act (Public Utilities Code section 18500 et seq.) ("Rail Act") and the Safe, Reliable High-Speed Passenger Train Bond

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Act for the 21st Century (codified at Streets and Highways Code section 2704 *et seq.*) ("Bond Act") that would serve the San Francisco Bay Area, Sacramento, Central Valley, Los Angeles and San Diego (as depicted in Attachment A-2); and

WHEREAS, the System includes segments (or portions thereof) that will be constructed within the San Joaquin Valley ("SJV") District Boundaries including the following: Merced to San Jose, Merced to Fresno, Fresno to Bakersfield, Bakersfield to Palmdale, and Sacramento to Merced collectively referred to as "HST SJV District Portion"; and

WHEREAS, in 2014 the Parties anticipate entering into a Memorandum of Understanding to establish the process to fully mitigate (by offsetting to net zero) emissions from construction of the HST SJV District Portion; and

WHEREAS, the Authority completed Program-level Environmental Impact Statements/Reports (EIS/EIR) in 2005, 2008, 2010 and 2012 pursuant to the National Environmental Policy Act ("NEPA") and California Environmental Quality Act ("CEQA") evaluating impacts of the System, and selecting preferred route corridors; and

WHEREAS, a project level Final EIS/EIR ("MF FEIR") for the Merced to Fresno Segment ("MF Segment") was certified via Resolution 12-19 ("MF FEIR Resolution") and the MF Segment was approved and CEQA findings made via Resolution 12-20 ("MF Segment Resolution") by the Authority's Board of Directors in May 2012 and FRA's associated Record of Decision ("ROD") issued in September 2012; and

WHEREAS, during the public process leading up to the MF FEIR, the District recommended in writing that the Authority enter this VERA with the District as a mitigation measure for construction emissions (because of the offsets it would achieve); and

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WHEREAS, construction of a portion of the MF Segment (grade separations, track bed and track bed structures from approximately Madera to downtown Fresno; rails, electrification and stations will be part of a future construction package(s)) is anticipated to commence in 2014 (known as Construction Package 1A/1 B or "CP 1A/1 B"), and the Authority has not secured funding to construct north of Madera; and

WHEREAS, despite incorporation of various requirements and mitigation measures (i.e., using the cleanest construction and hauling fleet as reasonably practicable, as detailed in MF FEIR AQ-MM#1 and #2) to reduce the construction emissions associated with the MF Segment, the Authority concluded in its MF Segment Resolution that construction would nevertheless still cause significant cumulative impacts on air quality within the District Boundaries because of the existing nonattainment status or maintenance status for Criteria Pollutants (extreme nonattainment, in the case of ozone precursors Oxides of Nitrogen ("NOx") and Volatile Organic Compounds ("VOCs")); and

WHEREAS, the Authority in the MF Segment Resolution committed to fully mitigate) cumulative air quality impacts of the MF Segment resulting from construction for VOC, NOx, Particulate Matter of 10 microns or less in size ("PM10") and Particulate Matter of 2.5 microns or less in size ("PM2.5") (the "Offset Obligation"), collectively referred to as "Criteria Pollutants", by offsetting Criteria Pollutants collectively in the aggregate to net zero; and

WHEREAS, the Authority determined the Offset Obligation was feasible because of the District's representations to the Authority about its expertise and its ability to partner with the Authority to implement the Offset Obligation at the Offset Cost Schedule set forth in Table 1; and

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WHEREAS, the Authority in the MF Segment Resolution committed to causing the emissions offsets to occur within one year of the associated emission to be offset, or longer as permitted by 40 Code of Federal Regulations Part 93 Section 93.163 ("Offset Timing Requirement"); and

WHEREAS, the District has developed Incentive Programs around several core principles, including cost-effectiveness, integrity, effective program administration, excellent customer service, the efficient use of District resources, fiscal transparency and public accountability; and

WHEREAS, the District's Incentive Programs involve the District using monies (such as project-proponent-provided monies) to fund (usually on a percentage basis) the purchase and use by third parties of newer equipment that emits fewer Criteria Pollutants to replace older, less-clean-burning equipment (such as farm tractors), which the District administers through Individual Incentive Program Funding Agreements; and

WHEREAS, the District's Individual Incentive Program Funding Agreements require the user of the new equipment to use the new equipment for a minimum number of hours (based on the user's historical use of the replaced equipment) over a specified number of years, with penalties and remedies for failure to so use the equipment including potentially having to return the funds for redeployment, and require permanent destruction of the replaced equipment; and

WHEREAS, the Individual Incentive Program Funding Agreements, because of their requirements, result in reductions of Criteria Pollutants that get assigned to the project proponent providing the funding (the Authority, in this case) to offset emissions by that project proponent ("Criteria Pollutant VERA Offsets"); and

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WHEREAS, the Criteria Pollutant VERA Offsets, because of the requirements of and protections in the Individual Incentive Program Funding Agreements, are generated and become secured upon execution of each Individual Incentive Program Funding Agreement; and

WHEREAS, the District's Incentive Programs are regularly audited by independent outside agencies including professional accountancy corporations on behalf of the federal government, the California Air Resources Board (ARB), the California Department of Finance and the California Bureau of State Audits ("Successful Audit History"); and

WHEREAS, the District has determined that with appropriate funding from Authority, the District can generate and certify Criteria Pollutant VERA Offsets to fully offset the CP 1A/1 B portion of the MF Segment ("CP 1A/1 B Portion") construction emissions of Criteria Pollutants; and

WHEREAS, District has a history of successfully implementing at least eleven agreements similar to this VERA at an average cost-effectiveness per ton of \$7,911, and has never to date needed to request a project proponent in any of those VERAs or any other VERA to provide funds beyond the original total funds estimate (including administrative fee) and deposit.

AGREEMENT

1. Offset of Emissions of Criteria Pollutants during Construction for CP 1A/1 B Portion and Cost Estimate

i For CP 1A/1 B, the Authority shall fully offset its actual construction emissions of Criteria Pollutants, which offsets the District shall provide and guarantee through the Authority's funding of and the District execution and implementation of

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Individual Incentive Program Funding Agreements ("IIPFA") that achieve surplus, quantifiable and enforceable emissions reductions.

ii. For the purpose of this Agreement, "fully offset" or "net zero" means that the aggregate sum of all Criteria Pollutants emission reductions achieved by the IIPFAs is equal to, or greater than, the aggregate sum of actual Criteria Pollutant emissions from construction of the CP 1A/1 B Portion, meaning excess offset of one Criteria Pollutant is credited against emissions of other Criteria Pollutants. "Surplus" emission reductions are reductions that are not otherwise required by existing laws or regulations.

iii. CP 1A/1 B extends approximately from the intersection of Avenue 17 and the Burlington Northern Santa Fe ("BNSF") rail line in Madera to the intersection of Santa Clara Street and the Union Pacific rail line in downtown Fresno, as shown in Attachment A-3. Estimated construction emissions of Criteria Pollutants, by year by pollutant, for CP 1A/1 B are set forth in Attachment A-4 ("CP 1A/1 B Criteria Pollutants Estimate"), which reflect implementation of AQ-MM#1 and #2 (contractor's use of a cleaner fleet). Based on the District's current estimated cost-per-ton, plus the District's four percent (4%) administrative cost overhead ("District Overhead") to procure offsets and to implement this Agreement, as specified in Section 2.1, and the CP 1A/1 B Criteria Pollutants Estimate, achieving Criteria Pollutant VERA Offsets for CP 1A/1 B to net zero will cost approximately \$1,364,377 ("CP 1A/1 B Offset Cost Estimate"), as also shown in Attachment A-4. This is only an estimate; the actual cost to fully offset CP 1A/1 B may be higher or lower depending upon a number of factors which cannot be precisely determined now, including but not limited to the evolving market price to accomplish offsets and the actual pace and sequencing of construction. Accordingly, the Authority agrees to provide funds up to \$1,705,472 ("Agreement Funding Maximum") (which is

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the above amount plus twenty-five percent (25%); any additional amount would require an amendment to this VERA) to fully offset its actual CP 1A/1 B construction emissions of Criteria Pollutants, subject to the District's obligations to secure those offsets on the Authority's behalf in a cost-effective manner as required by Paragraph 2.1.

iv. The Authority at any time may submit to the District a Revised CP 1A/1 B Criteria Pollutants Estimate to reflect then-current information about construction timing, sequencing and equipment. The Authority and District shall work closely after submission to review and revise as necessary to allow District approval in writing within 30 days of submission; the CP 1A/1 B Offset Cost Estimate shall be adjusted accordingly, upon such approval, via Operating Memorandum pursuant to Paragraph 16.ii.

2. Emissions Offsets Funding

2.1 Offset Cost Per Ton

Offset cost estimates under this VERA are based on the District's cost per ton set forth below in Table 1 (Offset Cost Schedule).

Table 1 Offset Cost Schedule

Criteria Pollutants	Cost \$/ton
NOx or VOC/ROG	\$9,350
PM10 (which includes PM2.5)	\$9,011

These per-ton costs are not a guarantee and only an estimate, but the District shall use every reasonable effort to accomplish average per-ton costs, calculated as of its execution of the last IIPFA under this VERA, no higher than these Table 1 costs, as Table 1 might be modified per this Paragraph 2.1. The Table 1 per-ton costs derive from District Rule 9510 (Indirect Source Review) and are subject to change through the

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District's formal public procedures for amending these rules. Consistent with District Rule 3180 (Administrative Fees for Indirect Source Review), the total offset cost estimates shall include (which is included in Attachment A-4) an administrative cost equal to four percent (4%) of the offset cost estimate. Any changes to District Rule 3180 or 9510 will be conducted through the District's formal public procedures and process for amending these rules.

District shall provide written notice (via email and mail) to the Authority of any pending Rule 3180/9510 cost per ton change at least fifteen (15) days prior to any District approval of or decision on such pending change. The results of that change shall be memorialized via Operating Memorandum pursuant to Paragraph 16.ii.

2.2 Air Quality Cost per Ton

Revisions to the CP 1A/1B Offset Cost Estimate (as contemplated in Paragraphs 1 and 3.2) shall be based on Table 1 or the average cost-effectiveness the District then projects it will accomplish for this VERA (based on the IIPFAs then executed to date under this VERA), if the District concludes after consulting with the Authority that the projected cost-effectiveness will be different than Table 1 (as Table 1 might be modified per Paragraph 2.1).

2.3 Payment of Funds for Criteria Pollutant VERA Offsets

i. Within fifteen (15) days after this VERA has been entered into by the Authority and the District, and then approved by the California Department of General Services ("DGS"), the District shall send to the Authority an Initial Invoice in the form of Attachment A-5, or in another form as the Authority may reasonably request.

ii. Within one hundred twenty (120) days after the Authority receives the Initial Invoice from the District or DGS has approved this VERA, whichever is later, the

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Authority shall deposit with the District initial funds in the amount of five-hundred thousand dollars (\$500,000) ("Initial Deposit"), or a greater amount if the parties so agree via Operating Memorandum pursuant to Paragraph 16.ii, as initial funding towards the CP 1A/1 B Offset Cost Estimate. This initial deposit and each subsequent deposit are collectively referred to herein as "Deposits" with each being a "Deposit".

iii. The District will place each Deposit into a District-held but segregated High Speed Rail Offset Funding Trust Account. Deposits will be used to fund Individual Incentive Program Funding Agreements. Deposits in the High Speed Rail Offset Funding Trust Account are held by the District in trust for the Authority and are the property of the Authority until moved to the District's Committed High Speed Rail Offsets Funds Account under Paragraph 2.4. This High Speed Rail Offset Funding Trust Account shall serve all Authority VERAs as the Authority replenishes it in accordance with Paragraph 2.4.

2.4 Individual Incentive Program Funding Agreements; Secured Criteria Pollutant VERA Offsets Receipt; Trust Account Replenishment

i. Upon the Authority's submission to District of the Initial Deposit (and upon the Authority's written notice to proceed from its Contract Manager to the District based on relative certainty of a likely construction start date) and upon each Authority additional Deposit, the District is obligated to use Deposits to enter into IIPFAs to achieve Criteria Pollutant VERA Offsets for construction of the CP 1A/1 B Portion on behalf of the Authority to the extent required under this Agreement. District shall use diligent efforts to negotiate and prepare draft Individual Incentive Program Funding Agreements with the owners and/or operators of the pollution source equipment ("IIPFA Equipment User") within District Boundaries, as identified by the District's Incentive

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Programs (such Agreements may not involve retrofit of existing equipment or facilities). District shall use reasonable efforts, balanced with other requirements of this VERA, to prioritize owners and/or operators of pollution source equipment that will lead to generation of Criteria Pollutant VERA Offsets located as close as possible geographically to the location of the CP 1A/1 B construction.

ii. IIPFAs shall include the following: (a) the business address of the IIPFA Equipment User; (b) the Tax Identification Number of the IIPFA Equipment User; (c) the location(s) where the funded equipment is anticipated to be used; (d) replaced equipment disposal requirement; (e) description of replaced and new equipment; (f) minimum annual usage requirement for new equipment; and (g) the Authority named as an intended third-party beneficiary if the Authority so requests and the District so agrees. The Parties may adjust the preceding IIPFA content requirements via Operating Memorandum (pursuant to Paragraph 16.ii) if necessary to improve VERA implementation, provided such adjustments will allow the Authority to meet its auditing and reporting requirements.

iii. The District shall provide each negotiated draft IIPFA to the Authority via e-mail prior to District execution, together with a draft Criteria Pollutant VERA Offsets Receipt (defined in Paragraph 2.4.v. below) specifying clearly the amount of Criteria Pollutant VERA Offsets, by pollutant by year, the IIPFA will provide, how much such Criteria Pollutant VERA Offsets will cost out of the Deposit funds (including District Overhead), and the per-ton-by-pollutant cost, for review by the Authority within five (5) business days. Authority's review is limited to ensuring each IIPFA and associated draft Criteria Pollutant VERA Offsets Receipt (a) identifies the quantity of Criteria Pollutant reductions of which type are generated by the IIPFA in each year and associated costs

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(so the Authority knows exactly what it is paying for at what cost) and (b) meets the requirements in Paragraph 2.4 (sub-sections i and iii) of this VERA for what IIPFAs and Criteria Pollutant VERA Offsets Receipts must contain.

iv. Upon full execution of an Authority-approved IIPFA, District may move funds equal to that shown in the associated draft Criteria Pollutant VERA Offset Receipt, including District Overhead which is to compensate the District for its staff time and other administrative costs to implement the IIPFA on behalf of the Authority. The Authority acknowledges that District has provided historical and auditable documentation to the Authority demonstrating that 4% is a reasonable approximation of the District's costs to implement agreements such as this VERA and IIPFAs; District agrees to provide any further of such documentation during the term of this VERA if the Authority reasonably concludes that such further documentation is necessary to satisfy any future audits or the FRA.

v. Within ten (10) days after full execution of each Authority-approved IIPFA, District shall provide a copy of that IIPFA and a Criteria Pollutant VERA Offsets Receipt (in the form of Attachment A-6, or in another form as the Authority may reasonably request) to the Authority specifying the amount of Criteria Pollutant VERA Offsets, by pollutant by year, secured by the IIPFA ("Secured Criteria Pollutant VERA Offsets"), how much such Criteria Pollutant VERA Offsets cost out of the Deposit funds (including the District Overhead), and the per-ton-by-pollutant cost. Thereafter, the District is obligated to implement each IIPFA and to ensure, at no further cost to and no further involvement by the Authority, that associated Secured Criteria Pollutants VERA Offsets are generated as set forth in the associated Criteria Pollutant VERA Offsets Receipt; should such generation fail as to any IIPFA and associated Criteria Pollutant VERA

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Offsets Receipt, the District shall take whatever steps are required (including but not limited to entering into additional IIPFAs, and funding them at no cost to the Authority) to ensure that substitute emissions reductions occur equivalent in amount to the associated Criteria Pollutant VERA Offsets Receipt, and in a timing manner that allows the Offset Timing Requirement to be met for actual Criteria Pollutant Emissions from CP 1A/1 B construction.

vi. The District shall keep detailed records of the generation of Secured Criteria Pollutants VERA Offsets over the life of the performances required under the associated IIPFA, consistent with District's record-keeping practices that have led to its Successful Audit History; District shall make such records available to the Authority and/or FRA for review upon request and shall keep such records for fifteen (15) years.

vii. Upon receiving any Criteria Pollutant VERA Offsets Receipt, the Authority shall have no more than sixty (60) days to replenish the High Speed Rail Offset Funding Trust Account in the amount of that Receipt until total Deposits equal the CP 1A/1 B Offset Cost Estimate as it may by then have been adjusted pursuant to Paragraphs 1(iv) or 3.2(i). The District acknowledges that this sixty-day requirement is dependent upon the Authority receiving the required replenishment amount from FRA as reimbursement to the Authority of the Criteria Pollutant VERA Offsets Receipt amount. This subsection is not a limit on the Authority's obligations set forth in Paragraph 1.

viii. The District shall use every reasonable effort initially to match the Secured Criteria Pollutant VERA Offsets to the by-pollutant-by-year CP 1A/1 B Criteria Pollutants Estimate listed in Attachment AA (as it may get revised per Paragraph 1(iv)) to satisfy the Offset Timing Requirement on a 1:1 basis (not the higher offset ratios permitted by the Offset Timing Requirement), and shall adjust those efforts over time as reasonably

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possible (including by delaying execution of further IIPFAs if Criteria Pollutant VERA Offsets production get too far ahead temporally of actual emissions) to reflect actual emissions of Criteria Pollutants, as reported in accordance with Paragraph 3.2. The District shall advise the Authority in writing, as soon as the District recognizes and before executing any additional IIPFAs, if it reasonably determines that the 1:1 standard cannot be met, in which case the Parties shall meet and confer to develop an implementation strategy to ensure the timing and amounts of emissions reductions occur at a minimum as specified by the Offset Timing Requirement.

3. Segment Related Construction Emissions

3.1 Actual Construction Emissions Assessment

i. Commencing at first to occur of excavation, grading, demolition, construction-vehicle travel on paved or unpaved surfaces creating vehicle exhaust, any of which occurs for the sole purpose of constructing (but not designing) the CP 1A/1 B Portion ("Construction"), the Authority shall start collecting detailed daily Construction information to determine the actual Criteria Pollutant Construction emissions for the CP 1A/1 B Portion. To determine the actual Criteria Pollutant Construction emissions for that Portion (for inclusion in the Construction Report required by Section 3.1.iii), the Authority shall use the California Emissions Estimator Model (CalEEMod), or any substitute computer model or analysis approved by the District (such as a spreadsheet containing hand calculations using the most current emission factors for quantifying actual construction emissions). The District and Authority shall agree in writing upon, via Operating Memorandum pursuant to Paragraph 16.ii, the date Construction started so as to fix subsequent reporting deadlines.

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ii. Construction information shall include emission sources associated with the on-site and off-site construction activities. For on-site construction activities, the Authority shall collect data for all off-road equipment by equipment type, engine horsepower, engine model year, and total daily hours of operation for each construction activity (i.e., site preparation, grading, paving, demolition, etc.). For off-site construction activities, the Authority shall collect all vehicle trips by general category of activity (employee and vendor travel or materials delivery), by vehicle type (i.e., auto, light-duty truck, heavy duty truck) and their associated total vehicle miles. The on-site and off-site construction activities will be monitored by the Authority, as presented in Attachment A-Z ("Construction Reporting Detail Information"). Records of the construction information shall be kept by the Authority for fifteen (15) years and made available to the District upon request.

iii. The Authority shall submit to the District a Construction Report within sixty (60) days starting at the end of every three (3) month period (or other frequency, as the Parties may agree in writing via Operating Memorandum pursuant to Paragraph 16.ii) following the start of Construction, and within sixty (60) days of any termination pursuant to Section SA.ii. The Construction Report, as outlined in Attachment A-8, shall be based on the Construction Reporting Detail Information collected during every three (3) month period and any other information or data as the Parties may agree to via Operating Memorandum pursuant to Paragraph 16.ii. The District shall evaluate the Construction Report and provide its review in the Emission Reduction Status Report in accordance with Paragraph 3.2. Upon completion of the entire CP 1A/1 B Construction activities that generate material amounts of Criteria Pollutants, but no later than sixty (60) days after the Authority's issuance to its CP 1A/1 B contractor of Certificate of Final Acceptance,

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the Authority shall submit to the District a Final Construction Report summarizing all actual Construction related Criteria Pollutant emissions for CP 1A/1 B.

3.2 Emission Reduction Status Reporting

i. Upon the District's receipt of the Construction Report, the District shall have sixty (60) days to prepare and submit to the Authority an Emission Reduction Status Report ("Status Report"). This Status Report shall compare the Secured Criteria Pollutant VERA Offsets to date to the emissions of Criteria Pollutants in the CP 1A/1 B Construction Reports to date. The Status Report also shall identify the average cost-effectiveness (in dollars per Criteria Pollutant per ton) based on the IIPFAs then executed to date under this VERA. Based on the foregoing in this Paragraph 3.2.i, the Status Report shall identify whether the then-current CP 1N1 B Offset Cost Estimate is accurate and if not accurate shall propose a re-adjustment as necessary for the Authority's review and consideration for approval within thirty (30) days. The Status Report also shall provide an accounting of (a) the High Speed Rail Offset Funding Trust Account, (b) the Committed High Speed Rail Offsets Funds Account (listing the IIPFA associated with each funds commitment entry) and (c) funds actually paid out from the Committed High Speed Rail Offsets Funds Account (listing the IIPFA associated with each pay out and the associated Secured Criteria Pollutant Offset amount). The District agrees to meet telephonically or in person with the Authority if the Authority has any questions related to any Status Report.

ii. When the total Secured Criteria Pollutant VERA Offsets equal or exceed the total emissions of Criteria Pollutants reported in Construction Reports through the Final Construction Report for CP 1A/1 B, the District shall issue a Final Status Report so verifying. Excess offsets achieved shall be handled pursuant to Paragraph 3.4. Any

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funds then remaining in the High Speed Rail Offset Funding Trust Account associated with CP 1A/1 B shall be returned to the Authority by the District within thirty (30) days of issuing the Final Status Report, unless otherwise agreed to in writing by the Authority.

3.3. MF Segment Construction Phases after CP 1A/1 B

Construction within the MF Segment beyond CP 1A/1 B will be handled via amendment to this VERA or via a separate VERA, as the Parties subsequently may agree in such amendment or separate VERA.

3.4. Disposition of Excess Secured Criteria Pollutants VERA Offsets

i. If total Secured Criteria Pollutant VERA Offsets exceed the total actual emissions of Criteria Pollutants reported in Construction Reports through the Final Construction Report for CP 1A/1 B ("CP 1A/1 B Excess Secured VERA Offsets"), as reported in the Final Status Report, such CP 1A/1 B Excess Secured VERA Offsets can be transferred to any other Authority construction within District Boundaries; use of such transfers must comply with the Offset Timing Requirement. Such transfer shall be deemed effective fifteen (15) days after Authority written notification to the District of such transfer. If other Authority construction is not available to receive the benefit of such a transfer, the Authority may transfer the CP 1A/1 B Excess Secured VERA Offsets to a third-party development project in the District Boundaries unless then-applicable law prohibits such a transfer.

ii. If CP 1A/1 B construction gets de-funded, halted or suspended for whatever reason for a predicted material amount of time, and if total Secured Criteria Pollutant VERA Offsets exceed the total emissions of Criteria Pollutants for CP 1A/1 B construction up to the construction halt or de-fund date, the District shall not enter any further IIPFAs for CP 1A/1B and the Authority may transfer the excess Secured Criteria

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Pollutant VERA Offsets to other Authority construction or to a third-party development project(s) in the District Boundaries. In addition, District shall apply any funds then in the High Speed Rail Offset Funding Trust Account for CP 1A/1 B to any then-active other Authority-District VERA(s); if there are none, then the District shall return to the Authority (if the Authority so requests) any such funds. Prior to re-starting CP 1A/1 B construction, the Authority shall deposit with the District funds equivalent to the transferred Secured Criteria Pollutant VERA Offsets plus any amount returned to the Authority (or applied to non-CP 1A/1 B Authority construction) out of the High Speed Rail Offset Funding Trust Account pursuant to the preceding sentence.

4. District Rule 9510 (Indirect Source Review) Requirement

Authority acknowledges that it is required to comply with Rule 9510. The Authority has submitted, and the District has approved, an Air Impact Assessment ("AIA") Application, consistent with District Rule 9510 (Indirect Source Review) requirements. The Authority acknowledges that it is subject to all applicable provisions of District Rule 9510 that are in effect at the time of submitting an Air Impact Assessment Application.

5. Subsequent Litigation, Legislation and/or Administrative Action / Credit to the Authority

In the event that despite this Agreement, Authority is required as a result of a final judgment or District Approved Settlement (as defined below) in any third-party litigation, to pay monies in addition to the monies to be paid by Authority pursuant to this VERA, then District shall acknowledge and credit Authority with any additional emission reduction achieved to offset MF Segment construction emissions that will result from Authority's payment of such additional monies. For purposes of this Paragraph, a

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"District Approved Settlement" shall mean a settlement of a lawsuit filed pursuant to CEQA, NEPA or other applicable environmental law which (i) provides for Authority's payment of monies in exchange for a dismissal of such lawsuit, (ii) provides for the use of such monies by the petitioner in such lawsuit in such a manner as to mitigate adverse air quality impacts of the MF Segment, and (iii) is approved in writing by District. The District shall have no authority to commit the Authority's money in any settlement of a third-party lawsuit without the Authority's consent, and the District shall have no authority over the Authority's ability or decision to settle or terms of settlement; the District's role is limited to evaluating any settlement for credit-giving purposes as stated above.

5A. Term of Agreement

i. This Agreement shall be effective upon the date fully executed and approved by the California Department of General Services, and shall terminate automatically upon the first to occur of (1) July 31, 2028, or (2) generation of all emissions reductions secured by the Secured Criteria Pollutant VERA Offsets required under this VERA, at which time the District shall so inform the Authority in writing.

ii. At any time prior to the events listed in Paragraph 5A.i, for any reason notwithstanding anything to the contrary in this VERA, but only after the Parties complete dispute resolution under Paragraph 6, either Party may by written notice to the other Party ("Termination Notice") terminate this Agreement; termination shall be effective upon the date the receiving party receives the Termination Notice and shall release the Parties from all VERA obligations to each other except as provided below and elsewhere in this Agreement. District shall refund to the Authority any funds in the High Speed Rail Offset Funding Trust Account associated with CP 1A1 B construction

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a of the date the District receives (or sends) the Termination Notice. Notwithstanding termination by Termination Notice by either Party or because the VERA end date of July 31, 2028, has been reached, District's obligations to oversee implementation of IIPFAs, to ensure that Secured Criteria Pollutants VERA Offsets are generated as set forth in Criteria Pollutant VERA Offsets Receipts, and to keep detailed records of the generation of Secured Criteria Pollutants VERA Offsets over the life of the IIPFAs, as required by Paragraph 2.4, shall remain effective for as long as necessary to ensure generation of all emissions reductions secured by the Secured Criteria Pollutant VERA Offsets regardless of termination by any means. In the event the Authority terminates this Agreement (unless the Authority terminates because the District materially breaches this Agreement or because funding for the construction of the CP 1A/1 B Portion is deleted or cancelled), or in the event the District terminates this Agreement because the Agreement Funding Maximum is not increased via VERA amendment despite the Parties' agreement that additional funding is necessary to satisfy the emissions-offset purposes of this VERA, the Authority shall consult with the District as the Authority develops a feasible alternative strategy to comply with the remainder of its Offset Obligation, which alternative strategy the Authority shall use best efforts to develop within ninety (90) days of such termination and regarding which the Authority thereafter shall obtain District's approval (which approval shall not be unreasonably withheld), which consultation and approval requirement shall survive such termination.

6. Dispute Resolution

In the event a dispute arises between the Parties about any provision in this Agreement or the implementation of this Agreement that cannot be resolved through

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discussions between the Parties or their authorized representatives, the following steps shall be taken.

i. The Executive Officer of the Party alleging a dispute shall send a letter to the other Party's Executive Officer outlining the dispute and the action desired. The receiving Party shall respond in writing within twenty-one (21) days. Should either Party request, the Executive Officers shall meet by telephone or in person.

ii. If despite Executive Officer communications the Parties cannot resolve the dispute, the Parties shall mediate the dispute in good faith if one Party so requests in writing. Mediation shall be conducted by JAMS mediation services (or a substitute, if the Parties mutually agree) in Sacramento by a mediator mutually selected by the Parties. The Parties shall use their best efforts to schedule the mediation to take place no later than two (2) months after the date mediation is requested, subject to mediator availability. The Parties shall share equally the costs of mediation as invoiced by JAMS or substitute (unless the Parties agree otherwise on a case-by-case basis), but shall bear their own attorney's fees.

iii. If mediation does not resolve the dispute, either Party may commence litigation in a court of competent jurisdiction, subject to the provisions of Paragraph 19.

iv. Should the dispute be of an urgent nature, the aggrieved Party may commence litigation without first completing mediation. In such case, the Parties shall mediate and litigate concurrently, with mediation occurring pursuant to Paragraph 6.ii.

v. The Parties shall continue to perform their obligations under this VERA during the dispute resolution process, unless the dispute at issue would prejudice one Party if that Party continued to perform a particular obligation; in such case, the Parties shall attempt to make arrangements, including contingencies as necessary, to allow the

EXHIBIT A
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Party to continue to perform the obligation during dispute resolution to allow the Party to perform the obligation in question without risk of prejudice.

7. Representations, Covenants and Warranties

7.1. The Authority's Representations, Covenants and Warranties.

The Authority represents, covenants and warrants to District, as of the date of this Agreement, as follows:

i. The undersigned representative(s) of the Authority are duly authorized to execute, deliver and perform this Agreement, and upon the Authority's execution and delivery of this Agreement, this Agreement will have been duly authorized by the Authority.

ii. Upon execution and delivery of this Agreement by the Authority, the Authority's obligations under this Agreement shall, subject to Legislative appropriation and availability of funds and review and approval by the California Department of General Services, be legal, valid and binding obligations of the Authority, duly enforceable at law and in equity in accordance with the terms and conditions of this Agreement.

iii. There is no lawsuit, legal action, arbitration, legal or administrative proceeding, legislative, quasi-legislative or administrative action or claim existing, pending, threatened or anticipated which would render all or any portion of this Agreement invalid, void or unenforceable in accordance with the terms and conditions thereof, with the exception of pending and anticipated legal proceedings that could lead to suspension or stoppage of CP 1A/1 B construction and/or its funding which would suspend or stop the Authority's ability and need to fund emissions offsets for that suspended or stopped construction.

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iv. Other than the execution and delivery of this Agreement by the undersigned representatives of Authority, and approval by the Board of Directors of the Authority (if and as required by Authority rules and delegations) and approval by DGS, there are no approvals, consents, confirmations, proceedings, or other actions required by Authority or any third party, entity or agency in order to enter into and carry out the terms, conditions and intent of the parties with respect to this Agreement, except as provided in Paragraph 7.1.ii.

v. Upon the approval of this Agreement by the Authority, the Chief Executive Officer of the Authority, or equivalent representative, or a delegee of such officer, has the authority to approve, deliver, verify, acknowledge and/or accept any communication, notice, notification, verification, and/or other document to be issued by Authority as reasonably necessary to implement, and if consistent with, the terms and conditions of this Agreement, without further approval of the Board of Directors of the Authority. This Section 7.1.v is a statement of existing authority, and does not grant any new or expanded authority.

7.2. District's Representations, Covenants and Warranties

District represents, covenants and warrants to the Authority, as of the date of this Agreement, as follows:

i. The undersigned representatives of District are duly authorized to execute, deliver and perform this Agreement, and upon District's execution and delivery of this Agreement, this Agreement will have been duly authorized by District.

ii. Upon execution and delivery of this Agreement by District, District's obligations under this Agreement shall be legal, valid and binding obligations of District,

EXHIBIT A
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duly enforceable at law and in equity in accordance with the terms and conditions of this Agreement.

iii. There is no lawsuit, legal action, arbitration, legal or administrative proceeding, legislative, quasi-legislative or administrative action or claim existing, pending, threatened or anticipated which would render all or any portion of this Agreement invalid, void or unenforceable in accordance with the terms and conditions thereof.

iv. Other than the execution and delivery of this Agreement by the undersigned representatives of District, and approval by the Governing Board of the District, there are no approvals, consents, confirmations, proceedings, or other actions required by District or any third party, entity or agency in order to enter into and carry out the terms, conditions and intent of the parties (except DGS approval per Paragraph 7.1.iv) with respect to this Agreement, except IIPFA Equipment User approval of IIPFAs.

v. The monies paid by the Authority under this Agreement shall be sufficient to ensure that the emission reduction contemplated by this Agreement shall occur, and District shall utilize such monies in such a manner as to ensure that such emission reductions shall occur.

vi. Upon the approval of this Agreement by the governing board of District, the Air Pollution Control Officer of District, or equivalent representative, or a delegee of such officer, shall have the authority to approve, deliver, verify, acknowledge and/or accept any communication, notice, notification, verification, and/or other document to be issued by District as reasonably necessary to implement, and if consistent with, the terms and conditions of this Agreement, without further approval of the Governing Board of District.

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8. Indemnification

i The Authority agrees to indemnify, defend and hold harmless District for, from and in connection with any third party claims, losses and/or liabilities arising from or in connection with Authority's performance under this Agreement, excluding only such claims, losses and/or liabilities which result from or are in connection with District's sole negligence, act or omission.

ii The District agrees to indemnify, defend and hold harmless the Authority, and its officers, agents and employees, for, from and in connection with any third party claims, losses and/or liabilities arising from or in connection with any IIPFA or equipment funded by it or the District's failure to perform its obligations under this Agreement, excluding only such claims, losses and/or liabilities which result from or are in connection with the Authority's sole negligence, act or omission.

9. Inurement

The Authority's rights and obligations under this Agreement, or applicable portions thereof, shall inure to the benefit of and be binding upon any government agency that may succeed to the Authority's responsibilities for the HST System construction work covered by this VERA. Upon any such succession, the rights and obligations of the Authority under this Agreement shall be transferred to the transferee thereof, and the Authority shall thereupon be released by District from all obligations and liabilities so assigned, except for such obligations and liabilities arising prior to such succession.

10. Assignment and Subcontracting

i Neither Party shall have the right to assign all or any part of its rights and/or obligations under this Agreement without the other Party's written consent, which consent shall not be unreasonably withheld. In the event the other Party does give

EXHIBIT A
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consent to any such assignment, the other Party, the third party assignee and the assigning Party shall enter into an amendment and novation of this Agreement which acknowledges the assignment and conforms the various provisions of this Agreement as may be required to be conformed in order to provide to the assignee the rights and benefits of this Agreement as if such assignee and its project were the original party and project contemplated in this Agreement.

ii. Neither Party may satisfy its obligations under this Agreement via a subcontract. IIPFAs are not subcontracts.

11. Recitals Incorporated

The recitals set forth hereinabove are hereby incorporated into this Agreement and acknowledged, agreed to and adopted by the Parties to this Agreement.

12. Further Assurances

The Authority and District agree to execute and deliver any documents and/or perform any acts which are reasonably necessary in order to carry out the intent of the parties with respect to this Agreement.

13. No Joint Venture or Partnership

District and the Authority agree that nothing contained in this Agreement or in any document executed in connection with this Agreement shall be construed as making District and the Authority joint venturers or partners.

14. Notices

Any notices or communications relating to this Agreement shall be given in writing and shall be deemed sufficiently given and served for all purposes when delivered, if (a) in person, (b) by facsimile or electronic mail (with the original delivered by other means set forth in this paragraph), (c) by generally recognized overnight

EXHIBIT A
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courier or (d) by United States Mail, postage prepaid, to the respective addresses set forth below, or to such other addresses as the Parties may designate from time to time by providing written notice of the change to the other Party.

<p>THE AUTHORITY</p> <p>Mark Mcloughlin Director of Env. Services 770 L Street, Suite 800 Sacramento, CA 95814 Ph: (916) 403-6934 Fax: (916) 322-0827 E-mail: mark.mcloughlin@hsr.ca.gov</p> <p>And Contract Manager 770 L Street, Suite 800 Sacramento, CA 95814 (916) 403-6934 Fax: (916) 322-0827</p>	<p>DISTRICT</p> <p>Seyed Sadredin Executive Director/APCO 1990 E Gettysburg Avenue Fresno, CA 93726 Ph: (559) 230-6000 Fax: (559) 230-6061 E-mail: seyed.sadredin@valleyair.org</p>
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15. Entire Agreement

The terms of this Agreement, together with all attached exhibits, are intended by the parties as the complete and final expression of their agreement with respect to such terms and exhibits and may not be contradicted by evidence of any prior or contemporaneous agreement. This Agreement specifically supersedes any prior written or oral agreements between the parties with respect to the subject matter of this Agreement.

16. Amendments and Waivers

i. No addition to or modification of this Agreement shall be effective unless set forth in writing, signed by the Party against whom the addition or modification is

EXHIBIT A
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sought to be enforced, and approved by the District's and Authority's respective governing boards if and as required by applicable law and then-extant Executive Officer delegations of authority. The Party benefited by any condition or obligation may waive the same, but such waiver shall not be enforceable by another Party unless made in writing and signed by the waiving Party.

ii. The Parties shall use Operating Memoranda, which shall be signed by both Parties, to formalize agreement as to matters which this Agreement requires or allows use of Operating Memoranda, or as to other matters where implementation detail requires further elaboration but is consistent with this Agreement.

17. Invalidity of Provisions

If any provision of this Agreement as applied to either Party or to any circumstance shall be adjudged by a court of competent jurisdiction to be void or unenforceable for any reason, the same shall in no way affect (to the maximum extent permissible by law) any other provision of this Agreement, the application of any such provision under circumstances different from those adjudicated by the court, or the validity or enforceability of this Agreement as a whole. The parties further agree to replace any such invalid, illegal or unenforceable portion with a valid and enforceable provision, which will achieve, to the maximum extent legally possible, the economic, business or other purposes of the invalid, illegal or unenforceable.

18. Construction

Unless otherwise indicated, all paragraph references are to the paragraph of this Agreement and all references to days are to calendar days (unless otherwise specified). Whenever, under the terms of this Agreement the time for performance of a covenant or condition falls upon a Saturday, Sunday or California state holiday, the time for

EXHIBIT A
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performance shall be extended to the next business day. The headings used in this Agreement are provided for convenience only and this Agreement shall be interpreted without reference to any headings. Wherever required by the context, the singular shall include the plural and vice versa, and the masculine gender shall include the feminine or neuter genders, or vice versa. This Agreement may be executed in one or more counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the same instrument. Facsimile or scanned (.pdf, .jpeg, etc.) images of signatures shall be treated as originals. The language in all parts of this Agreement shall be construed as a whole in accordance with its fair meaning, and shall not be construed against any Party solely by virtue of the fact that such Party or its counsel was primarily responsible for its preparation.

19. Governing Law

The rights and obligations of the parties and the interpretation and performance of this Agreement shall be governed in all respects by the laws of the State of California.

20. No Third-party Beneficiaries

Nothing in this Agreement, express or implied, is intended to confer any rights or remedies under or by reason of this Agreement on any person other than the parties to it and their respective permitted successors and assigns, nor is anything in this Agreement intended to relieve or discharge any obligation of any third person to any Party hereto or give any third person any right of subrogation or action over or against any Party to this Agreement.

21. Attachments

The attachments to this Exhibit A Scope of Work shall be deemed to be a part of this Agreement and are fully incorporated herein by reference. All capitalized terms

EXHIBIT A
SCOPE OF WORK

used in the attachments and not defined therein shall have the meaning as defined herein. The attachments are:

A-1: District Boundaries

A-2: High Speed Rail Segments Map

A-3: Construction Package 1A/1 B Map

A-4: CP 1A/1B Criteria Pollutants Estimate and Cost

A-5: Initial Deposit Invoice

A-6: Criteria Pollutant Offset Receipt

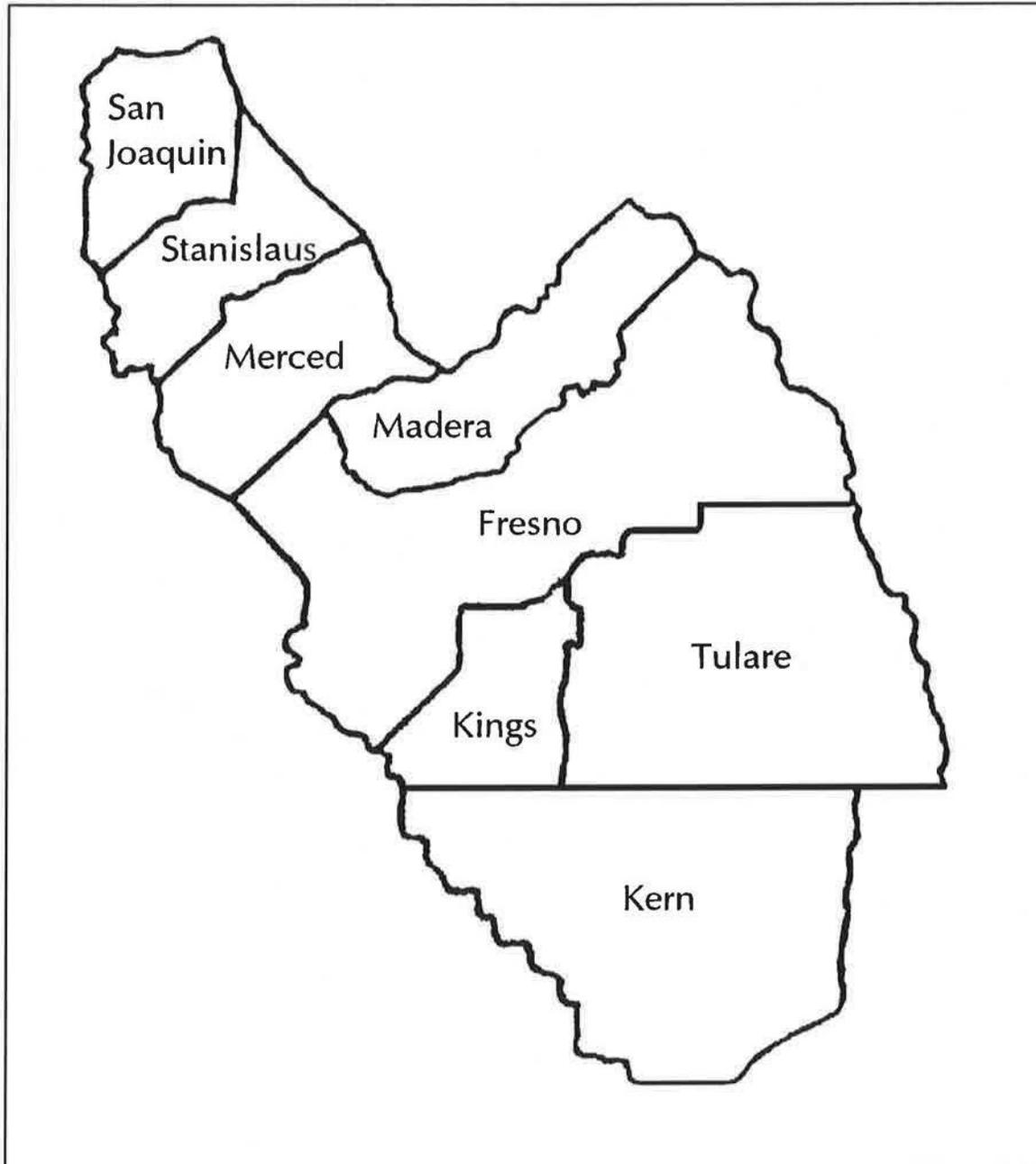
A-7: Construction Reporting Detail Information

A-8: Construction Report Format

22. Force Majeure

The time within which any Party shall be required to perform under this Agreement shall be extended on a day-per-day basis for each day during which such performance is prevented or delayed by reason of events reasonably outside of the control of the performing Party, including, without limitation, acts of God, events of destruction, acts of war, civil insurrection, strikes, shortages, non-Party governmental delays, non-Party moratoria, civil litigation and the like, and/or delays caused by the other Party's act or omission.

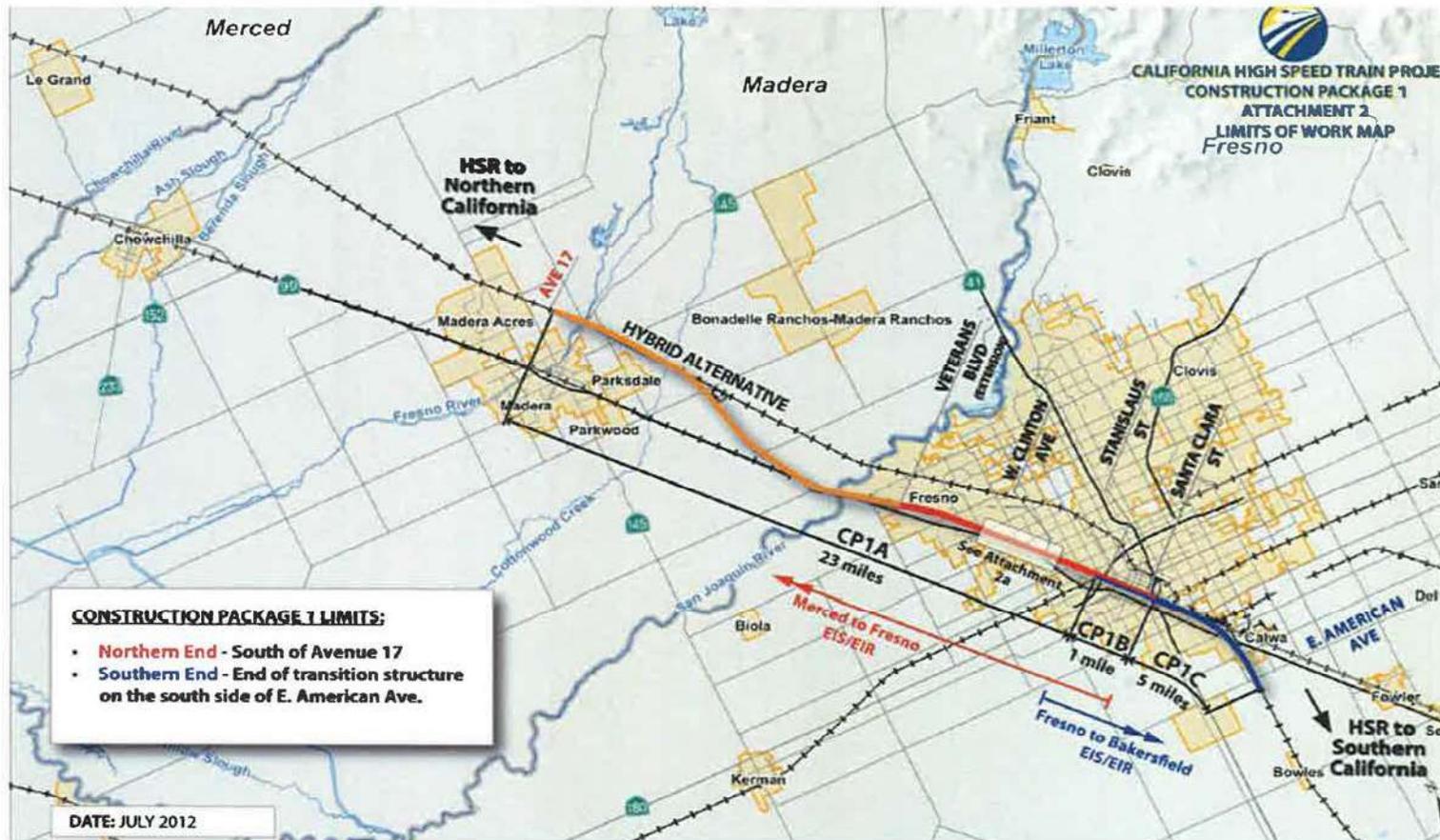
**ATTACHMENT A-1
DISTRICT BOUNDARIES**



ATTACHMENT A-2 HIGH SPEED RAIL SEGMENTS MAP



ATTACHMENT A-3 CONSTRUCTION PACKAGE 1A/1B MAP



ATTACHMENT A-4

CP 1A/1B OFFSET COST ESTIMATE

Pollutant	ROG/VOC	NOx	PMIO*
Tons to be Reduced - 2014	1.66	24.13	2.89
Tons to be Reduced - 2015	2.67	38.81	5.37
Tons to be Reduced - 2016	1.86	27.63	3.20
Tons to be Reduced - 2017	1.85	27.62	3.15
Tons to be Reduced - 2018 to 2022	0.00	0.00	0.00
Total for CP 1A/1B	8.04	118.19	14.61
Cost per ton (\$/Ton)	\$ 9,350.00	\$ 9,350.00	\$ 9,011.00
Emission Offset Funds	\$75,174	\$1,105,077	\$131,651
4% Administrative Cost (District Overhead)	\$3,007	\$44,203	\$5,266
CPIA/18 Offset Cost Estimate (including District Overhead)	\$1,364,377		
Agreement Funding Maximum	\$1,705,472		
*PM2.5 is included in PMIO			

ATTACHMENT A-5

INITIAL DEPOSIT INVOICE

INVOICE

San Joaquin Air Pollution Control District

Bill to Address

California High-Speed Rail Authority
770 L Street, Suite 800 Sacramento, CA
95814

Invoice Date:
Invoice No.:

Attn:

Project No:
Contract No:

For Initial Deposit as required by section 2.3 of the VERA Agreement _____ (District number) and
_____ (Authority number)

Construction Emissions Offsets

Total Contract Value \$ -

Current Invoice

Initial Deposit Amo

Total Amount Due \$ -

Contract Authorization Remaining \$ -

(Name/Title or person authorized to sign invoice)

Please Remit Payment to:

(San Joaquin Valley Air Pollution Control District)
(Address or other Bank Information)

ATTACHMENT A-6
CRITERIA POLLUTANT VERA OFFSETS RECEIPT

[On attached two (2) pages]

INVOICE
San Joaquin Valley Air Pollution Control District

Bill to Address

California High-Speed Rail Authority
770 L Street, Suite 800
Sacramento, CA 95814

Invoice Date:
Invoice No.:

Project No:
Contract No:

Attn:

For Emissions Reductions Secured and Certified as Detailed in the Attached, under the
Voluntary Emissions Reduction Agreement _____ (District number) and _____
(Authority number)

Total Contract Authorization Amount	\$
Previous Invoices Total	\$
Current Invoice (Including 4% administrative coat)	\$ - - - - -
Total all Invoice	\$
Total Contract Authorization Remaining	\$

(Name of person authorized to sign Invoice)

Please Remit payment to:
San Joaquin Valley Air Pollution Control District
(Address or other Bank Information)



CRITERIA POLLUTANT VERA OFFSET RECEIPT

THIS RECEIPT IS PRESENTED TO CALIFORNIA HIGH-SPEED RAIL AUTHORITY CERTIFYING THE EMISSION REDUCTIONS LISTED BELOW HAVE BEEN SECURED THROUGH THIS AGREEMENT.



CALIFORNIA

High-Speed Rail Authority

HSR14-

AGREEMENT NUMBER	TOTAL PROJECT COST (INCLUDING ADMINISTRATIVE COST)	REPLACED EQUIPMENT TYPE	NEW EQUIPMENT TYPE	COST EFFECTIVENESS (\$/TONS)
C-21000	\$20,800.00	AGRICULTURAL TRACTOR	AGRICULTURAL TRACTOR	\$3,291.51

YEAR	NO _x REDUCTIONS (TONS)	PM ₁₀ REDUCTIONS (TONS)*	VOC REDUCTIONS (TONS)	TOTAL REDUCTIONS (TONS)
2014	2.65	0.15	0.43	3.23
2015	2.65	0.15	0.43	3.23
2016	2.65	0.15	0.43	3.23
2017	2.65	0.15	0.43	3.23
2018	2.65	0.15	0.43	3.23
2019	2.65	0.15	0.43	3.23
2020	2.65	0.15	0.43	3.23
2021	2.65	0.15	0.43	3.23
2022	2.65	0.15	0.43	3.23
2023	2.65	0.15	0.43	3.23
<i>TOTAL</i>	<i>26.5</i>	<i>1.50</i>	<i>4.30</i>	<i>32.3</i>

• * PM 2.5 IS INCLUDED IN PM10

ATTACHMENT A-7

CONSTRUCTION REPORTING INFORMATION

Contractor's Daily Record (From Authority's Environmental Mitigation Management and Assessment (EMMA) system)

- **Equipment (On- or Off-road)**
- **Serial Number**
- **Make, Model, Model Year**
- **Rated Horsepower**
- **Load Factor**
- **Fuel Type**
- **Hours Operated**
- **Construction Activity**

ATTACHMENT A-8 CONSTRUCTION REPORT FORMAT

On-site Sources (off-road equipment)

Step 1:

High Speed Rail Authority (HSRA) is to collect the following information associated with actual construction by construction activities: On-site off-road equipment, engine horsepower, engine model year, and total hours of operation by equipment type.

Step 2:

Upon completing step 1, HSRA is to quantify the actual construction emissions and prepare a Construction Report with the following content:

- Project Description and Location. Identify the following:
 - o VERA Number 20140105/ Indirect Source Review (ISR) project number 20130103
 - o Project/Segment Name (i.e - High Speed Rail project - Merced to Fresno; Fresno to Madera)
 - o 3-month Reporting Period Evaluated
 - o Date of Report
 - o Construction Package Number (e.g.: CP1A)
- On-site Actual Construction Criteria Pollutants Emissions (NO_x, VOC, PM₁₀, PM_{2.5}) in pounds
 - o By equipment type
 - o By model year
 - o By horsepower
- Description of methodology used for the construction analysis (e.g.: CalEEMod, hand calculation with emission factors, etc.)

Off-site Sources (i.e. vehicles)

Step 1:

The Authority is to collect the following information associated with actual construction by construction activities: vehicle types (i.e - light auto, heavy duty trucks, etc, All construction vehicle trips, and associated total vehicle miles traveled by vehicle type.) by trip activity (i.e.: hauling, employee trips, etc.)

Step 2:

Upon completing step 1, HSRA is to quantify the actual construction emissions and include in the Construction Report with the following content:

- Project Description and Location. Identify the following:
 - o VERA number 20140105
 - o Project/Segment Name (i.e - High Speed Rail project - Merced to Fresno; Fresno to Madera)
 - o 3-month Reporting Period Evaluated
 - o Date of Report
 - o Construction Package Number (e.g.: CP1 A)
- Off-site Actual Construction Criteria Pollutants Emissions (i.e.: NO_x, VOC, PM₁₀, PM_{2.5}) in pounds by type of trips:
 - o Employee trips: VMT by vehicle model year
 - o Hauling trips: VMT by vehicle model year
 - o Delivery trips: VMT by vehicle model year
- Description of methodology used for the construction analysis (e.g.: CalEEMod, hand calculation with emission factors, etc.)

EXHIBIT B
BUDGET DETAIL AND PAYMENT PROVISIONS

A. FUNDING REQUIREMENTS/BUDGET CONTINGENCY CLAUSES

1. It is mutually agreed that if the Legislature's Budget Act, Congressional Budget Act, of the current year (if amended or repealed) and/or any subsequent years covered under this Agreement does not appropriate sufficient funds for commencing pursuit of work under this contract, this Agreement may be terminated in accordance with Section SA.ii. of Exhibit A of this Agreement.
2. In addition, this Agreement is subject to any additional restrictions, limitations, conditions or any statute enacted by Congress or State Legislature that may affect the provisions, terms or funding of this Agreement in any manner.
3. If funding for any fiscal year is reduced or deleted by the Legislature's Budget Act or a Congressional Budget Act for purposes of this Agreement, the Authority shall have the option to terminate the Agreement in accordance with Section SA.ii. of this Agreement, or to otherwise offer an Agreement Amendment to the Contractor in accordance with Section 16 of the Agreement to reflect the reduced amount.

B. INVOICING

1. Criteria Pollutant VERA Offsets Receipts shall include the Authority's Agreement number listed on the front page of this Agreement and shall be processed in accordance with Exhibit A, except that the Contractor shall send two copies of each such Receipt (in addition to what is required in Exhibit A) to:

California High-Speed Rail Authority
Attention: Financial Operations Section
770 L Street, Suite 800
Sacramento, CA 95814

EXHIBIT C
GENERAL TERMS AND CONDITIONS

EXHIBITC

GENERAL TERMS AND CONDITIONS

1. APPROVAL: This Agreement is of no force or effect until signed by both parties and approved by the Department of General Services, if required. Contractor may not commence performance until such approval has been obtained.
2. AMENDMENT: No amendment or variation of the terms of this Agreement shall be valid unless made in writing, signed by the parties and approved as required. No oral understanding or Agreement not incorporated in the Agreement is binding on any of the parties.
3. ASSIGNMENT: This Agreement is not assignable by the Contractor, either in whole or in part, without the consent of the State in the form of a formal written amendment.
4. AUDIT: Contractor agrees that the awarding department, the Department of General Services, the Bureau of State Audits, or their designated representative shall have the right to review and to copy any records and supporting documentation pertaining to the performance of this Agreement. Contractor agrees to maintain such records for possible audit for a minimum of three (3) years after final payment, unless a longer period of records retention is stipulated. Contractor agrees to allow the auditor(s) access to such records during normal business hours and to allow interviews of any employees who might reasonably have information related to such records. Further, Contractor agrees to include a similar right of the State to audit records and interview staff in any subcontract and/or IIPFA related to performance of this Agreement. (Gov. Code §8546.7, Pub. Contract Code §10115 et seq., CCR Title 2, Section 1896).
5. INDEMNIFICATION: See Section 8 of Exhibit A.
6. DISPUTES: Contractor shall continue with the responsibilities under this Agreement during any dispute.
7. TERMINATION FOR CAUSE: The Authority may terminate this Agreement in accordance with Section 5A.ii.
8. INDEPENDENT CONTRACTOR: Contractor, and the agents and employees of Contractor, in the performance of this Agreement, shall act in an independent capacity and not as officers or employees or agents of the State.
9. RECYCLING CERTIFICATION: Not applicable because this Agreement does not involve the sale of products, materials, goods or supplies to the Authority.
10. NON-DISCRIMINATION CLAUSE: During the performance of this Agreement, Contractor and its subcontractors and/or IIPFA Equipment Users shall not unlawfully discriminate, harass, or allow harassment against any employee or applicant for employment because of sex, race, color, ancestry, religious creed, national origin, physical disability (including HIV and AIDS),

EXHIBIT C
GENERAL TERMS AND CONDITIONS

mental disability, medical condition (e.g., cancer), age (over 40), marital status, denial of family care leave and denial of pregnancy disability leave. Contractor and subcontractors and/or IIPFA Equipment Users shall insure that the evaluation and treatment of their employees and applicants for employment are free from such discrimination and harassment. Contractor and subcontractors shall comply with the provisions of the Fair Employment and Housing Act (Gov. Code §12990 (a-f) et seq.) and the applicable regulations promulgated thereunder (California Code of Regulations, Title 2, Section 7285 et seq.). The applicable regulations of the Fair Employment and Housing Commission implementing Government Code Section 12990 (a-f), set forth in Chapter 5 of Division 4 of Title 2 of the California Code of Regulations, are incorporated into this Agreement by reference and made a part hereof as if set forth in full. Contractor and its subcontractors and/or IIPFA Equipment Users shall give written notice of their obligations under this clause to labor organizations with which they have a collective bargaining or other agreement.

Contractor shall include the nondiscrimination and compliance provisions of this clause in all subcontracts and/or IIPFAs.

11. CERTIFICATION CLAUSES: The CONTRACTOR CERTIFICATION CLAUSES contained in the document CCC 307 are hereby incorporated by reference and made a part of this Agreement by this reference as if attached hereto.

12. TIMELINESS: Time is of the essence in this Agreement.

13. COMPENSATION: The consideration to be paid Contractor, as provided herein, shall be in compensation for all of Contractor's expenses incurred in the performance hereof, including travel, per diem, and taxes, unless otherwise expressly so provided.

14. GOVERNING LAW: This contract is governed by and shall be interpreted in accordance with the laws of the State of California.

15. ANTITRUST CLAIMS: The Contractor by signing this agreement hereby certifies that if these services or goods are obtained by means of a competitive bid, the Contractor shall comply with the requirements of the Government Codes Sections set out below.

a. The Government Code Chapter on Antitrust claims contains the following definitions:

1) "Public purchase" means a purchase by means of competitive bids of goods, services, or materials by the State or any of its political subdivisions or public agencies on whose behalf the Attorney General may bring an action pursuant to subdivision (c) of Section 16750 of the Business and Professions Code.

2) "Public purchasing body" means the State or the subdivision or agency making a public purchase. Government Code Section 4550.

b. In submitting a bid to a public purchasing body, the bidder offers and agrees that if the bid is accepted, it will assign to the purchasing body all rights, title, and interest in and to all causes of action it may have under Section 4 of the Clayton Act (15 U.S.C. Sec. 15) or under the

EXHIBIT C
GENERAL TERMS AND CONDITIONS

Cartwright Act (Chapter 2 (commencing with Section 16700) of Part 2 of Division 7 of the Business and Professions Code), arising from purchases of goods, materials, or services by the bidder for sale to the purchasing body pursuant to the bid. Such assignment shall be made and become effective at the time the purchasing body tenders final payment to the bidder. Government Code Section 4552.

c. If an awarding body or public purchasing body receives, either through judgment or settlement, a monetary recovery for a cause of action assigned under this chapter, the assignor shall be entitled to receive reimbursement for actual legal costs incurred and may, upon demand, recover from the public body any portion of the recovery, including treble damages, attributable to overcharges that were paid by the assignor but were not paid by the public body as part of the bid price, less the expenses incurred in obtaining that portion of the recovery. Government Code Section 4553.

d. Upon demand in writing by the assignor, the assignee shall, within one year from such demand, reassign the cause of action assigned under this part if the assignor has been or may have been injured by the violation of law for which the cause of action arose and (a) the assignee has not been injured thereby, or (b) the assignee declines to file a court action for the cause of action. See Government Code Section 4554.

16. CHILD SUPPORT COMPLIANCE ACT: For any Agreement in excess of \$100,000, the contractor acknowledges in accordance with Public Contract Code 7110, that:

a. The contractor recognizes the importance of child and family support obligations and shall fully comply with all applicable state and federal laws relating to child and family support enforcement, including, but not limited to, disclosure of information and compliance with earnings assignment orders, as provided in Chapter 8 (commencing with section 5200) of Part 5 of Division 9 of the Family Code; and

b. The contractor, to the best of its knowledge is fully complying with the earnings assignment orders of all employees and is providing the names of all new employees to the New Hire Registry maintained by the California Employment Development Department.

17. UNENFORCEABLE PROVISION: In the event that any provision of this Agreement is unenforceable or held to be unenforceable, then the parties agree that all other provisions of this Agreement have force and effect and shall not be affected thereby.

18. PRIORITY HIRING CONSIDERATIONS: If this Contract includes services in excess of \$200,000, the Contractor shall give priority consideration in filling vacancies in positions funded by the Contract to qualified recipients of aid under Welfare and Institutions Code Section 11200 in accordance with Pub. Contract Code §10353.

19. SMALL BUSINESS PARTICIPATION AND DVBE PARTICIPATION REPORTING REQUIREMENTS:

EXHIBIT C
GENERAL TERMS AND CONDITIONS

a. If for this Contract Contractor made a commitment to achieve small business participation, then Contractor must within 60 days of receiving final payment under this Contract (or within such other time period as may be specified elsewhere in this Contract) report to the awarding department the actual percentage of small business participation that was achieved. (Govt. Code § 14841.)

b. If for this Contract Contractor made a commitment to achieve disabled veteran business enterprise (DVBE) participation, then Contractor must within 60 days of receiving final payment under this Contract (or within such other time period as may be specified elsewhere in this Contract) certify in a report to the awarding department: (1) the total amount the prime Contractor received under the Contract; (2) the name and address of the DVBE(s) that participated in the performance of the Contract; (3) the amount each DVBE received from the prime Contractor; (4) that all payments under the Contract have been made to the DVBE; and (5) the actual percentage of DVBE participation that was achieved. A person or entity that knowingly provides false information shall be subject to a civil penalty for each violation. (Mil. & Vets. Code§ 999.5(d); Govt. Code§ 14841.)

20. LOSS LEADER:

If this contract involves the furnishing of equipment, materials, or supplies then the following statement is incorporated: It is unlawful for any person engaged in business within this state to sell or use any article or product as a "loss leader" as defined in Section 17030 of the Business and Professions Code. (PCC 10344(e).)

EXHIBIT D
SPECIAL TERMS AND CONDITIONS

1. AMENDMENT (CHANGE IN TERMS)

No amendment or variation of the terms of this agreement shall be valid unless made in writing, signed by the parties, and approved as required. No oral understanding or agreement not incorporated in agreement is binding on any of the parties.

The DISTRICT shall only commence work covered by an amendment after the amendment is executed and notification to proceed has been provided in writing by the AUTHORITY's Contract Manager.

2. DISPUTES

The Parties shall continue with their respective responsibilities under this Agreement during any work dispute.

3. DISTRICT'S DELIVERABLES UNDER EARLY TERMINATION

Upon termination, the DISTRICT shall provide all project-related documents and correspondence required as part of the Scope of Work (Exhibit A). Project-related documents shall include all documents that are in complete and final form and which have been accepted as complete by the AUTHORITY, or documents in draft and/or incomplete form for those deliverables, which are in progress by the DISTRICT and have not been accepted as complete.

4. RETENTION OF RECORD/AUDITS

For the purpose of determining compliance with Public Contract Code Section 10115, et seq. and Title 21, California Code of Regulations, Chapter 21, Section 2500 et seq., when applicable, and other matters connected with the performance of the Agreement pursuant to Government Code Section 8546.7, the DISTRICT, IIPFA Equipment Users, and the AUTHORITY shall maintain all books, documents, papers, accounting records, and other evidence pertaining to the performance of the Agreement, including but not limited to, the costs of administering the Agreement. All parties shall make such materials available at their respective offices at all reasonable times during the Agreement period and for three (3) years from the date of expenditure under this Agreement. The AUTHORITY, the State Auditor, or any duly authorized representative having jurisdiction under any laws or regulations shall have access to any books, records, and documents of the DISTRICT that are pertinent to the Agreement for audits, examinations, excerpts, and transactions, and copies thereof shall be furnished if requested.

Any IIPFA in excess of \$25,000.00, entered into as a result of this Agreement, shall contain all the provisions of this clause.

EXHIBIT D
SPECIAL TERMS AND CONDITIONS

5. AUDIT REVIEW PROCEDURES

Any dispute concerning a question of fact arising under an interim or post audit of this Agreement that is not disposed of by agreement shall be reviewed by the Contract Manager.

Not later than 30 days after issuance of an interim or final audit report, the DISTRICT may request a review by the Contract Manager of unresolved audit issues. The request for review will be submitted in writing to the Authority's Chief Executive Officer (CEO). The request must contain detailed information of the factors involved in the dispute as well as justifications for reversal. A meeting by the CEO will be scheduled if the Contract Manager concurs that further review is warranted. After the meeting, the Contract Manager will make recommendations to the CEO who will make the final decision for the AUTHORITY. The final decision will be made within three (3) months of receipt of the notification of dispute.

Neither the pendency of a dispute nor its consideration by AUTHORITY will excuse the DISTRICT from full and timely performance, in accordance with the terms of this clause.

6. IIPFAs

Nothing contained in this Agreement or otherwise, shall create any obligation of the Authority or State flowing or owing to any IIPFA Equipment User

7. CONFIDENTIALITY OF DATA

The parties acknowledge that this Agreement is subject to the California Public Records Act (Govt. Code Section 6250 et seq.), California Government Code Section 11019.9; and California Civil Code Section 1798 et seq. However, all financial, statistical, personal, technical, or other data and information relative to the AUTHORITY's operations, which is designated confidential by the AUTHORITY and made available to the DISTRICT in order to carry out this Agreement, shall be protected by the DISTRICT from unauthorized use and disclosure.

8. STATEMENT OF COMPLIANCE

The DISTRICT's signature affixed herein and dated shall constitute a certification under penalty of perjury under the laws of the State of California that the DISTRICT has, unless exempt, complied with the nondiscrimination program requirements of Government Code Section 12990 and Title 2, California Code of Regulations, Section 8103.

9. CONFLICT OF INTEREST

The DISTRICT hereby certifies that it does not now have nor shall it acquire any financial or business interest that would conflict with the rP.form,mr.P. of services under this Agreement.

10. REBATES, KICKBACKS OR OTHER UNLAWFUL CONSIDERATION

The DISTRICT warrants that this Agreement was not obtained or secured through rebates, kickbacks or other unlawful consideration either promised or paid to any AUTHORITY

EXHIBIT D
SPECIAL TERMS AND CONDITIONS

agency employee. For breach or violation of this warranty, the AUTHORITY shall have the right, in its discretion, to terminate this Agreement without liability, to pay only for the value of the work actually performed, or to deduct from this Agreement price or otherwise recover the full amount of such rebate, kickback or other unlawful consideration.

11. PROHIBITION OF EXPENDING STATE FUNDS FOR LOBBYING

The DISTRICT certifies, to the best of his or her knowledge and belief, that:

- No State appropriated funds have been paid or will be paid, by or on behalf of the DISTRICT, to any person for influencing or attempting to influence an officer or employee of any State agency, a Member of the State Legislature or United States Congress, an officer or employee of the Legislature or Congress, or any employee of a Member of the Legislature or Congress in connection with the awarding of any State agreement, the making of any State grant, the making of any State, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any State agreement, grant, loan, or cooperative agreement.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by Section 1352, Title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000.00 and not more than \$100,000.00 for each such failure.

EXHIBIT E
CONDITIONS FOR CONTRACTS RECEIVING FEDERAL FUNDING
AMERICAN RECOVERY AND REINVESTMENT ACT OF 2009 (ARRA)

A FEDERAL REQUIREMENTS

The Contractor understands that the Authority has received Federal funding from FRA that will be used to fund this Agreement. Accordingly, Contractor acknowledges that applicable federal laws, regulations, policies and related administrative practices, including as they may change over the life of this VERA, will govern the administration of that funding, which could affect this VERA and its requirements, whether or not they are specifically referenced herein. The Contractor shall ensure its IIPFAs include specific notice that Federal law requirements, regulations and policies may change and could affect reporting and other requirements of the IIPFA but would not affect funding in any IIPFA.

The Contractor shall not perform any act, fail to perform any act, or refuse to comply with any reasonable Authority requests, which would cause the Authority to be in violation of FRA requirements.

B ACCESS REQUIREMENTS FOR INDIVIDUALS WITH DISABILITIES

The Contractor agrees to comply with all applicable requirements regarding Access for Individuals with Disabilities contained in the Americans with Disabilities Act of 1990 (ADA), as amended, 42 U.S.C. §§ 12101 et seq.; and Section 504 of the Rehabilitation Act of 1973, as amended, 29 U.S.C. § 794 ("Nondiscrimination under Federal grants and programs"). Contractor shall ensure IIPFAs include requirements to so comply.

C ENVIRONMENTAL REQUIREMENTS

The Contractor and IIPFA Equipment Users shall comply with all applicable environmental requirements and regulations, as follows:

The Contractor will conduct work under this Agreement in compliance with the following laws, as modified from time to time, all of which are incorporated herein by reference:

1. Section 114 of the Clean Air Act, 42 U.S.C. 7414, and section 308 of the Federal Water Pollution Control Act, 33 U.S.C. 1318, and all regulations issued thereunder.
2. The Contractor certifies that no facilities that will be used to perform work under this Agreement are listed on the List of Violating Facilities maintained by the U.S. Environmental Protection Agency ("EPA"). The Contractor will notify the Authority as soon as it or any IIPFA Equipment User receives any communication from the EPA indicating that any facility which will be used to perform work pursuant to this Agreement is under consideration to be listed on the EPA's List of Violating Facilities; provided, however, that the Contractor's duty of notification hereunder shall extend only to those communications of which it is aware.

D ENERGY CONSERVATION

EXHIBIT E
CONDITIONS FOR CONTRACTS RECEIVING FEDERAL FUNDING
AMERICAN RECOVERY AND REINVESTMENT ACT OF 2009 (ARRA)

The Contractor agrees to comply with mandatory standards and policies relating to energy efficiency which are contained in the State energy conservation plan issued in compliance with the Energy Policy and Conservation Act (42 U.S.C. 6421 et seq.).

E. FRAUD AND FALSE OR FRAUDULENT STATEMENTS, AND RELATED ACTS

1. The Contractor acknowledges that the provisions of the Program Fraud Civil Remedies Act of 1986 (6 C.F.R. 13), as amended, 31 U.S.C. § 3801 et seq., and USDOT regulations Program Fraud Civil Remedies (49 C.F.R. Part 31), apply to its actions under this Agreement. Upon execution of this Agreement, the Contractor certifies or affirms the truthfulness and accuracy of any statement it has made, it makes, it may make, or causes to be made, pertaining to the Agreement and or the FRA assisted project for which this Agreement is being made. In addition to other penalties that may be applicable, the Contractor further acknowledges that if it makes or causes to be made, a false, fictitious, or fraudulent claim, statement, submission, or certification, the Federal Government reserves the right to impose the penalties of the Program Fraud Civil Remedies Act of 1986 as cited above on the Contractor to the extent the Federal Government deems appropriate.
2. The Contractor also acknowledges that if it makes, or causes to be made, a false, fictitious, or fraudulent claim, statement, submission, or certification to the Federal Government under a contract connected with a project that is financed in whole or in part with Federal assistance originally awarded by FRA, the Government reserves the right to impose the penalties of 18 U.S.C. § 1001 and 49 U.S.C. § 5307 (n)(1) on the Contractor, to the extent the Federal Government deems appropriate.
3. The Contractor agrees to include the above two paragraphs in each IIPFA. It is further agreed that the paragraphs shall not be modified, except to identify the IIPFA Equipment User who will be subject to the provisions.

F. NO OBLIGATION BY THE FEDERAL GOVERNMENT

1. The Authority and the Contractor acknowledge and agree that, notwithstanding any concurrence by the federal government in or approval of this Agreement, absent the express written consent by the federal government, the federal government is not a party to this Agreement and shall not be subject to any obligations or liabilities to the Contractor or any IIPFA Equipment User.
2. The Contractor agrees to include the above paragraph in each IIPFA financed in whole or in part with federal assistance provided by FRA. It is further agreed that the paragraph shall not be modified, except to identify the IIPFA Equipment User who will be subject to its provisions.

G. DEBARMENT AND SUSPENSION

EXHIBIT E
CONDITIONS FOR CONTRACTS RECEIVING FEDERAL FUNDING
AMERICAN RECOVERY AND REINVESTMENT ACT OF 2009 (ARRA)

1. This Contract is a covered transaction for purposes of 2 C.F.R. 1200. As such, the Contractor is required to comply with applicable provisions of Executive Orders Nos. 12549 and 12689, "Debarment and Suspension," 31 U.S.C. § 6101 note, and U.S. DOT regulations, "Non-procurement Suspension and Debarment," 2 C.F.R. Part 1200, which adopt and supplement the provisions of U.S. Office of Management and Budget (U.S. OMB) "Guidelines to Agencies on Government-wide Debarment and Suspension (Non-procurement)," 2 C.F.R. Part 180.
2. To the extent required by the aforementioned U.S. DOT regulations and U.S. OMB guidance, the Contractor must verify that each IIPFA Equipment User is not excluded or disqualified in accordance with said regulations by going to <https://www.sam.gov/portal/public/SAM/> and using the Search Records function to search by party name to see if that party is Excluded.

H. CIVIL RIGHTS

The following requirements apply to the Contract:

1. NONDISCRIMINATION

In accordance with Title VI of the Civil Rights Act, as amended; 42 U.S.C. § 2000d, Section 303 of the Age Discrimination Act of 1975, as amended; 42 U.S.C. § 6102, Section 202 of the Americans with Disabilities Act of 1990; 42 U.S.C. § 12132; and 49 U.S.C. § 306, the Contractor agrees that it will not discriminate against any individual because of race, color, religion, national origin, sex, age or disability in any activities leading up to or in performance of the Contract. In addition, the Contractor agrees to comply with applicable federal implementing regulations and other implementing requirements that FRA may issue.

2. EQUAL EMPLOYMENT OPPORTUNITY

The following equal employment opportunity requirements apply to the Contract:

3. RACE, COLOR, RELIGION, NATIONAL ORIGIN, SEX

In accordance with Title VII of the Civil Rights Act, as amended, 42 U.S.C. § 2000e, the Contractor agrees to comply with all applicable equal opportunity requirements of U.S. Department of Labor (U.S. DOL) regulations, "Office of Federal Contract Compliance Programs, Equal Employment Opportunity, Department of Labor," including 41 C.F.R 60 et seq. (which implements Executive Order No. 11246, "Equal Employment Opportunity," as amended by Executive Order No. 11375, "Amending Executive Order 11246 Relating to Equal Employment Opportunity," 42 U.S.C. § 2000e note), and with any applicable federal statutes, executive orders, regulations, and federal policies that may in the future affect activities undertaken to implement this Agreement. The Contractor agrees to take affirmative action to ensure that applicants are employed, and that employees are

EXHIBIT E
CONDITIONS FOR CONTRACTS RECEIVING FEDERAL FUNDING
AMERICAN RECOVERY AND REINVESTMENT ACT OF 2009 (ARRA)

treated during employment, without regard to their race, color, religion, national origin, sex, or age. Such action shall include the following: employment, upgrading, demotion or transfer, recruitment or recruitment advertising, layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. In addition, the Contractor agrees to comply with any implementing requirements FRA may issue.

AGE

In accordance with Section 4 of the Age Discrimination in Employment Act of 1967, as amended, 29 U.S.C. § 623, the Contractor agrees to refrain from discrimination against present and prospective employees for reason of age. In addition, the Contractor agrees to comply with any implementing requirements FRA may issue.

DISABILITIES

In accordance with Section 102 of the Americans with Disabilities Act, as amended, 42 U.S.C. § 12112, the Contractor agrees that it will comply with the requirements of U.S. Equal Employment Opportunity Commission, "Regulations to Implement the Equal Employment Provisions of the Americans with Disabilities Act," 29 C.F.R Part 1630, pertaining to employment of persons with disabilities. In addition, the Contractor agrees to comply with any implementing requirements FRA may issue.

The Contractor also agrees not to discriminate on the basis of drug abuse, in accordance with the Drug Abuse Office and Treatment Act of 1972 (P.L. 92-255), as amended, alcohol abuse, in accordance with the Comprehensive Alcohol Abuse and Alcoholism Prevention, Treatment and Rehabilitation Act of 1970 (P.L. 91-616), as amended, and to comply with Sections 523 and 527 of the Public Health Service Act of 1912 (42 U.S.C. §§ 290 dd-3 and 290 ee-3), as amended, relating to confidentiality of alcohol and drug abuse patient records. In addition, the Contractor agrees to comply with applicable federal implementing regulations and other implementing requirements that FRA may issue.

EXHIBIT E
CONDITIONS FOR CONTRACTS RECEIVING FEDERAL FUNDING
AMERICAN RECOVERY AND REINVESTMENT ACT OF 2009 (ARRA)

I ACCESS TO AND INSPECTION OF RECORDS

1. The Contractor agrees to provide the Authority, the Secretary of the U.S. Department of Transportation, the FRA Administrator, the Comptroller General of the United States, the appropriate Inspector General appointed under Section 3 or 8G of the United States Inspector General Act of 1978, or any of their authorized representatives access to any books, documents, papers, and records of the Contractor which are directly pertinent to this Agreement for the purposes of making audits, examinations, excerpts, and transcriptions.
2. The Contractor agrees to permit any of the foregoing parties to reproduce by any means whatsoever or to copy excerpts and transcriptions as reasonably needed, and to permit interview by any of the foregoing parties of any officer or employee of Contractor.
3. The Contractor agrees to maintain all books, records, accounts, and reports required under this Agreement for a period of not less than seven years after the date of termination or expiration of this Agreement, except in the event of litigation or settlement of claims arising from the performance of this Agreement, in which case the Contractor agrees to maintain same until the Authority, the FRA Administrator, the Comptroller General, or any of their duly authorized representatives, have disposed of all such litigation, appeals, claims or exceptions related thereto. Reference 49 C.F.R. § 18.39(i)(11); see also ARRA Sections 902, 1514 and 1515.

J DISADVANTAGED BUSINESS ENTERPRISES

1. The Authority encourages the Contractor to utilize small business concerns owned and controlled by socially and economically disadvantaged individuals (as that term is defined for certain USDOT agencies in Title VI) in carrying out this Agreement.
2. The Contractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this Contract. The Contractor shall carry out applicable requirements of Title VI in the administration of this Agreement. Failure by the Contractor to carry out these requirements is a material breach of this Agreement, which may result in the termination of this Agreement or such other remedy as the Authority deems appropriate.

EXHIBIT E
CONDITIONS FOR CONTRACTS RECEIVING FEDERAL FUNDING
AMERICAN RECOVERY AND REINVESTMENT ACT OF 2009 (ARRA)

K ARRA-Funded Project

Funding for this Agreement has been provided through the American Recovery and Reinvestment Act (ARRA) of 2009, Pub. L 111-5. Contractor and IIPFA Equipment Users are subject to audit by appropriate federal or State entities.

L Recovery of Misspent Funds

The Contractor agrees that if the Contractor or any IIPFA Equipment User uses any funds provided through this Agreement for purposes other than as required by this Agreement, the Authority may recover misspent funds following an audit. This provision is in addition to all other remedies available to the Authority under all applicable state and federal laws.

M Prohibition on Use of ARRA Funds

The Contractor agrees in accordance with ARRA, Provision 1604, that none of the funds made available under this contract may be used for any casino or other gambling establishment, aquarium, zoo, golf course, or swimming pools.

N Whistleblower Protection

The Contractor agrees that it shall comply with Section 1553 of the ARRA, which prohibits all non-federal contractors, including the State, and all contractors of the State, from discharging, demoting or otherwise discriminating against an employee for disclosures by the employee that the employee reasonably believes are evidence of any of the following:

1. Gross mismanagement of a contract relating to ARRA funds
2. A gross waste of ARRA funds
3. A substantial and specific danger to public health or safety related to the implementation or use of ARRA funds
4. An abuse of authority related to implementation or use of ARRA funds
5. A violation of law, rule, or regulation related to an agency contract (including the competition for or negotiation of a contract) awarded or issued relating to ARRA funds

The Contractor agrees that it shall post notice of the rights and remedies available to employees under Section 1553 of Title XV of Division A of the ARRA.

O. False Claims Act

The Contractor agrees that it shall promptly notify the Authority and shall refer to an appropriate federal inspector general any credible evidence that a principal, employee,

EXHIBIT E
CONDITIONS FOR CONTRACTS RECEIVING FEDERAL FUNDING
AMERICAN RECOVERY AND REINVESTMENT ACT OF 2009 (ARRA)

agent, IIPFA Equipment User or other person has committed a false claim under the False Claims Act (31 U.S.C. §3729 et seq.) or has committed a criminal or civil violation of laws pertaining to fraud, conflict of interest, bribery, gratuity, or similar misconduct involving ARRA funds.

P. Reporting Requirements

Pursuant to Section 1512(c) and other sections of the ARRA, the Authority must submit periodic reports to FRA about how ARRA funds are being spent, where, by whom, on what, etc. The Authority reasonably believes that the information required from the District set forth in Exhibit A, such as the information IIPFAs and the District's quarterly Status Reports must contain, will enable the Authority to meet its ARRA reporting requirements to FRA.

However, the District agrees to provide any additional information related to this Agreement and its implementation that the Authority needs to satisfy its reporting obligations to FRA under ARRA. The Authority agrees to compensate the District, if the District so requests, for any material additional time the District must spend (beyond the activities the District is required to perform under this Agreement absent the need to collect and report such additional information) to provide such additional information, at the District's staff-time rates the District then is charging similarly-situated third parties for its services (the District must document those rates and the additional time spent).

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CALIFORNIA

High-Speed Rail Authority

July 7, 2021

Bret Banks
Antelope Valley AQMD
43301 Division Street
Suite 206
Lancaster, CA 93535

Re: General Conformity for the Bakersfield to Palmdale Section of California High-Speed Rail

Dear Bret Banks:

Purpose

The purpose of this letter is to document the commitment to satisfy General Conformity (GC) for the Bakersfield to Palmdale Section of the California High-Speed Rail project with the Antelope Valley Air Quality Management District (AVAQMD).

Project

The California High-Speed Rail (HSR) System will provide intercity, high-speed service on more than 800 miles of guideway throughout California, connecting the major population centers of Sacramento, the San Francisco Bay Area, the southern Central Valley, Los Angeles, the Inland Empire, Orange County, and San Diego. The Bakersfield to Palmdale HSR Section ("Project" or "Action") is a critical link connecting the Merced to Fresno, and Bakersfield to Palmdale HSR sections to the Palmdale to Los Angeles HSR sections.¹

General Conformity Rule

The General Conformity Rule, as codified in Title 40 Code of Federal Regulations Part 93, Subpart B, establishes the process by which federal agencies determine conformance of proposed projects that are federally funded or require federal approval with applicable air quality standards. This determination must demonstrate that a Proposed Action would not cause or contribute to new violations of air quality standards, exacerbate existing violations, or interfere with timely attainment or required interim emissions reductions towards attainment. The California High-Speed Rail Authority (Authority), as the Action proponent, is receiving federal grant funds through the Federal Railroad Administration's (FRA) High-Speed Intercity Passenger Rail program. The Action may also receive FRA safety approvals. Because of the federal funding and potential safety approvals, the Action is subject to the General Conformity Rule; and because construction-phase emissions (without mitigation) would exceed General Conformity *de minimis* thresholds, the Action is not exempt and must demonstrate conformity.

General Conformity Determination

The draft General Conformity Determination documents FRA's finding that the Action complies with the General Conformity Rule and that it conforms to the purposes of the area's approved State Implementation Plan and is consistent with all applicable requirements. The draft General

¹As part of its first phase, the California HSR system is currently planned as seven distinct sections from San Francisco in the north to Los Angeles and Anaheim in the south.

Conformity Determination is being issued for public review and comment concurrent with the publication of the *Bakersfield to Palmdale Section Final Environmental Impact Report/Environmental Impact Statement (EIR/EIS)*.

The draft General Conformity Determination is based on the Impact Avoidance and Minimization Measures (IAMF) and Mitigation Measures (MM) that are described in Section 3.3.8 of the EIR/EIS and that will be implemented for the Action. This compliance is demonstrated as follows:

The operation of the Action would result in a reduction of regional emissions of all applicable air pollutants and would not cause a localized exceedance of an air quality standard; and

Whereas emissions generated during the construction of the Action would exceed General Conformity thresholds for one pollutant, these emission increases would be offset through the Air Quality Investment Program in the Antelope Valley Air Quality Management District (AVAQMD).

Based on the current emissions analysis, construction emissions exceed General Conformity *de minimis* thresholds for nitrogen oxides (NO_x) in the AVAQMD. These exceedances are based on current construction schedule and equipment estimates. It should be noted that the emission numbers provided in the Authority's EIR/EISs are reasonable estimates based on the available information to date. The methodology used in creating these estimates is similar to what was used for estimating the emissions for the Merced to Fresno and Fresno to Bakersfield project section environmental documents. After seven years of construction in the central valley, it has become clear that the estimates in the EIR/EIS are conservative and actual emissions from construction are currently lower than estimates by 50-70%.

The Authority has a long history of being proactive towards reducing construction emissions. As shown in Figure 1, the Authority has continually updated its policies and procedures to ensure that the project embraces and pushes the boundaries towards reducing emissions.

Impact Avoidance and Minimization Features

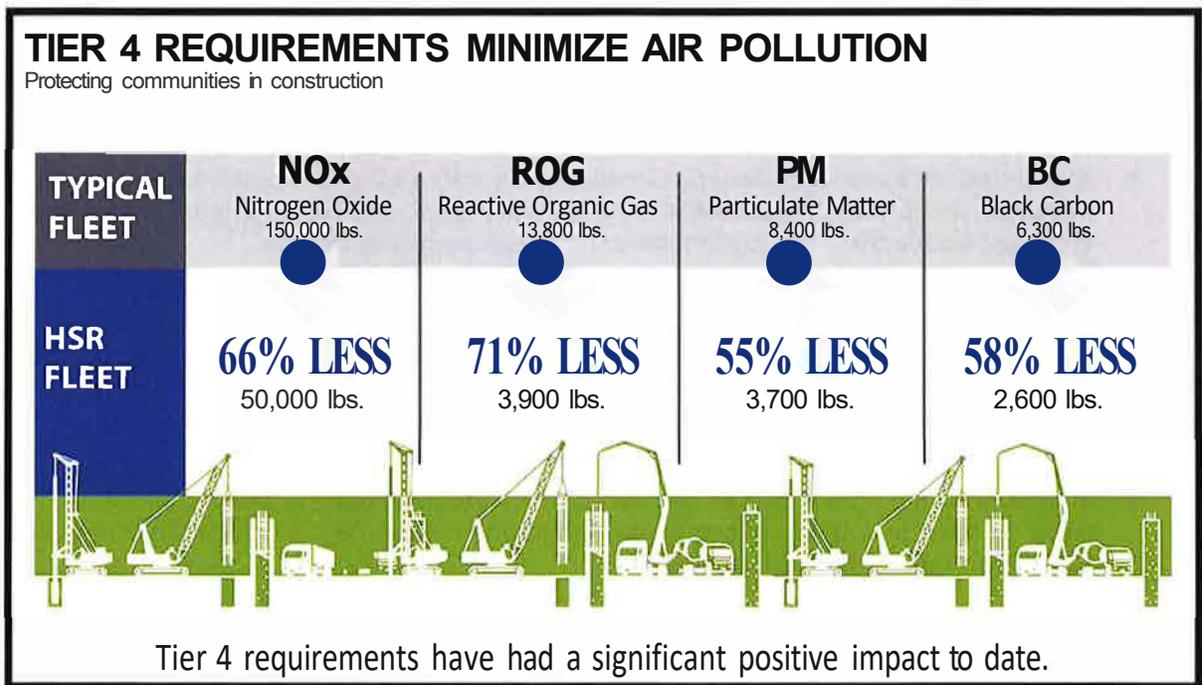
Avoiding and minimizing emissions is a strategy that is consistent with the net-zero greenhouse gas objectives of the Authority's Sustainability Policy. As such, the Authority has incorporated the following Impact Avoidance and Minimization Features (IAMF) into the project:

- **AQ-IAMF#1: Fugitive Dust Emissions:** The contractor would employ several control measures to minimize and control fugitive dust emissions and prepare a fugitive dust control plan for each distinct construction segment.
- **AQ-IAMF#2: Selection of Coatings:** The contractor would use lower VO_E content paint than that required by SCAQMD Rule 1113.
- **AQ-IAMF#3: Renewable Diesel:** The contractor would use renewable diesel fuel to minimize and control exhaust emissions from all heavy-duty diesel-fueled construction diesel equipment and on-road diesel trucks.
- **AQ-IAMF#4: Reduce Criteria Exhaust Emissions from Construction Equipment:** All heavy-duty off-road construction diesel equipment used during the construction phase would meet Tier 4 engine requirements.

- **AQ-IAMF#5: Reduce Criteria Exhaust Emissions from On-Road Construction Equipment:** All on-road trucks would consist of model year 2010 or newer.
- **AQ-IAMF#6: Reduce the Potential Impact of Concrete Batch Plants:** The contractor would prepare a technical memorandum documenting the concrete batch plant siting criteria, including locating the plant at least 1,000 feet from sensitive receptors, and utilization of typical control measures.

These IAMFs have helped to reduce the construction emissions generated by the project. For example, Figure 1 highlights the significant criteria pollutant emission reductions demonstrated by the project due to the IAMF#4.

Figure 1 - Emission Savings due to Tier 4 Equipment in 2020



Future Emissions Estimates

Since funding has not been fully secured for this project section, construction emissions would be re-visited and re-calculated after funding is secured, prior to the implementation of any offset programs. As such, the following steps will be followed to demonstrate conformity:

- Once construction funding is secured for the project section, a revised construction schedule will be developed.
- Based on the new schedule, a construction plan will be developed and analyzed to determine the emission burdens generated by construction.
- At the time of analysis, the IAMFs and MMs will be revisited and updated to include technologies and methodologies that were not considered in the earlier analysis. This

review and implementation of updated measures will aid the project in reducing the generation of emissions due to construction.

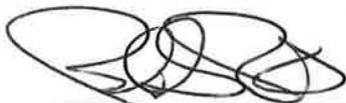
- Once emission estimates are calculated using the revised IAMF and MMs, it will be determined if the estimates are still above the applicable General Conformity de minimis thresholds.
- All affected air districts will be notified of the emission levels and consulted to offset emissions for those years/pollutants that exceed General Conformity de minimis thresholds. Alternatively, the air districts could include these emissions in the applicable State Implementation Plan (SIP).
- The emission accounting program the Authority uses to track emissions for the segments currently being constructed will be utilized to actively quantify the construction emissions generated by the project.

Conclusion

As such, by signing this letter, the Authority and the air districts commit to the following:

- The Authority will work with the air district in order to ensure that the lowest level of construction emissions are generated through the use of mitigation measures outlined in this document and rolling review of best available technologies.
- Any emissions exceeding General Conformity de minimis thresholds will be completely mitigated, in the year of occurrence, through either existing offset programs or inclusion in the applicable SIP. The current emission offset programs include:
 - o Air Quality Investment Program (AQIP) with the Antelope Valley Air Quality Management District (AVAQMD). The AQIP is a voluntary emission reduction compliance option, in which moneys are paid by an AQIP Clean Air Investor to the District for use to fund stationary and mobile source emission reduction strategies that will achieve emission reductions (<https://avaqmd.ca.gov/files/c97c5e2cf/AV2501.pdf>).
- In addition to the above, and as discussed with AVAQMD, there is also an option for those air districts to utilize offsets obtained through the SJVAPCD's Voluntary Emission Reduction Agreement (VERA) program.
- The Authority and the air district will enter into a contractual agreement to mitigate the project's emissions, as required by General Conformity regulations, by providing funds for the applicable offset program to fund grants for projects that achieve the necessary emission reductions.
- The air district will seek and implement the necessary emission reduction measures, using Authority funds; and
- The air district will serve in the role of administrator of the emissions reduction projects and verifier of the successful mitigation effort.

As such, General Conformity will be satisfied for this project section.



Brett Banks, AVAQMD



July 7, 2021

Glen Stephens
Eastern Kern Air Pollution Control District
2700 "M" Street, Suite 302
Bakersfield, California 93301-2370

Re: General Conformity for the Bakersfield to Palmdale Section of California High-Speed Rail

Dear Glen Stephens:

Purpose

The purpose of this letter is to document the commitment to satisfy General Conformity (GC) for the Bakersfield to Palmdale Section of the California High-Speed Rail project with the Eastern Kern Air Pollution Control District (EKAPCD).

Project

The California High-Speed Rail (HSR) System will provide intercity, high-speed service on more than 800 miles of guideway throughout California, connecting the major population centers of Sacramento, the San Francisco Bay Area, the southern Central Valley, Los Angeles, the Inland Empire, Orange County, and San Diego. The Bakersfield to Palmdale HSR Section ("Project" or "Action") is a critical link connecting the Merced to Fresno, and Bakersfield to Palmdale HSR sections to the Palmdale to Los Angeles HSR sections.¹

General Conformity Rule

The General Conformity Rule, as codified in Title 40 Code of Federal Regulations Part 93, Subpart B, establishes the process by which federal agencies determine conformance of proposed projects that are federally funded or require federal approval with applicable air quality standards. This determination must demonstrate that a Proposed Action would not cause or contribute to new violations of air quality standards, exacerbate existing violations, or interfere with timely attainment or required interim emissions reductions towards attainment. The California High-Speed Rail Authority (Authority), as the Action proponent, is receiving federal grant funds through the Federal Railroad Administration's (FRA) High-Speed Intercity Passenger Rail program. The Action may also receive FRA safety approvals. Because of the federal funding and potential safety approvals, the Action is subject to the General Conformity Rule; and because construction-phase emissions (without mitigation) would exceed General Conformity *de minimis* thresholds, the Action is not exempt and must demonstrate conformity.

General Conformity Determination

The draft General Conformity Determination documents FRA's finding that the Action complies with the General Conformity Rule and that it conforms to the purposes of the area's approved State Implementation Plan and is consistent with all applicable requirements. The draft General Conformity Determination is being issued for public review and comment concurrent with the

¹ As part of its first phase, the California HSR system is currently planned as seven distinct sections from San Francisco in the north to Los Angeles and Anaheim in the south.

publication of the *Bakersfield to Palmdale Section Final Environmental Impact Report/Environmental Impact Statement (EIR/EIS)*.

The draft General Conformity Determination is based on the Impact Avoidance and Minimization Measures (IAMF) and Mitigation Measures (MM) that are described in Section 3.3.8 of the EIR/EIS and that will be implemented for the Action. This compliance is demonstrated as follows:

- The operation of the Action would result in a reduction of regional emissions of all applicable air pollutants and would not cause a localized exceedance of an air quality standard; and
- Whereas emissions generated during the construction of the Action would exceed General Conformity thresholds for one pollutant, these emission increases would be offset through the Emission Banking Certificate Program in the Eastern Kern Air Pollution Control District (EKAPCD).

Based on the current emissions analysis, construction emissions exceed General Conformity *de minimis* thresholds for nitrogen oxides (NO_x) in the EKAPCD. These exceedances are based on current construction schedule and equipment estimates. It should be noted that the emission numbers provided in the Authority's EIR/EISs are reasonable estimates based on the available information to date. The methodology used in creating these estimates is similar to what was used for estimating the emissions for the Merced to Fresno and Fresno to Bakersfield project section environmental documents. After seven years of construction in the central valley, it has become clear that the estimates in the EIR/EIS are conservative and actual emissions from construction are currently lower than estimates by 50-70%.

The Authority has a long history of being proactive towards reducing construction emissions. As shown in Figure 1, the Authority has continually updated its policies and procedures to ensure that the project embraces and pushes the boundaries towards reducing emissions.

Impact Avoidance and Minimization Features

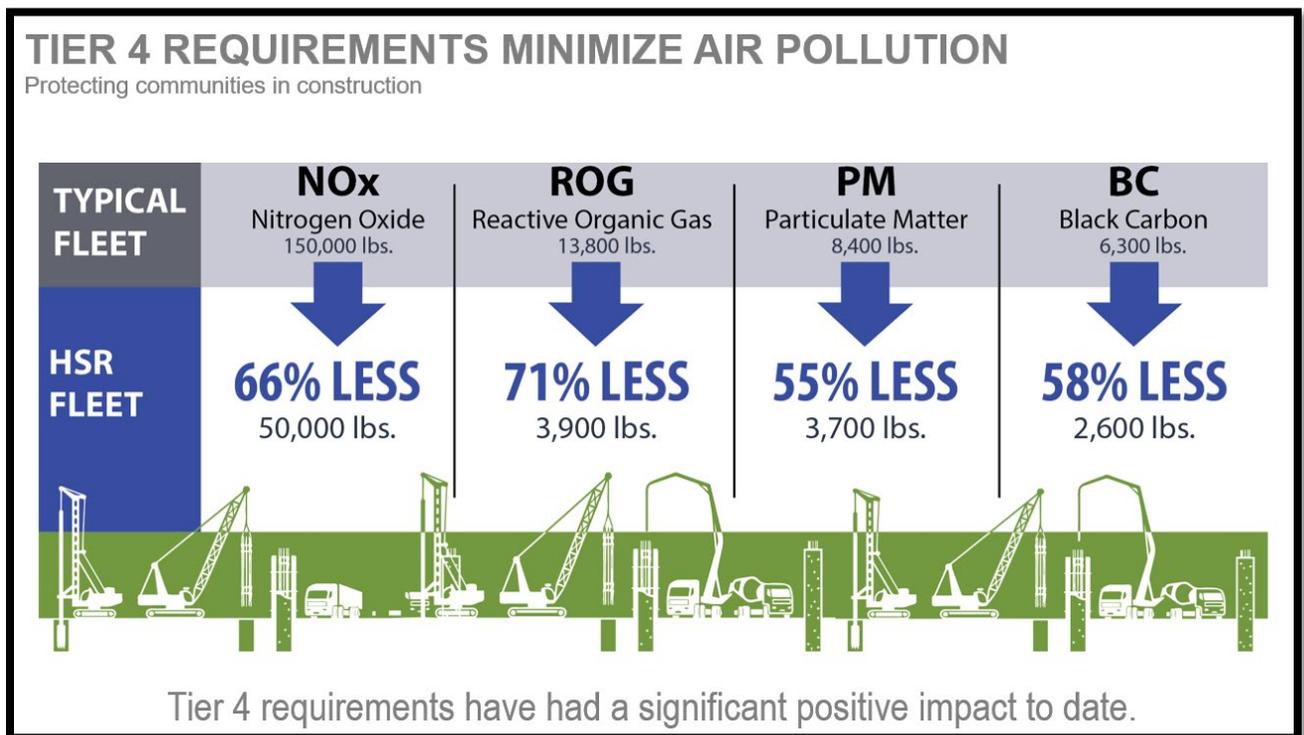
Avoiding and minimizing emissions is a strategy that is consistent with the net-zero greenhouse gas objectives of the Authority's Sustainability Policy. As such, the Authority has incorporated the following Impact Avoidance and Minimization Features (IAMF) into the project:

- **AQ-IAMF#1: Fugitive Dust Emissions:** The contractor would employ several control measures to minimize and control fugitive dust emissions and prepare a fugitive dust control plan for each distinct construction segment.
- **AQ-IAMF#2: Selection of Coatings:** The contractor would use lower VOC content paint than that required by SCAQMD Rule 1113.
- **AQ-IAMF#3: Renewable Diesel:** The contractor would use renewable diesel fuel to minimize and control exhaust emissions from all heavy-duty diesel-fueled construction diesel equipment and on-road diesel trucks.
- **AQ-IAMF#4: Reduce Criteria Exhaust Emissions from Construction Equipment:** All heavy-duty off-road construction diesel equipment used during the construction phase would meet Tier 4 engine requirements.
- **AQ-IAMF#5: Reduce Criteria Exhaust Emissions from On-Road Construction Equipment:** All on-road trucks would consist of model year 2010 or newer.

- AQ-IAMF#6: Reduce the Potential Impact of Concrete Batch Plants:** The contractor would prepare a technical memorandum documenting the concrete batch plant siting criteria, including locating the plant at least 1,000 feet from sensitive receptors, and utilization of typical control measures.

These IAMFs have helped to reduce the construction emissions generated by the project. For example, Figure 1 highlights the significant criteria pollutant emission reductions demonstrated by the project due to the IAMF#4.

Figure 1 - Emission Savings due to Tier 4 Equipment in 2020



Future Emissions Estimates

Since funding has not been fully secured for this project section, construction emissions would be re-visited and re-calculated after funding is secured, prior to the implementation of any offset programs. As such, the following steps will be followed to demonstrate conformity:

- Once construction funding is secured for the project section, a revised construction schedule will be developed.
- Based on the new schedule, a construction plan will be developed and analyzed to determine the emission burdens generated by construction.
- At the time of analysis, the IAMFs and MMs will be revisited and updated to include technologies and methodologies that were not considered in the earlier analysis. This review and implementation of updated measures will aid the project in reducing the generation of emissions due to construction.

- Once emission estimates are calculated using the revised IAMF and MMs, it will be determined if the estimates are still above the applicable General Conformity *de minimis* thresholds.
- All affected air districts will be notified of the emission levels and consulted to offset emissions for those years/pollutants that exceed General Conformity *de minimis* thresholds. Alternatively, the air districts could include these emissions in the applicable State Implementation Plan (SIP).
- The emission accounting program the Authority uses to track emissions for the segments currently being constructed will be utilized to actively quantify the construction emissions generated by the project.

Conclusion

As such, by signing this letter, the Authority and the air districts commit to the following:

- The Authority will work with each air district in order to ensure that the lowest level of construction emissions are generated through the use of mitigation measures outlined in this document and rolling review of best available technologies.
- Any emissions exceeding General Conformity *de minimis* thresholds will be completely mitigated, in the year of occurrence, through either existing offset programs or inclusion in the applicable SIP. The current emission offset programs include:
 - Emission Banking Certificate Program (EBCP) with the Eastern Kern Air Pollution Control District (EKAPCD). The EBCP facilitates the use of emission reductions by industry as tradeoffs or offsets for new or modified stationary sources of air contaminants, including transfer of ownership of such credits (http://www.kernair.org/Rule%20Book/2%20Permits/210_3%20Emissions%20Reductions%20Banking.pdf).
- In addition to the above, and as discussed with EKAPCD, there is also an option for those air districts to utilize offsets obtained through the SJVAPCD's Voluntary Emission Reduction Agreement (VERA) program.
- The Authority and the air district will enter into a contractual agreement to mitigate the project's emissions, as required by General Conformity regulations, by providing funds for the applicable offset program to fund grants for projects that achieve the necessary emission reductions.
- The air district will seek and implement the necessary emission reduction measures, using Authority funds; and
- The air district will serve in the role of administrator of the emissions reduction projects and verifier of the successful mitigation effort.

As such, General Conformity will be satisfied for this project section.



Glen Stephens, EKAPCD

APPENDIX B: U.S. FISH AND WILDLIFE SERVICE BIOLOGICAL OPINION, JUNE 16, 2021

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United States Department of the Interior

FISH AND WILDLIFE SERVICE
Sacramento Fish and Wildlife Office
2800 Cottage Way, Suite W-2605
Sacramento, California 95825-1846
SFWO_mail@fws.gov



In Reply Refer to:
08ESMF00-2013-F-0534

June 16, 2021

Serge Stanich
Director of Environmental Services
California High-Speed Rail Authority
770 L Street, Suite 620
Sacramento, California 95814
Serge.Stanich@hsr.ca.gov

Subject: Formal Consultation on the California High-Speed Rail System: Bakersfield to Palmdale Project Section

Dear Serge Stanich:

This letter is in response to the California High-Speed Rail Authority's (Authority) request for initiation of formal consultation with the U.S. Fish and Wildlife Service (Service) on the proposed Bakersfield to Palmdale Project Section of the California High-Speed Rail (HSR) System (proposed project) in Kern and Los Angeles counties, California. This letter is sent to the Authority in its role as the federal lead agency for the Bakersfield to Palmdale Project Section under the National Environmental Policy Act (NEPA) and other federal laws. Pursuant to 23 United States Code (U.S.C.) 327, under the NEPA Assignment Memorandum of Understanding (MOU) between the Federal Railroad Administration (FRA) and the State of California, effective July 23, 2019, the Authority is the federal lead agency for environmental reviews and approvals for all Authority Phase 1 and Phase 2 projects. Under the MOU, the Authority has been assigned FRA's Endangered Species Act (Act) Section 7 (16 U.S.C. 1536) responsibilities for consultations (formal and informal) with respect to HSR and other projects described in subpart 3.3 of the MOU.

At issue are the proposed project's effects on the following federally listed species:

Species federally listed as endangered:

- California jewelflower (*Caulanthus californicus*) (jewelflower)
- Kern mallow (*Eremalche kernensis*) (mallow)
- San Joaquin woolly-threads (*Monolopia congdonii*) (woolly-threads)
- Bakersfield cactus (*Opuntia basilaris* var. *treleasei* [*O. treleasei*]) (cactus)
- blunt-nosed leopard lizard (*Gambelia sila*) (lizard)
- southwestern willow flycatcher (*Empidonax traillii extimus*) (flycatcher)
- California condor (*Gymnogyps californianus*) (condor)

- least Bell's vireo (*Vireo bellii pusillus*) (vireo)
- Tipton kangaroo rat (*Dipodomys nitratoides nitratoides*) (kangaroo rat)
- San Joaquin kit fox (*Vulpes macrotis mutica*) (kit fox)

Species federally listed as threatened:

- San Joaquin adobe sunburst (*Pseudobahia peirsonii*) (sunburst)
- Kern primrose sphinx moth (*Euproserpinus euterpe*) (moth)
- desert tortoise (*Gopherus agassizii*) (tortoise)
- Western Distinct Population Segment (Western DPS) of yellow-billed cuckoo (*Coccyzus americanus*) (cuckoo)

Critical habitat has been designated for the tortoise, flycatcher, condor, vireo, and cuckoo. Because no designated or proposed critical habitat for these species occurs in the action area, it is not considered in this Biological Opinion.

This response is provided under the authority of the Act of 1973, as amended (16 U.S.C. 1531 et seq.), and in accordance with the implementing regulations pertaining to interagency cooperation (50 Code of Federal Regulations [CFR] 402).

The federal action on which we are consulting is the construction, operation, and maintenance of the Authority's Bakersfield to Palmdale Project Section of the HSR system, and specifically the Preferred Alternative, Alternative 2 with the Refined Cesar Chavez National Monument (CCNM) Design Option (Preferred Alternative) (proposed action). Pursuant to 50 CFR 402.12(j), you submitted a biological assessment (BA) and a BA supplement for our review and requested concurrence with the findings presented therein. These findings conclude the proposed action may affect, and is likely to adversely affect the following federally listed species: the mallow, the cactus, the sunburst, the moth, the lizard, the tortoise, the vireo, the kangaroo rat, and the kit fox.

In considering your request, we based our evaluation on the following:

- 1) Extensive coordination between the Service and the Authority (and the FRA prior to the MOU, as described above) from April 2015 through June 2021 regarding the proposed project, conservation measures, and framework for evaluating the effects of the proposed action on federally listed species
- 2) The April 2020 and June 2021 letters from the Authority to the Service requesting initiation of formal consultation
- 3) The *Bakersfield to Palmdale Project Section Biological Assessment*, dated April 2020 and updated September 2020
- 4) The *Bakersfield to Palmdale Project Section Biological Assessment Supplement*, dated June 2021
- 5) Correspondence between the Authority and the Service
- 6) Other information available to the Service

The Service concurs with your determination that the project, as proposed, may affect but is not likely to adversely affect the jewelflower, the woolly-threads, the cuckoo, and the flycatcher based on the following reasons:

- 1) The species have not been documented and are not expected to occur in the action area

- 2) Proposed conservation measures, as provided under Description of the Proposed Action, including CM-PLT-01 and CM-PLT-02 for the jewelflower and the woolly-threads, and CM-Avian-01 for the cuckoo and the flycatcher will be implemented and will avoid adverse effects should the species unexpectedly occur within the action area
- 3) The small amount of suitable habitat in the action area

The Service also concurs with your determination that the project, as proposed, may affect but is not likely to adversely affect the condor based on the following reasons:

- 1) Implementation of proposed conservation measures, as provided below (CM-CACO-01 through CM-CACO-07)
- 2) Implementation of proposed general conservation measures, as described under the Description of the Proposed Action, including CM-GEN-20, which states that the project, including the catenary system, masts, and other structures such as fencing, electric lines, communication towers and facilities, will be designed to be bird and raptor-safe (i.e., avoid electrocution and strike) in accordance with applicable Avian Power Line Interaction Committee (APLIC) recommendations in *Suggested Practices for Raptor Protection on Power Lines: The State of the Art in 2006* (APLIC 2006) and *Reducing Avian Collisions with Power Lines: State of the Art in 2012* (APLIC 2012)
- 3) The Authority's commitment to designing the project's catenary system to provide a minimum safe distance between the conductors of 83 horizontal inches and 52 vertical inches to avoid condor electrocution (Authority 2020)
- 4) No nesting habitat for the condor occurs within the action area

Conservation Measures Specific to California Condor

CM-CACO-01: Coordinate with the Service on California Condor Locations

The Project Biologist will coordinate with the Service at least seven days prior to initiation of construction activities (including vegetation removal) within the California condor's range to review California condor tracking locations so that appropriate monitoring and avoidance measures can be determined. The Designated Biologist or Biological Monitor will continue to review California condor tracking locations daily using available data or website managed by the Service for the purpose of implementing monitoring and avoidance measures.

CM-CACO-02: Monitor for California Condor

A Biological Monitor with California condor experience will be present during construction activities occurring within two miles of where California condor have been observed within the prior 14 days, based on the most recent tracking and location information obtained from the Service prior to construction activities. The Biological Monitor will have the ability to halt construction activities if a California condor enters the Work Area and may be affected by project activities. Monitoring of the condor will continue until the condor has left the two-mile buffer area.

CM-CACO-03: Work Timing Restrictions Near California Condor Roosting Locations

If California condors are observed roosting within 0.5 mile of the construction area, no construction activity will occur between one hour before sunset and one hour after sunrise or until the Designated Biologist or Biological Monitor has determined that the bird(s) have left the area. The Designated Biologist will review construction activities seven days prior to initiation of construction activities.

CM-CACO-04: Implement Avoidance Measures for California Condor

During any ground-disturbing activities in the range of California condor, the Project Biologist will implement the following avoidance measures:

- Construction materials in Work Areas, including items that could pose a risk of entanglement, such as ropes and cables, will be properly stored and secured when not in use.
- Litter, small artificial items (screws, washers, nuts, bolts, etc.), and all food waste will be stored in self-closing, sealable containers with lids that latch to prevent entry by wind, common ravens, and mammals. All trash receptacles will be inspected and collected regularly; the contents disposed of from Work Areas on a daily basis to prevent spillage and maintain sanitary conditions. The receptacles will be removed from the project area when construction or O&M activities are complete.
- All fuels, fluids, and components with hazardous materials or wastes will be handled in accordance with applicable regulations. These materials will be kept in segregated, secured and/or secondary containment facilities as necessary. Any spills of liquid substances that could harm wildlife will be immediately addressed.
- The project will avoid the use of ethylene glycol-based anti-freeze or other ethylene glycol-based liquid substances. All parked vehicles/equipment will be kept free of leaks, particularly anti-freeze.
- Polychemical lines will not be used or stored on site to preclude wildlife, especially California condor, from obtaining and ingesting pieces of polychemical lines.

CM-CACO-05: Implement Helicopter Avoidance Measures for California Condor

The Project Biologist will coordinate with the Service, as appropriate, prior to helicopter use that could affect condor, to establish that no known individuals are in the project area. If condors are present, helicopter use will be avoided until the birds have left the area. If condors are observed in helicopter construction areas, further helicopter use will be avoided until the Designated Biologist or Biological Monitor has determined that the condors have left the area. The Designated Biologist and Biological Monitors will have radio contact with the project foreman, who will be in radio contact with the helicopter pilot. The biologist will provide real-time information updates to the project foreman and helicopter pilot to avoid conflicts with condors.

CM-CACO-06: Stop Work and Implement Hazing Methods for California Condor

If a California condor(s) lands or is observed in or near a Work Area, the Designated Biologist or Biological Monitor will assess the construction activities occurring and determine whether there is a potential hazard to the condor. Activities determined to be a potential hazard will be stopped until the condor has abandoned the area. After 15 minutes, if a condor has not left of its own volition, the Designated Biologist or Biological Monitor, or other Service-approved personnel, will implement Service-approved hazing methods in accordance with the Service Recovery Program's *Guidance on Hazing California Condors* (Service 2014).

If the California condor does not leave the area within 30 minutes of the initiation of hazing, the Designated Biologist or Biological Monitor will notify the Project Biologist. The Project Biologist will coordinate with the Authority and the Service to determine the appropriate actions.

CM-CACO-07: Implement Removal of Carrion that may Attract California Condor

Dead and injured wildlife found in the right-of-way and tracks will be removed during construction and O&M when the train is not in operation. During O&M within California condor range, automated security monitoring and track inspections will be used to detect fence failures and/or the presence of carrion in the right-of-way.

Because no populations of the jewelflower, the woolly-threads, the cuckoo, or the flycatcher are known to exist in the action area, the absence of nesting habitat for condor, and the conservation measures proposed by the Authority, the Service believes that adverse effects to these species from the proposed action are extremely unlikely to occur, and are therefore discountable for purposes of this consultation. While condor is known to occur in the action area, with the implementation of the above measures, as well as the project design features, adverse effects to this species are not anticipated.

The remainder of this document provides our biological opinion on the effects of the proposed action on the following federally listed species: the mallow, the cactus, the sunburst, the moth, the lizard, the tortoise, the vireo, the kangaroo rat, and the kit fox.

Consultation History

April to December 2015	The Authority initiated informal consultation with the Service; coordinated meetings with the Service; provided maps of the proposed alignments and species models to the Service; requested a list of species for consideration for the BA.
January to December 2016	The Authority coordinated with the Service regarding species information, modeling, and mitigation.
January to June 2017	The Authority coordinated with the Service regarding species information, modeling, and mitigation.
December 6, 2018	The Authority resumed informal consultation with the Service, including providing a Draft BA for review.
March 25 and May 6, 2019	The Authority and the Service held workshops and reviewed Service comments on the Draft BA.
April 20, 2020	The Authority requested formal consultation with the Service for the proposed project and submitted the Bakersfield to Palmdale Project Section BA.
September 15, 2020	The Authority submitted an updated BA based on modifications to the project footprint.
June 2021	The Authority submitted a supplement to the BA.

BIOLOGICAL OPINION

Description of the Proposed Action

Project Overview

The proposed action is the construction, operation, and maintenance of the approximately 85-mile Bakersfield to Palmdale Project Section of the HSR system. The State of California proposes to build an HSR system to connect the major population centers of the San Francisco Bay Area with the Los Angeles metropolitan region. The HSR system is envisioned as an electrically powered, high-speed, steel-wheel-on-steel-rail technology with state-of-the-art safety, signaling, and automated train-control systems. The trains would be capable of operating at speeds of up to 220 miles per hour (mph) over a fully grade-separated, dedicated track alignment. The Authority has identified Alternative 2 with the Refined CCNM Design Option as the Preferred Alternative for the Bakersfield to Palmdale Project Section. The alignment would begin 1.4 miles north of the Bakersfield Station and travel southeast through the Tehachapi Mountains generally following State Route (SR) 58 to Tehachapi and then south through Rosamond, Lancaster, and Palmdale along the existing rail corridor, ending 1.1 miles south of the Palmdale Station (Figure 1).

The alignment would start in Bakersfield on an elevated structure 1.4 miles north of the Bakersfield Station at the Project Section's northern logical terminus and continue to the north of and along the SR 204/Edison Highway corridor before transitioning to the SR 58 corridor east of Morning Drive. The alignment would continue along an elevated embankment north of SR 58, crossing over the Edison Road/SR 58 interchange to the south side of SR 58, continuing to parallel the existing freeway before crossing back over SR 58 just past Towerline Road (both crossings on elevated structures). Four additional elevated structures would be required between Edison Road and the crossing of SR 58 east of Towerline Road to cross the alignment over existing north-south Malaga Road, Comanche Drive, Tejon Highway, and Towerline Road. The alignment would continue eastbound parallel to Edison Highway, crossing over Caliente Creek on a viaduct.

From Caliente Creek to Bealville Road, the alignment would begin to climb the Tehachapi Mountains, roughly following the existing Tejon Ranch Conservancy easement boundary. This part of the alignment would require a combination of cut sections, fill sections, tunnels, and viaducts before reaching Bealville Road approximately five miles northwest of Keene. It would cross over Caliente Creek, Bena Road, Caliente Bodfish Road, and an access road on viaducts and pass through three tunnels approximately 1,500, 1,630, and 2,000 feet in length.

From Bealville Road to the City of Tehachapi the alignment generally follows the SR 58 corridor and similarly includes sections of cut and fill, tunnels, and viaducts. The section from Bealville Road to Keene has three viaducts: one crossing Tehachapi Creek, an access road and the Union Pacific Railroad (UPRR); a second crossing an access road; and the third crossing Tweedy Creek and an access road. Two tunnels are present in this section, approximately 6,000 and 4,100 feet in length.

Where it passes Nuestra Señora Reina de La Paz and the CCNM (La Paz), the alignment would emerge at grade from the 4,100-foot tunnel approximately 0.5 mile north of La Paz at its closest, before the viaduct crossing at Tweedy Creek. An approximately 1,500-foot-long berm would be constructed to the same height as the catenary for the track. The berm would be an average of 80 feet in height from the existing ground level.

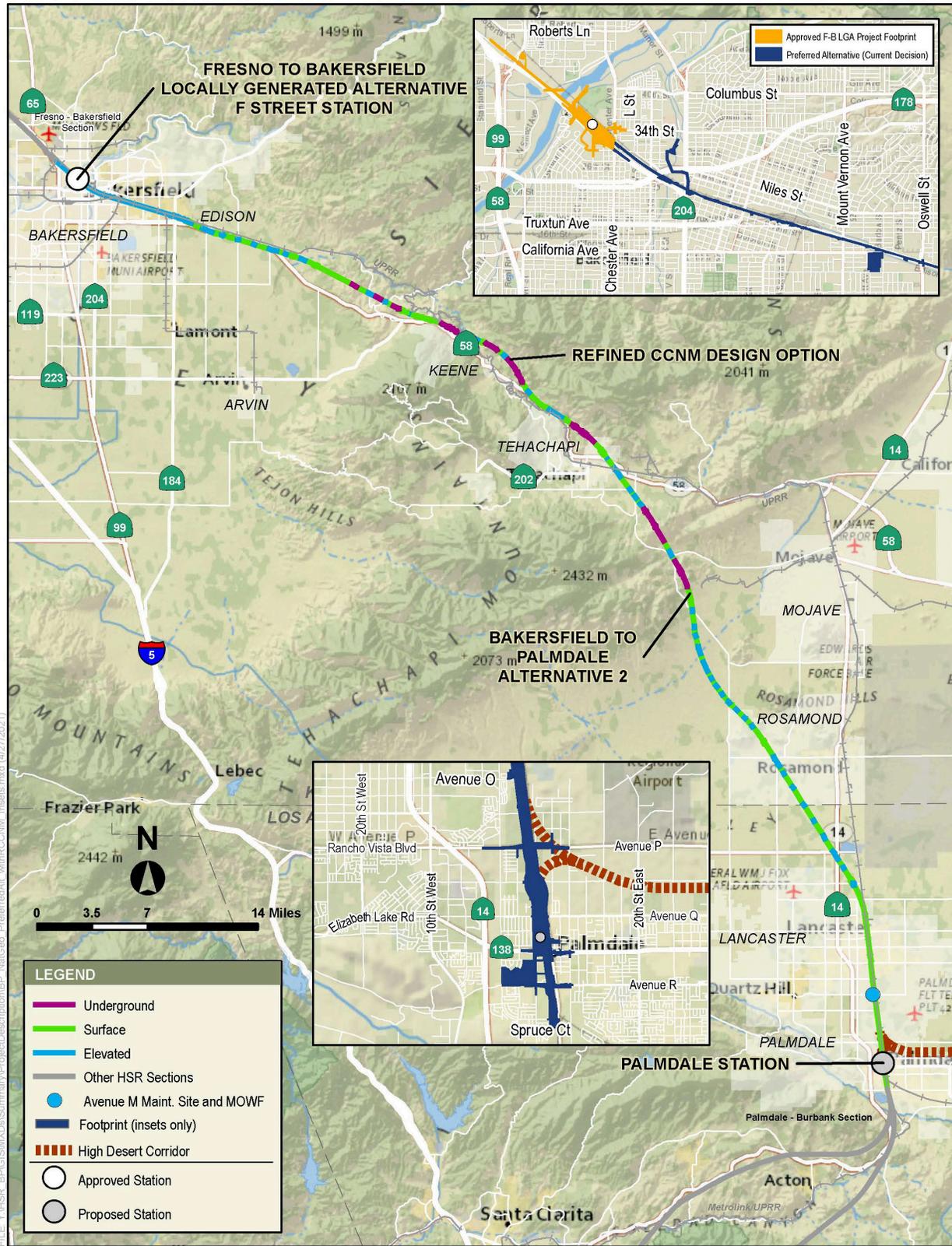


Figure 1 Bakersfield to Palmdale Project Section Preferred Alternative—Alternative 2 with the Refined CCNM Design Option

From La Paz and Tweedy Creek, the alignment would continue at grade before entering an approximately 8,900-foot long tunnel that would emerge approximately 0.5 mile north of Broome Road then cross a viaduct spanning an access road near the Broome Road and SR 58 interchange. The alignment would continue at grade in the existing SR 58 right-of-way (ROW) corridor, where the freeway would be relocated to the south, before crossing SR 58 and Tehachapi Creek by means of a 4,600-foot long viaduct. Where SR 58 turns south, the alignment would continue southeast, enter an approximately 8,800-foot-long tunnel and cross another viaduct over a new section of Challenger Drive, then cross over SR 58 near Arabian Drive.

The alignment would traverse the Tehachapi Valley on an embankment or fill section, crossing local roads on viaducts. The alignment would pass through the mountains southeast of Tehachapi in an approximately 14,100-foot tunnel, roughly following Tehachapi Willow Springs Road. It would then descend in cut and viaducts into the northern Antelope Valley east of a realignment of Tehachapi Willow Springs Road, near the Cameron Canyon Road intersection and the Pacific Crest Trail. The alignment would then pass just west of the CalPortland Company existing limestone quarry in an approximately 11,200-foot tunnel and continue southeast toward the community of Rosamond on an embankment or fill section crossing local roads on viaducts.

Through Rosamond, the alignment would travel southeast past the east side of Willow Springs International Raceway, where it would proceed over Rosamond Boulevard toward the north end of Los Angeles County and the city of Lancaster. In the Lancaster area, the alignment would continue on an embankment or fill, and pass over SR 138 and SR 14 near their interchange and over other local roads on viaducts. The alignment would then enter Lancaster at Avenue H, running parallel to the Sierra Highway and the relocated UPRR corridor through Lancaster and into Palmdale. From Avenue H through Lancaster, the alignment would combine the HSR, UPRR, and Metrolink rail corridors into one combined corridor. The alignment would continue at-grade and pass under most local roads that have been modified to cross over HSR, the exceptions being undercrossings at Avenue I, and Lancaster Boulevard near the Lancaster Metrolink station at Lancaster Boulevard.

The new combined rail corridor would be placed as close as possible to the easterly edge of existing Sierra Highway and then widened approximately 220 feet to the east to accommodate all three rail systems. The alignment would require the relocation of the UPRR and Metrolink facilities in the corridor from north of Avenue H to approximately Avenue L. The alignment would create separate ROW for the UPRR and Metrolink rail corridors to the east of the HSR ROW, which would align east of Sierra Highway and west of the UPRR corridor.

The Lancaster Metrolink station would be relocated to accommodate the HSR. The existing station building would be replaced with a new structure approximately 550 feet north of its current location. The existing Metrolink platforms would be relocated approximately 140 feet east and 400 feet north of its existing location. The Metrolink parking lot and station building would be connected to the relocated platform via an Americans with Disabilities Act-compliant pedestrian underpass that would pass beneath the HSR tracks and the relocated Metrolink and UPRR tracks.

To avoid airspace restrictions from the U.S. Air Force Plant 42 Airport to the south, the alignment would begin a transition to the west at Avenue K. This transition would continue to Avenue M, where the HSR alignment would be situated west of the existing UPRR/Metrolink ROW, which would remain in its existing location. The HSR alignment would dip below the existing grade from approximately Avenue L at Avenue O and continue south parallel to and along the westerly side of the existing rail corridor to the Palmdale Station at the Palmdale Transportation Center. The westerly transition of the alignment, from Avenue K to Avenue O,

would require the relocation of approximately 4.5 miles of Sierra Highway to the west. Preliminary routes for this highway relocation would vary between 500 and 2,900 feet west of its existing location. This would provide a separation of 500 to 2,900 feet between the rail corridor and the highway. The alignment would end approximately 1.1 miles south of the Palmdale Station at the Project Section's southern logical terminus.

Project Footprint

The project footprint extends from the Project Section's northern logical terminus, approximately 1.4 miles north of the Bakersfield Station to its southern logical terminus, approximately 1.1 miles south of the Palmdale Station (Figure 2). The project footprint extends to the physical limits of the construction activities associated with the proposed action and includes all areas that will be permanently or temporarily affected by the proposed action. The project footprint includes all components and ROW needed to construct, operate, and maintain all permanent HSR features between the Project Section's logical termini. The estimated project footprint (i.e., combined permanent and temporary disturbance areas) for the proposed action is expected to be no greater than approximately 9,882 acres.

The project footprint primarily consists of rail ROW that would include both a northbound and a southbound track in a corridor ranging from 60 feet wide, where elevated on a viaduct, to several hundred feet wide, where on embankment or in cut. Additional ROW would be required to accommodate associated facilities and improvements, such as maintenance facilities and equipment storage areas, permanent access roads, traction power substations (TPSS), switching and paralleling stations, train signaling and communication facilities, grade separations (overheads and underpasses), intrusion protection barriers, and wildlife crossing structures. The project footprint also includes areas for utility relocations, roadway relocations, electrical power connections, and construction activities (e.g., laydown, storage, and similar areas). The project footprint consists of the limits of cut and fill, plus all access roads and areas required for operating, storing, and refueling construction equipment.

Due to the Design/Build nature of the project, design refinements will occur as construction progresses, which may result in shifts in the project footprint into adjacent habitat. In addition, acquisition of ROW will provide access for surveys and updated habitat mapping. The HSR system, project footprint, and modeled habitat acreages included in the text below are based on the best available information at this time. Regardless of the final project footprint, project impacts will be similar geographically as well as in general nature and magnitude.

High-speed Rail System Infrastructure

The infrastructure and systems of the proposed project consist of trains (i.e., rolling stock), tracks, grade-separated ROW, stations, train control, power systems, and maintenance facilities. The design includes a double-track rail system and the HSR system safety criteria also requires grade-separated overheads or underpasses for roadways or roadway closures and modifications to existing systems that do not span the planned ROW.

Vehicles and Track Sections

The HSR System would be designed for the operation of trainsets ranging from 8 to 16 cars that are 9 to 11 feet wide and 660 to 1,320 feet long and designed to operate at a top speed of 220 mph. The number of trains per day, night, and during the peak hour are 174, 22, and 15, respectively, and represent the total combining both northbound and southbound.



Figure 2 Bakersfield to Palmdale Project Section Preferred Alternative Project Footprint

The proposed project would consist of a fully dedicated, grade-separated rail line using five different track sections: at-grade, fill, cut, tunnel, and elevated. Types of bridges that might be built include pre-cast, cast-in-place, and balanced cantilever segmental.

At-grade track sections would be used in areas where the ground is relatively flat and in rural areas where interference with local roadways is infrequent. The height of at-grade sections may vary to accommodate slight changes in topography and provide clearance for stormwater culverts and structures to allow water flow as well as occasional wildlife movement. Off-site culverts would be placed to convey off-site flow.

Fill sections would be used where it is necessary to raise the rail alignment so it can cross over existing surface-level rail tracks, roads, or highways. The guideway would be raised off the existing ground on a fill platform with 2:1 side slopes or flatter. Fill sections are also necessary intermittently when traversing mountains or irregular terrain to cross over intermittent low points and drainage crossings.

Cut sections would be used when the rail profile needs to be lowered so it can cross under existing surface-level rail tracks, roads, highways, or in mountainous regions. The cut section embankment heights vary from 0 to about 250 feet and are benched every 30 feet vertically. The guideway would be lowered below the existing ground with 2:1 slopes or flatter, unless in rocky stable terrain, where steeper slopes may be appropriate with approval of the Geotechnical Engineer. Cut sections would be used mainly for short distances in highly urbanized and constrained situations, or when traversing mountainous or irregular terrain to cross through intermittent high points and ridges, such as the Tehachapi Mountains. Cut sections would be used in some cases when it is less disruptive to the existing traffic network to depress the rail profile under crossing roadways or for roads or highways when it is more desirable to depress the roadway underneath a surface HSR alignment. Retaining walls are also used to minimize the impact area by preventing the grading catch points from chasing existing slopes or to avoid ground features. The retaining wall heights vary from 6 to 77 feet and the lengths vary from 33 to 9,200 feet.

Tunnel sections would be used when the rail alignment traverses highly variable topography or highly constrained, densely developed urban areas. The tunnels have two basic configurations: a single tunnel containing both tracks and dual-bore tunnels with a single track in each tunnel. Some locations would require cut-and-cover tunnels for short distances. Each cut-and-cover tunnel would have an internal width of approximately 24 feet. Jet fans would be provided where required for ventilation.

Each dual-bore tunnel would have an internal diameter of approximately 28 feet, with a typical center-to-center spacing for the twin tunnels of 66 feet. The single tunnel would have an internal width of approximately 49 feet and the minimum distance between track centerlines would be approximately 25 feet. Tunnels would be fully lined in some areas for structural, water and gas tightness, and aerodynamic reasons.

Tunnel portals provide a transition from the tunneled sections to cut, at-grade, or elevated sections. During construction, portals serve as the primary access to the tunnels. In the permanent configuration, facilities and infrastructure elements would be located at the portals to support HSR tunnel operations, including provisions needed to meet first responder, fire and life safety, and ventilation requirements. The principal factors influencing which elements of the portal infrastructure are required are tunnel length, the proximity of tunnels to the portals, accessibility, and environmental impacts.

The following major portal infrastructure elements are incorporated in the portal design, based on preliminary engineering design, and are subject to change as the project design is refined:

- Noise Attenuation Hood at the portals up to 150 feet long
- Portal Ventilation Building, a three-story, roughly 65-foot-tall building requiring direct access to the tunnels and located immediately over the tunnel portal
- Access Road provides access to the portals and is required for emergency responders, evacuating passengers, and maintenance staff. A 22-foot-wide access road runs up and around the portal ventilation building to provide access to the third floor
- Emergency Vehicle Assembly and Turnaround Area, minimum 75-foot by 75-foot and located adjacent to the tunnel portal
- Rescue Area/Passenger Assembly Area, 5,000-square-foot minimum, as close as practical to the tunnel portal and well lit
- Fire Hydrants and Water Supply for tunnel firefighting purposes. Supplied by the 4-inch water line along the alignment for tunnel water needs
- Area Lighting system needed to illuminate the portal site during a train evacuation
- Train Surface Evacuation and Fire Control Zone located immediately outside the portal
- Communication Facilities tower, approximately 100 feet in height and 6 feet in diameter, may be required to enable reliable transmission
- Rock Fall and Debris Containment consisting of trench excavations or berms
- Detention Pond required to handle stormwater runoff for each portal location (less than 1 acre in size)
- Parking for Tunnel Maintenance and Traction Power Facilities, approximately eight spaces provided for maintenance staff
- Public Utilities may include water, electricity, telephone, and sewer lines

Elevated sections may be used in urban areas where extensive road networks must be maintained. They may also be used in rugged, mountainous, or otherwise uneven terrain to ensure a level track and reduce the impacts associated with very tall fill section heights or other grade-stabilizing measures. The alignment would utilize elevated sections ranging in length from approximately 130 to 48,300 feet. Elevated sections must have a minimum clearance of approximately 17 feet over roadways and approximately 24 feet over railroads. Pier supports would vary between 12 feet and 20 feet in diameter at ground level. Such structures could also be used to cross water bodies; even though the trackway might be at-grade on either side, the width of the water channel could require a bridge to span the floodplain.

Elevated sections have two basic configurations: twin structures, each with a single track, or a single structure with both tracks. Each twin structure would be approximately 50 feet wide, except in transition areas where the width of each twin structure would be approximately 59 feet. Additionally, the typical spacing between the twin structures would vary between approximately 21 and 41 feet. The width of each single structure would vary between approximately 44 and 53 feet and the typical center-to-center spacing for the twin structure would be 66 feet.

Where elevated sections cross over a roadway or railway on a very sharp skew (degree of difference from the perpendicular) straddle bent pier structures, spaced as needed (typically 110 feet apart), that span the functional/operational limit of a roadway, highway, or railway would be

used. Typical roadway and highway crossings that have a small skew (i.e., the crossing is nearly perpendicular) would use intermediate piers in medians and span the functional ROW. For some larger skew angle crossings median piers would result in excessively long spans that are not feasible.

Grade Separations

The HSR system would be a fully grade-separated and access-controlled guideway. There would be no surface road crossings and the HSR system would not share its rails with freight trains. The following list describes possible scenarios for HSR grade separations for roadways, irrigation and drainage facilities, and wildlife:

- **Elevated HSR Road Crossings:** In urban areas it may be more feasible to raise the HSR to minimize impacts on the existing roadway system. This type of grade separation may also be used in mountainous, uneven, or rural areas.
- **Roadway Overheads and Underpasses:** Where state and local roads are affected by the HSR alignment they would be shifted and rebuilt to maintain their function. Where roads cross the alignment, overheads or underpasses would be used to provide continued mobility for local residents and farm operations. Some roads may be closed and alternate routes provided. Typical roadway overheads would vary in width between 25 and 123 feet. Overheads would have 2 to 6, 12-foot lanes depending on the existing facility. They would include shoulders, a bike lane, and a sidewalk, or a combination of these. The minimum clearance height would be 27 feet over the HSR. The HSR alignment would require underpasses for the HSR to travel over some roadways. Roadway widths would vary between 10 and 164 feet.
- **Tunnels:** The HSR alignment would require tunneling in certain areas due to topography or other constraints, such as grade limitations and grade separations. Tunnels are specifically relevant for the Tehachapi segment of the proposed action.
- **Irrigation and Drainage Facilities:** The HSR alignment would affect some existing drainage and irrigation facilities, which would be modified, improved, or replaced as needed to maintain existing drainage and irrigation functions and to support HSR drainage requirements. Types of drainage crossings that might be built include drainage overheads (bridges), large box culverts, or, for some wider river crossings, limited piers within the ordinary high-water channel.
- **Wildlife Crossing Structures:** Wildlife crossing structures designed for the proposed action generally consist of a 6-foot concrete arch, perpendicular to the rail, in the embankment that supports the HSR tracks. The length of these crossing structures varies depending on the embankment width. The preliminary design includes 39 wildlife crossing structures placed to minimize effects of the proposed action on wildlife permeability. Generally, wildlife crossings were reviewed for fenced at-grade segments at intervals of 0.31 mile for small to medium species and one mile for large species. A minimum preliminary design height requirement of 17.5 feet was established at roadway crossings. Other preliminary wildlife crossing design criteria used were less than 200 feet in length, less than 2 percent slope, natural bottom substrate, and near natural grade.

Achieving both the desired crossing intervals and all design criteria is infeasible at some locations; for example, where the width of the HSR fill slope adjacent to natural grade would exceed the desired maximum crossing length. However, additional design elements such as the tunnels, elevated sections of the alignment, road overcrossings or

undercrossings, and crossings of drainages, would avoid impacts to wildlife movement entirely or minimize those impacts since they essentially unimpeded connectivity for wildlife.

The Authority has analyzed site-specific movement corridors to determine design refinements that would incorporate appropriate wildlife crossings as necessary and as feasible to facilitate wildlife movement. The analysis included information from, and consultation with, stakeholders and agencies. The assessment identified important ecoregions for wildlife movement, areas where wildlife movement may be constrained for various species, appropriate locations and sizes for dedicated crossings, and measures to avoid, minimize, or mitigate the effects.

Additional wildlife crossing structure designs may include larger structures (10-foot concrete arch) to accommodate taller species such as mule deer (*Odocoileus hemionus*) within their species range. However, at several locations the HSR is in a cut below natural grade. In these cases, overcrossings were designed to accommodate wildlife movement over the HSR alignment. In several instances, wildlife crossings were combined with roads or a drainage; these crossings would consist of a 30-foot-wide dirt shoulder adjacent to the road or drainage. A physical separation or barrier, such as a wall, would be built between the crossing area and the road. In the instances where wildlife crossings are combined with roads or drainages, the wildlife crossing would be visible to wildlife.

Access Roads

Access roads are required to provide emergency and maintenance access from public roadways to HSR facilities. Access roads would be located continuously along both sides of the tracks except where the alignment is in a tunnel or on a bridge, where roads terminate and walkways are provided. Additional access roads would provide connections from public roadways to HSR facilities in between every tunnel or bridge, providing access to every segment of at-grade track. Access roads within the HSR ROW would be paved, with a minimum width of 22 feet to provide maintenance and emergency access. Access roads within the HSR ROW would be restricted for use by authorized HSR personnel and emergency responders. On public roads up to the HSR ROW use would be unrestricted. All parcels would have roadway access or be acquired if access to the parcel cannot reasonably be otherwise provided. Temporary access roads are required to provide construction access along the HSR alignment in mountainous terrain. Temporary access roads would be removed and restored to pre-construction conditions upon construction completion.

Traction Power Distribution

Implementation of the HSR system would not entail the construction of a separate power source. Instead, it would include the extension of underground or overhead power transmission lines to a series of TPSSs positioned along the HSR corridor that would even out the power feed from the power supply company to the train system.

Trains would draw electric power from an overhead contact system (OCS) consisting of a series of mast poles approximately 24 feet higher than the top of the rail, with contact wires suspended from the mast poles between 17 and 19 feet from the top of the rail. The train would have an arm, called a pantograph, that would make and maintain contact with this wire and provide power to the train. The mast poles would be spaced approximately every 200 feet along straight portions of the track and as close as every 70 feet in tight-turn track areas. The OCS would be

connected to the switching stations and the power supply would consist of a 2- by 25-kilovolt (kV) OCS for all electrified portions of the statewide system.

Based on the HSR system's estimated power needs, each TPSS would encompass approximately 32,000 square feet (200 by 160 feet) and be located at approximately 30-mile intervals. TPSSs would be built at locations where high-voltage power lines cross near the HSR alignment. Each TPSS would have two 115/50-kV or 230/50-kV single-phase transformers, both of which would be rated at 60 megavolt-amperes. The autotransformer feed system would step down the transmission voltage to 50 kV (phase-to-phase), with 25 kV (phase-to-ground) to power the traction power distribution system. TPSSs would require a buffer area for safety purposes. The TPSSs and associated feeder gantries may be screened from view with a perimeter wall or fence. Each TPSS site would have a 20-foot-wide access road (or easement) from the street access point to the protective fence perimeter at each parcel location. Each site would require a parcel of up to 2 acres.

Traction power switching stations would be required at approximately 15-mile intervals, midway between the substations. Each traction power switching station would encompass approximately 14,400 square feet (160 by 90 feet). Traction power paralleling stations would be required at approximately 5-mile intervals between the TPSS and the switching stations. Each traction power paralleling station would encompass approximately 9,600 square feet (120 by 80 feet). The traction power switching and paralleling stations and associated feeder gantries may be screened from view with a perimeter wall or fence.

Each TPSS would have two 115/50-kV or 230/50-kV single-phase transformers. These transformers would interconnect the TPSS to two breaker-and-a-half bays built at a new utility switching station within the fence line of an existing utility facility via a short section of 230-kV transmission or 115-kV power lines (tie-lines). Per Authority requirements, the proposed interconnection points would need redundant transmission (i.e., double-circuit electrical lines) from the point of interconnection, with each interconnection connected only to two phases of the transmission source. A new utility switching station would encompass approximately 32,200 square feet (160 by 220 feet) and include an approximately 975-square-foot (15- by 65-foot) control building, a 525-square-foot (15- by 35-foot) battery building, and, if required, a retention basin. The utility switching station may be screened from view with perimeter walls or fences.

The Authority has developed conceptual locations for electrical interconnections along the HSR alignment. Electric power utility improvements as designed, including construction and permanent maintenance easements, are included in the project footprint. Network upgrades could include modifications to existing infrastructure such as expansion of existing substations and reconductoring of existing electrical lines (i.e., replacement of power structures [poles and lattice steel towers] and electrical conductors with taller structures and more efficient electrical wires or new electrical lines). All network upgrades would be implemented pursuant to California Public Utilities Commission General Order 131-D. Nine paralleling stations, three substations, and one switching station would be in Kern County and two paralleling stations and one switching station would be in Los Angeles County.

Signaling and Train-control Elements

A computer-based, enhanced automatic train control system would control the trains. The system would use a radio-based communications network that would include a fiber-optic backbone and communications towers at intervals of approximately three miles or less. Signaling and train control elements within the ROW would include 18 by 15-foot communications shelters or signal huts/bungalows. Train control facilities ranging from 2,450 square feet (70 by 35 feet) to

7,175 square feet (110 by 65 feet) would be located along the track. Communications towers within these facilities would use a 6- to 8-foot-diameter, 100-foot-tall pole. The communications facilities would be in the vicinity of track switches and would be grouped with other traction power, maintenance, station, and similar HSR facilities where possible. Where communications towers cannot be located with TPSSs or other HSR facilities, the communications facilities would be located near the HSR corridor in a fenced area of approximately 40 feet by 25 feet.

Track Structure

The track structure would consist of either a direct fixation system (with track, rail fasteners, and slab) or ballasted track. Ballasted track requires more frequent maintenance than slab track but is less expensive to install. Slab track would be used for track supported by structures longer than 1,000 feet, while ballast would be used for track supported by earthwork or structures shorter than 1,000 feet.

Maintenance Facilities

The proposed project would include one maintenance-of-way facility (MOWF), two maintenance-of-infrastructure sidings facilities (MOIS), and a light maintenance facility (LMF) facility. Two maintenance facility site options were evaluated in the Lancaster area, the Lancaster North site and the Avenue M site. The Authority evaluated these two locations with regard to the Authority's criteria for maintenance sites and determined that the Preferred Alternative should include a MOWF at Avenue M in Lancaster and Palmdale. One reason for the Avenue M site being chosen is that the footprint area is of sufficient size to accommodate an LMF in the future. Avenue M is on the west side of the HSR alignment and to the west of existing Sierra Highway. The site extends generally between W Avenue L-4 and Avenue O. It is primarily in an open, urban area and offers a good location for both an LMF and MOWF due to its 230-acre size and proximity to freight rail for delivery of materials. The two MOIS facilities are proposed in Edison and in Tehachapi.

The MOWF would be outfitted to support maintenance activities for tunnels and high viaducts for approximately 50 to 75 miles in either direction. The functional requirements of the MOWF includes: six yard tracks plus one siding track (1,600 feet), approximately 8,150 feet of yard track capacity, stockpile areas for ballast and other bulk materials, secured stockpile areas for non-bulk materials, and road-rail vehicle access locations. The MOWF may be co-located with the nearest LMF to consolidate HSR resources and minimize community impacts. MOWF facilities are estimated to be approximately 30 acres in size, including roadways and parking.

The MOIS facilities would be centrally located within the 50- to 75-mile maintenance sections on either side of the MOWF. More than one location may be required in some maintenance sections because of difficult terrain, such as the Tehachapi Mountains. The MOIS facilities are approximately five acres in size.

LMFs require yard tracks, plus two runaround/transfer tracks, and shop tracks designed to accommodate a minimum of one trainset each. The Project Section would require a total of 29 facility tracks (21 yard tracks and eight shop tracks). The LMF would also include a train wash and wheel detection facilities. The recommended LMF configuration would require approximately 40 to 110 acres.

Stations

Two stations would serve the Project Section: one in Bakersfield and one in Palmdale. Station facilities include public and nonpublic areas, station site improvements to facilitate intermodal

connectivity and station accessibility, and ancillary facilities. Both stations would include the following elements: passenger boarding platforms; station head house with ticketing, waiting areas, passenger amenities, vertical circulation, administration and employee areas, and baggage and freight-handling service; short-term and long-term vehicle parking; pick-up and drop-off areas; motorcycle/scooter and bicycle parking; waiting areas and queuing space for taxis and shuttle buses; and pedestrian walkway connections.

The Bakersfield Station would be located at F Street along the proposed HSR alignment parallel to the existing rail corridor. The entire site would be approximately 46 acres, with approximately 2.2 acres of the site designated for the two station buildings. To facilitate vehicle circulation, F Street would cross under SR 204. Additional circulation improvements are required including new roadway providing access from the 30th Street and Alder Street intersection, realignment of the Chester Avenue and 34th Street intersection, conversion of the Chester Avenue and 32nd Street intersection to a right-in/right-out driveway into the station site, and closure of SR 204 North and South frontage roads to accommodate construction of the F Street interchange ramps.

The Palmdale Station would be located along the proposed HSR alignment parallel to the existing rail corridor. The existing Palmdale Transportation Center would be expanded to the south to accommodate the HSR system and would be bounded by Technology Drive to the north and Palmdale Boulevard to the south. The Palmdale Station would consist of train platforms, pedestrian walkways/connectors, a transit plaza pick-up/drop-off facility for private automobiles, and surface parking areas. The station facilities would be located on approximately 50 acres.

Train platforms would be built along either side of the proposed HSR alignment, beginning approximately 200 feet south of E Avenue Q. In addition, the existing Metrolink platform would be replaced by a 700-foot Metrolink platform east of the HSR platform. Pedestrian access would connect the train station/platforms to surrounding parking areas, which would provide 3,300 potential parking spaces in multiple lots by 2040. The closest parking spots would be located at station entrances, while the farthest parking spots would be within 0.5 mile of the station. Two transit centers, one on either side of the HSR alignment, would house bus terminals for buses and shuttles.

Pre-construction Activities

During final design, the Authority or its contractor would conduct several pre-construction activities to determine how to best stage and manage actual construction. These activities include the following:

- Conducting geotechnical investigations to define precise geology, groundwater, seismic, and environmental conditions to guide final design and construction methods. Helicopters may be utilized to access geotechnical field investigation sites.
- Identifying construction laydown and staging areas used for geotechnical investigations, mobilizing personnel, stockpiling materials, and storing. In some cases, these areas would also be used to assemble or pre-fabricate components of guideway or wayside facilities. The Authority or its contractor would also identify pre-casting yards, temporary spoil storage, workshops, and temporary storage of delivered construction materials. Field offices and temporary jobsite trailers would also be located at the staging areas. After conclusion of construction and geotechnical investigations, the staging, laydown, and pre-casting areas would be restored to pre-construction conditions.
- Initiating site preparation and demolition, such as clearing, grubbing, and grading, followed by the mobilization of equipment and materials. Demolition would require strict

controls to ensure that adjacent buildings or infrastructure are not damaged or otherwise affected by the demolition efforts.

- Relocating utilities. The contractor would work with the utility companies to relocate or protect in place high-risk utilities prior to construction and geotechnical investigations.
- Implementing temporary, long-term, and permanent road closures to reroute or detour traffic away from construction activities. Handrails, fences, and walkways would be provided for the safety of pedestrians and bicyclists.
- Constructing the access and haul routes. This activity would require clearing and grubbing, potential demolition and relocation of utilities, establishment of detours, erection of safety devices, and earthmoving activities. Haul routes would use existing roads as much as possible. The project would require inbound and outbound and off-road and on-road earth haul routes for import and removal of materials.
- Locating temporary batch plants as needed to produce Portland cement concrete or asphaltic concrete. The facilities generally consist of silos containing fly ash, lime, and cement; heated tanks of liquid asphalt; sand and gravel material storage areas; mixing equipment; aboveground storage tanks; and designated areas for sand and gravel truck unloading, concrete truck loading, and concrete truck washout. The contractor would be responsible for implementing procedures for reducing air pollutant emissions, mitigating noise impacts, and reducing the discharge of potential pollutants from the use of equipment, materials, and waste products into storage drains or watercourses.
- Conducting other studies and investigations as needed, such as local business or agriculture surveys to identify usage, delivery, shipping patterns, and critical times of the day or year for business, planting, or harvesting activities in order to develop construction requirements and worksite traffic control plans and identify potential alternative routes, cultural resource investigations, and historic property surveys.
- Constructing access roads to connect the HSR ROW with existing local roads. The contractor would be responsible for roads within the ROW to extend access to tunnel portals and on-site construction staging sites. The contractor would maintain these on-site temporary roads and relocate them as general project grading develops.
- The contractor must sequence the tunnel/bridge construction with the mass grading to provide access to these sites, which are in remote areas. Grading would begin with bulldozers and other appropriate equipment for pioneering roads. The contractor would construct haul roads suitable for dump trucks. Construction of tunnels and extended viaduct structures would require specialized heavy equipment to accomplish the work. Access roads to reach tunnel portals and bridge locations must be suitable for highway-legal trucks and trailers (“18-wheelers”) to deliver equipment and materials. Where nighttime construction lighting would be required, the Contractor would be required to shield such lighting and direct it downward in a manner that minimizes the light that falls outside the project boundaries.

Non-operational Right-of-way

In certain negotiated ROW purchase situations, the Authority may enter into agreements to acquire properties or portions of properties that are not directly needed for the construction of the HSR Project and are not intended to be part of the operational ROW. These are known as excess properties and are distinct from severed remnant parcels (evaluated as part of the project footprint). The Authority would need to conduct various management and maintenance activities

on them. The activities required on a given parcel may include structure demolition, vegetation management, pest management, site security, and structure maintenance.

The Authority has identified locations for potential construction staging and laydown areas and pre-casting yards, as well as batch plant, rock crushing, and rail storage and welding areas included within the preliminary engineering design. One 6.1-acre staging area would be in Bakersfield. Eight staging areas ranging in size from 0.7 acre to 6 acres would be in or around Edison. An approximately 45-acre staging, rock crushing, and pre-cast area and a 12-acre rail storage and welding area would also be located near Edison. One 3.3 acre and one 4.6-acre laydown area and a 9.5-acre staging area would be in Keene. In Tehachapi there would be two laydown areas, each 3.3 acres, one 151.6-acre staging, rock crushing, and pre-cast area, and one 12-acre rail storage and welding area. In the Antelope Valley, one 3.3-acre laydown area, one 24.8-acre staging, rock crushing, and pre-cast area, and one 15.5-acre rail storage and welding area. Lancaster would have five laydown areas ranging from 0.5 acre to 1.9 acres and two staging areas of 12.6 and 16 acres. One 1.5-acre laydown area would be in Palmdale.

Major Construction Activities

Major construction activities anticipated for the proposed project include earthwork; at-grade construction; bridge, aerial structure, road and wildlife crossing construction; roadway detours; tunnels; railroad systems construction; and station construction.

Earthwork

Earthwork is the disturbance of soil or earth by any means, including, tunneling, drilling, infilling, stockpiling, dumping of soil or sand, and construction/reconstruction of any track, embankment, or drainage channel. Earth support is an important factor in constructing deep excavations that would be encountered in some portions of the project. The three general excavation support categories are described below.

- Open-cut slope would be used in areas where sufficient room is available to open-cut the area and slope the sides back to meet the adjacent existing ground surface, taking into account the natural slope of adjacent ground material and global stability in the area.
- Temporary excavation support structures such as soldier piles and lagging, sheet-pile walls, slurry walls, secant piles, or tangent piles, may be installed to support vertical or near-vertical faces of excavations in areas where space is not available for open-cut slope. These structures do not contribute to the final load-carrying capacity of the tunnel or trench structure and would be either abandoned in place or dismantled as the excavation is backfilled.
- Permanent structures such as slurry walls, secant piles, or tangent pile walls may be installed to support vertical or near-vertical faces of the excavation in areas where space is not available for open-cut slope and would form part of the permanent final structure.

For the proposed action, a balanced earthwork condition is not achievable due to profile changes and would result in approximately 2.4 million cubic yards of excess spoils from cut slope excavation and tunnel construction. Those materials would be stockpiled in the area north of SR 58 in the vicinity of Bealville Road. These materials would be similar to materials excavated throughout the project footprint and could be either processed into soils or conglomerates or left in the condition they are pulled out of the ground (ripped and dumped).

Bridge, Aerial Structure, Road Crossing, and Wildlife Crossing Construction

Elevated guideways would be designed and built as single-box segmental girder construction. Where needed, other structural types would be considered and used, including steel girders, steel truss, and cable-supported structures. The following provides an overview of the construction methods required for foundations, substructures, and superstructures of bridges, aerial structures, and roadway crossings:

- Foundations: A typical aerial structure foundation pile cap is supported by an average of four large-diameter bored piles with diameters ranging from five to nine feet. Pile construction can be achieved by using rotary drilling rigs, and either bentonite slurry or temporary casings to stabilize pile shaft excavation. The estimated pile production rate is four days per pile installation. Additional pile installation methods available to the contractor include bored piles, rotary drilling cast-in-place piles, driven piles, and a combination of pile jetting and driving. Upon completing the piles, pile caps can be built using conventional methods. For pile caps constructed near existing structures, such as railways, bridges, and underground drainage culverts, temporary sheet piling may be used to minimize disturbances to adjacent structures. Sheet piling installation and extraction are anticipated to be achieved using hydraulic sheet piling machines.
- Substructure: Typical aerial structures of up to 90 feet would be built using cast-in-place concrete bent caps and columns supported upon pile caps with large-diameter cast-in-drilled hole piles. A self-climbing formwork system equipped with a hydraulic operated winched lifting device may be used to construct piers and portal beams over 90 feet high. In general, a three-day cycle for each 12-foot pour height can be achieved.
- Superstructure: The final design would depend on the contractor's means and methods of construction and may include several different methods such as span-by-span, incrementally launched, progressive cantilever, and balanced cantilever.

Road crossings of existing railroads, roads, and the HSR would be built on the line of the existing road or offline at some locations. When built online, the existing road would be closed or temporarily diverted. When built offline, the existing road would be maintained in use until the new crossing is completed. Where new roadway underpasses of existing railroads are required, a temporary shoofly track would be built to maintain railroad operations during underpass construction.

Wildlife structures would also include dedicated overcrossings or concrete arch undercrossings. Where bridges, aerial structures, and road crossings coincide with proposed dedicated wildlife crossing structures, such features would serve the function of, and supersede the need for, dedicated wildlife crossing structures or dual-purpose road and wildlife crossings. These crossings would include fencing designed to prevent wildlife from entering the road.

Construction of foundations and substructures would be similar to construction of the aerial structures but on a smaller scale. The superstructure would likely be built using pre-cast, pre-stressed, concrete girders and cast-in-place deck. Approaches to the bridges would be earthwork embankments, mechanically stabilized earth wall, or other retaining structures.

Roadway Detours

Some proposed grade separations at major arterials are close to one another and would require roadway detours during construction. To facilitate the construction of the roadway grade separations in these areas the contractor would phase the construction by closing and building every other arterial.

In the Edison area major arterials are spaced about 1 mile apart, starting on the north end with Vineland Road and ending at Towerline Road. Only Vineland Road would need to be closed during the construction of the grade separation; all other arterials could remain open during construction, including both crossings of SR 58.

In the Lancaster area, major arterials are spaced 1 mile apart, starting on the north end with Avenue G and ending at Avenue M. The first phase of construction of the proposed project would include the closure and construction of Avenues G, I, K, and M. The second phase of construction would include the closure and construction of Avenues H, J, and L. Approximately 4.5 miles of Sierra Highway, from north of Avenue K to Avenue O, would be relocated to the west. Once the relocations are complete, all traffic could be shifted to the relocated Sierra Highway.

Tunnels

Tunnel construction would occur at various locations in the Tehachapi Mountains. The selected two-track single tunnel or single-track double tunnel configuration would depend on alignment, ground conditions, construction method, portal configuration, approach structures, fire and life safety, and operations and maintenance (O&M) considerations.

The primary methods for tunnel construction are the sequential excavation method, cut-and-cover, and the tunnel boring machine (TBM) method. The sequential excavation method uses drilling and blasting excavation or excavator-type equipment that produces an arched tunnel cross-section. Cut-and-cover is built by open-cut methods to create stand-alone structures where soil conditions are questionable, or the amount of overburden is less than desirable. A TBM is typically used when tunnels exceed one mile in length.

The sequential excavation method, drill and blast construction, and TBM construction would progress at rates of approximately 10, 20, and 30 feet per day, respectively. Total utilized equipment for each method would require approximately 10 operating hours per day. Surface disruption would occur with construction of tunnel portals and cut-and-cover tunnels. Two cut-and-cover tunnels are proposed in the Project Section.

Railroad Systems Construction

The railroad systems would include trackwork, traction electrification, signaling, and communications. Trackwork is the first rail system to be built after completion of earthwork and structures and must be in place at least locally to start traction electrification and railroad signaling installation. Trackwork construction of new tracks generally requires the welding of transportable lengths of steel running onto longer, continuous lengths already present (approximately 0.25 mile). These are placed in position on crossties or track slabs and field-welded into continuous lengths.

Tie and ballast construction, which would be used for surface and minor structures, typically uses crossties and ballast that are distributed along the trackbed by truck or tractor. In sensitive areas, such as where the HSR is parallel to or near streams, rivers, or wetlands and in areas of limited accessibility, this operation may be accomplished by using the established ROW with material delivery via the constructed rail line. For major civil structures, slab-track construction would be used. Slab-track construction is a non-ballasted track form employing pre-cast track supports.

Traction electrification equipment to be installed includes TPSSs and the OCS. TPSSs are typically fabricated and tested in a factory then delivered by tractor-trailer to a prepared site

adjacent to the alignment. The OCS is assembled in place over each track and includes poles, brackets, insulators, conductors, and other hardware.

Signaling equipment to be installed includes wayside cabinets and bungalows, communications towers, wayside signals (at interlocking), switch machines, insulated joints, impedance bounds, and connecting cables.

Station Construction

HSR stations would be newly constructed. Existing train operations, including station capacity and passenger levels of service, would be maintained during construction. The typical construction sequence would be as follows:

- **Demolition and Site Preparation:** The contractor would construct detour roadways, new station entrances, construction fences and barriers, and other elements required due to taking existing facilities on the worksite out of service. The contractor would perform street improvement work, site clearing and earthwork, drainage work, and utility relocations.
- **Structural Shell and Mechanical/Electrical Rough-Ins:** The contractor would construct foundations and erect the structural frame for the new station, enclose the new building, and/or construct new platforms and connect the structure to site utilities. The contractor would rough-in electrical and mechanical systems and install specialty items such as elevators, escalators, and ticketing equipment.
- **Finishes and Tenant Improvements:** The contractor would install electrical and mechanical equipment, communications and security equipment, finishes, and signage.

Construction Materials and Equipment

The materials required for construction would include steel rails; building materials for the maintenance facilities, control buildings, and power supply facilities; concrete; reinforcing steel; ballast; cement; aggregates; specialized train system components; fuel; and water. The materials would be delivered and stored at the project site for use.

Fill material would be excavated from construction activities in the project footprint. Railroad ballast may be drawn from existing, permitted quarries with sufficient supply quantities located closest to the construction areas from the Bay Area to southern California, including those in the southern Central Valley and Antelope Valley. Ballast would be delivered by a combination of rail and trucks. All materials would be suitable for construction purposes and free from toxic pollutants in toxic amounts in accordance with Section 307 of the Clean Water Act, and state and local requirements, as applicable.

Various types of construction equipment would be used in the different phases of the project. These may include, but are not limited to: flatbed trucks, water trucks, service trucks, boom trucks, excavators, dozers, forklifts, tractors, loaders, backhoes, trenchers, cranes, lifts, scrapers, rollers, asphalt pavers, sweepers, air compressors, aggregate spreaders, concrete saws, bore/ drill rigs, welders, cement and mortar mixers, and generator sets.

Construction Timeline

The Authority would begin implementing its construction plan upon receiving the required environmental approvals and securing needed funding. Given the size and complexity of the HSR project, the design and construction work may be divided into several procurement packages. In general, the procurement would address the following: civil/structural

infrastructure, including design and construction of passenger stations, maintenance facilities, and ROW facilities; trackwork, including design and construction of direct-fixation track and sub-ballast, ballast, ties and rail installation, switches, and special trackwork; and core systems, such as traction power, train controls, communications, the operations center, and the procurement of rolling stock.

One or more design/build (D/B) packages would be developed, and the Authority would then issue construction requests for proposals, start ROW acquisition, and procure construction management services to oversee physical construction of the project. The Authority anticipates that the selected contractor(s) will complete final design over a period of three to five years. During this period, and in advance of the start of construction, the Authority would begin securing environmental compensatory mitigation and finalize ROW and third-party agreements. As design nears completion, and in advance of the initiation of construction, the Authority would complete species habitat assessment, protocol level, and pre-construction surveys. These surveys would be phased with project buildout and the start of activities at each Work Area.

Once construction begins, work is envisioned to be underway at several locations along the route during peak construction periods, with overlapping construction of various project elements. Working hours and workers present at any time would vary depending on the activities being performed. Where construction fencing is required, it would be restricted to areas designated for construction staging and areas where public safety is an issue. Although the D/B contractor would set the actual schedule, the approximate schedule for construction would be eight years. A breakdown of estimated durations of activities is provided in Table 1.

Operations and Service Plan

High-speed Rail Service

The conceptual HSR service plan for Phase 1 describes service from Anaheim and Los Angeles, through the Central Valley from Bakersfield to Merced, and northwest into the Bay Area. Phase 2 of the HSR system include a southern extension from Los Angeles to San Diego via the Inland Empire and an extension from Merced north to Sacramento.

Three basic service types are planned for the HSR system: 1) express trains, which would serve major stations only and provide fast travel times (i.e., a run time between downtown San Francisco and Los Angeles Union Station of 2 hours and 40 minutes); 2) limited-stop trains, which would skip stations along a route to provide faster service between stations; and 3) all-stop trains, which would focus on regional service.

Most trains would provide limited-stop services and offer a relatively fast run time along with connectivity among various intermediate stations. Numerous limited-stop patterns would be provided to achieve a balanced level of service at the intermediate stations. The service plan envisions at least four limited-stop trains per hour in each direction, all day long, on the main route between San Francisco and Los Angeles. Each intermediate station in the Bay Area, the Central Valley between Fresno and Bakersfield, Palmdale in the high desert, and Sylmar and Burbank in the San Fernando Valley would be served by at least two limited-stop trains every hour—offering at least two reasonably fast trains per hour to San Francisco and Los Angeles. Selected limited-stop trains would be extended south of Los Angeles as appropriate to serve projected demand.

Table 1 Construction Schedule

Activity	Tasks	Duration¹
ROW Acquisition	<ul style="list-style-type: none"> • Proceed with ROW acquisitions after the Authority approves a Record of Decision and once the State Legislature appropriates funds in the annual budget 	Typically completed in 2 years (after the Record of Decision)
Survey and Pre-Construction	<ul style="list-style-type: none"> • Locate utilities • Establish ROW and project control points and centerlines • Establish or relocate survey monuments • Conduct geotechnical investigations 	2 years
Mobilization	<ul style="list-style-type: none"> • Safety devices • Special construction equipment 	6 months at each construction staging location.
Site Preparation	<ul style="list-style-type: none"> • Utility and roadway relocation • Clearing/grubbing ROW • Establishment of detours and haul routes • Preparation of construction equipment yards, stockpile materials, and pre-cast concrete segment casting yard 	2 – 3 years overall. Within six months at each construction staging location.
Earthmoving	<ul style="list-style-type: none"> • Excavation and earth support structures 	4 years. Highly dependent on chosen staging and sequencing.
Tunneling	<ul style="list-style-type: none"> • Construct tunnels at planned locations 	3 – 5 years. Dependent on selected technology and geotechnical findings.
Construction of Road Crossings	<ul style="list-style-type: none"> • Surface street modifications • Grade separations 	4 – 5 years. Dependent on alternative chosen and number of grade separations to be built.
Construction of Elevated Structures	<ul style="list-style-type: none"> • Aerial structure and bridge foundations, substructure, and superstructure 	3.5 – 5 years.
Track Laying	<ul style="list-style-type: none"> • Includes backfilling operations and drainage facilities 	2 years
Systems	<ul style="list-style-type: none"> • Train control systems • Overhead contact system • Communication system • Signaling equipment 	2 years
Demobilization	<ul style="list-style-type: none"> • Includes site cleanup 	1 year
Maintenance Facilities	<ul style="list-style-type: none"> • Construction of facilities along the alignment 	2 years

¹ The duration of some of the listed activities may overlap.

Including the limited-stop trains on the routes between Sacramento and Los Angeles and between Los Angeles and San Diego, and the frequent-stop local trains between San Francisco and Los Angeles and Anaheim and between Sacramento and San Diego, every station on the HSR network would be served by at least two trains per hour per direction throughout the day and at least three trains per hour during the morning and afternoon peak periods. Stations with higher ridership demand would generally be served by more trains than those with lower estimated ridership demand.

The service plan provides direct train service between most station pairs at least once per hour. Certain routes may not always be served directly, and some passengers would need to transfer from one train to another at an intermediate station, such as Los Angeles Union Station, to reach their destination. Generally, the Phase 1 conceptual operations and service plan offers a wide spectrum of direct-service options and minimizes the need for passengers to transfer.

Phase 1 of the HSR system would open in stages, from 2025 through 2029. Upon completion, the Phase 1 HSR system would extend from a north terminal in San Francisco to the south terminal at Anaheim. The Project Section would connect the Central Valley to the Antelope Valley, closing the existing passenger rail gap over the Tehachapi Mountains with proposed stations in Bakersfield and at the Palmdale Transportation Center.

Lighting

In general, the ROW would not be lighted except at stations and associated maintenance and electrical facilities. Station lighting would be designed to provide safety for arriving and departing passengers in urban areas. Maintenance and electrical facilities would have permanent lighting for both interior and exterior areas, as needed to support operations, including those operations that require lighting 24 hours per day. Typically, exterior lights would be mounted on tall masts, towers, or poles and illuminate the area with light-emitting diode (LED) luminaires. The lights would be angled toward the ground to limit reflectance on the surrounding community. Lighting associated with maintenance and security would be minimal and would be required to be focused on the site, minimizing light spillage onto neighboring areas. Light generated by HSR trains, tracks, signs, and signals would be minimal and would be directed to the tracks to minimize light spillover.

Maintenance Activities

The Authority would regularly perform maintenance along the track and railroad ROW, as well as on the power, train control, signaling, communications, and other vital systems required for safe operation of the HSR system. The FRA would specify standards of maintenance, inspection, and other items in a set of regulations (i.e., Rule of Particular Applicability) to be issued in the next several years. The brief descriptions of maintenance activities described below are based on best professional judgment regarding future practices in California. Offsite drainages are to be maintained by the adjacent property owner and not maintained by the Authority.

- **Track and ROW:** The track at any point would be inspected several times per week using measurement and recording equipment aboard special measuring trains. These trains are similar to the regular trains but would operate at a lower speed. They would run between 12:00 a.m. and 5:00 a.m. and would usually pass over any given section of track once per night.

Most adjustments to the track and routine maintenance would be accomplished in a single night at any specific location, with crews and material brought by work trains along the

line. When rail resurfacing (i.e., rail grinding) is needed (perhaps several times per year), specialized equipment would pass over the track sections at five to 10 mph.

Approximately every four to five years, the ballasted track would require tamping. This more intensive maintenance of the track uses a train with a succession of specialized cars to raise, straighten, and tamp the track, and vibrating “arms” to move and position the ballast under the ties. The train would typically cover a one-mile-long section of track during one night’s maintenance. Slab track, which is expected to comprise track at elevated sections, would not require this activity. No major track components are expected to require replacement through 2040.

Other maintenance of the ROW, aerial structures, and bridge sections of the alignment would include drain cleaning, vegetation control, litter removal, and other inspection that would typically occur monthly to several times per year.

- **Power:** The OCS along the ROW would be inspected nightly, with repairs being made when needed. Required repairs would typically be accomplished during a one-night maintenance period. Other inspections would occur monthly. The status and many of the functions of substations and smaller facilities outside of the trackway would be monitored remotely. However, visits would be made to repair or replace minor items and would also be scheduled several times per month to check the general site. No major component replacements for the OCS or the substations are expected through 2040.
- **Structures:** Visual inspections of the structures along the ROW and testing of fire/life safety systems and equipment in or on structures would occur monthly; inspections of all structures for structural integrity would occur at least annually. Steel structures would also require painting every several years. Repair and replacement of lighting and communication components of tunnels and buildings would be performed on a routine basis. No major component replacements or reconstruction of any structures are expected through 2040.
- **Signaling, Train Control, and Communications:** Inspection and maintenance of signaling and train control components would be guided by FRA regulations and standards to be adopted by the Authority. Typically, physical in-field inspection and testing of the system would occur four times per year using hand-operated tools and equipment. Communication components would be inspected and maintained routinely. This would usually occur at night, although daytime work may be conducted if the Work Area is clear of the trackway. No major component replacement for these systems is expected through 2040.
- **Stations:** Each station would be inspected and cleaned daily. Inspections of the structures, including the platforms, would occur annually. Inspections of other major systems, such as escalators, heating and ventilation systems, ticket-vending machines, and the closed-circuit television system would be according to manufacturer recommendations. Major station components are not expected to require replacement through 2040.
- **Perimeter Fencing and Intrusion Protection:** Fencing and intrusion protection systems would be monitored remotely and inspected periodically. Maintenance would occur as needed; however, fencing or systems are not expected to require replacement before 2040.

Compensatory Habitat

The Authority will provide compensatory habitat mitigation that seeks to increase the amount of conserved wetlands and protected habitat for special-status species (including federally listed species), preserve and enhance important wildlife movement corridors, and consolidate and expand existing protected habitat.

The Authority will secure conservation easements, and develop long-term management plans, for compensatory mitigation sites. The list of potential compensatory mitigation sites has not been finalized and is subject to augmentation with Service approval. The final compensatory mitigation sites would be selected based on their relatively high conservation value (e.g., proximity to other protected habitats or conserved areas (e.g., core habitat areas, linkages connecting core habitat patches), location within important wildlife movement corridors, recovery areas, or designated critical habitat, the presence of listed species and/ or suitable habitat (i.e., high species richness/high biodiversity sites), mitigation habitat overlap among species, and ability to satisfy the requirements of the Service and other permitting agencies). The permanent protection of the compensatory mitigation sites would also support goals identified for the mallow, the cactus, the moth, the lizard, the tortoise, the vireo, the kangaroo rat, and the kit fox in the recovery plans for these species by protecting habitat; and protection of key wildlife movement corridors for kit fox (Service 1984, Service, 1996, Service 1998a, Service 1998b, Service 2011a).

For all proposed mitigation sites, long-term management plans, conservation easements, and funding analyses for the long-term endowments will be submitted to the Service for review and approval before the plans are finalized and implemented. The Authority may also purchase habitat compensation credits at a Service-approved mitigation site or conservation bank in addition to securing compensatory sites.

To avoid a temporal loss of habitat and reduce project effects to listed species, the Authority's proposed mitigation strategy includes securing compensatory mitigation prior to the start of construction. Compensatory mitigation would be secured in phases in accordance with the progress of construction of the Bakersfield to Palmdale Project Section. As such, the Authority's proposed mitigation strategy will ensure that the compensatory mitigation will be secured before or concurrent with the commencement of construction for each Construction Package (CP). In the event that it is not possible to secure all of the compensatory mitigation for each CP in advance, it will be completed no later than 18 months after the initiation of ground disturbance of each CP.

All areas of habitat loss for federally listed species would be documented in compliance reporting. This documentation would include GIS data layers, associated metadata, and photo documentation of areas of habitat loss for each species. For each species, a cumulative acreage of habitat loss would be presented in a table.

Reporting

The Authority will submit monthly and annual reports to the Service documenting compliance with the conservation measures and this biological opinion. The reports will include summaries of the habitat assessment and species-specific pre-activity surveys and findings, observations and incidental take of threatened or endangered species, compliance with conservation measures successfully implemented, non-compliance events and corrections or adjustments to meet compliance, an accounting of the cumulative total number of acres of species suitable habitat that has been disturbed (with associated GIS layers, associated metadata, and photo documentation), and the type and number of acres for which compensatory mitigation has been secured.

Conservation Measures

The Authority has proposed the following measures to minimize effects on federally listed species. The measures proposed below are considered part of the proposed action evaluated by the Service in this biological opinion.

The results of the habitat suitability modeling, described below, will be used as a guide during species' habitat assessment surveys. However, Designated Biologists will consider all areas in and adjacent to the project footprint when determining where surveys are warranted. Habitat assessment, protocol level surveys, and pre-construction surveys will be phased with project buildout and the start of activities at each Work Area.

General Measures

CM-GEN-1: Establish Qualified Biologists and Biological Monitors

At least 15 days prior to the onset of activities, the Authority will submit, for review and approval by the Service, the name(s), contact information, and relevant qualifications and experience of Project Biologists and Designated Biologists who will conduct activities specified in the following measures. The roles of biologists will be as follows:

- **Project Biologists.** For each section or construction package, the Authority will identify a Project Biologist(s). For their section or construction package, the Project Biologist(s) will be responsible for implementation of the conservation measures, oversee the scheduling and work of Designated Biologists and Biological Monitors, and develop compliance reporting.
- **Designated Biologists.** Designated Biologists will be responsible for directly overseeing and reporting the implementation of general and species-specific conservation measures. Designated Biologists may be Service-approved on a species-specific basis, in which case Designated Biologists will only be authorized to conduct surveys and implement other measures for the covered species for which they have been approved. The Designated Biologists will have support from Biological Monitors. Designated Biologists will submit memoranda and reports to the Authority to document compliance with conservation measures.
- **Biological Monitors.** Biological Monitors will report directly to a Designated Biologist for implementation of species measures or directly to the Project Biologist for implementation of general measures. Biological Monitors will be selected by the Authority based on their documented experience with and understanding of the ecology of the species included in the biological opinion. Biological Monitors will be responsible for conducting Worker Environmental Awareness Program (WEAP) training, implementing general conservation measures, conducting compliance monitoring, and reporting their compliance monitoring activities. Biological Monitors also may assist Designated Biologists in implementing species-specific conservation measures under the direct, on-site, supervision of the Designated Biologist.

No ground-disturbing project activities (e.g., geotechnical investigations, utility realignments, creation of staging areas, or initial vegetation clearing and grubbing) will begin until written authorization is received from the Service.

CM-GEN-2: Conduct Monitoring of Construction Activities

The Designated Biologist or Biological Monitor will be present in the Work Area to verify compliance with avoidance and minimization measures, including during ground- or vegetation-disturbing activities in or adjacent to Environmentally Sensitive Areas (ESA), wildlife exclusion fencing (WEF), and construction exclusion fencing (exclusion fencing).

CM-GEN-3: Prepare and Implement a Biological Resources Management Plan

Prior to construction activities, the Project Biologist will prepare the Biological Resources Management Plan (BRMP). The goal of the BRMP will be to provide the Project Biologist, Designated Biologists, and Biological Monitors with an organized reference and reporting tool to verify that the mitigation measures and terms and conditions are implemented and reported in a timely manner. The BRMP will include terms and conditions from applicable permits and agreements and make provisions for monitoring assignments, scheduling, and responsibility designations. These will include all conservation measures and repair, mitigation, and compensatory actions included in the biological opinion. These measures and conditions will be tracked through final design, implementation, and post-construction phases. For all measures, terms, and conditions, requirements and planned mechanisms for documenting and reporting compliance will be identified. The BRMP will also identify the individual responsible for post-construction compliance reporting. All project environmental plans, such as the Restoration and Revegetation Plan (RRP) and Weed Control Plan (WCP), will be included as appendices to the BRMP. The BRMP will contain, but not be limited to, the following information:

- A master schedule that shows construction of the project, pre-construction surveys, and establishment of buffers and exclusions zones to protect sensitive biological resources
- Specific measures for the protection of special-status species
- Identification (on construction plans) of the locations and quantity of habitats to be avoided or removed, along with the locations where habitats are to be restored
- Identification of agency-approved Project Biologist(s), Designated Biologists, and Biological Monitor(s), including those responsible for notification and report of injury or mortality of federally- or state-listed species
- Measures to preserve topsoil and control erosion
- Design and locations of protective fencing around ESA and the construction staging areas
- Locations of trees to be protected as wildlife habitat (roosting sites) and locations for planting replacement trees
- Specification of the purpose, type, frequency, and extent of chemical use for insect and disease control operations as part of vegetative maintenance in sensitive habitat areas
- Specific measures for the protection of riparian areas. These measures may include erosion and siltation control measures, protective fencing guidelines, dust control measures, grading techniques, construction area limits, and biological monitoring requirements
- Provisions for biological monitoring during ground-disturbing activities to confirm compliance and success of protective measures will: (1) identify specific locations of wildlife habitat and sensitive species to be monitored; (2) identify the frequency of monitoring and the monitoring methods (for each habitat and sensitive species to be monitored); (3) list required qualifications of Biological Monitor(s); (4) identify the

reporting requirements; and (5) provide an accounting of impacts to special-status species habitat compared to pre-construction impact estimates

- Notification and reporting requirements in the event of an accidental death or injury to a federally listed species during project activities or failure to meet conservation measures included in the biological opinion

The BRMP will be submitted to the Authority for review and approval prior to any ground-disturbing activity.

CM-GEN-4: Prepare and Implement a Restoration and Revegetation Plan

Prior to any ground-disturbing activity, the Project Biologist will prepare an RRP to address temporary impacts resulting from ground-disturbing activities in areas that potentially support special-status species, wetlands and/or other aquatic resources. Restoration activities may include, but not be limited to: grading landform contours to approximate pre-disturbance conditions, re-vegetating disturbed areas with native plant species, and using certified weed-free straw and mulch. The Authority will implement the RRP in all temporarily disturbed areas outside of the permanent right-of-way that potentially support special-status species, wetlands, and/or other aquatic resources.

Consistent with section 1415 of the Fixing America's Surface Transportation Act, restoration activities will provide habitat for native pollinators by planting native forbs and grasses. The Project Biologist will obtain a locally sourced native seed mix. The restoration success criteria will include limits on non-native invasive species, as defined by the California Invasive Plant Council, to an increase no greater than 10 percent compared to the pre-disturbance condition, or to a level determined through a comparison with an appropriate reference site consisting of similar natural communities and management regimes. The RRP will be submitted to the Authority for review and approval.

CM-GEN-5: Prepare and Implement a Weed Control Plan

Prior to any ground-disturbing activity during the construction phase, the Project Biologist will develop a WCP.

The purpose of the WCP is to establish approaches to minimize and avoid the spread of invasive weeds during ground-disturbing activities during construction and operations and maintenance. The WCP will include, at a minimum, the following:

- A requirement to delineate ESAs in the field prior to weed control activities
- A schedule for weed surveys to be conducted in coordination with the BRMP
- Success criteria for invasive weed control will be linked to the BRMP standards for on-site work during ground-disturbing activities. In particular, the criteria will establish limits on the introduction and spread of invasive species, as defined by the California Invasive Plant Council, to less than or equal to the pre-disturbance conditions in the area temporarily affected by ground-disturbing activities. If invasive species cover is found to exceed pre-disturbance conditions by greater than 10 percent or is 10 percent greater than levels at a similar, nearby reference site, a control effort will be implemented. If the target, or other success criteria identified in the WCP, has not been met by the end of the WCP monitoring and implementation period, the Authority will continue the monitoring and control efforts, and remedial actions will be identified and implemented until the success criteria are met.

- Provisions to ensure consistency between the WCP and the RRP, including verification that the RRP includes measures to minimize the risk of the spread and/or establishment of invasive species and reflects the same revegetation performance standards as the WCP
- Identification of weed control treatments, including permitted herbicides and manual and mechanical removal methods
- Timeframes for weed control treatment for each plant species
- Identification of fire prevention measures

CM-GEN-6: Facilitate Regulatory Agency Access

Throughout the construction period, the Authority or its designee will allow access by the Service or other resource agency staff to the project site. Because of safety concerns, all visitors will check in with the Authority's resident engineer prior to entering the project footprint. If agency personnel visit the project footprint, the Project Biologist will prepare a memorandum within three business days after the visit documenting the issues raised during the field meeting. The Project Biologist will report any issues regarding regulatory compliance raised by agency personnel to the Authority.

CM-GEN-7: Prepare WEAP Training Materials and Conduct Construction Period WEAP Training

Prior to any ground-disturbing activity, the Project Biologist will prepare a WEAP to train construction crews to recognize and identify sensitive biological resources that may be encountered in the vicinity of the project footprint. The WEAP training materials will be submitted to the Authority for review and approval. A video of the WEAP training prepared and presented by the Project Biologist and approved by the Authority may be used if the Designated Biologist or Biological Monitor is not available to present the training in person.

At a minimum, WEAP training materials will include the following information: key provisions of the Act, the California Endangered Species Act, the Bald and Golden Eagle Protection Act, the Migratory Bird Treaty Act, California Fish and Game Code 1600, Porter-Cologne Water Quality Control Act, and the Clean Water Act; the consequences and penalties for violation or noncompliance with these laws and regulations and project authorizations; identification and characteristics of special-status plants, special-status wildlife, jurisdictional waters, and special-status plant communities and explanations about their ecological value; hazardous substance spill prevention and containment measures; the contact person and procedures in the event of the discovery of a dead or injured wildlife species; and review of avoidance, minimization, and mitigation measures.

The Designated Biologist or Biological Monitor will present WEAP training to all construction personnel prior to working in the project footprint. As part of the WEAP training, construction timing in relation to species' habitat and life-stage requirements will be detailed and discussed on project maps, which will show areas of planned minimization and avoidance measures. Crews will be informed during the WEAP training that, except when necessary as determined in consultation with the Designated Biologist or Biological Monitor, travel in the project footprint is restricted to established roadbeds, which include all pre-existing and project-constructed unimproved and improved roads. Training materials will include a fact-sheet handout or wallet-sized card conveying this information to be distributed to all participants in WEAP training sessions and will be provided in other languages as necessary to accommodate non-English

speaking workers. All construction staff will attend WEAP training prior to beginning work on-site and will attend the WEAP training on an annual basis thereafter.

Upon completion of the WEAP training, each construction crew training attendee will sign a form stating that they attended the training, understood the information presented, and agreed to comply with the requirements set out in the WEAP training. The Project Biologist will submit the signed WEAP training forms to the Authority monthly, and annually the Authority will certify that WEAP training had been provided to all construction personnel. Each month, the Project Biologist will provide updates relevant to the training to construction personnel during the daily safety (tailgate) meeting.

CM-GEN-8: Conduct Operation and Maintenance Period WEAP

Prior to initiating O&M activities, O&M personnel will attend a WEAP training session arranged by the Authority. At a minimum, O&M WEAP training materials will include the following information: key provisions of the Act, the California Endangered Species Act, the Bald and Golden Eagle Protection Act, the Migratory Bird Treaty Act, Porter-Cologne Water Quality Control Act, and the Clean Water Act; the consequences and penalties for violation or noncompliance with these laws and regulations and project authorizations; identification and characteristics of special-status plants, special-status wildlife, jurisdictional waters, and special-status plant communities and explanations about their ecological value; hazardous substance spill prevention and containment measures; and the contact person in the event of the discovery of a dead or injured wildlife species. The training will include an overview of provisions of the BRMP, annual vegetation and management plan, WCP, and security fencing, ESAs, and WEF maintenance plans pertinent to O&M activities. A fact sheet prepared by the Authority environmental compliance staff will be prepared for distribution to the O&M employees. The training will be provided by the Authority's environmental compliance staff. The training sessions will be provided to employees prior to their involvement in any O&M activity and will be repeated for all O&M employees on an annual basis. Upon completion of the WEAP training, O&M employees will, in writing, verify their attendance at the training sessions and confirm their willingness to comply with the requirements set out in those sessions.

CM-GEN-9: Establish Monofilament Restrictions

Prior to any ground-disturbing activity, the Biological Monitor will verify that plastic monofilament netting (erosion control matting) or similar material is not being used as part of erosion control materials. Non-monofilament substitutes including coconut coir matting, tackified hydroseeding compounds, rice straw wattles, and reusable erosion, sediment, and wildlife control systems that have been approved by the regulatory agencies (e.g., ERTEC Environmental Systems products) may be used.

CM-GEN-10: Avoid Animal Entrapment

At the beginning and end of each work day all excavated, steep-walled holes or trenches that are more than eight inches deep with sidewalls steeper than a 1:1 (45 degree) slope will be inspected for trapped animals and, at the close of each day, will be covered with plywood or similar materials or provided a minimum of one escape ramp constructed of fill earth per 10 feet of trenching. Before such holes or trenches are filled, they will be thoroughly inspected for trapped wildlife by the Biological Monitor(s).

All construction pipe, culverts, or similar structures with a diameter of three inches or greater that are stored overnight in the project footprint will be covered and elevated at least one foot above ground. Pipes or similar structures, regardless of diameter, will be covered such that avian

entrapment is avoided. All pipes, culverts, and similar structures will be inspected for wildlife before such material is moved, buried, or capped.

CM-GEN-11: Delineate Equipment Staging Areas and Traffic Routes

Prior to any ground-disturbing activity, the Designated Biologist and Biological Monitor(s) will establish staging areas for construction equipment in areas that minimize effects to sensitive biological resources, including habitat for special-status species, seasonal wetlands, and wildlife movement corridors. Staging areas (including any temporary material storage areas) will be in areas that will be occupied by permanent facilities, where practicable. Equipment staging areas will be identified on final project construction plans. The Designated Biologist and Biological Monitor(s) will flag and mark access routes to ensure that vehicle traffic in the project footprint is restricted to established roads, construction areas and other designated areas.

CM-GEN-12: Dispose of Construction Spoils and Waste

The contractor will dispose of waste materials associated with construction, including soil materials unsuitable for reuse, in local landfills permitted to take these types of materials, and in conformance with State and federal laws.

CM-GEN-13: Establish Environmentally Sensitive Areas and Non-Disturbance Zones

Prior to any ground-disturbing activity in a Work Area, the Project Biologist will use flagging to mark ESAs that support special-status species or aquatic resources and are subject to seasonal restrictions or other avoidance and minimization measures. The Project Biologist will also direct the installation of WEF to prevent special-status wildlife species from entering Work Areas. The WEF will have exit doors to allow animals that may be inside an enclosed area to leave the area. The Project Biologist will also direct the installation of construction exclusionary fencing (exclusionary fencing) at the boundary of the Work Area, as appropriate, to avoid and minimize impacts to special-status species or aquatic resources outside of the Work Area during the construction period. The ESAs, WEF, and exclusionary fencing will be fine mesh material (e.g., Animex Fencing or similar) and delineated by the Designated Biologist based on the results of habitat mapping or modeling and any pre-construction surveys, and in coordination with the Authority. The ESA, WEF, and exclusionary fencing locations will be identified and depicted on an exclusion fencing exhibit. The purpose of the ESAs and WEF will be explained at WEAP training and the locations of the ESA and WEF areas will be noted during worker tailgate sessions.

Fencing installation will be monitored by a Designated Biologist or Biological Monitor to ensure that federally listed species are not injured or killed during installation. Temporary fencing will be installed in areas of construction that are beyond the perimeter of the right-of-way or in areas where construction staging will occur. After installation of the temporary fencing, the Work Area will be surveyed by a Designated Biologist(s) to confirm the absence of federally-listed wildlife. The ESA, WEF, and exclusionary fencing will be regularly inspected and maintained by the Designated Biologist or Biological Monitors to ensure its integrity and that wildlife are not trapped.

CM-GEN-14: Install Aprons or Barriers within Security Fencing

Prior to final construction design the Project Biologist will review the fencing plans along any portion of the permanent right-of-way adjacent to natural habitats and confirm that the permanent security fencing will be enhanced with a barrier (e.g., fine mesh fencing) that extends at least 12 inches below ground and 12 inches above ground to prevent special-status reptiles,

amphibians, and mammals from moving through or underneath the fencing and gaining access to areas in the right-of-way. At the 12-inch depth of the below grade portion of the apron, it will extend or be bent at an approximately 90-degree angle and oriented outward from the right-of-way a minimum of 12-inches, to prevent fossorial wildlife from digging or tunneling below the security fence. A climber barrier (e.g., rigid curved or bent overhang) will be installed at the top of the apron to prevent wildlife from climbing over the apron. The Project Biologist may coordinate with the Service prior to completion of the fencing design.

The Project Biologist will ensure that the selected apron material and climber barrier will not have the potential to cause harm, injury, entanglement, or entrapment to wildlife species. The Authority will provide for yearly inspection and repair of the fencing.

Prior to construction and operation, the Project Biologist will field inspect the fencing along any portion of the permanent right-of-way that is adjacent to natural habitats and confirm that the fencing has been appropriately installed. Both the fencing plan review and field inspection will be documented in memorandums from the Project Biologist and provided to the Authority.

CM-GEN-15: Establish Wildlife Crossings

The Authority will create dedicated wildlife crossings to accommodate wildlife movement across permanently fenced infrastructure (consistent with any wildlife corridor assessment prepared), where wildlife movement will be significantly reduced. Prior to final construction design the Project Biologist will confirm appropriate placement and dimensions of wildlife crossings.

For terrestrial wildlife, crossings will conform to the minimum spacing and dimensions identified in the *Bakersfield to Palmdale Project Section Wildlife Corridor Assessment Report* (Authority and FRA 2018) unless different dimensions are specified in authorizations issued under the Act.

To the extent feasible, all wildlife crossings created specifically for terrestrial species will include the following features and design considerations:

- Native earthen bottom
- Ledges or tunnels will be incorporated into the design to facilitate safe passage of small mammals
- Unobstructed entrances (e.g., no riprap, energy dissipaters, grates), although vegetative cover, adjacent to and near the entrances of crossings, is permissible
- Openness and clear line of sight from end to end
- Year-round absence of water for a portion of the width of the crossing (i.e., no flowing water)
- Slight grade at approaches to prevent flooding
- Limited open space between crossing and cover/habitat
- Separation from human use areas (e.g., trails, multiuse undercrossings)
- Avoidance of artificial light at approaches to wildlife crossings

The Authority will incorporate features to accommodate wildlife movement into the design of bridges and culverts that are replaced or modified as part of project construction, wherever feasible. Project Biologist review of final construction design for consistency with placement and dimensions of wildlife crossings will be verified in a memorandum provided to the Authority.

CM-GEN-16: Work Stoppage

During construction activities, the Designated Biologists and general Biological Monitors will have stop work authority to protect any federally listed wildlife species in the project footprint. This work stoppage will be coordinated with the Authority or its designee. The Contractor will suspend vegetation- or ground-disturbing activities in the Work Area(s) where the potential construction activity could result in injury or mortality of listed species; work may continue in other areas. The Contractor will continue the suspension until the individual leaves voluntarily or is moved to an approved release area using Service-approved handling techniques and methods, or as required by the Service.

CM-GEN-17: Enforce Construction Speed Limit

A speed limit of 15 mph will be enforced during project construction for all vehicles operating on unimproved access roads and in temporary and permanent construction areas in the limit of direct effect.

CM-GEN-18: Implement Avoidance of Nighttime Light Disturbance

Prior to construction requiring nighttime lighting, the Contractor will prepare a Lighting Plan verifying how the Contractor will shield nighttime construction lighting and direct it downward in such a manner to minimize the light that falls outside the construction site boundaries. The Lighting Plan will be submitted to the Authority for review and approval prior to any work requiring nighttime lighting. The Lighting Plan will describe the type of lighting that will be used, maximum level of lumens to be emitted, and a schematic showing where lighting equipment will be stationed and which cardinal direction(s) the lighting equipment will face. Permanent or temporary, fixed, exterior lighting, including motion triggered security lighting that casts light beyond the project footprint between sunset and sunrise will not be used.

CM-GEN-19: Implement Water or Dust Palliative Measures

Water or dust palliatives will be applied to the construction right-of-way, dirt roads, trenches, spoil piles, and other areas where ground disturbance takes place to minimize dust emissions and topsoil erosion. Dust palliatives will be nontoxic to wildlife and plants. For construction in suitable habitat for listed species, the Biological Monitor will patrol areas of disturbance to ensure that water does not puddle for long periods and attract listed species (e.g., desert tortoise), common ravens (*Corvus corax*), or other wildlife to the project site. Operational ponding will be avoided through careful grading and hydrologic design. Water tanks will be covered with secure lids. Leaking hoses, tanks, or other sources of inadvertent pooling will be repaired immediately or moved offsite.

CM-GEN-20: Design the Project to be Bird Safe

Prior to final construction design, the Authority, in consultation with the Project Biologist, will ensure that the catenary system, masts, and other structures such as fencing, electric lines, communication towers and facilities are designed to be bird and raptor-safe in accordance with the applicable recommendations presented in *Suggested Practices for Raptor Protection on Power Lines: The State of the Art in 2006* (APLIC 2006) and *Reducing Avian Collisions with Power Lines: State of the Art in 2012* (APLIC 2012).

Applicable APLIC recommendations include, but are not limited to:

- Ensuring sufficient spacing of phase conductors to prevent bird electrocution

- Configuring lines to reduce vertical spread of lines and/or decreasing the span length if such options are feasible
- Marking lines and fences (e.g., Bird Flight Diverter for fencing and lines) to increase the visibility of lines and reduce the potential for collision. Where fencing is necessary, using bird compatible design standards to increase visibility of fences to prevent collision and entanglement
- Installing perch guards to discourage avian presence on and near project facilities
- Minimizing the use of guy wires. Where the use of guywires is unavoidable, demarcating guywires using the best available methods to minimize avian strikes (e.g. line markers)
- Structures will be monopole or dual-pole design versus lattice tower design to minimize perching and nesting opportunities. Communication towers will conform to *Recommended Best Practices for Communication Tower Design, Siting, Construction, Operation, Maintenance, and Decommissioning* (Service 2018a)
- Reusing or co-locating new transmission facilities and other ancillary facilities with existing facilities and disturbed areas to minimize habitat impacts and avoid collision risks
- Use of facility lighting that does not attract birds or their prey to project sites. These include using non-steady burning lights (red, dual red and white strobe, strobe-like flashing lights) to meet Federal Aviation Administration requirements, using motion or heat sensors and switches to reduce the time when lights are illuminated, using appropriate shielding to reduce horizontal or skyward illumination, and avoiding the use of high-intensity lights (e.g., sodium vapor, quartz, and halogen). Lighting will not be installed under viaduct and bridge structures in riparian habitat areas
- Ensuring poles do not have openings that could entrap birds; including sealing or capping all openings in poles or providing for escape routes (e.g., openings accommodating escape for various species)
- Designing aerial structures (e.g., viaducts and bridges) and tunnel portals to discourage birds and bats from roosting in expansion joints or other crevices
- Insulated wire or tree wire will be used for all electrical conduits to increase visibility of wires and minimize potential for collision

Additional bird operational actions would be required for dry lakes and playas, Audubon Important Bird Areas, and documented avian movement corridors. These measures include:

- Avoid, to the extent feasible, siting transmission lines across canyons or on ridgelines to prevent bird and raptor collisions
- Install bird flight diverters on all facilities spanning or within 1,000 feet of stream and wash channels, canals, ponds, and any other natural or artificial body of water

Fencing or other type of flight diverter will be installed on all viaduct structures to encourage birds and raptors to fly over the HSR and avoid flying directly in the path of on-coming trains.

CM-GEN-21: Prohibit Pets in Work Areas

No pets will be allowed on site during construction or O&M.

CM-GEN-22: Prepare Post-Construction Compliance Report

A post-construction compliance report will be submitted to the Service upon completion of each construction package, as defined by the Authority-Contractor D/B contracts. The post-construction compliance report will provide the following information:

- Dates of project groundbreaking and completion
- Pertinent information concerning the success of the project in meeting compensation and other conservation measures
- Known project effects on listed species
- Observed incidences of injury or mortality of any listed species
- Other pertinent information

CM-GEN-23: Notification of Dead, Injured, or Sick Wildlife

The Authority will notify the Service within 24 hours if dead, injured, or sick listed species are observed.

Conservation Measures Specific to Federally Listed Plants**CM-PLT-01: Conduct Pre-construction Surveys for Listed Plants and Implement Avoidance and Minimization Measures**

Prior to ground- or vegetation-disturbing activities, the Designated Biologist will conduct surveys for listed plants' suitable habitat. The Designated Biologist(s) will conduct protocol level surveys for federally listed plant species prior to any ground or vegetation-disturbing activities in suitable habitat for federally listed plant species during the appropriate bloom period for each species. Habitat assessment and protocol level surveys will be phased with project buildout and the start of activities at each Work Area.

The surveys will be consistent with *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities* (CDFW 2018) and *Guidelines for Conducting and Report Botanical Inventories for Federally Listed, Proposed and Candidate Plants* (Service 2000). The Designated Biologist will flag and record in GIS the locations of any observed federally listed plant species. Prior to surveys and if a reference population exists, reference populations for target survey species will be visited, to confirm bloom conditions and ensure target species have flowers or other discernible features necessary to identify plants.

If federally listed plants are observed during plant surveys, ESA fencing will be installed to protect the population or individuals, plus a 100-foot buffer (where access permitted). If plants cannot be avoided, they will be documented prior to impacts or salvage efforts. Documentation will include density and percent cover of the affected species; key habitat characteristics, including soil type, associated species, hydrology, and topography; and photo documentation of pre-construction conditions.

Prior to any vegetation- or ground-disturbing activity, the Designated Biologist will salvage plants, if feasible, collect seeds and plant materials and stockpile and segregate the top four inches of topsoil from locations in the Work Area where federally listed plant species were observed during surveys for use on off-site locations. The salvage and collection of plants and materials will be conducted in accordance with a Salvage, Relocation, and Monitoring Plan (SRMP).

CM-PLT-02: Prepare and Implement Salvage, Relocation, and Monitoring Plan for Listed Plants

The Project Biologist will implement an SRMP to address monitoring, salvage, relocation and/or seed banking of federally listed plant species. The plan will include the following at a minimum:

- Provisions that address the techniques, locations, and procedures required for the collection, storage, and relocation of seed and plant material.
- Provisions that address the techniques, location, and procedures required for the collection, stockpiling, and redistribution of topsoil and associated seed.
- Provisions for requirements related to performance, maintenance, monitoring, implementation, funding, adaptive management, and the annual reporting requirements.

The relocation or propagation of these plants and their seed will be performed at a suitable mitigation site, as appropriate for each species. Suitable sites to receive salvaged plants and materials include Authority mitigation sites, refuges, reserves, federal or state lands, and public/private mitigation banks.

The Project Biologist will submit the plan to the Authority and Service for review and approval prior to vegetation- or ground-disturbing activity where federally listed species occur.

Conservation Measures Specific to Bakersfield Cactus**CM-BACA-01: Implement Avoidance Measures for Bakersfield Cactus**

Areas in the project footprint that support Bakersfield cactus will be avoided to the extent feasible. Portions of the known population adjacent to the alignment will be protected with ESA fencing, plus a 100-foot buffer (where access permitted). ESA fencing will be installed prior to initiation of ground- or vegetation-disturbance, under the guidance of the Designated Biologist or Biological Monitor. Fenced individuals will be monitored twice annually in late winter and mid-spring (timed for maximum production of annual invasive species) for the duration of construction at that location to ensure that the fencing has not resulted in an increased cover of invasive species due to the potential exclusion of herbivores.

CM-BACA-02: Implement Translocation of Bakersfield Cactus

In the event individual Bakersfield cactus cannot be avoided and will be directly impacted in the Work Area, the Project Biologist will include translocation of Bakersfield cactus individuals in an SRMP, which will be prepared per the requirements of CM-PLT-02. The SRMP will outline the methodologies for translocation of Bakersfield cactus individuals from the project footprint which will follow practices that maximize survival of outplantings, according to current research on best practices identified in recent research published by the California State University Stanislaus Endangered Species Recovery Program (e.g., Cypher et al. 2015) and others, as relevant at the time of translocation. In addition, the SRMP will contain details regarding proposed translocation sites and maintenance and management of translocated individuals. Translocation sites will be selected with priority given to maintaining size of the impacted occurrence on permanently protected land (e.g., existing preserves and/or designated conservation sites) by planting translocated individuals in suitable habitat at perimeters of occupied habitat and providing maintenance and management as described in the SRMP. Where this is infeasible, translocation sites will be as close as possible to the impacted site(s), with similar topography, soils, vegetation, aspect, and drainage as the salvage locations. The Project

Biologist will submit the SRMP to the Authority and Service for review and approval prior to the start of construction in areas that support Bakersfield cactus.

Conservation Measures Specific to Kern Primrose Sphinx Moth

CM-KPSM-01: Conduct Pre-construction Surveys for Kern Primrose Sphinx Moth Suitable Habitat and Implement Avoidance and Minimization Measures

Prior to ground- or vegetation-disturbing activities, the Designated Biologist will conduct surveys for Kern primrose sphinx moth suitable habitat. Suitable habitat for the species includes sandy alluvial soils in and beside washes that support its larval host plants (*Camissonia contorta* and *C. campestris*). Habitat assessment surveys will be phased with project buildout and the start of activities at each Work Area. Results of the survey efforts will be transmitted to the Authority prior to the initiation of ground- or vegetation-disturbing activities at the survey sites.

If Kern primrose sphinx moth suitable habitat is observed, the following measures will be implemented:

- Host plants will be flagged and avoided to the greatest extent feasible through establishment of ESAs and 50-foot non-disturbance zones.
- If host plants cannot be avoided, the no-disturbance buffer will be maintained, to the extent feasible, until the flight and larval seasons (cumulatively, February 1 through May 31) are passed, to allow sufficient time for the adults to lay eggs and for the larvae to pupate and disperse from the area.
- A Designated Biologist or Biological Monitor familiar with the life history and identification of Kern primrose sphinx moth will monitor disturbance to or removal of host plants and will have the authority to stop work if Kern primrose sphinx moth are observed.
- Kern primrose sphinx moth larval host plants will be seeded or planted in temporary disturbance areas after work is complete in and beside washes with sandy alluvial soils. The reseeded or planted area will be of comparable amounts to what is disturbed.

Conservation Measures Specific to Blunt-nosed Leopard Lizard

CM-BNLL-01: Conduct Pre-construction Surveys for Blunt-Nosed Leopard Lizard and Implement Avoidance Measures

No more than 12 months before the start of ground-disturbing activities, a habitat assessment of the project footprint plus a 100-foot buffer (where access permitted) will be conducted by the Designated Biologist to identify suitable habitat for blunt-nosed leopard lizard. Suitable habitat for the species will be determined by the presence of burrows or other suitable shelters, appropriate vegetation cover, and appropriate topography. Habitat assessment surveys will be phased with project buildout and the start of activities at each Work Area.

Within 12 months prior to ground-disturbing activities, the Designated Biologist will conduct protocol level surveys for blunt-nosed leopard lizard where suitable habitat has been identified. These surveys will be conducted in accordance with the *Approved Survey Methodology for the Blunt-Nosed Leopard Lizard* (CDFW 2019), or other more recent guidelines, if available. These surveys may be paired with scent detection dog surveys for blunt-nosed leopard lizard scat. The protocol level surveys will be phased with project buildout and the start of activities at each

Work Area. Survey reports will be transmitted to the Authority prior to the initiation of ground- or vegetation-disturbing activities at the survey site.

Where protocol level surveys are negative for blunt-nosed leopard lizard:

- WEF and construction exclusionary fencing will be installed as per CM-GEN-13 immediately following surveys around the Work Area and access roads to ensure that no blunt-nosed leopard lizards can enter the Work Area.
- The WEF installation will be overseen by a Designated Biologist with knowledge of blunt-nosed leopard lizard biology.
- The Designated Biologist will maintain and monitor the WEF daily.
- Protocol level surveys will be conducted if one year has elapsed since the last survey was conducted to reconfirm the absence of blunt-nosed leopard lizard if WEF is not installed or maintained to exclude blunt-nosed leopard lizards from the Work Area.

Where protocol level surveys are positive for blunt-nosed leopard lizard:

- During the non-active season for blunt-nosed leopard lizards (October 16 through April 14) the following measures will be implemented:
 - To the extent feasible, ground-disturbing activities will not occur in areas where blunt-nosed leopard lizards or signs of the species have been observed.
 - If ground-disturbing activities are scheduled during the non-active season, suitable burrows identified during the surveys will be avoided through establishment of 50-foot no-work buffers to prevent impacts until the active season.
 - The no-work buffer will be established by placing ESA fence and WEF around suitable burrow sites in a manner that allows for a connection between the burrow site and the suitable natural habitat adjacent to the project footprint so that lizards can leave the Work Area during the active season. This connection will be achieved by the inclusion of one-way escape exits spaced every 100 feet in the fencing.
 - The Designated Biologist may reduce the size of the no-work buffers in consultation with and approval by the Service.
- During the active season when blunt-nosed leopard lizards are moving above-ground (April 15 through October 15), the following measures will be implemented:
 - The Designated Biologist will establish, monitor, and maintain 50-foot no-work buffers (where access permitted) around burrows and egg clutch sites identified during surveys.
 - The buffers will be established around burrows by the ESA fence and WEF being placed in a manner that allows for a connection between the burrow site and suitable natural habitat adjacent to the project footprint so that blunt-nosed leopard lizard adults and hatchlings may leave the Work Area after eggs have hatched. This connection will be achieved by the inclusion of one-way escape exits spaced every 100 feet in the fencing.
 - Construction activities will not occur within the 50-foot no-work buffers until such time as the eggs have hatched and blunt-nosed leopard lizards have left the area.

- The Designated Biologist will conduct protocol level surveys to confirm the absence of blunt-nosed leopard lizards prior to the initiation of work in the buffer areas. These surveys may be paired with scent detection dog surveys for blunt-nosed leopard lizard scat.

Temporary ESA, WEF, and exclusion fencing will be monitored daily and maintained. In suitable habitat for blunt-nosed leopard lizard, temporary fencing will be installed in accordance with current standard guidance (e.g., non-gaping, non-climbable barrier) to prevent blunt-nosed leopard lizards from gaining access into the Work Area.

Conservation Measures Specific to Desert Tortoise

CM-DETO-01: Conduct Pre-construction Surveys for Desert Tortoise and Implement Avoidance Measures for Burrows

Prior to the start of ground- or vegetation-disturbing activities, a Designated Biologist familiar with desert tortoise and their sign will conduct pre-construction surveys in suitable habitat for desert tortoise. The surveys will be phased with project buildout and the start of activities at each Work Area and will be conducted in general accordance with the Service protocol *Preparing for Any Action That May Occur within the Range of the Mojave Desert Tortoise (Gopherus agassizii*; Service 2018b) or current pre-project survey protocol. The survey(s) will occur no more than 48 hours before the start of ground- or vegetation-disturbing activity in each Work Area in suitable habitat for desert tortoise and may be conducted any time of year, but preferably during the desert tortoise active period (i.e., early March through early June, and September through early November). The survey will consist of transect surveys spaced no greater than 15 feet apart and will include a 50-foot buffer (where access permitted) around the Work Area. Results of the survey effort will be transmitted to the Authority prior to the initiation of ground- or vegetation-disturbing activities at the survey site.

If active burrows (i.e., burrow with tortoise present) are identified in the project footprint:

- A 50-foot non-disturbance buffer (where access permitted) will be established, maintained, and monitored.
- The buffer will be established by routing the ESA fence and WEF around the active burrows in a manner that allows for desert tortoise to leave the project footprint.
- Following the procedures and precautions outlined in the *Desert Tortoise (Mojave Population) Field Manual (Gopherus agassizii)* (Service 2009), all desert tortoise pallets and burrows that are not practical to avoid will be examined and excavated by hand during the clearance survey by the Designated Biologist and collapsed to prevent re-entry.

CM-DETO-02: Implement Avoidance Measures for Desert Tortoise

Following the pre-construction desert tortoise survey(s):

- Where construction activities will be of short duration (i.e., less than one month) in suitable tortoise habitat, full-time monitoring by a Biological Monitor with experience with desert tortoise may be used in lieu of fencing. In these situations, a daily pre-activity clearance sweep will be conducted by the Biological Monitor prior to start of daily construction activities.

- Where construction activities will occur for more than one consecutive month in suitable tortoise habitat:
 - A Biological Monitor with desert tortoise experience will be present during all construction activities.
 - Desert tortoise exclusionary fencing, barriers, and guards will be installed and maintained to avoid take of desert tortoise, including destruction of nests, or their potential habitat in the project footprint. ESA fencing and WEF in desert tortoise habitat will be constructed to standards outlined in *Preparing for Any Action That May Occur within the Range of the Mojave Desert Tortoise (Gopherus agassizii)* (Service 2018b) and will be used to delineate the area. The WEF will be maintained and monitored daily during the desert tortoise active period (i.e., early March through early June, and September through early November) to ensure it is maintained in good condition, and to determine if tortoises are “trapped” along the fence searching for a way to access the other side. Outside of the desert tortoise active period, fence inspections will occur at least once weekly.
 - ESA fence and WEF design will incorporate shade structures on the exterior of the fence to provide refuge and reduce the risk of hyperthermia for desert tortoise walking along the fence. Construction of shade structures will follow Service guidance (e.g., Service 2018d).

If any project vehicle must drive off established routes in suitable tortoise habitat, a Biological Monitor will walk immediately in front of the vehicle to search for desert tortoise. The Biological Monitor will visually account for 100 percent of the footprint of the route or work location plus a 15-foot buffer (where access permitted) on each side.

During project implementation, all workers will immediately inform the Biological Monitor if a desert tortoise is observed in or near project Work Areas. All work in the vicinity of the animal which could cause disturbance, injury or mortality, will cease immediately.

CM-DETO-03: Prepare and Implement Project Guidelines for Handling Desert Tortoise during Construction

Prior to construction activities, the Designated Biologist will prepare and implement project specific guidelines to move desert tortoise a short distance (i.e., no more than 984 feet) out of harm’s way, based on the *Translocation of Mojave Desert Tortoises from Project Sites: Plan Development Guidance* (Service 2018c), *Health Assessment Procedures for the Mojave Desert Tortoise (Gopherus agassizii): A Handbook Pertinent to Translocation* (Service 2013a), and *Desert Tortoise (Mojave Population) Field Manual (Gopherus agassizii)* (Service 2009) or other current Service guidelines. The project guidelines will provide details on desert tortoise surveys, for moving desert tortoises out of harm’s way, and will include methodology for visual desert tortoise body condition assessments. Project procedures and guidelines will be provided to the Service for review and approval prior to the start of construction.

Desert tortoises found in Work Areas will be moved by the Designated Biologist out of harm’s way a short distance to an undisturbed suitable habitat area beyond the construction site, no more than 984 feet from where it was found and within its territory, to the greatest extent feasible. Preferred locations for release include areas where alternate burrows or appropriate shelter (i.e., shade of shrubs) are available.

Prior to the Designated Biologist moving desert tortoise out of the Work Area, the biologist will survey the relocation site to ensure that suitable burrows or shelter for desert tortoise exist. If no

burrows or shelter are available, shade structures will be installed along the outer perimeter of the ESA and WEF following the guidelines in the *Desert Tortoise (Mojave Population) Field Manual (Gopherus agassizii)* (Service 2009) and *Shade Structures for Desert Tortoise Exclusion Fence: Design Guidance* (Service 2018d), or as updated or replaced by the Service.

Only Designated Biologists authorized by the Service will handle desert tortoises.

CM-DETO-04: Inspect Structures that Provide Potential Shelter for Desert Tortoise

Any construction pipe, culvert, or similar structure with a diameter greater than three inches that is stored less than eight inches aboveground, outside a fenced area of desert tortoise habitat, and left unattended for any time period when desert tortoise are active (i.e., early March through early June and September through early November) will be inspected for desert tortoise before the material is moved, buried, or capped. As an alternative, all such structures will be capped or placed on pipe racks.

CM-DETO-05: Inspect under Vehicles in Desert Tortoise Habitat

Any time a vehicle or construction equipment is parked for more than 10 minutes outside of the fenced area, the ground under the vehicle will be inspected for the presence of desert tortoise before the vehicle/equipment is moved. If a desert tortoise is present, the vehicle/equipment will not be moved until the desert tortoise moves on its own away from the vehicle/equipment. If it does not move in 15 minutes during construction, the Designated Biologist may move the animal out of harm's way to a safe location a distance of no greater than 984 feet (300 meters), according to Service protocol.

CM-DETO-06: Installation of Desert Tortoise Guards

In occupied desert tortoise habitat and in areas of high vehicular construction traffic, desert tortoise guards that resemble cattle guards will be installed and connected to the exclusionary fencing at construction area entry points and permanent rail alignment maintenance access points to prohibit desert tortoise from crossing into the construction area right-of-way and alignment but still allowing the passage of construction vehicles. The desert tortoise guard will have a clear escape route away from construction activity for any desert tortoise that should fall into the guard. The guard will be inspected daily for desert tortoise during the species' active period (i.e., early March through early June, and September through early November) and to ensure the escape route is free of obstruction. The guard will also be cleared of debris that may allow desert tortoise passage across the guard and out of construction area. Outside of the desert tortoise active period, guard inspections will occur at least once weekly. The desert tortoise guard will be maintained throughout its use during the construction process by the Designated Biologist or Biological Monitor.

CM-DETO-07: Implement Common Raven Avoidance Measures in Desert Tortoise Habitat

Measures will be implemented to ensure construction and O&M activities do not attract common ravens to the right-of-way by creating food or water subsidies, perch sites, roost sites, or nest sites. All active Work Areas will be kept free of trash and debris. All trash will be covered, kept in self-closing sealable containers with lids that latch to prevent entry by wind, common ravens, and mammals, and removed from the project site at the end of each day or at regular intervals prior to periods when workers are not present at the site. Dead and injured wildlife found in the project footprint will be removed to reduce attraction of opportunistic predators. Dead and

injured wildlife will be handled and removed in accordance with any applicable project permits and plans.

A Designated Biologist with knowledge of common raven identification (including nests) and desert tortoise remains (e.g., carcass, shell and bone fragments) will be approved by the Service. The Designated Biologist will survey for presence of common ravens and nests within 100 feet of the project facilities in desert tortoise habitat for the purpose of identifying ravens that may prey upon desert tortoise. Nest locations will be recorded using a GPS unit and mapped for future surveys to search for tortoise remains in proximity to the nests.

CM-DETO-08: Regional Raven Management Funding

Various project components will likely provide subsidies in the form of perches, nest sites, and food (i.e., trash and wildlife mortality related to the project) for common ravens, a known predator of desert tortoise. The maintenance facilities (e.g., MOWFs and LMFs) and the Palmdale Station are most likely to provide raven subsidies based on their size and range of activities that they include. Although these facilities are not located directly within desert tortoise habitat, common ravens can travel extensive distances within a single day between foraging, nesting, and roosting areas. To address the project-related increase in raven subsidies, the Authority will contribute \$105 per acre for the estimated permanent disturbance footprint of the Avenue M Maintenance site and MOWF and the Palmdale Station on a one-time basis to the regional management and monitoring program fund for the common raven in the California Desert Conservation Area maintained by the National Fish and Wildlife Foundation. These funds will be used to monitor the number of common ravens throughout conservation areas for the desert tortoise, control common ravens that prey on desert tortoises, monitor the effectiveness of management techniques, and cooperate on research and development of additional tools to reduce desert tortoise predation by common ravens.

Conservation Measures Specific to Federally Listed Riparian Nesting Birds

CM-Avian-01: Conduct Pre-construction Surveys for Federally Listed Riparian Nesting Birds and Implement Avoidance Measures

No more than 30 days prior to any ground- or vegetation-disturbing activity, the Designated Biologist will make an initial site visit to determine if suitable habitat for western yellow-billed cuckoo, southwestern willow flycatcher, or least Bell's vireo exists in the Work Area, plus a 500-foot buffer (where access permitted).

Where suitable habitat is present, the Designated Biologist will conduct surveys prior to ground- or vegetation-disturbing activities, adhering to guidance in:

- *A Natural History Summary and Survey Protocol for the Western Distinct Population Segment of Yellow-billed Cuckoo* (Halterman et al. 2015)
- *A Natural History Summary and Survey Protocol for the Southwestern Willow Flycatcher* (Sogge et al. 2010)
- *Least Bell's Vireo Survey Guidelines* (Service 2001)

Habitat assessment and species surveys will be phased with project buildout and the start of activities at each Work Area. Following the surveys, the Designated Biologist(s) will conduct bi-monthly surveys (every two weeks) during construction activities that occur within 500 feet of suitable habitat during the nesting season for riparian nesting bird species or as required by the survey guidelines. If construction activities are subsequently halted or delayed by more than two

weeks (14 days) during the nesting season for riparian nesting bird species, the Designated Biologist(s) will repeat surveys five days prior to the re-initiation of construction activities. Upon re-initiation of construction activities, the Designated Biologist will conduct the bi-monthly surveys. A survey report will be transmitted to the Authority prior to the initiation of ground- or vegetation-disturbing activities at the survey site.

If a federally listed nesting bird or nest is detected within 500 feet of construction or maintenance activities, the Designated Biologist will establish a 300-foot no-work buffer (where access permitted) around the individual or nest to the extent practicable. The Designated Biologist may adjust the size of the no-work buffer in coordination with the Authority and Service. The Designated Biologist or Biological Monitor will have the authority to halt work if federally listed nesting birds exhibit distress and/or abnormal nesting behavior.

The no-work buffer will remain in place until the Designated Biologist has determined that the individual(s) has left the area or the nest has failed or the young have fledged and are no longer reliant upon the nest site. The Designated Biologist will adjust the no-work buffer size and/or location to ensure that adults and young are not adversely affected by construction.

For construction activities involving the use of a helicopter, the nest buffer for federally listed nesting birds will be 500-foot horizontal and 300-foot vertical. Buffers will be measured from the location of the nest, regardless of where the nest is located.

Conservation Measures Specific to Tipton Kangaroo Rat

CM-TKR-01: Conduct Pre-construction Surveys for Tipton Kangaroo Rat and Implement Avoidance and Minimization Measures

The Designated Biologist will conduct habitat assessment surveys in Tipton kangaroo rat potential habitat in the project disturbance footprint plus a 500-foot buffer (where access permitted) within 30 days prior to vegetation or ground-disturbing activities in each Work Area. Where suitable habitat occurs, the Designated Biologist will conduct surveys to determine the presence/absence of kangaroo rat burrows or their signs. The surveys will be phased with project buildout and the start of activities at each Work Area. If no burrows or sign of potential kangaroo rats are observed, no further measures will be required.

If kangaroo rat sign is observed in Tipton kangaroo rat suitable habitat, it will be assumed to be Tipton kangaroo rat in the absence of trapping. Trapping conducted to identify the species of kangaroo rat will follow *Survey Protocol for Determining Presence of San Joaquin Kangaroo Rats* (Service 2013b). If trapping is conducted and no Tipton kangaroo rats are detected after five consecutive trapping nights, no further measures will be required. The Project Biologist will submit the survey findings report prior to the start of vegetation- or ground-disturbing activities to the Authority to document compliance with this measure.

In areas where Tipton kangaroo rat are assumed or confirmed to be present:

- ESA fence and WEF will be installed at least 14 days prior to construction or ground-disturbing activities.
- The fencing will be installed under the supervision of the Designated Biologist or Biological Monitor.
- The WEF will be installed at the boundary of the Work Area and will have exits to allow animals inside an enclosed area to leave the Work Area.

- No-work buffers will extend 50 feet beyond the WEF (where access permitted) to avoid and minimize impacts to kangaroo rats outside of the Work Area during the construction period.
- All construction activities within 50 feet of any assumed or confirmed Tipton kangaroo rat burrow will cease one-half hour before sunset and will not begin earlier than one half hour before sunrise to avoid impacts from artificial light to this nocturnal species.

In areas of the project footprint where Tipton kangaroo rat are assumed or confirmed to be present and cannot be avoided:

- Trapping to relocate individuals immediately outside of the Work Area will be conducted following *Survey Protocol for Determining Presence of San Joaquin Kangaroo Rats* (Service 2013b).
- Trapping will be phased with project buildout.
- Trapped Tipton kangaroo rats will be relocated to suitable habitat adjacent to and outside the Work Area, and to the extent feasible, released in areas that are known to be absent of other Tipton kangaroo rats.
- Trapping will continue until no Tipton kangaroo rats are detected for five consecutive trapping nights.

Conservation Measures Specific to San Joaquin Kit Fox

CM-SJKF-01: Conduct Pre-construction Surveys for San Joaquin Kit Fox and Implement Exclusion Areas around Dens

Within 30 days prior to the start of any ground-disturbing activity in each Work Area, the Designated Biologist will conduct pre-construction surveys in suitable habitat for San Joaquin kit fox in the Work Area plus a 500-foot buffer (where access permitted). If no potential dens or sign of San Joaquin kit fox are observed, no further measures will be required. The surveys will be phased with project buildout and the start of activities at each Work Area.

Potential dens will be monitored for a minimum of five consecutive nights with a trail camera and tracking medium to evaluate den status and determine the presence/absence of San Joaquin kit fox. If there is a risk that cameras may be stolen or vandalized, then at that site, monitoring may be conducted using tracking medium only with prior concurrence from the Service. All potential San Joaquin kit fox dens will be mapped and photo documented and described in the survey report. The Project Biologist will submit a survey findings report prior to start of ground-disturbing activities to the Authority to document compliance with this measure.

Except for den excavations, disturbance to natal, atypical, known, or potential San Joaquin kit fox dens (see definitions below) will be avoided to the maximum extent practical. If a den is present within or adjacent to the Work Area, a non-disturbance exclusion zone will be marked by ESA fencing and WEF as described below. The WEF will have exit doors appropriately sized for kit fox to allow animals inside an enclosed area to leave the Work Area. Natal dens will not be enclosed with WEF until they are no longer occupied. The buffer distances described below may be adjusted based on the conditions of the site and recommendations from the Designated Biologist following consultation with the Service.

- **Potential Den.** 100 feet buffer. A potential den includes all natural earthen dens/burrows with entrances/tunnels 3.5 inches in diameter or larger, but for which there are no historic records or current evidence of use.

- **Atypical Dens.** 100 feet buffer. Atypical dens are manmade structures that could potentially be or are currently in use by San Joaquin kit fox. Atypical dens may include, but are not limited to, pipes, culverts and diggings beneath concrete slabs and buildings.
- **Known Den.** 100 feet buffer. A known den is any existing natural den structure that is in use or has historically been used at any time in the past.
- **Natal Den.** 250 feet buffer. A natal den is any den that has historically been used or is currently being used by San Joaquin kit fox to whelp and/or rear pups.

CM-SJKF-02: Minimize Impacts on San Joaquin Kit Fox

The Authority will implement the Service's *Standardized Recommendations for Protection of the San Joaquin Kit Fox Prior to or During Ground Disturbance* (Service 2011b) to minimize impacts on this species, as well as the following measures:

- Disturbance to all kit fox dens will be avoided to the extent feasible.
- Construction activities that occur within 200 feet of any occupied dens will cease within one-half hour after sunset and will not begin earlier than one-half hour before sunrise, to the extent feasible.
- All construction pipes, culverts, or similar structures with a diameter of four inches or greater that are stored within the Work Area for one or more overnight periods will be thoroughly inspected for kit foxes before the pipe is subsequently buried, capped, or otherwise used or moved.
- To minimize the temporary impacts of WEF and construction exclusion fencing on kit fox and their movement/migration corridors during construction, for every den identified in the Work Area, one artificial den will be installed along the outer perimeter of adjacent WEF and construction exclusion fencing. Artificial dens or similar escape structures will also be installed at dedicated wildlife crossing structures to provide escape cover and protection against predation. The artificial dens will be located on parcels owned by the Authority or at locations where access is available.
- If construction activities within the non-disturbance exclusion zone of active dens cannot be avoided, the agency-approved Project Biologist may initiate passive harassment measures during this period after receiving concurrence from the Service.

CM-SJKF-03: Implement San Joaquin Kit Fox Den Excavation Measures

Dens in the project footprint may be excavated under the direct supervision of the Designated Biologist the next day after no kit fox are detected for a minimum of five consecutive nights of den monitoring using trail cameras and tracking medium. If a kit fox is observed at the den during the monitoring period, the den will continue to be monitored until at least five consecutive nights have passed without kit fox detection at the den. If the kit fox does not leave the den, the agency-approved Designated Biologist may initiate passive harassment measures upon receiving concurrence from the Service.

After a den is determined to be unoccupied, it may be excavated under the direction and supervision of the Designated Biologist. Dens will be fully excavated to the end of all tunnels, and then backfilled with dirt and compacted to ensure that kit foxes cannot reenter or use the den site during construction activities.

Destruction of any occupied natal or pupping dens will not occur without prior written approval from the Service.

Artificial dens will be installed outside of Work Areas along the outer perimeter of the ESA fence and WEF and/or up to 200 feet distant, as access and conditions permit, to provide cover for displaced kit fox. Artificial dens will be installed prior to excavation of a known occupied den. Artificial den design and materials will conform to those recommended by the Service at the time of project construction.

Action Area

The action area is defined in 50 CFR § 402.02, as “all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action.” The action area encompasses the project footprint and lands surrounding it. The estimated length of the alignment will extend approximately 85 miles between the Project Section’s northern logical terminus, approximately 1.4 miles north of the Bakersfield Station, to its southern logical terminus, approximately 1.1 miles south of the Palmdale Station (Figure 1 and Figure 2). The area affected by disturbance from noise, vibrations, dust, and lighting during project construction is expected to extend up to 100 feet (from both sides of the project footprint) for federally listed plant species and 1,000 feet (from both sides of the project footprint) for federally listed wildlife species. Associated project structures, such as roadway improvements, overcrossings, related ancillary facilities, and other permanent project elements, are included in the estimated project action area. The action area is estimated to include a total of 13,642 acres for plants and 41,766 acres for wildlife, which will be considered for the purposes of this biological opinion.

Analytical Framework for the Jeopardy Determination

Section 7(a)(2) of the Act requires that federal agencies ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of listed species. “Jeopardize the continued existence of” means to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species (50 CFR § 402.02).

The jeopardy analysis in this biological opinion considers the effects of the proposed federal action, and any cumulative effects, on the rangewide survival and recovery of the listed species. It relies on four components: (1) the *Status of the Species*, which describes the current rangewide condition of the species, the factors responsible for that condition, and its survival and recovery needs; (2) the *Environmental Baseline*, which analyzes the current condition of the species in the action area without the consequences to the listed species caused by the proposed action, the factors responsible for that condition, and the relationship of the action area to the survival and recovery of the species; (3) the *Effects of the Action*, which determines all consequences to listed species that are caused by the proposed federal action; and (4) the *Cumulative Effects*, which evaluates the effects of future, non-federal activities in the action area on the species. The *Effects of the Action* and *Cumulative Effects* are added to the *Environmental Baseline* and in light of the status of the species, the Service formulates its opinion as to whether the proposed action is likely to jeopardize the continued existence of the listed species.

Status of the Species

Kern mallow

Please refer to the *Kern Mallow* (*Eremalche kernensis* = *Eremalche parryi* ssp. *kernensis*) *5-year Review* (Service 2020a) for the current status of the species. No change in the species' listing status was recommended in the 5-year review. Threats evaluated during that review have continued to act on the species since the review was published. To date, no proposed action has had a level of effect for which the Service has issued a biological opinion of jeopardy for the species.

Bakersfield cactus

Please refer to the *Bakersfield Cactus* (*Opuntia treleasei* = *Opuntia basilaris* ssp. *treleasei*) *5-year Review* (Service 2020b) for the current status of the species. No change in the species' listing status was recommended in the 5-year review. Threats evaluated during that review have continued to act on the species since the review was published. To date, no proposed action has had a level of effect for which the Service has issued a biological opinion of jeopardy for the species.

San Joaquin adobe sunburst

Please refer to the *Hartweg's golden sunburst* (*Pseudobahia bahiifolia*) and *San Joaquin adobe sunburst* (*Pseudobahia peirsonii*) *5-year Review* (Service 2007) for the current status of the species. No change in the species' listing status was recommended in the 5-year review. Threats evaluated during that review have continued to act on the species since the review was published. To date, no proposed action has had a level of effect for which the Service has issued a biological opinion of jeopardy for the species.

Kern primrose sphinx moth

Please refer to the *Kern Primrose Sphinx Moth* (*Euproserpinus euterpe*) *5-Year Review* (Service 2020c) for the current status of the species. No change in the species' listing status was recommended in the 5-year review. Threats evaluated during that review have continued to act on the species since the review was published. To date, no proposed action has had a level of effect for which the Service has issued a biological opinion of jeopardy for the species.

Blunt-nosed leopard lizard

Please refer to the *Species Status Assessment for the Blunt-nosed Leopard Lizard* (*Gambelia sila*) *Version 1.0* (Service 2020d) for the current status of the species. No change in the species' listing status was recommended in the Service's most recent 5-year review (Service 2020e). Threats evaluated during that review have continued to act on the species since the review was published. To date, no proposed action has had a level of effect for which the Service has issued a biological opinion of jeopardy for the species.

Desert tortoise

Please refer to the *Mojave Population of the Desert Tortoise* (*Gopherus agassizii*) *5-Year Review: Summary and Evaluation* (Service 2010) for the current status of the species. No change in the species' listing status was recommended in the 5-year review. Threats evaluated during that review have continued to act on the species since the review was published. To date, no

proposed action has had a level of effect for which the Service has issued a biological opinion of jeopardy for the species.

Least Bell's vireo

Please refer to the *Least Bell's Vireo* (*Vireo bellii pusillus*) *5-Year Review: Summary and Evaluation* (Service 2006) for the current status of the species. The 5-year review recommended that the species be downlisted to threatened. Threats evaluated during that review have continued to act on the species since the review was published. To date, no proposed action has had a level of effect for which the Service has issued a biological opinion of jeopardy for the species.

Tipton kangaroo rat

Please refer to the *Tipton Kangaroo Rat* (*Dipodomys nitratoides nitratoides*) *5-Year Review* (Service 2020f) for the current status of the species. No change in the species' listing status was recommended in the 5-year review. Threats evaluated during that review have continued to act on the species since the review was published. To date, no proposed action has had a level of effect for which the Service has issued a biological opinion of jeopardy for the species.

San Joaquin kit fox

Please refer to the *Species Status Assessment Report for the San Joaquin Kit Fox* (*Vulpes macrotis mutica*) *Version 1.0* (Service 2020g) for the current status of the species. No change in the species' listing status was recommended in the Service's most recent 5-year review (Service 2020h). Threats evaluated during that review have continued to act on the species since the review was published. To date, no proposed action has had a level of effect for which the Service has issued a biological opinion of jeopardy for the species.

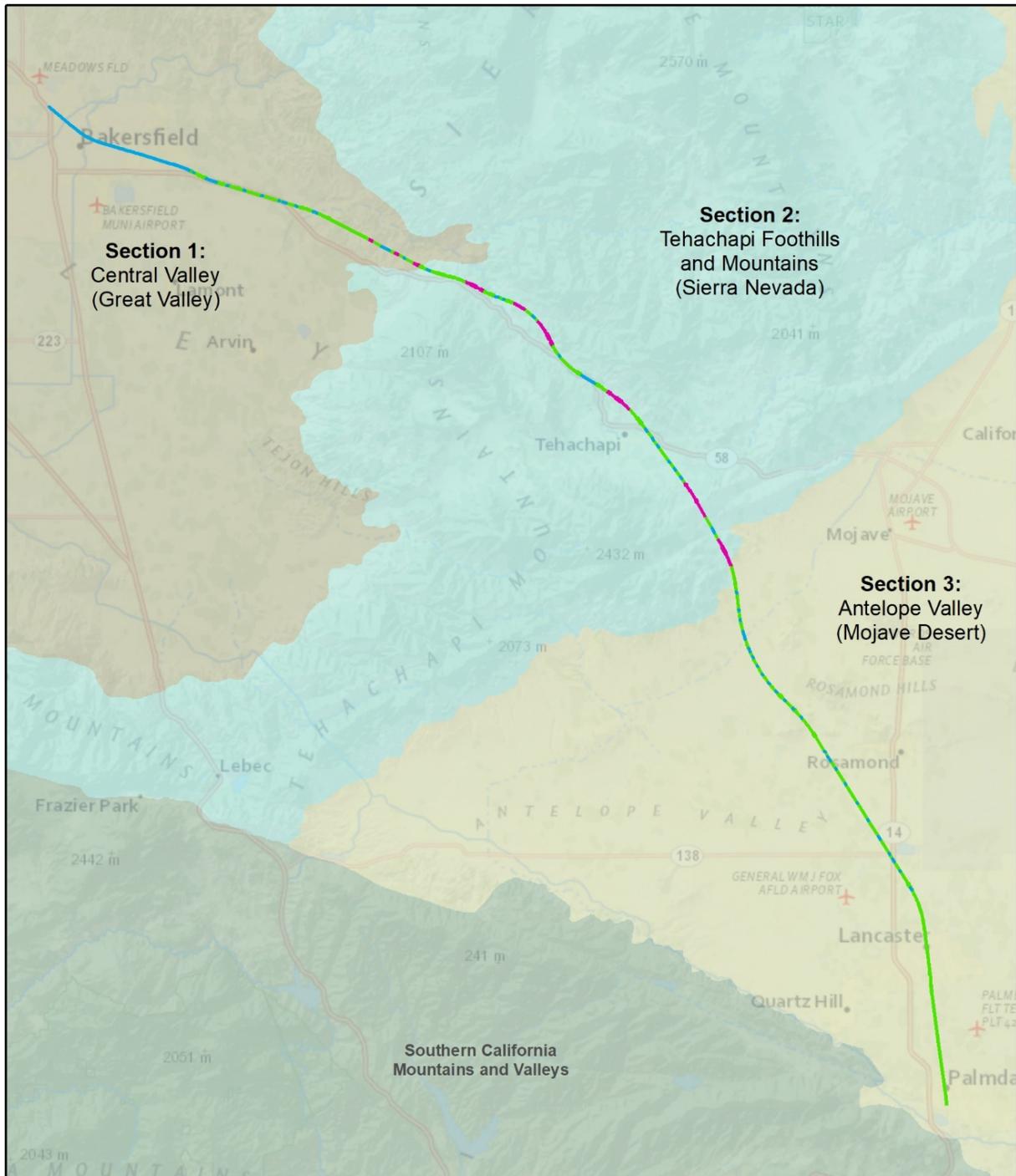
Environmental Baseline

The action area encompasses three ecoregions (sections): the Central Valley Ecoregion (Section 1), the Tehachapi Foothills and Mountains Ecoregion (Section 2), and the Antelope Valley Ecoregion (Section 3) (Figure 3). These sections traverse a landscape composed primarily of open natural land, subject to varying levels of disturbance associated with activities such as cattle and sheep ranching, wind energy, and off-road vehicle use.

Mineral/rock extraction occurs in some locations, and in the larger metropolitan areas of Bakersfield, Tehachapi, and Palmdale, the habitat is highly disturbed and fragmented by urban, agricultural, highway, and local transportation land uses. Sections 1 and 3 have an arid to semi-arid climate with generally hot and dry summers. Section 2 experiences a typical Mediterranean climate pattern characterized by warm, dry summers and cool, wet winters.

Section 1 extends approximately 24 miles from the Project Section's northern terminus in Bakersfield to near the junction of SR 223 and SR 58 in the Tehachapi foothills. The terrain is moderately flat with an elevation between 408 feet to 1,923 feet. Land use is predominantly urban and agricultural in and near Bakersfield, transitioning to grassland and scalebroom (*Lepidospartum squamatum*) scrub on the eastern edge of the Central Valley.

Section 2 extends approximately 26 miles from near the junction of SR 223 and SR 58 in the Tehachapi foothills, through the Tehachapi Mountains, to approximately two miles south of Oak Creek Road near the southeastern boundary of the Tehachapi foothills.



SOURCE: Esri/National Geographic (2018); USFS Calveg Ecoregions (2007); CHSR, (10/2019).

June 2, 2021

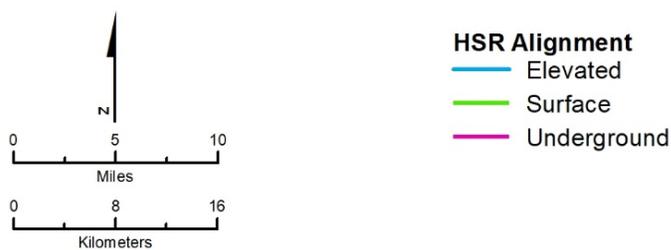


Figure 3 Bakersfield to Palmdale Project Section—Ecoregions

The terrain in the action area varies between gently sloping hills and valleys to a complex mix of steep hills and valleys in the mountains with the elevation an elevation between 1,682 feet to 5,015 feet. The low foothills along the edge of the urban and agricultural areas are covered predominantly in grassland that is utilized for grazing. Mountainous areas are dominated by blue oak (*Quercus douglasii*) and California foothill pine (*Pinus sabiniana*) woodlands, with Fremont cottonwood (*Populus fremontii*), California sycamore (*Platanus racemosa*), and willows (*Salix* spp.) in the larger drainages. Disturbed areas are primarily occupied by annual grasslands. The desert-facing slopes of the mountains are covered by California juniper (*Juniperus californica*) and California buckwheat (*Eriogonum fasciculatum*) scrub at higher elevations, and by Joshua tree (*Yucca brevifolia*) woodland, creosote bush (*Larrea tridentata*) scrub, and cheesebush (*Ambrosia salsola*) scrub at lower elevations.

Section 3 extends approximately 35 miles from approximately two miles south of Oak Creek Road the near the southeastern boundary of the Tehachapi foothills to the Project Section's southern terminus in Palmdale. The landscape is dominated by alluvial basins, scattered remnant mountains worn away by erosion or buried by sediment and debris, and dry lake playas (Norris and Webb 1990). Elevation in the action area ranges from 2,308 feet to 3,942 feet.

The gently undulating topography consists of a mosaic of shallow claypan depressions interspersed among surrounding vegetation and vegetated mounds (termed claypan mosaics). Much of the action area passes through active and fallow agricultural lands. Undeveloped portions are predominantly vegetated with creosote bush, cattle saltbush (*Atriplex polycarpa*), Joshua trees, and Nevada jointfir (*Ephedra nevadensis*) at higher elevations, and by shadscale (*Atriplex confertifolia*) at lower elevations, with rubber rabbitbrush (*Ericameria nauseosa*) and grassland in disturbed areas.

Species

The Authority used species habitat suitability modeling initially to delineate potentially suitable habitat (hereinafter referred to as "modeled habitat") and to estimate potential species distribution in the action area along the alignment. It can be reasonably assumed that not all modeled habitat will be occupied. The modeling effort used a combination of newly developed rule-based models for the mallow, the cactus, the sunburst, the moth, the lizard, and the vireo, and statistical models developed for the tortoise, the kangaroo rat, and the kit fox from previous regional planning efforts. Rule-based models identified potentially suitable habitat based on scientific literature and species expert input related to the physical and biological habitat parameters associated with species occurrence. The precision of the species models is greatest in the project corridor, where detailed vegetation mapping was conducted for the permanent and temporary project impact footprints and within 500 feet of the permanent and temporary project impact footprints, using high resolution aerial photography and field reconnaissance surveys where access was available.

The results of the species habitat suitability modeling were applied to the following:

- **Impact estimates:** The species habitat suitability models were overlain with the proposed project footprint to determine the total area of potential impact to each species modeled habitat.
- **Developing avoidance and minimization measures and determining habitat offsets:** Species habitat suitability models provided information for the development and application of species-specific conservation measures, and for the determination of the amount of compensatory mitigation that may be required for impacts to each species habitat.

Kern mallow

The action area contains 1,180 acres of modeled habitat for the mallow, which are all in Section 1. Approximately 212 acres of modeled habitat for the mallow are in the project's temporary disturbance footprint and approximately 669 acres are in the permanent disturbance footprint.

There are no known occurrences of the mallow in the action area and this species was not detected during botanical surveys conducted for the proposed project where access was granted in 2011, 2013, 2015, or 2016. However, there is a documented, presumed extant occurrence of the mallow in the California Natural Diversity Database (CNDDDB) from 2009 in a Tejon Ranch conservation unit, approximately 2.8 miles south of the action area in Section 2 (CDFW 2020). While the mallow has not been documented in the action area, its presence is assumed based on the presence of suitable habitat in the action area and proximity to documented occurrences.

Bakersfield cactus

The action area contains approximately 3,902 acres of modeled habitat for the cactus. There are approximately 1,101 acres of modeled habitat in Section 1 and 2,801 acres in Section 2. Approximately 463 acres of modeled habitat for the cactus are in the project's temporary disturbance footprint and approximately 2,525 acres are in the permanent disturbance footprint.

There are two extant CNDDDB records for the cactus reported in the action area in Section 2, east of Bakersfield (CDFW 2020). Cactus were observed during botanical surveys conducted for the proposed project where access was granted in 2015 and 2016 (Rincon Consultants 2015, Rincon Consultants 2016). These observations occurred at the east edge of the Central Valley in Caliente Creek in Section 1 and on adjacent hillslopes near Bena Road in Section 2. The individuals were mapped in locations that overlapped one of the CNDDDB records.

San Joaquin adobe sunburst

The action area contains approximately 2,220 acres of modeled habitat for the sunburst. There are approximately 955 acres of modeled habitat in Section 1 and 1,265 acres in Section 2, primarily from Caliente Creek to Tweedy Creek southeast of Bakersfield. Approximately 245 acres of modeled habitat for the sunburst are in the project's temporary disturbance footprint and approximately 1,517 acres are in the permanent disturbance footprint.

There are no documented occurrences for the sunburst in the action area. However, approximately 400 sunburst were observed during botanical surveys conducted for the proposed project where access was granted in 2015 and 2016 (Rincon Consultants 2015, Rincon Consultants 2016). This population was located on Tejon Ranch in Section 2, immediately adjacent to the action area (i.e., approximately 100 feet outside the survey area), approximately two miles southwest of Ilmon, between SR 58 and Bena Road. While the sunburst has not been documented in the action area, its presence is assumed based on the presence of suitable habitat in the action area and observations of this species immediately adjacent to the action area.

Kern primrose sphinx moth

The action area contains approximately 4,860 acres of modeled habitat for the moth. There are approximately 2,409 acres of modeled habitat in Section 1 and 2,451 acres in Section 2. Approximately 218 acres of modeled habitat for the moth are in the project's temporary disturbance footprint and approximately 968 acres are in the permanent disturbance footprint.

The moth is typically found in sandy alluvial soils in and beside washes that support its larval host plants, evening primrose (*Camissonia contorta*) in the Walker Basin and sun cup

(*Camissonia campestris*) in the Carrizo Plain and Cuyama Valley. During the project's 2015 and 2016 botanical surveys, the moth's host plants were observed in areas of sandy/gravelly soils, including streambeds on Tejon Ranch in Section 1 and Section 2 (Rincon Consultants 2015, Rincon Consultants 2016).

The ephemeral watercourses and alluvial fans in the foothills of the San Joaquin Valley and Tehachapi Mountains in the action area (Section 1 and Section 2) are between these geographic areas of known occurrence (Walker Basin in Kern County, Carrizo Plain in San Luis Obispo County, and Cuyama Valley at the intersection of Santa Barbara, San Luis Obispo, Ventura, and Kern counties). Therefore, although no documented occurrences for the moth exist in the action area, its presence is assumed where *Camissonia* occurs in sandy washes of Section 1 and Section 2. The moth is not expected to be present in the San Joaquin Valley floor of Section 1 because suitable habitat is largely absent due to modification by agriculture and development.

Blunt-nosed leopard lizard

The action area contains 5,519 acres of modeled habitat for the lizard. There are approximately 4,519 acres of modeled habitat in Section 1 and 1,000 acres in Section 2. Approximately 322 acres of modeled habitat for the lizard are in the project's temporary disturbance footprint and approximately 1,309 acres are in the permanent disturbance footprint.

Following our review of the distribution and extent of modeled habitat for the lizard in the action area, it is our professional judgement that the habitat suitability modeling overestimates the range of where lizards potentially occur along the project and thus overestimates the amount of suitable habitat available. Specifically, we believe that lizards are potentially present in undeveloped habitat around Caliente Creek and the adjacent lower Tehachapi foothills (Figure 2). Based on the length of this section and the footprint of the project, we estimate there are approximately 382 acres of suitable habitat for the lizard in the project footprint. Lizards were not observed during general wildlife and habitat assessment surveys conducted for the proposed action where access was granted in 2011 and 2015. Because of the presence of suitable habitat in the action area, this species is assumed to be present in small or isolated populations in annual grassland habitats with sparse vegetation and appropriate sandy soils near the San Joaquin Valley floor in Section 1.

Desert tortoise

The action area contains approximately 16,084 acres of modeled habitat for the tortoise, including approximately 961 acres of modeled habitat in Section 2 and 15,123 acres in Section 3. The southern portion of the action area is in the Western Mojave Recovery Unit for tortoise (Service 2011a) and an indicator for where tortoises potentially occur. Approximately 680 acres of potentially suitable modeled habitat for the tortoise are in the project's temporary disturbance footprint and approximately 3,108 acres are in the permanent disturbance footprint.

Following our review of the distribution and extent of modeled habitat for the tortoise in the action area, it is our professional judgement that existing survey and monitoring data and other information from the vicinity of the project (Authority 2020, Bransfield 2021) provide a more accurate method for estimating the potential area of suitable habitat and numbers of tortoises in the action area. Specifically, we believe that the habitat suitability modeling overestimates the range of where tortoises potentially occur along the project and thus overestimates the amount of suitable habitat available. We based this determination on the results of surveys and monitoring conducted for numerous industrial-scale solar projects, wind-energy projects, and transmission lines in the area (Bransfield 2021). These surveys found very low numbers of tortoises in the

foothills of the southern slope of the Tehachapi Mountains and no tortoises south of the town of Mojave. Similarly, the California Natural Diversity Database includes a small number of isolated tortoise records from within 10 miles of the action area in the Antelope Valley and southeast edge of the Tehachapi Mountains. The southernmost observations of tortoise that we are aware of in the vicinity of the project were on Backus Road at its junction with State Route 14 (Bransfield 2021) and at Champagne Road and Tehachapi Willow Springs Road near Rosamond (CNDBB 2020). Protocol level surveys for desert tortoises conducted by the Authority in 2012 within a limited area of the project footprint found no tortoises.

We used this information to determine the extent of the project where tortoises could occur; the northernmost area was where the project emerged at surface level from the Tehachapi Mountains and the southernmost area was where the project intersected with the Backus Road and Champagne Road area, west of, and between the towns of Mojave and Rosamond (Figure 2). Based on the length of this section and the footprint of the project, we estimate that tortoises are potentially present in approximately 738 acres of suitable habitat in the project footprint.

We used this area calculation to estimate the number of tortoises potentially occurring in the action area. Since 1999, the Service and Utah Division of Wildlife Resources have conducted line-distance sampling surveys for tortoises in the five recovery units delineated across the range of the species (Alison and McLuckie 2018). Data from these surveys are used to estimate tortoise density and abundance and monitor population trends in each of 17 different Tortoise Conservation Areas. Survey results from 2019 indicated that the estimated density of large tortoises (>180 mm carapace length) in the Fremont-Kramer Area of Critical Environmental Concern (ACEC), the nearest Tortoise Conservation Area to the project located approximately 11 miles to the east, was 2.7 large tortoises per square kilometer (247.1 acres) with 95% confidence intervals from 1.7 to 4.3 large tortoises per square kilometer (Service 2020i). Using the amount of suitable habitat estimated to be within the action area (738 acres) and the lower 95% confidence interval for the estimated density of tortoises in the Fremont-Kramer ACEC, we estimate that 5 large tortoises occur in the action area. We chose to use the lower 95% confidence interval from the density estimates because the project includes large areas with disturbed and degraded habitat. Therefore, we assume there are lower densities of tortoises in the action area compared to the Fremont-Kramer ACEC. Based on habitat conditions in the vicinity of the project and results of surveys and monitoring mentioned previously, we believe that these lower density estimates overestimate the number of tortoises that likely occur in the action area. We report numbers of large desert tortoises because individuals of this size are most likely to be detected by observers and therefore this was the metric reported for the line-distance sampling surveys.

Least Bell's vireo

The action area contains approximately 155 acres of modeled breeding habitat for the vireo. There are 39 acres of modeled habitat in Section 1 and approximately 116 acres in Section 2. Approximately six acres of modeled habitat for the vireo are in the project's temporary disturbance footprint and approximately 18 acres are in the permanent disturbance footprint.

There are no documented occurrences for the vireo in the action area in CNDBB. However, one individual was documented singing at Una Lake in 2005 and another was documented in the Lancaster area in 2006 (CDFW 2020). Both observations were approximately one mile outside the action area for Section 3. eBird (2020) reports Bell's vireo (*Vireo bellii*) in and adjacent to the action area, including a May 2000 observation of one individual in the action area in Palmdale and one individual at the Amargosa Creek Flood Basin, approximately one mile west of the action area, in May 2006 and 2012 and in May and June 2017.

Although riparian areas are preferred for breeding, the vireo may also use other habitat types in the action area as a transient during migration or dispersal. Because of the presence of suitable habitat in and near the action area, breeding and transient individuals are assumed to be present in the action area in suitable habitat.

Tipton kangaroo rat

The action area contains approximately 3,441 acres of modeled habitat for the kangaroo rat. There are approximately 2,564 acres of modeled habitat in Section 1 and 877 acres in Section 2. Approximately 195 acres of modeled habitat for the kangaroo rat are in the project's temporary disturbance footprint and approximately 908 acres are in the permanent disturbance footprint.

Following our review of the distribution and extent of modeled habitat for the kangaroo rat in the action area, it is our professional judgement that the habitat suitability modeling overestimates the range of where kangaroo rats potentially occur along the project and thus overestimates the amount of suitable habitat available. Specifically, we believe that kangaroo rats are potentially present in undeveloped habitat around Caliente Creek and the adjacent lower Tehachapi foothills (Figure 2). Based on the length of this section and the footprint of the project, we estimate there are approximately 244 acres of suitable habitat for the kangaroo rat in the project footprint. This species was not observed during general wildlife and habitat assessments surveys conducted for the proposed project where access was granted in 2011 and 2015. While the kangaroo rat has not been documented in the action area, its presence is assumed in undisturbed grassland habitat and open areas around Caliente Creek in Section 1.

San Joaquin kit fox

The action area contains approximately 10,408 acres of modeled habitat for the kit fox. There are approximately 9,075 acres of modeled habitat in Section 1 and 1,333 acres in Section 2. Approximately 3,530 acres of modeled habitat in Section 1 in Bakersfield is classified as urban suitable habitat. Portions of the action area are in recovery plan areas for the kit fox, including the Metropolitan Bakersfield Satellite Recovery Area (approximately 296 acres) and the Bakersfield to Tehachapi Foothills Linkage Area (approximately 1,602 acres). Approximately 564 acres of modeled habitat for the kit fox are in the project's temporary disturbance footprint and approximately 2,022 acres are in the permanent disturbance footprint.

The kit fox has been documented successfully living and reproducing in urban Bakersfield in Section 1. The Tehachapi foothills southeast of Bakersfield in Section 2 consist primarily of annual grasslands on gently sloping terrain; this natural habitat provides greater potential for kit fox utilization than intensively agriculturally developed areas. The CNDDDB also reports two occurrences of the kit fox in the action area in Section 1 in and near Bakersfield (CDFW 2020).

Stressors

Common stressors in the action area to most or all the species include:

- Disturbance to habitat from urbanization, energy development (oil, gas, and solar), grazing, and agriculture
- Impacts from introduction of non-native invasive species (plants and insects)
- Herbicide and pesticide use
- Off-highway vehicle use
- Small population size

- Predation (for wildlife species, including nest brood parasitism for avian species)
- Climate change (including impacts from regional drought and fire)
- Inadequacy of existing regulatory mechanisms

Additional stressors for the tortoise include the presence of roads, routes, trails, railroads, and utility corridors in suitable habitat. Additional stressors for the kit fox include shooting and vehicle-caused mortality.

Effects of the Action

Effects of the action are all consequences to listed species or critical habitat that are caused by the proposed action, including the consequences of other activities that are caused by the proposed action. A consequence is caused by the proposed action if it would not occur but for the proposed action and it is reasonably certain to occur. Effects of the action may occur later in time and may include consequences occurring outside the immediate area involved in the action.

The proposed action will result in temporary and permanent loss of suitable habitat for the mallow, the cactus, the sunburst, the moth, the lizard, the tortoise, the vireo, the kangaroo rat, and the kit fox.

Kern mallow, Bakersfield cactus, and San Joaquin adobe sunburst

The proposed action is anticipated to affect the mallow, the cactus, and the sunburst where suitable habitat is identified in the action area. Of the 881 acres of modeled habitat in the project footprint for the mallow, 2,988 acres for the cactus, and 1,762 acres for the sunburst, these species are reasonably certain to occur in approximately 818 acres, 2,821 acres, and 75 acres respectively of suitable habitat that will be temporarily disturbed or permanently lost due to construction of the proposed action. This habitat corresponds to areas where populations are known to or could occur, and required soil substrates and textures, vegetation communities, and/or elevation exist (i.e., core suitable habitat), and where adverse effects to the mallow, the cactus, and the sunburst are likely to occur if individuals are present. The remaining 63 acres, 167 acres, and 1,687 acres of modeled habitat for the mallow, the cactus, and the sunburst, respectively, are areas where these species have not been encountered or are outside of core suitable habitat. Effects to these species from construction and O&M activities could occur outside the project footprint but are not likely to be adverse.

Construction activities, such as vegetation clearing, ground disturbance, and operation of equipment and vehicles, may result in habitat loss, modification or degradation, disruption of soil seed banks, or injury or mortality to individuals of these species. If these species are present, the potential for effects will depend on whether individuals can be avoided. If these species are present and cannot be avoided, salvage and relocation will be implemented. Although the cactus is known to occur in the action area, relatively few of the individuals will be affected; they will be readily detectable year-round and relocated to suitable habitat.

Construction may result in loss, modification, or degradation of suitable habitat if non-native invasive plant species are introduced increasing competition for resources. However, most suitable habitat for these species occurs in areas subject to heavy grazing and non-native invasive plant species are already present and established. Additionally, these species may colonize portions of the project footprint that are temporarily impacted and revegetated upon completion of construction.

Habitat fragmentation may result in genetic isolation if seeds are unable to disperse across the project footprint. Seed dispersal agents are unknown for each of these species, but gravity, wind, water, and animals may aid with seed dispersal. The cactus produces seeds infrequently; this species more commonly grows from fallen pads that may be dispersed during flood events. The design of the proposed action includes systems to facilitate drainage and wildlife movement allowing seeds (or pads) to be carried via water and animals. Furthermore, wind will continue to function as a dispersal mechanism to carry seed through the security fencing and across the tracks. Therefore, this effect is anticipated to be low.

During the O&M phase of the proposed action, direct injury or mortality may result if activities occur in areas that these species colonize after construction. Application of herbicide may result in injury or mortality if overspray occurs. Fugitive dust released during O&M activities may result in reduced vigor leading to potential decline of individual plants. Ground disturbance and vegetation control via clearing and grubbing may facilitate the spread of non-native invasive plant species into habitats adjacent to the project through the introduction of seeds and propagules, resulting in increased competition for resources with these species. However, as noted above, non-native invasive plant species already persist in the majority of suitable habitat for these species in the action area.

To avoid and minimize effects to these species from the proposed action, the Authority has proposed general and species-specific conservation measures including pre-construction surveys, establishment of environmentally sensitive areas and non-disturbance zones, and salvage and relocation plans. Suitable habitat for these species that is temporarily disturbed will be restored to pre-disturbance conditions following construction. Compensatory mitigation for the mallow, the sunburst, and the cactus will also be implemented for temporary and permanent impacts to suitable habitat.

Kern primrose sphinx moth

The project will result in effects to modeled habitat but does not affect known occupied habitat of the moth. Of the 1,186 acres of modeled habitat in the project footprint, moths are reasonably certain to occur in approximately 53 acres of suitable habitat that will be temporarily disturbed or permanently lost due to construction of the proposed project. This habitat corresponds to washes where sandy alluvial soils may be present and could support the species' larval host plants (*Camissonia*) and where adverse effects are likely to occur if moths are present. The remaining 1,133 acres of modeled habitat are areas not associated with washes and where sandy soils that support the species' host plants appear to be absent or are only infrequently observed. Changes in moth behavior from construction and O&M activities could result outside the project footprint but are not likely to result in adverse effects.

Construction activities, including vegetation clearing (including removal of *Camissonia*), rail bed build up, and placement of temporary and permanent structures, may result in loss and modification of suitable habitat. Modification of habitat due to direct removal of host or nectaring plants, the introduction or spread of nonnative plants, dust, soil erosion and compaction, or alterations to hydrology may result in a reduction or decline of plant populations that support moth breeding and foraging. The loss or modification of habitat may result in increased competition for resources leading to competitive exclusion. Mortality or injury may result from collisions with vehicles or equipment and disturbance and displacement of individuals may result from noise, vibration, and air turbulence. Disturbance of occupied host plants or sandy soils may result in injury or mortality of eggs, pupae, larvae, or adults. Lighting may attract moths and may result in increased vulnerability to predation. These effects may in

turn disrupt normal breeding or foraging behaviors, resulting in increased mortality and decreased reproduction and survival.

O&M activities may result in limited to temporary displacement or direct mortality or injury from passing trains and maintenance vehicles. O&M noise, light, and vibration disturbance from the trains, including nighttime train operations, from security lighting around facilities, and from routine maintenance and repair activities may result in disruption of behavior or displacement of individuals that occur near the project. Routine maintenance activities may include herbicide or pesticide application to reduce weeds and nuisance animals, which may reduce the fitness and lower survivorship of individual plants or moths. These effects may in turn result in abandonment of feeding and breeding sites, affecting the species' recovery.

To avoid and minimize adverse effects to the moth from the proposed action, the Authority has proposed general and moth-specific conservation measures including but not limited to pre-construction surveys, biological monitors, establishment of environmentally sensitive areas, avoidance of nighttime light disturbance, and water and dust palliative measures. Suitable habitat for the moth that is temporarily disturbed will be restored to pre-disturbance conditions following construction. Compensatory mitigation for the moth will be implemented for temporary and permanent impacts to suitable habitat containing host plants (*Camissonia*) in sandy washes where moth are assumed to be present. The action area does not overlap with the known geographic range of the moth; however injury and mortality to eggs, larvae, pupae, and adults that occur in suitable habitat impacted by the proposed action where the moth is assumed to be present are likely unavoidable due to the cryptic nature of this species and its biology (e.g., short flight season for adults; burrows underground until suitable conditions occur).

Blunt-nosed leopard lizard

Lizards are reasonably certain to occur in approximately 382 acres of suitable habitat that will be temporarily disturbed or permanently lost due to construction of the proposed project. This corresponds to undeveloped habitat that overlaps portions of modeled, core suitable habitat, potentially suitable habitat, and atypical habitat. This habitat extends approximately 3.3 linear miles along the project alignment from the eastern edge of active agricultural areas on the west side of Caliente Creek, east into the lower Tehachapi foothills to approximately 600 feet in elevation above Caliente Creek. We believe this is where lizard populations could occur and where adverse effects are likely to occur if lizards are present. The remaining modeled habitat outside of this area is where lizards are expected to be absent due to too much vegetative cover, increased topography, or active agricultural and urban land uses. Changes in lizard behavior from construction and O&M activities could result outside the project footprint but are not likely to result in adverse effects.

Construction related habitat loss, degradation, modification, or fragmentation may result in disruption or decline in feeding and breeding, loss of burrowing/refugia sites, disruption of movement corridors, and genetic isolation. Construction related operation of equipment and maintenance vehicles or placement of debris may result in injury or mortality of lizards, crush their burrows and/or nests, or entomb/entrap lizards. Noise and vibrations from construction equipment as well as habitat loss or modification may disturb any lizards in the action area causing them to leave the area and experience reduced fitness due to disruption of normal behaviors and increased pressure from competition and/or predation.

O&M activities may result in injury or mortality to lizards due to train or maintenance vehicle strikes. Impermeable infrastructure such as rail beds, ballast, or tracks may obstruct dispersal or migratory movements. Tall or elevated project components such as fencing and other structures

may provide increased perch sites for avian predators. Ongoing habitat changes due to maintenance activities involving pesticides and herbicides may reduce prey availability or otherwise alter the vegetation composition of areas within and adjacent to the project footprint. Noise or vibration during the operation of trains, including nighttime train operations, may disrupt normal behavior or displace individuals residing near the project, resulting in declines in feeding or breeding or causing them to abandon burrows or breeding sites.

To minimize and avoid these effects of the proposed action on the lizard, the Authority has proposed general and lizard specific conservation measures including pre-construction surveys, daily surveys, exclusion fencing, and biological monitors. Security fencing will be designed to exclude the species from accessing the ROW to avoid injury and mortality of individuals from vehicle or train strikes. Suitable habitat for the lizard that is temporarily disturbed will be restored to pre-disturbance conditions following construction and large continuous swaths of habitat will remain intact adjacent to the project. Compensatory mitigation for the lizard will also be implemented for temporary and permanent impacts to suitable habitat. Habitat fragmentation and substantial obstruction of movement will be avoided with implementation of wildlife crossing structures proposed throughout the alignment and will provide lizards with movement and dispersal corridors, though it may increase the potential for the species to encounter predators that may also be utilizing the wildlife crossings.

Desert tortoise

Tortoises are reasonably certain to occur in approximately 738 acres of suitable habitat that will be temporarily disturbed or permanently lost due to construction of the proposed project. This habitat overlaps portions of modeled, moderate value suitable habitat and low value suitable habitat. This habitat extends approximately 4.7 linear miles along the project alignment from Backus Road, north to the lower Tehachapi foothills to approximately 3,600 feet in elevation. We believe this is where tortoise populations could occur and where adverse effects are likely to occur if tortoise are present. The remaining modeled habitat outside of this area is where tortoise populations appear to be absent, are only infrequently observed, or are associated with heavily urbanized areas in the Lancaster and Palmdale areas where tortoise have not been encountered. Changes in tortoise behavior from construction and O&M activities could result outside the project footprint but are not likely to result in adverse effects.

Construction of HSR infrastructure, such as security fences, elevated structures, rail beds, and associated facilities, may result in habitat modification or loss from reduction, degradation, fill, pollution, or conversion of suitable breeding or refugia habitat, including loss of vegetative cover or burrows. Introduction of non-native invasive plant species may alter the vegetation structure causing degradation of suitable habitat. Loss, fragmentation, or degradation of habitat may lead to displacement of tortoises into adjacent habitats.

Movement of individuals may be impeded during construction due to increased human disturbance, and associated noise, lights, and dust generated by project construction activities. Increased disturbance and/or inability to move freely may result in burrow/nest abandonment and/or displacement into adjacent habitat. Placement of temporary barriers (e.g., temporary fencing), construction staging areas, increased vehicular traffic, or construction laydown in suitable habitat may also affect the ability of the tortoise to move freely. Impedance of movement by obstacles may result in mortality from hypothermia if tortoises pace newly fenced or otherwise obstructed areas.

Injury or mortality may occur if vehicles or equipment strike the tortoise or crush their burrows or nests, if individuals fall into excavated areas becoming trapped, or during relocation activities.

The capture and handling of desert tortoises for translocation, in this case moving them out of harm's way, can subject them to stress which could cause tortoises to void their bladders and lose stored water. Averill-Murray (2002) demonstrated that desert tortoises that urinated during handling had lower survival rates than those that did not. Consequently, desert tortoises that void their bladders are at an increased risk of dying after their translocation.

The effects identified above and any other construction related activities that interfere with daily and seasonal activities may result in disruption of normal behaviors leading to reduced fecundity and foraging efficiency and decreased survival.

O&M activities may result in injury or mortality if tortoises gain access to the ROW and are exposed to collisions or crushing by maintenance vehicles or trains. Their burrows may be crushed by maintenance vehicles if individual tortoise become established in the ROW or on access roads. Noise, vibration, or light disturbance from train operation, including nighttime train operations, may disrupt or displace tortoises and alter behavior or use areas for individuals residing near the project, including current road crossing locations.

O&M activities may also result in injury or mortality due to increased intra- and interspecific competition due to displacement and exposure to pesticides aimed at other animals, such as California ground squirrels. Ongoing habitat modification may also occur with introduction of non-native invasive plant species and/or application of herbicides during maintenance activities. Herbicides may reduce food resources. O&M activities may also result in disruption of normal behaviors and displacement of tortoises into adjacent habitat.

The track and associated fencing create a linear barrier through otherwise contiguous areas of natural habitat. The track, fencing, and other permanent structures erected in natural lands and known linkages may affect individual tortoise's ability to move freely and limit dispersal, thereby potentially limiting genetic exchange necessary to support the ongoing survival and recovery of the species. Limited dispersal may also lead to increasing foraging competition and tortoises travelling parallel to linear features may experience greater risk of predation.

To avoid and minimize the effects of the proposed action on the tortoise, the Authority has proposed general and tortoise-specific conservation measures including but not limited to pre-construction surveys, biological monitoring, inspections of vehicles and potential shelters, wildlife crossings, avoidance measures for the tortoise and for burrows, and entrapment avoidance. Suitable habitat for the tortoise that is temporarily disturbed will be restored to pre-disturbance conditions following construction and large continuous swaths of habitat will remain intact adjacent to the project. Compensatory mitigation for the tortoise will also be implemented for temporary and permanent impacts to suitable habitat.

Displaced tortoises may reoccupy portions of the project footprint that are temporarily impacted and revegetated upon completion of construction. Mortality of individuals in the fenced train ROW will be avoided as the security fencing will be designed to exclude the species from accessing the ROW. Wildlife crossing structures will be installed throughout the alignment to allow species migration and dispersal and avoid limiting genetic exchange. While the installation of wildlife crossing structures will minimize the impedance of movement for tortoises, they may increase the potential for the species to encounter predators that will also utilize the wildlife crossings.

Least Bell's vireo

The vireo prefers riparian areas for breeding, though individuals may use other habitat types in the action area during migration or dispersal. The proposed action is anticipated to affect the

vireo where breeding habitat is associated with water. Migrating individuals and migratory stopover habitat may also be affected by the proposed action. Vireos are reasonably certain to occur in approximately 24 acres of suitable habitat that will be temporarily disturbed or permanently lost due to construction of the proposed project. This habitat corresponds to areas of suitable riparian habitat in the species' historic range where expanding vireo populations are beginning to recolonize and where adverse effects are likely to occur if vireo are present. Changes in vireo behavior from construction and O&M activities could result outside the project footprint but are not likely to result in adverse effects.

Construction activities, such as clearing of vegetation and road construction, may result in the reduction, degradation, fragmentation, fill, pollution, or conversion of suitable foraging, migratory, and breeding habitat. Construction-related introduction of non-native invasive plants may alter vegetation structure or otherwise degrade habitat. Fragmentation of habitat may result in increased edge (non-contiguous) habitat, potentially increasing the presence of avian predators. Loss or modification of habitat and the displacement of vireos into adjacent habitat may result in increased competition for food and nest sites and increased vulnerability to predators.

Operation of equipment and vehicles during construction may result in injury or mortality of individuals from collision and may destroy active nests, nestlings, or hatchlings if activities occur during the breeding season. Increased human disturbance, heavy equipment operation, and associated noise, light, and dust generated by construction activities may disrupt natural foraging and nesting activities and migratory patterns for the vireo. Increased intensity of disturbance may result in nest abandonment, stress-related reduced fecundity, reduced foraging efficiency, and increased flight response, which may result in difficulty in providing food to young and increased energy expenditure, possibly leading to loss of young.

An increase in predation may occur after the HSR system is constructed where security fencing, elevated structures, and other project components create new perch sites or provide protective cover for predatory birds and mammals. If vireos enter the ROW, injury or mortality may result from strikes by trains or maintenance vehicles, or from collisions with overhead power lines. Increased human disturbance and noise from O&M activities (such as passing trains, including nighttime train operations, and maintenance vehicle traffic) may result in displacement from breeding, foraging, or migratory habitat and alteration of natural behavior of individuals occurring near the project, leading to nest abandonment, loss of young, reduced fecundity, reduced foraging efficiency, increased flight response, and increased energy expenditure.

To minimize or avoid effects of the proposed action on the vireo, the Authority has proposed general and vireo-specific conservation measures including pre-construction nesting bird surveys, biological monitors, establishment of environmentally sensitive areas and non-disturbance zones, and bird safe project design. Suitable habitat for the vireo will be restored to pre-disturbance conditions following construction. Compensatory mitigation for the vireo will also be implemented for temporary and permanent impacts to suitable habitat.

Tipton kangaroo rat

Loss, fragmentation, and/or alteration of suitable habitat may result from the construction of the proposed action. Kangaroo rats are reasonably certain to occur in approximately 244 acres of suitable habitat that will be temporarily disturbed or permanently lost due to construction of the proposed action. This habitat corresponds to areas around Caliente Creek that are not subject to seasonal flooding and are free of urban and agricultural uses and overlaps portions of modeled and other potentially suitable habitat. This habitat extends approximately 1.9 linear miles along

the project alignment from the eastern edge of active agricultural areas on the west side of Caliente Creek, east into the lower Tehachapi foothills to approximately 400 feet in elevation above Caliente Creek. We believe this is where kangaroo rat populations could occur and where adverse effects are likely to occur if kangaroo rat are present. The remaining modeled habitat outside of this area is where kangaroo rat populations are expected to be absent due to too much vegetative cover, increased topography, or active agricultural and urban land uses. Changes in kangaroo rat behavior from construction and O&M activities could result outside the project footprint but are not likely to result in adverse effects.

Construction activities may result in reduction, degradation, fill, pollution, or conversion of suitable breeding or refugia habitat, including loss of vegetative cover or crushing of burrows. The placement of temporary barriers (e.g., temporary fencing), construction staging areas, increased vehicular traffic, or construction laydown in natural lands and linkages may affect the ability of kangaroo rats to move freely. Construction of security fences, elevated structures, rail beds, and associated facilities will also alter the landscape and may interfere with the daily and seasonal activities, movement, and dispersal of kangaroo rat. The introduction and colonization of non-native invasive plant species may reduce habitat suitability. Disruption of natural foraging, breeding, and movement patterns may result in nest/burrow abandonment, stress-related reduced fecundity, reduced foraging efficiency, increased flight response, increased energy expenditure, and loss of young. These effects may also occur to resident individuals if kangaroo rats are relocated to occupied habitat. Kangaroo rats trapped during pre-disturbance surveys and/or for relocation may be susceptible to injury or mortality during trapping and handling.

The installation of track segments, road crossing stations, maintenance facilities, or electrical substations may affect movement or alter the effectiveness of existing wildlife movement corridors. The installation of physical barriers such as fencing may increase exposure of kangaroo rat to predators whose movements are also altered by the proposed action. Sound and vibration related disruptions and uncontained trash from construction activities may alter kangaroo rat behavior or that of other species that may result in increased predation (e.g. attract a predator such as the common raven). Injury or mortality of kangaroo rats may result from vehicles or equipment crushing individuals or their burrows/nests, entrapment of individuals in excavations, pipes, culverts, or similar structures, or during relocation activities. Translocated or otherwise displaced kangaroo rats may experience increased intra- and interspecific competition for food, mates, and burrow/breeding sites.

O&M activities may disrupt normal kangaroo rat behaviors and displace rats in adjacent habitat, as well as cause injury or mortality due to increased intra- and interspecific competition and exposure to pesticides aimed at other animals, such as California ground squirrels. Noise, vibration, or light disturbance during the operation of trains, including from nighttime train operations, could disrupt or displace kangaroo rats residing near the project and change their behavior or use areas and decrease fecundity and survival. Habitat modification may occur with introduction of non-native invasive plant species and/or application of herbicides during maintenance activities. Injury or mortality may result if kangaroo rats gain access to the ROW and are killed through incidental crushing individuals or occupied burrows by the HSR train or maintenance vehicles.

To avoid and minimize the potential effects to the kangaroo rat from the proposed action, the Authority has proposed general and rat-specific conservation measures including but not limited to pre-construction surveys, a trapping and relocation plan, biological monitors, entrapment avoidance measures, wildlife crossings, and wildlife requirements for security fencing. Suitable habitat for the kangaroo rat that is temporarily disturbed will be restored to pre-disturbance

conditions following construction and large continuous swaths of habitat will remain intact adjacent to the project. Compensatory mitigation for the kangaroo rat will also be implemented for temporary and permanent impacts to suitable habitat. Wildlife crossing structures are proposed throughout the alignment to allow species migration and dispersal. The conservation measures, including the linear nature of the project and installation of wildlife crossings, will avoid and minimize potential effects. Portions of the proposed action that will be placed in tunnels will have no linear surface barriers prohibiting wildlife movement. While the installation of wildlife crossing structures will minimize the impedance of movement for kangaroo rats, it may increase the potential for the species to encounter predators that will utilize the wildlife crossings.

Kangaroo rats temporarily displaced by construction may reoccupy portions of the project footprint that are temporarily impacted and revegetated upon completion of construction. Security fencing will be designed to exclude the species from accessing the ROW to avoid injury and mortality of individuals from vehicle or train strikes.

San Joaquin kit fox

The project may result in effects to habitat suitable for the kit fox in natural, agricultural, and urban habitats where the alignment traverses the southern San Joaquin Valley from Bakersfield to the Tehachapi foothills (Section 1 and Section 2). Of the 2,586 acres of modeled habitat in the project footprint, kit fox are reasonably certain to occur in approximately 776 acres of suitable habitat that will be temporarily disturbed or permanently lost due to construction of the proposed action. This habitat corresponds to areas where kit fox populations are known to persist, including in Bakersfield, or are intermittently present and where adverse effects are likely to occur. The remaining 1,810 acres of modeled habitat are areas where kit fox populations appear to be absent, are only infrequently observed, or are associated with active agriculture where kit fox are not expected to den and the likelihood of occurrence is low. Changes in kit fox behavior from construction and O&M activities could result outside the project footprint but are not likely to result in adverse effects.

Construction activities may result in reduction, degradation, fill, pollution, or conversion of suitable kit fox habitat. Habitat loss and/or modification may result in additional effects, including the loss of potential denning habitat, restriction of dispersal/movement, and reduction of prey availability. Some individuals may forage closer to conspecifics, resulting in less prey being available in the region and increased exposure to predatory species, such as coyotes, domestic dogs, raccoons, and skunks. As a result, mortality of kit foxes may increase due to predation, competitive exclusion, and disease transmission. A long-term effect of habitat loss or modification may include a reduced survival rate for pups, juvenile, and adult kit fox.

Increased human disturbance, heavy equipment operation, and associated noise, lights, and dust generated by construction may disrupt natural foraging and breeding activities and migratory patterns. Increased disturbances may result in den abandonment, stress-related reduced fecundity, reduced foraging efficiency, and increased flight response, which lead to increased energy expenditure and difficulty in providing food to young, possibly leading to loss of young. Kit foxes may be displaced into adjacent habitat and may experience increased intra- and interspecific competition for food, mates, and breeding sites.

Injury or mortality may occur if the kit fox is present and/or occupying dens within the project footprint while vehicles and construction equipment are in operation and/or ground disturbance is occurring. Entrapment may occur if there are open excavations at a depth that prevent kit foxes from escaping on their own or if individuals are present in pipes, culverts, or similar structures

when they are manipulated during construction (e.g., moved, covered). The placement of temporary barriers (e.g., temporary fencing), construction staging areas, increased vehicular traffic, or construction laydown within natural lands and known linkages may affect the ability of kit fox to move freely and utilize the project footprint for foraging and denning.

Construction of the proposed action may result in changes in long-term habitat connectivity for the kit fox. The action area passes through agricultural lands that are generally not suitable for denning and foraging; however, these areas support dispersal between more suitable habitat areas. The linear nature of the project and the use of permanent access restricted fencing may limit the ability of kit fox to move throughout the region. At-grade portions of the proposed action will restrict kit fox movement. This may affect individual viability by increasing the energetic costs and risks of activities, including mate selection, genetic exchange between dispersed populations, breeding success, hunting, and colonization of new habitats.

During O&M, injury or mortality of kit fox may result if individuals get through the security fencing and are struck by trains or maintenance vehicles and equipment. This could include vehicles traveling on unfenced maintenance access roads to and from the fenced facility. O&M-level noise, light, and vibration from the train traveling on the tracks, including from nighttime train operations, from security lighting around facilities, and from routine maintenance and repair activities, may disturb kit foxes and result in behavioral changes to individuals residing near the project. Such disturbances may disrupt or displace kit foxes, disrupting normal breeding and foraging behaviors and/or causing them to abandon dens. Routine maintenance activities could include application of herbicides and pesticides to reduce weeds and nuisance animals that may lead to on-going reduction of prey availability in proximity to the alignment. These effects may result in reduced survival of pups, juveniles, and adults.

The loss of potential refugia due to the presence of the HSR infrastructure may increase kit fox vulnerability to predators. O&M activities may result in increased predator presence if trash is allowed to accumulate along the track. O&M of the facility may result in an increase in mortality if kit foxes become trapped by predators (e.g., coyotes, domestic/wild dogs) at the wildlife crossings, and/or while traveling parallel to the rail line looking for crossing opportunities.

The Authority has proposed general and kit fox-specific conservation measures to avoid and minimize effects on the kit fox from the proposed action, including but not limited to pre-construction surveys, biological monitors, entrapment avoidance measures, wildlife crossings, avoidance of nighttime light disturbance, den exclusion areas and den excavation measures. Security fencing will be designed to exclude the species from accessing the ROW to avoid injury and mortality of individuals from vehicle or train strikes. Suitable habitat for the kit fox will be restored to pre-disturbance conditions following construction and large contiguous swaths of habitat will remain intact adjacent to the project. Compensatory mitigation for the kit fox will also be implemented for temporary and permanent impacts to suitable habitat. The proposed action includes a combination of tunnels, elevated structures, and at-grade tracks through kit fox habitat. Where tracks are on elevated structures or in tunnels, wildlife movement will not be impeded. Wildlife crossing structures are proposed throughout the alignment to allow for species migration and dispersal.

Compensatory Habitat

The Authority is proposing to provide compensatory habitat as part of the proposed action. This compensatory habitat mitigation is intended to offset the effect on the species of the proposed project's anticipated incidental take, resulting from the permanent and temporary loss, modification, and/or degradation of habitat described above. The compensatory habitat proposed

will be in the form of placing conservation easements with long-term management plans on compensatory mitigation sites and the purchase of habitat compensation credits at a Service-approved mitigation site or conservation bank.

The amount of suitable habitat for each species that will be impacted, and where adverse effects are reasonably certain to occur, is as follows:

- mallow – 818 acres
- cactus – 2,821 acres
- sunburst – 75 acres
- moth – 53 acres
- lizard – 382 acres
- tortoise – 738 acres
- vireo – 24 acres
- kangaroo rat – 244 acres
- kit fox – 306 acres

Kit fox compensation acreage quantification includes only the non-urban suitable habitat areas outside the city of Bakersfield that will be temporarily disturbed or permanently lost. Impacts to urban habitat within the city of Bakersfield where kit fox is known to occur are not included as replacement of impacted urban habitat is not feasible.

The Authority will provide compensatory mitigation for impacts to suitable habitat for each species per the above acreages. However, upon design finalization of each CP and completion of the pre-construction habitat assessment surveys, the amount of compensatory mitigation may be adjusted downward based on revised estimated impacts to species' suitable habitat, if needed, for each Work Area.

This component of the action will have the effect of protecting and managing lands for the species' conservation in perpetuity. The compensatory lands will provide suitable habitat for breeding, feeding, or sheltering commensurate with or better than habitat lost as a result of the proposed project. Providing this compensatory habitat mitigation will offset the loss of habitat and may contribute to other recovery efforts for the species.

Cumulative Effects

Cumulative effects include the effects of future State, Tribal, local, or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act. During this consultation, the Service did not identify any future non-federal actions that are reasonably certain to occur in the action area.

Conclusion

After reviewing the current status of the mallow, the cactus, the sunburst, the moth, the lizard, the tortoise, the vireo, the kangaroo rat, and the kit fox; the environmental baseline for the action area; the effects of the proposed action; and the cumulative effects, it is the Service's biological opinion that the construction of the Bakersfield to Palmdale Project Section, as proposed, is not likely to jeopardize the continued existence of these species. The Service reached this conclusion because the project-related effects to the species, when added to the environmental baseline and analyzed in consideration of all potential cumulative effects, will not result in precluding recovery or appreciably reducing the likelihood of survival of these species based on the following:

- 1) The Conservation Measures are designed to avoid or minimize and offset adverse impacts to these species and their suitable habitat.
- 2) Project activities that will result in temporary and permanent impacts to suitable habitat only occur on a small percentage of such habitat within the action area and throughout the full range of these species, and as such, would be unlikely to reduce landscape-scale habitat functionality.
- 3) Protection of habitats within the compensatory mitigation sites would preserve and restore suitable habitat in the same recovery areas (as applicable) affected by constructing and operating the Preferred Alternative of the Bakersfield to Palmdale Project Section.
- 4) For the lizard, the tortoise, the kangaroo rat, and the kit fox, the Authority has proposed to install dedicated wildlife crossings and other structures to reduce the project's effects to connectivity among populations of these species.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harass is defined by Service regulations at 50 CFR 17.3 as an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering. Harm is defined by the same regulations as an act which actually kills or injures wildlife. Harm is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavior patterns, including breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

The measures described below are non-discretionary and must be undertaken by the Authority so that they become binding conditions of any grant or permit issued to the applicant, as appropriate, for the exemption in section 7(o)(2) to apply. The Authority has a continuing duty to regulate the activity covered by this incidental take statement. If the Authority (1) fails to assume and implement the terms and conditions or (2) fails to adhere to the terms and conditions of the incidental take statement, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, the Authority must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement [50 CFR §402.14(i)(3)].

Sections 7(b)(4) and 7(o)(2) of the Act generally do not apply to listed plant species. However, limited protection of listed plants from take is provided to the extent that the Act prohibits the removal and reduction to possession of federally listed endangered plants or the malicious damage of such plants on areas under federal jurisdiction, or the destruction of endangered plants on non-federal areas in violation of State law or regulation or in the course of any violation of a State criminal trespass law.

Amount or Extent of Take

Blunt-nosed leopard lizard, Tipton's kangaroo rat, and Kern primrose sphinx moth

The Service anticipates that incidental take of blunt-nosed leopard lizard, Tipton kangaroo rat, and Kern primrose sphinx moth will be difficult to detect due to their life history and ecology and because the number of individuals within the project action area is unknown. Specifically, blunt-nosed leopard lizards and sphinx moth can be difficult to locate due to their cryptic appearance and finding a dead or injured individual during project execution is unlikely due to their relatively small size. Tipton kangaroo rats are also nocturnal which may result in some harm, harassment, and mortality being unobservable. Losses of blunt-nosed leopard lizard, Tipton kangaroo rat, and Kern primrose sphinx moth may also be difficult to quantify due to seasonal fluctuations in their numbers, random environmental events, changes in their habitat, or additional environmental disturbances. Therefore, the amount of habitat for these species that will be impacted as a result of the proposed project will be used as a surrogate for quantifying take. The Service anticipates that all individuals within 382 acres of suitable habitat for the blunt-nosed leopard lizard, within 244 acres of suitable habitat for the Tipton's kangaroo rat, and within 53 acres for the Kern primrose sphinx moth could be subject to injury, mortality, harm, or harassment as a result of the proposed project.

Desert Tortoise

The Service anticipates the incidental take of all desert tortoises in the action area during the construction and O&M of the project. We anticipate that most large desert tortoises (>180 millimeters mean carapace length) will be captured and moved out of harm's way as the form of take. Large desert tortoises that are not detected during construction and O&M activities may be killed or wounded. Because of the difficulty in finding small desert tortoises, we expect that most of these individuals are likely to be killed or wounded during these activities.

For the purposes of our analysis, we estimate that approximately 5 large desert tortoises reside within the approximately 738 acres of the action area where desert tortoise may occur. We expect that we have overestimated the number of large individuals that are present. We are unable to state precisely how many desert tortoises are present within the action area for several reasons. Desert tortoises are cryptic (i.e., individuals spend much of their lives underground or concealed under shrubs), they are inactive in years of low rainfall, and their numbers and distribution within the action area may have changed since the surveys were completed because of hatchlings, deaths, immigration, and emigration. The numbers of hatchlings and eggs are even more difficult to quantify because of their small size, the location of eggs underground, and the fact that their numbers vary depending on the season; that is, at one time of the year, eggs are present but they become hatchlings later in the year.

Construction and O&M activities are likely to kill or wound few large desert tortoises because our prior experience is that the proposed avoidance and minimization measures will be effective. However, occasionally even large desert tortoises remain undetected by project personnel (i.e., Designated Biologists, Biological Monitors, construction and O&M workers) and could be killed or wounded as a result of project activities. Project personnel are likely to detect and move out of harm's way some of the small desert tortoises that occur in the action area; they are unlikely to detect eggs.

Because the Authority is not likely to find every dead or wounded desert tortoise in the action area, the number of dead or wounded individuals that are found likely will be a subset of the number that are killed or wounded. For this reason, we will consider that the Authority has exceeded the amount or extent of take if project activities kill or injure more than 2 large desert

tortoises. We used large desert tortoises to establish this amount or extent of take because small desert tortoises are difficult to find and the method by which we calculate their abundance contains more assumptions and therefore more potential for variation than does our method for predicting the number of large desert tortoises.

Least Bell's vireo

The Service anticipates that all least Bell's vireo individuals within the 24 acres of suitable habitat that will be disturbed by the project could be subject to incidental take in the form of injury, mortality, harm, or harassment.

San Joaquin kit fox

The Service anticipates that incidental take of the San Joaquin kit fox will be difficult to detect due to their shy nature which may cause harmed or harassed individuals to avoid human activity. Also, the species is nocturnal, which may result in some harm being unobservable. There is a risk of harm and injury as a result of the proposed construction activities and the permanent and the temporary loss / degradation of suitable habitat. Therefore, the Service anticipates that all San Joaquin kit fox within the 776 acres that will be disturbed by the project will be subject to incidental take in the form of harm, injury, or harassment. The Service does not anticipate direct lethal take of San Joaquin kit fox as a result of the proposed project based on project design features and the proposed conservation measures.

Upon implementation of the Reasonable and Prudent Measures, these levels of incidental take associated with the Bakersfield to Palmdale Project Section in the form of harm, harassment, capture, injury, and death of the blunt-nosed leopard lizard and the Tipton's kangaroo rat caused by habitat loss and construction and O&M activities will become exempt from the prohibitions described under section 9 of the Act.

Effect of the Take

In the accompanying biological opinion, the Service determined that this level of anticipated take is not likely to result in jeopardy to the mallow, the cactus, the sunburst, the moth, the lizard, the tortoise, the vireo, the kangaroo rat, or the kit fox.

Reasonable and Prudent Measures

All necessary and appropriate measures to avoid or minimize effects on the mallow, the cactus, the sunburst, the moth, the lizard, the tortoise, the vireo, the kangaroo rat, and the kit fox resulting from implementation of the Bakersfield to Palmdale Project Section have been incorporated into the project's proposed conservation measures. Therefore, the Service believes the following reasonable and prudent measure is necessary and appropriate to minimize incidental take of the mallow, the cactus, the sunburst, the moth, the lizard, the tortoise, the vireo, the kangaroo rat, and the kit fox:

- 1) All conservation measures, as described here in the Project Description section of this biological opinion, shall be fully implemented and adhered to. Further, this reasonable and prudent measure shall be supplemented by the terms and conditions below.

Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the Act, the Authority must ensure compliance with the following terms and conditions, which implement the reasonable and prudent measure described above. These terms and conditions are nondiscretionary.

- 1) The Authority will include full implementation and adherence to the conservation measures as a condition of any permit or contract issued for the project.
- 2) The Authority will require that all personnel associated with this project are made aware of the conservation measures and the responsibility to implement them fully.
- 3) For those components of the action that will result in habitat degradation or modification whereby incidental take in the form of harm is anticipated, the Authority will provide a precise accounting of the total acreage of habitat impacted to the Service on a monthly and annual basis as described in the reporting section of the project description.
- 4) In order to monitor whether the amount or extent of incidental take anticipated from implementation of the project is approached or exceeded, the Authority will adhere to the reporting requirements described in the project description. The Authority and Service will coordinate annually at a minimum to discuss the project and determine if any adjustments need to be made to the annual limit, the description of covered actions, or any other portion of the project.
- 5) Because it is likely that the Authority will not begin construction on the proposed project for a number of years, the Authority will confer with the Service no less than one year before the start of project construction to assess any changes to the project, the species baseline in the action area, and potential changes to the effects from the project on listed species. This process will ensure that the assessment of impacts and proposed avoidance and minimization measures within this opinion are still accurate and reflect existing conditions on the ground.

Salvage and Disposition of Individuals:

Injured listed species must be cared for by a licensed veterinarian or other qualified person(s), such as the Service-approved biologist. Dead individuals must be sealed in a resealable plastic bag containing a paper with the date and time when the animal was found, the location where it was found, and the name of the person who found it, and the bag containing the specimen frozen in a freezer located in a secure site, until instructions are received from the Service regarding the disposition of the dead specimen. The Service contact person is the San Joaquin Valley Division Supervisor at the SFWO at (916) 414-6544.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information. The Service recommends the following actions:

- 1) The Authority should continue to work with the Service to assist us in meeting the goals of the *Recovery Plan for Upland Species of the San Joaquin Valley*.

In order for the Service to be kept informed of actions minimizing or avoiding adverse effects or benefiting listed species or their habitats, the Service requests notification of the implementation of any conservation recommendations.

REINITIATION—CLOSING STATEMENT

This concludes formal consultation on the California High-Speed Rail System: Bakersfield to Palmdale Project Section. As provided in 50 CFR §402.16(a), reinitiation of consultation is required and shall be requested by the federal agency or by the Service where discretionary federal involvement or control over the action has been retained or is authorized by law, and:

- 1) If the amount or extent of taking specified in the incidental take statement is exceeded;
- 2) If new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered;
- 3) If the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in the biological opinion; or written concurrence, or
- 4) If a new species is listed or critical habitat designated that may be affected by the identified action.

If you have any questions regarding this biological opinion, please contact Justin Sloan, Senior Wildlife Biologist, at justin_sloan@fws.gov or (559) 221-1828 or Patricia Cole, Supervisor, San Joaquin Valley Division, at patricia_cole@fws.gov or (916) 414-6544, or the letterhead address.

Sincerely,



Michael Fris
Field Supervisor

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APPENDIX C: MITIGATION MONITORING AND ENFORCEMENT PLAN (MMEP)

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California High-Speed Rail Authority

Bakersfield to Palmdale

Project Section

Mitigation Monitoring and Enforcement Plan

August 2021



The environmental review, consultation, and other actions required by applicable Federal environmental laws for this project are being or have been carried out by the State of California pursuant to 23 U.S.C. 327 and a Memorandum of Understanding dated July 23, 2019, and executed by the Federal Railroad Administration and the State of California.

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**California High-Speed Rail Project
Bakersfield to Palmdale Project Section**



**MITIGATION MONITORING AND
ENFORCEMENT PLAN**

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1 INTRODUCTION

On June 25, 2021, the California High-Speed Rail Authority (Authority), as the state lead agency and as the federal lead agency pursuant to the National Environmental Policy Act (NEPA) Assignment Memorandum of Understanding (July 23, 2019), issued a Final Environmental Impact Report (EIR)/Environmental Impact Statement (EIS) (Final EIR/EIS) for the Bakersfield to Palmdale Project Section of the California High-Speed Rail (HSR) Project (the Project). The Final EIR/EIS satisfies the requirements of the California Environmental Quality Act (CEQA) and NEPA and is the basis for the Authority's decision. In its decision, the Authority selected the Preferred Alternative (Alternative 2 with the Refined César E. Chávez National Monument [CCNM] Design Option, the Avenue M Maintenance Site and Maintenance of Way Facility, and the Palmdale Station).

This Mitigation Monitoring and Enforcement Plan (MMEP)¹ has been prepared for the Preferred Alternative. As described in Section 3.1 of the Final EIR/EIS, some mitigation measures from the *Fresno to Bakersfield Section Final Supplemental Environmental Impact Report* (Authority 2018) and *Fresno to Bakersfield Section Final Supplemental Environmental Impact Statement* (Authority 2019) have been incorporated into the Final EIR/EIS to mitigate impacts for the portion of the alignment from immediately south of the F Street Station in Bakersfield, at the intersection of 34th Street and L Street, to Oswell Street. Those mitigation measures are identified with an abbreviation for the Fresno to Bakersfield Locally Generated Alternative, "F-B LGA."

Table 1 of the MMEP describes mitigation measures from the F-B LGA that apply to and would mitigate the adverse environmental impacts of the portion of the alignment from the intersection of 34th Street and L Street to Oswell Street only. Table 2 of the MMEP describes mitigation measures from the Bakersfield to Palmdale Project Section that would mitigate adverse environmental impacts of the entire Preferred Alternative from 34th and L Streets in Bakersfield to Spruce Court in Palmdale. These measures were developed by the Authority in consultation with appropriate agencies, as well as input from the public, to meet the requirements of CEQA and NEPA. The mitigation measures in Table 1 and Table 2 are conditions of approval that the Authority is required to comply with as it implements the Preferred Alternative.

The Preferred Alternative incorporates impact avoidance and minimization features (IAMFs) including Best Management Practices (BMP) identified in the Final EIR/EIS and described in detail in the technical reports that support the environmental document. As a result of incorporating these IAMFs, the Preferred Alternative will avoid potential adverse environmental impacts related to geology, soils, seismicity, and paleontological resources. In addition, the regulatory requirements, including permitting and coordination with regulatory agencies, for many project-related activities provide additional assurance that potential adverse environmental impacts will not occur. Three cooperating agencies are part of the NEPA review process: the U.S. Army Corps of Engineers (USACE), the Bureau of Land Management (BLM), and the Surface Transportation Board (STB). As part of the CEQA process, the responsible agencies include the California Department of Fish and Wildlife (CDFW), California Department of Transportation (Caltrans), California Public Utilities Commission, California State Lands Commission, Lahontan Regional Water Quality Control Board, San Joaquin Valley Air Pollution Control District, Eastern Kern Air Pollution Control District, and Antelope Valley Air Quality Management District. Like the mitigation measures listed in Table 1 and Table 2, the project IAMFs and compliance with regulatory requirements are a condition of project approval and must be implemented by the Authority during design, construction, and operation of the Preferred Alternative.

The IAMFs that are part of the Preferred Alternative are listed in Table 3, and they are described in Appendix 2-E, Impact Avoidance and Minimization Features of the Final EIR/EIS. Table 4 includes the applicable impact avoidance and mitigation measures (IAMM) from the Fresno to Bakersfield Supplemental EIR and Fresno to Bakersfield Supplemental EIS that apply only to the portion of the Preferred Alternative from 34th and L Streets to Oswell Street in Bakersfield. The

¹ The MMEP is consistent with CEQA requirements for mitigation monitoring as set forth in Sections 15091(d) and 15097 of the CEQA Guidelines (Title 14 California Code of Regulations, Division 6, Chapter 3).

laws and orders the Project is subject to are described for the following resource areas in more detail in the corresponding chapters of the Final EIR/EIS.

- Transportation – Section 3.2.2
- Air Quality and Global Climate Change – Section 3.3.2
- Noise and Vibration – Section 3.4.2
- Electromagnetic Fields and Electromagnetic Interference – Section 3.5.2
- Public Utilities and Energy – Section 3.6.2
- Biological and Aquatic Resources– Section 3.7.2
- Hydrology and Water Resources – Section 3.8.2
- Geology, Soils, Seismicity, and Paleontological Resources – Section 3.9.2
- Hazardous Materials and Wastes – Section 3.10.2
- Safety and Security – Section 3.11.2
- Socioeconomics and Communities – Section 3.12.2
- Station Planning, Land Use, and Development – Section 3.13.2
- Agricultural Farmland and Forest Land – Section 3.14.2
- Parks, Recreation, and Open Space – Section 3.15.2
- Aesthetics and Visual Quality – Section 3.16.2
- Cultural Resources – Section 3.17.2
- Regional Growth – Section 3.18.2
- Cumulative Impacts – Section 3.19.2

The MMEP adheres to the Council on Environmental Quality's (CEQ) regulations (40 Code of Federal Regulations Section 1505)² and Federal Railroad Administration Procedures for Considering Environmental Impacts (64 Federal Register 28545, May 26, 1999) and was prepared based on the CEQ finalized guidance entitled *Appropriate Use of Mitigation and Monitoring and Clarifying the Appropriate Use of Mitigated Findings of No Significant Impact* (CEQ January 14, 2011). The CEQ guidance assists NEPA lead agencies to develop mitigation programs that provide effective documentation, implementation, and monitoring of mitigation commitments.

² The Council on Environmental Quality (CEQ) issued new regulations, effective September 14, 2020, updating the NEPA implementing procedures at 40 CFR 1500-1508. However, because this project initiated the NEPA process before September 14, 2020, it is not subject to the new regulations. The Authority is relying on the regulations as they existed prior to September 14, 2020. Therefore, all citations to CEQ regulations in this environmental document refer to the 1978 regulations, pursuant to 40 CFR 1506.13 (2020) and the preamble at 85 Fed Reg. 43340.

2 MITIGATION MONITORING AND ENFORCEMENT PLAN

The environmental effects of the Preferred Alternative will result in impacts considered significant under CEQA and in impacts under NEPA. Mitigation measures that will reduce or eliminate potential adverse environmental impacts are described in Chapter 3 of Volume 1 of the Final EIR/EIS. The specific provisions contained in this MMEP are presented as tables and include mitigation measures identified in the Final EIR/EIS, organized by environmental issue and topical areas addressed in the Final EIR/EIS. In collaboration with the appropriate agencies, the Authority may refine the means by which it will implement a mitigation measure, as long as the alternative means would be equally or more effective. This MMEP describes implementation and monitoring procedural guidance, responsibilities, and timing for each mitigation measure identified in the Final EIR/EIS. Components include:

- **Impact Number and Impact Text:** Provides the impact number and description of the impact requiring mitigation as identified in the Final EIR/EIS.
- **Mitigation Measures:** Provides the number, title, and text of the mitigation measures as identified in the Final EIR/EIS.
- **Phase:** Provides the phase during which the mitigation measure will be implemented (pre-construction, during construction, post-construction, or during operation).
- **Implementation Action/Text/Mechanism:** Identifies the actions required to implement the measures, including any required agreements and/or conditions.
- **Reporting Schedule:** Identifies the stage of the project and the frequency that reporting is to occur, if reporting is required.
- **Implementing Party/Reporting Party:** Identifies the entity that will be responsible for directly implementing the mitigation measures, monitoring, and reporting. Implementation can be the responsibility of the Authority or its Design Build Contractor (Contractor). Monitoring will generally be the responsibility of the Contractor, with oversight provided by the Authority during construction. Long-term mitigation monitoring responsibilities will be the responsibility of the Authority.

The use of brackets (i.e.: []) indicate text with minor corrections compared to the mitigation measures and IAMFs as presented in the Final EIR/EIS or to direct the reader where to find the figure or table that was referenced.

2.1 Roles and Responsibilities

As the lead agency and proponent of this Project, the Authority will implement the mitigation measures through its own actions, those of its Contractors, and actions taken in cooperation with other agencies and entities. The Authority is ultimately accountable for the overall administration of the MMEP and for assisting relevant individuals and parties in their oversight and reporting responsibilities. The responsibilities of mitigation implementation, monitoring, and reporting extended to several entities as discussed above; however, the Authority will bear the primary responsibility for verifying that the mitigation measures are implemented. The Authority defines the mitigation measures required for the Project. When project work is undertaken by the Authority's contractor, the Contractor shall implement the mitigation measures that are pertinent to its scope of work. The Contractor shall monitor construction activities to ensure that the mitigation measures are being properly implemented and accurately report their activity and results to the Authority. The Authority will periodically check the Contractor's activity, reports, and effectiveness of mitigation activities.

- **Authority:** While the Authority retains responsibility for the implementation and reporting on mitigation measures and IAMFs as specified in this MMEP, activities may be carried out by an Authority representative or an Authority-approved contractor. Authority responsibilities may also include certain measures outside of the scope of the Design-Build Contractor such as future studies or operations-phase implementation. In addition,

oversight of implementation and reporting may be provided by Authority contractor or representatives as lead agency representatives to facilitate regulatory oversight agency coordination and compliance during implementation and reporting.

- **Contractor:** The Design-Build Contractor (or the environmental team provided by the Design-Build Contractor) will be responsible for implementing or monitoring mitigation measures and IAMFs as specified in this MMEP.
- **Mitigation Manager:** The Design-Build Contractor's representative responsible for overseeing their environmental team's implementation and reporting of environmental commitments will be responsible for reporting the status of each mitigation measure to the Authority in accordance with this MMEP.
- **Biological Monitor(s):** The Design-Build Contractor-provided Biological Monitor(s) will be approved by and report directly to the Contractor's Biologist. The Biological Monitor(s) will be present onsite within a reasonable monitoring distance during all ground-disturbing activities that have the potential to affect biological resources as directed by the Project Biologist and will be the principal agent(s) in the direct implementation of the MMEP and compliance assurance.
- **Cultural Resources Compliance Manager/Principal Investigator:** This position must be an Archaeologist who meets relevant Secretary of the Interior qualifications for an archaeologist. The Cultural Resources Compliance Manager/Principal Investigator is responsible for implementing mitigation measures in compliance with the terms and conditions outlined in the MMEP and treatment plans, and coordinating the status of archaeological mitigation with the Authority in accordance with this MMEP, the Authority's Programmatic Agreement with the California SHPO, and the Bakersfield to Palmdale Memorandum of Agreement.
- **Cultural Resources Monitor(s):** The Design-Build Contractor-provided Cultural Resources Monitor(s) will be approved by and report directly to the Cultural Resources Compliance Manager/Principal Investigator. This/these Monitor(s) will be present onsite within a reasonable monitoring distance during ground disturbing activities in areas indicated as culturally sensitive and will be the principal agent(s) in the direct implementation of the MMEP and compliance assurance as directed by the Cultural Resources Compliance Manager/Principal Investigator.
- **Paleontological Resources Specialist:** The Design-Build Contractor-provided Paleontological Resources Specialist is responsible for implementing mitigation measures in compliance with the terms and conditions outlined in the MMEP including preparation of the Paleontological Resources Management Plan and approval and direction of the Paleontological Resource Monitor(s).
- **Paleontological Resources Monitor(s):** The Design Build Contractor provided Paleontological Resources Monitor(s) will be approved by and report directly to the Paleontological Resources Specialist. The Paleontological Resources Monitor(s) will be present onsite within a reasonable monitoring distance during ground disturbing activities in areas indicated as resource sensitive and will be the principal agent(s) in the direct implementation of the MMEP and compliance assurance as directed by the Paleontological Resources Specialist.

3 ENVIRONMENTAL MITIGATION MANAGEMENT APPLICATION (EMMA) SYSTEM

The Authority will implement an Environmental Mitigation Management Application (EMMA) system consisting of strategic planning, policies, and procedures, organizational structure, staffing and responsibilities, milestones, schedule, and resources devoted to achieving the Authority's environmental commitments. The EMMA will also include a component that tracks the implementation of mitigation measures (as well as environmental commitments, BMPs, and IAMFs) and can produce reports on compliance. The Authority will receive periodic reports on compliance and may request additional reports as necessary to ensure that the MMEP is fully implemented. This system will rely on data provided by the design-build contractor, regional consultants, and others to produce status reports regarding construction status, permitting activities, monitoring, inspections, and other compliance activities.

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Table 1 Fresno to Bakersfield Locally Generated Alternative Project Section Mitigation Monitoring and Enforcement Plan: Mitigation Measures that Apply to the Bakersfield to Palmdale Project Section from Immediately south of the F Street Station to Oswell Street in the City of Bakersfield Only

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
Noise and Vibration										
F-B LGA N&V-MM#1	Construction Noise Mitigation Measures	<p>During construction, the contractor will monitor construction noise to verify compliance with the noise limits shown in Table 3.4-1 of the (Fresno to Bakersfield Section) Final EIR/EIS. The contractor would be given the flexibility to meet the FRA construction noise limits in the most efficient and cost-effective manner. This would be done by either prohibiting certain noise-generating activities during nighttime hours or providing additional noise control measures to meet the noise limits. A noise-monitoring program will be developed to meet required noise limits, and the following noise control mitigation measures will be implemented as necessary, for nighttime and daytime:</p> <ul style="list-style-type: none"> • Install a temporary construction site sound barrier near a noise source. • Avoid nighttime construction in residential neighborhoods. • Locate stationary construction equipment as far as possible from noise-sensitive sites. • During nighttime work, use smart back-up alarms, which automatically adjust the alarm level based on the background noise level, or switch off back-up alarms and replace with spotters. • Use low-noise emission equipment. • Implement noise-deadening measures for truck loading and operations. • Monitor and maintain equipment to meet noise limits. • Line or cover storage bins, conveyors, and chutes with sound-deadening material. • Use acoustic enclosures, shields, or shrouds for equipment and facilities. • Use high-grade engine exhaust silencers and engine-casing sound insulation. • Prohibit aboveground jackhammering and impact pile driving during nighttime hours. • Minimize the use of generators to power equipment. • Limit use of public address systems. • Grade surface irregularities on construction sites. • Use moveable sound barriers at the source of the construction activity. • Limit or avoid certain noisy activities during nighttime hours. • To mitigate noise related to pile driving, the use of an augur to install the piles instead of a pile driver would reduce noise levels substantially. If pile driving is necessary, limit the time of day that the activity can occur. 	Pre-construction/ construction	Monitoring/ reporting	Weekly	Authority/ Contractor	Contractor	Weekly monitoring construction noise/ developing and implementing noise monitoring program	Contract requirements and specifications	F-B LGA Impact N&V #1: Construction Noise F-B LGA Impact LU #1: Potential for Construction to Alter Land Use Patterns

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
F-B LGA N&V-MM#2	Construction Vibration Mitigation Measures	Building damage from construction vibration is only anticipated from impact pile driving at very close distances to buildings. If pile driving occurs more than 77 feet from fragile or historic buildings, 55 feet from residential structures, or if alternative methods such as push piling, auger piling, or cast-in-drill-hole (CIDH) can be used, damage from construction vibration is not expected to occur. Other sources of construction vibration do not generate high enough vibration levels for damage to occur. When a construction scenario has been established, preconstruction surveys are conducted at locations within 50 feet of pile driving to document the existing condition of buildings in case damage is reported during or after construction. The Authority will arrange for the repair of damaged buildings or will pay compensation to the property owner. Although vibration impacts would occur during construction activities, the construction activities are considered temporary, as they would cease after completion.	Pre-construction/ construction/ post-construction	Reporting/ funding	Weekly	Authority/ Contractor	Authority/ Contractor	Pre-construction surveys to establish baseline/ ongoing weekly monitoring during construction/ post-construction assessments and repairs building damage as needed	Contract requirements and specifications	F-B LGA Impact N&V #2: Construction Vibration F-B LGA Impact LU #1: Potential for Construction to Alter Land Use Patterns F-B LGA Impact PK #1: Construction Impacts on Parks, Recreation, Open Space and School District Recreation Facilities
F-B LGA N&V-MM#3	Implement Proposed California High-Speed Rail Project Noise Mitigation Guidelines	<p>To determine the appropriate mitigation measure for properties experiencing severe noise impacts, noise mitigation guidelines would be applied as follows:</p> <ul style="list-style-type: none"> Prior to operation of the HSR, the Authority will install sound barriers where they can achieve between 5 and 15 dBA of noise reduction, depending on their height and location relative to the tracks. The primary requirements for an effective sound barrier are that the barrier must (1) be high enough and long enough to break the line-of-sight between the sound source and the receiver, (2) be of an impervious material with a minimum surface density of 4 pounds per square foot, and (3) not have any gaps or holes between the panels or at the bottom. Because many materials meet these requirements, aesthetics, durability, cost, and maintenance considerations usually determine the selection of materials for sound barriers (examples are shown in Figure 3.4-14 of the Final EIR/EIS). Depending on the situation, sound barriers can become visually intrusive. Typically, the sound barrier style is selected with input from the local jurisdiction to reduce the visual effect of barriers on adjacent lands uses. For example, sound barriers could be solid or transparent, and made of various colors, materials, and surface treatments. The minimum number of affected sites should be at least 10, and the length of a sound barrier should be at least 800 feet. The maximum sound barrier height would be 14 feet for at-grade sections; however, all sound barriers would be designed to be as low as possible to achieve a substantial noise reduction. Berm and berm/wall combinations are the preferred types of sound barriers where space and other environmental constraints permit. On aerial structures, the maximum sound barrier height would also be 14 feet, but barrier material would be limited by engineering weight restrictions for barriers on the structure. Sound barriers on the aerial structure will still be designed to be as low as possible to achieve a substantial noise reduction. Sound barriers on both aerial structures and at-grade structures could consist of solid, semitransparent or transparent materials. The Authority will work with the communities to identify how the use and height of sound barriers would be determined using jointly developed performance criteria. Other solutions may result in higher numbers of residual impacts than reported herein. Options may be to reduce the height of sound barriers and combine barriers with sound insulation or to accept higher noise thresholds than the FRA's current noise thresholds. 	Pre-construction/ construction/ post-construction	Design	Weekly	Authority/ Contractor	Authority/ Contractor	Implement sound barriers as needed or acquire easements on properties severely affected by noise	Contract requirements and specifications/ California High-Speed Rail Project Noise Mitigation Guidelines	F-B LGA Impact N&V #3: Moderate and Severe Noise Impacts from Project Operation to Sensitive Receivers F-B LGA Impact N&V #6: Traffic Noise F-B LGA Impact PK #4: Project Changes to Park Character F-B LGA Impact BIO #6: Project Effects on Special Status Wildlife Species Direct Effects

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
		<ul style="list-style-type: none"> If sound walls are not proposed or do not reduce sound levels to below a severe impact level, building sound insulation can be installed. Sound insulation of residences and institutional buildings to improve the outdoor-to-indoor noise reduction is a mitigation measure that can be provided when the use of sound barriers is not feasible in providing a reasonable level (5 to 7 dBA) of noise reduction. Although this approach has no effect on noise in exterior areas, it may be the best choice for sites where sound barriers are not feasible or desirable and for buildings where indoor sensitivity is of most concern. Substantial improvements in building sound insulation (on the order of 5 to 10 dBA) can often be achieved by adding an extra layer of glazing to windows, by sealing holes in exterior surfaces that act as sound leaks, and by providing forced ventilation and air conditioning so that windows do not need to be opened. Performance criteria would be established to balance existing noise events and ambient roadway noise conditions as factors for determining mitigation measures. If sound barriers or sound insulation is not effective, the Authority can acquire easements on properties severely affected by noise. Another option for mitigating noise impacts is for the Authority to acquire easements on residences likely to be impacted by HSR operations in which the homeowners would accept the future noise conditions. This approach is usually taken only in isolated cases where other mitigation options are infeasible, impractical, or too costly. 								
F-B LGA N&V-MM#4	Vehicle Noise Specification	In the procurement of an HSR vehicle technology, the Authority will require bidders to meet the federal regulations (40 CFR Part 201.12/13) at the time of procurement for locomotives (currently a 90-dBA-level standard), for cars operating at speeds of greater than 45 mph. Depending on the available technology, this could significantly reduce the number of impacts throughout the corridor.	Post-construction	HSR vehicle purchasing	Prior to HSR operation	Authority	Authority	HSR vehicle noise specification	Contract requirements and specifications	F-B LGA Impact N&V #3: Moderate and Severe Noise Impacts from Project Operation to Sensitive Receivers
F-B LGA N&V-MM#5	Special Track Work	Because the impacts of HSR wheels over rail gaps at turnouts increases HSR noise by approximately 6 dBA over typical operations, turnouts can be a major source of noise impacts. If the turnouts cannot be moved from sensitive areas, the project can use special types of trackwork that eliminate the gap. Table 3.4-29 [of the Fresno to Bakersfield Section Final Supplemental EIR/EIS] provides additional mitigation measures that would reduce operational vibration levels when the train, railway, and railway structures are already in good condition. As shown in Table 3.4-29, mitigation would take place at the source, sensitive receptor, or along the propagation path from the source to the sensitive receptor. If mitigation measures provided in Table 3.4-29 are not feasible, the Authority would attempt to negotiate a vibration easement with property owners or the Authority would negotiate to relocate the property owner outside of the area subject to significant vibration impacts.	Pre-construction	Design	Prior to final design	Authority/ Contractor	Authority/ Contractor	Special track work as per Table 3.4-29 [of the Fresno to Bakersfield Section Final Supplemental EIR/EIS]	Contract requirements and specifications	F-B LGA Impact N&V #3: Moderate and Severe Noise Impacts from Project Operation to Sensitive Receivers F-B LGA Impact N&V #5: Impacts from Project Vibration

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
F-B LGA N&V-MM#6	Additional Noise and Vibration Analysis Following Final Design	<p>If final design or final vehicle specifications result in changes to the assumptions underlying the noise and vibration analysis (including analysis regarding resident and business displacements), reassess noise and vibration impacts and recommendations for mitigation and provide supplemental environmental documentation, as required by law.</p> <p>Several single-family homes will be subject to traffic peak-hour noise levels in excess of 66 dBA Leq. These noise levels would exceed the Caltrans Noise Abatement Criteria and potentially require the preparation of Noise Study Reports and noise abatement measures. In determining the reasonableness of abatement, FHWA highway traffic noise regulation requires, among other factors, the feasibility of the noise mitigation measure as well as the consideration of the viewpoints of the affected residents and property owners. Feasibility generally deals with considering whether it is possible to build an abatement measure, given site constraints; and whether the abatement measure provides a minimum reduction in noise levels. Feasibility also requires that all of the homes potentially affected face the roadway from which the noise emanates. As a result, noise mitigation measures would be infeasible for any home with a driveway for which access must be maintained. The sound barrier would not be continuous, and subsequently would not provide the minimum 5 dBA of noise reduction. A noise abatement measure is not feasible unless the measure achieves a noise reduction of at least 5 dBA for front-row receivers. Highway sound barriers are designed to protect areas of "frequent human use," which generally do not include the front yards of homes. Caltrans does not generally put sound barriers across the front yards of homes because they are acoustically infeasible and because most homeowners wish to maintain the views from the fronts of their homes.</p>	Pre-construction	Design	Prior to construction/ prior to final vehicle specification	Authority (vehicle)/ Contractor	Authority (vehicle)/ Contractor	Reassessment of noise and vibration impacts and recommended mitigation following final design	Submit assessment and supplemental environmental documentation	F-B LGA Impact N&V #3: Moderate and Severe Noise Impacts from Project Operation to Sensitive Receivers F-B LGA Impact N&V #6: Traffic Noise
F-B LGA N&V-MM#7	Station, Maintenance of Infrastructure Facility, and Traction Power Supply Station	<p>In order to reduce the noise from the facilities, the following noise mitigation measures are recommended:</p> <ul style="list-style-type: none"> • Enclose as many of the activities within the facility as possible. • Eliminate windows in the building that would face toward noise-sensitive land uses adjacent to the facility. If windows are required to be located on the side of the facility facing noise-sensitive land uses, they should be the fixed type of windows with a sound transmission class (STC) rating of at least 35. If the windows must be operable, they should be closed during nighttime activities. • Close facility doors where the rails enter the facility during nighttime activities. • Tracks that cannot be located within the facility should be located on the far side of the facility from adjacent noise-sensitive receivers. • For tracks that cannot be installed away from noise-sensitive receivers, install sound barriers along the maintenance tracks in order to protect the adjacent noise-sensitive receivers. • All mechanical equipment (compressors, pumps, generators, etc.) should be located within the facility structure. • Any mechanical equipment located exterior to the facility (compressors, pumps, generators, etc.) should be located on the far side of the facility from adjacent noise-sensitive receivers. If this is not possible, this equipment should be located within noise enclosures to mitigate the noise during operation. • All ventilation ducting for the facility should be pointed away from the adjacent noise-sensitive receivers. 	Pre-construction/ operation	Design/ facility operation	Prior to final design/ during facility operation	Authority/ Contractor	Authority/ Contractor	Reduce noise from the facilities	Contract requirements and specification	F-B Impact LGA N&V #7: Noise Impacts from HSR Stationary Facilities F-B LGA Impact N&V #3: Moderate and Severe Noise Impacts from Project Operation to Sensitive Receivers F-B LGA Impact N&V #6: Traffic Noise

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
Biological and Aquatic Resources										
F-B LGA BIO-MM#1	Designate Project Biologist(s), Regulatory Specialist(s) (Waters), Project Botanist(s), and Project Biological Monitor(s)	A Project Biologist shall be designated by the Environmental Compliance Manager to oversee regulatory compliance requirements and monitor the restoration activities associated with ground-disturbing activities in accordance with the adopted mitigation measures and applicable laws. The Project Biologist, Regulatory Specialist, and Project Botanist are responsible for the timely implementation of the biological mitigation measures as outlined in the MMEP, construction documents, and pertinent resource agency permits. Resumes for the Designated Project Biologist(s), Regulatory Specialists (Waters), and Project Botanists, and Project Biological Monitors(s) must be submitted to the USFWS during final design. Additional duties of the Project Biologist Regulatory Specialist (Waters) and Project Botanist include reviewing design documents and construction schedules, determining project biological monitoring needs, and guiding and directing the work of the Project Biological Monitors. The duties of the Project Biological Monitor include monitoring construction crew activities, as needed, to document applicable mitigation measures and permit conditions. The Project Biologist(s), Regulatory Specialist(s) (Waters), Project Botanist(s) and the Project Biological Monitor(s) report to the Mitigation Manager. The Project Biologist(s), Regulatory Specialist(s) (Waters), Project Botanist(s) and/or the Project Biological Monitor(s) may require special approval from the USFWS and CDFW to implement certain mitigation measures. In these circumstances, they are referred to as agency-approved biologist(s).	Pre-construction	Surveying/ monitoring/ reporting	Prior to construction initiation	Authority/ Contractor/ Project Biologist, Regulatory Specialist, and Project Botanist/ Mitigation Manager	Authority/ Contractor/ Project Biologist, Regulatory Specialist, and Project Botanist/ Mitigation Manager	Designate Project Biologist(s), Regulatory Specialist(s) (Waters), Project Botanist(s), and Project Biological Monitor(s) and provide resumes to regulatory agencies as required	Condition of design-build contract	F-B LGA Impact BIO #1: Effects on Special-Status Plant Species F-B LGA Impact BIO #2: Effects on Special-Status Wildlife F-B LGA Impact BIO #3: Effects on Special-Status Plant Communities F-B LGA Impact #5: Project Effects on Special-Status Plant Species F-B LGA Impact BIO #6: Project Effects on Special-Status Wildlife Species F-B LGA Impact BIO #7: Project Effects on Habitats of Concern
F-B LGA BIO-MM#2	Regulatory Agency Access	If requested, before, during, or on completion of ground-disturbing activities, the Contractor will allow access by USFWS, USACE, SWRCB, and CDFW staff to the construction site. Because of safety concerns, all visitors will be required to check in with the Contractor before accessing the construction site. If agency personnel access the construction site, the Project Biologist will prepare a memorandum within 1 day of the visit to document agency access and the issues raised during the field meeting. This memorandum will be submitted to the Mitigation Manager. Any non-compliance issues will be reported to the Contractor and Authority.	Pre-construction/ construction/ post-construction	Surveying/ monitoring/ reporting	1 day following agency site visit	Authority/ Contractor/ Project Biologist/ Mitigation Manager	Authority/ Contractor/ Project Biologist/ Mitigation Manager	Submit memorandum within 1 day of regulatory agency site visit to document field meeting	Condition of design-build contract	F-B LGA Impact BIO #1: Effects on Special-Status Plant Species F-B LGA Impact BIO #2: Effects on Special-Status Wildlife F-B LGA Impact BIO #3: Effects on Special-Status Plant Communities F-B LGA Impact #5: Project Effects on Special-Status Plant Species F-B LGA Impact BIO #6: Project Effects on Special-Status Wildlife Species F-B LGA Impact BIO #7: Project Effects on Habitats of Concern

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
F-B LGA BIO-MM#3	Prepare and Implement a Worker Environmental Awareness Program	Before the start of ground-disturbing activities, the Project Biologist, Regulatory Specialist (Waters) and Project Botanist will prepare and implement a WEAP for construction crews. WEAP training materials will include the following: discussion of the federal Endangered Species Act (federal ESA), the California Endangered Species Act (CESA), the Bald and Golden Eagle Protection Act (BGEPA), the Migratory Bird Treaty Act (MBTA), and the Clean Water Act (CWA); the consequences and penalties for violation or noncompliance with these laws and regulations and project permits; identification of special-status plants, special-status wildlife, jurisdictional waters, and special-status plant communities and explanations about their value; hazardous substance spill prevention and containment measures; the contact person in the event of the discovery of a dead or injured wildlife species; and review of mitigation measures. In the WEAP, construction timing in relation to species' habitat and life-stage requirements will be detailed and discussed on project maps, which will show areas of planned minimization and avoidance measures. A factsheet conveying this information will be prepared by the Project Biologist, Regulatory Specialist (Waters) and Project Botanist for distribution to the construction crews and to others who enter the construction footprint. On completion of the WEAP training, construction crews will sign a form stating that they attended the training, understood the information presented, and will comply with the WEAP requirements. The Project Biologist, Regulatory Specialist (Waters) and Project Botanist will submit the signed WEAP training forms to the Mitigation Manager on a monthly basis. Construction crews will be informed during the WEAP training that, except when necessary as determined in consultation with the Project Biologist, Regulatory Specialist (Waters) and Project Botanist travel within the marked project site will be restricted to established roadbeds. Established roadbeds include all pre-existing and project-constructed unimproved and improved roads.	Pre-construction/ construction	Surveying/ monitoring/ reporting.	Monthly	Authority/ Contractor/ Project Biologist/ Regulatory Specialist (Waters)/ Project Botanist/ Mitigation Manager	Contractor/ Project Biologist/ Regulatory Specialist (Waters)/ Project Botanist/ Mitigation Manager	Prepare and implement a WEAP for construction crews prior to start of construction; submit signed WEAP training forms to the Mitigation Manager on monthly basis	Condition of design-build contract	F-B LGA Impact BIO #1: Effects on Special-Status Plant Species F-B LGA Impact BIO #2: Effects on Special-Status Wildlife F-B LGA Impact BIO #3: Effects on Special-Status Plant Communities F-B LGA Impact #5: Project Effects on Special-Status Plant Species F-B LGA Impact BIO #6: Project Effects on Special-Status Wildlife Species F-B LGA Impact BIO #7: Project Effects on Habitats of Concern
F-B LGA BIO-MM#4	Prepare and Implement a Weed Control Plan and Annual Vegetation Management Plan	A construction-phase Weed Control Plan and an operation phase Annual Vegetation Control Plan will be developed and implemented. Before the start of ground-disturbing activities, the Project Botanist will prepare and oversee the implementation a Weed Control Plan to minimize or avoid the spread of weeds during ground-disturbing activities. The Weed Control Plan will address the following: Schedule for noxious weed surveys to be conducted in coordination with the Biological Resources Management Plan (BRMP) (BIO-MM#5). The success criteria for noxious and invasive weed control, as established by a qualified biologist. The success criteria will be linked to the Biological Resources Management Plan [BRMP] (BIO-MM#5) standards for onsite work during construction. In particular, the criteria will limit the introduction and spread of highly invasive species, as defined by the California Invasive Plant Council (CallPC), to less than or equal to the pre-disturbance conditions in areas temporarily impacted by construction activities. If invasive species cover is found to exceed by 10% the pre-disturbance conditions during monitoring—or is 10% more compared with a similar, nearby reference site with similar vegetation communities and management—a control effort will be implemented. If the target, or other success criteria identified in the Comprehensive Mitigation and Monitoring Plan (CMMP), has not been met by the end of the BRMP monitoring and implementation period, the Authority or its designee will continue the monitoring and control efforts, and remedial actions would be identified and implemented until the success criteria are met. Depending on monitoring results, additional or revised measures may be	Pre-construction/ construction/ post-construction/ operation	Design/ surveying/ monitoring/ reporting	Prior to construction initiation/ monthly reporting	Authority/ Contractor/ Project Botanist/ Mitigation Manager	Authority/ Contractor/ Project Botanist/ Mitigation Manager	Prepare and implement Weed Control Plan and Annual Vegetation Management Plan; monthly reporting to document implementation	Condition of design-build contract	F-B LGA Impact BIO #1: Effects on Special-Status Plant Species F-B LGA Impact BIO #2: Effects on Special-Status Wildlife F-B LGA Impact BIO #3: Effects on Special-Status Plant Communities F-B LGA Impact #5: Project Effects on Special-Status Plant Species F-B LGA Impact BIO #6: Project Effects on Special-Status Wildlife Species F-B LGA Impact BIO #7: Project Effects on Habitats of Concern

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
		<p>needed to ensure that the introduction and spread of noxious weeds are not promoted by the construction and operation of the project. Provisions to ensure that the development of the Weed Control Plan will be coordinated with development of the Restoration and Revegetation Plan (RRP) (BIO-MM#6) so that the RRP incorporates measures to reduce the spread and establishment of noxious weeds, and incorporates percent cover of noxious weeds into revegetation performance standards. Identification of weed control treatments, including the use of permitted herbicides, and manual and mechanical removal methods. Herbicide application will be restricted from use in Environmentally Sensitive Areas and on compensatory mitigation sites, which are defined in BIO-MM#7, Delineate Environmentally Sensitive Area and Environmental Restricted Area (on plans and in field).</p> <p>Determination of timing of the weed control treatment for each plant species. Identification of fire prevention measures. During operation, the Authority will generally follow the procedures established in Chapter C2 of the Caltrans Maintenance Manual to manage vegetation on Authority property [Caltrans 2014]. Vegetation would be controlled by chemical, thermal, biological, cultural, mechanical, structural, and manual methods. A separate plan, the Annual Vegetation Control Plan, would also be developed each winter for implementation no later than April 1 of each year.</p> <p>That plan would consist of site-specific vegetation control methods, as outlined below: Chemical vegetation control noting planned usage. Mowing program. Other non-chemical vegetation control plans (manual, biological, cultural, thermal (includes the use of propane heat or steam and is not specific to controlled burning) and structural). List of sensitive areas. Other chemical pest control plans (e.g., insects, snail, rodent). Only Caltrans-approved herbicides will be used in the vegetation control program. Pesticide application will be conducted in accordance with all requirements of the California Department of Pesticide Regulation and County Agricultural Commissioners by certified pesticide applicators. Noxious/invasive weeds will be treated where requested by County Agricultural Commissioners. The Authority will cooperate in area-wide control of noxious/invasive weeds if established by local agencies. Farmers/landowners who request weed control on state right-of-way that is not identified in the annual vegetation control plan will be encouraged to submit a permit request application for weed control that identifies the target weeds and control method desired. The Contractor will implement the Weed Control Plan during the construction period. The Authority will require that HSR maintenance crews follow the guidelines in the Weed Control Plan and Annual Vegetation Control Plan during project operation. The Authority or its designee will appoint the responsible party during the operations period to ensure the Annual Vegetation Control Plan is being carried out appropriately and effectively. A monthly memorandum will be prepared by the Project Botanist to document the progress of the plan and its implementation.</p>								

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
F-B LGA BIO-MM#5	Prepare and Implement a Biological Resource Management Plan	<p>During final design, the Mitigation Manager, or its designee (Project Biologist, Regulatory Specialist or Project Botanist) will prepare the Biological Resources Management Plan (BRMP) and assemble the biological resources mitigation measures. The BRMP will include terms and conditions from applicable permits and agreements and make provisions for monitoring assignments, scheduling, and responsibility. The BRMP will also include habitat replacement and revegetation, protection during ground-disturbing activities, performance (growth) standards, maintenance criteria, and monitoring requirements for temporary and permanent native plant community impacts. The parameters for the BRMP will be formed with the mitigation measures from this project-level EIR/EIS, including terms and conditions as applicable from the USFWS, USACE, SWRCB, and CDFW permits. The goal of the BRMP is to provide an organized reporting tool to ensure that the mitigation measures and terms and conditions are implemented in a timely manner and are reported on. These measures, terms, and conditions include all avoidance, minimization, repair, mitigation, and compensatory actions stated in the mitigation measures or terms and conditions from the permits referenced above. These measures, terms, and conditions are tracked through final design, implementation, and post-construction phases. The BRMP will help the long-term perpetuation of biological resources within the temporarily disturbed areas and protect adjacent targeted habitats.</p> <p>The BRMP will be submitted to the Contractor and will contain, but not be limited to, the following information:</p> <ol style="list-style-type: none"> A master schedule that shows that construction of the project, Pre-construction surveys, and establishment of buffers and exclusions zones to protect sensitive biological resources. Specific measures for the protection of special-status species. Identification (on construction plans) of the locations and quantity of habitats to be avoided or removed, along with the locations where habitats are to be restored. Procedures for vegetation analyses of temporarily affected habitats to approximate their relative composition and procedures for site preparation, irrigation, planting, and maintenance. This information may be used to determine the requirements of the revegetation areas for both onsite temporary impacts and offsite compensatory sites. Sources of plant materials and methods of propagation. Identification of specific parameters consistent with mitigation ratios and permit conditions for determining the amount of replacement habitat for temporary disturbance areas. Specification of parameters for maintenance and monitoring of re-established habitats, including weed control measures, frequency of field checks, and monitoring reports for temporary disturbance areas. Specification of performance standards for the re-established plant communities within the construction limits. Specification of the remedial measures to be taken if performance standards are not met (e.g., a form of adaptive management). Methods and requirements for monitoring restoration/replacement efforts, which will be a combination of qualitative and quantitative data consistent with mitigation measures and permit conditions. Measures to preserve topsoil and control erosion. 	Pre-construction/ construction/ post-construction	Design/ surveying/ monitoring/ reporting	Monthly or in accordance with reporting schedule established by agency agencies	Authority/ Contractor/ Mitigation Manager, Project Biologist, Regulatory Specialist or Project Botanist/ Mitigation Manager	Authority/ Contractor/ Mitigation Manager, Project Biologist, Regulatory Specialist or Project Botanist/ Mitigation Manager	Prepare and implement BRMP; monthly reporting to document implementation	Condition of the design-build contract	<p>F-B LGA Impact BIO #1: Effects on Special-Status Plant Species</p> <p>F-B LGA Impact BIO #2: Effects on Special-Status Wildlife</p> <p>F-B LGA Impact BIO #3: Effects on Special-Status Plant Communities</p> <p>F-B LGA Impact #5: Project Effects on Special-Status Plant Species</p> <p>F-B LGA Impact BIO #6: Project Effects on Special-Status Wildlife Species</p> <p>F-B LGA Impact BIO #7: Project Effects on Habitats of Concern</p>

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
		<p>l. Design of protective fencing around Environmentally Sensitive Areas (ESA), environmentally restricted areas (ERA), and the construction staging areas.</p> <p>m. Specification of the locations and quantities of gallinaceous guzzlers (catch basin/artificial watering structures) and the monitoring of water levels in them.</p> <p>n. Locations of trees to be protected as wildlife habitat (roosting sites) and locations for planting replacement trees.</p> <p>o. Specification of the purpose, type, frequency, and extent of chemical use for insect and disease control operations as part of vegetative maintenance within sensitive habitat areas.</p> <p>p. Specific construction monitoring programs for habitats of concern and special-status species, as needed.</p> <p>q. Specific measures for the protection of vernal pool habitat and riparian areas. These measures may include erosion and siltation control measures, protective fencing guidelines, dust control measures, grading techniques, construction area limits, and biological monitoring requirements.</p> <p>r. Provisions for biological monitoring during ground-disturbing activities to confirm compliance and success of protective measures. The monitoring procedures will (1) identify specific locations of wildlife habitat and sensitive species to be monitored; (2) identify the frequency of monitoring and the monitoring methods (for each habitat and sensitive species to be monitored); (3) list required qualifications of biological monitor(s), and (4) identify the reporting requirements.</p>								
F-B LGA BIO-MM#6	Prepare and Implement a Restoration and Revegetation Plan	<p>During final design, the Project Botanist will prepare a Restoration and Revegetation Plan (RRP) for temporarily disturbed upland communities. (Site restoration will also be conducted to restore temporary impacts on valley foothill riparian areas [BIO-MM#47] and jurisdictional waters [BIO-MM#48].) In the RRP, impacts on habitat subject to temporary ground disturbances that will require decompaction or regrading will be addressed, if appropriate. The Project Biologist will approve the seed mix. The standards for onsite work during construction will limit highly invasive species, as defined by the California Invasive Plant Council, to less than 10% greater than the pre-disturbance condition or as determined through a comparison with an appropriate reference site with similar natural communities and management. During ground-disturbing activities, the Contractor will implement the RRP in temporarily disturbed areas. The Project Biologist will prepare and submit compliance reports to the Mitigation Manager to document implementation and performance of the RRP.</p>	Pre-construction/ construction/ post-construction	Design/ surveying/ monitoring/ reporting	Prior to construction/ monthly reporting	Authority/ Contractor/ Project Botanist/ Mitigation Manager	Authority/ Contractor/ Project Botanist/ Mitigation Manager	Prepare and implement RRP/ monthly reporting to document implementation	Condition of design-build contract	<p>F-B LGA Impact BIO #1: Effects on Special-Status Plant Species</p> <p>F-B LGA Impact BIO #2: Effects on Special-Status Wildlife</p> <p>F-B LGA Impact BIO #3: Effects on Special-Status Plant Communities</p> <p>F-B LGA Impact #5: Project Effects on Special-Status Plant Species</p> <p>F-B LGA Impact BIO #6: Project Effects on Special-Status Wildlife Species</p> <p>F-B LGA Impact BIO #7: Project Effects on Habitats of Concern</p>

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
F-B LGA BIO-MM#7	Delineate Environmentally Sensitive Areas and Environmentally Restricted Areas (on plans and in-field)	Before the start of ground-disturbing activities, the Project Biologist, Regulatory Specialist (Waters), and Project Botanist will verify that ESAs and ERAs are delineated on final construction plans (including grading and landscape plans) and in the field and will update as necessary. ESAs are areas within the construction zone, or on compensatory mitigation sites, containing suitable habitat for special-status species and habitats of concern that may allow construction activities but have restrictions based on the presence of special-status species or habitats of concern at the time of construction. ERAs are sensitive areas that are typically outside the construction footprint that must be protected in place during all construction activities. Before and during the implementation of ground-disturbing activities, the Project Biologist, Regulatory Specialist (Waters), and Project Botanist, will mark ESAs and ERAs with high-visibility temporary fencing, flagging, or other agency-approved barriers to prevent encroachment of construction personnel and equipment. Sub-meter accurate Global Positioning System (GPS) equipment will be used to delineate all ESAs and ERAs. The Contractor will remove ESA and ERA fencing when construction is complete or when the resource has been cleared according to agency permit conditions in the MMRP and construction drawings and specifications. The Project Biologist, Regulatory Specialist (Waters), and Project Botanist will submit a memorandum regarding the field delineation and installation of all ESAs/ERAs to the Mitigation Manager.	Pre-construction/ construction	Design/ surveying/ monitoring/ reporting	Prior to construction/ reporting upon delineation and installation	Authority/ Contractor/ Project Biologist, Regulatory Specialist (Waters), and Project Botanist/ Mitigation Manager	Authority/ Contractor/ Project Biologist, Regulatory Specialist (Waters), and Project Botanist/ Mitigation Manager	Identify and establish ESAs and ERAs/ reporting to document delineation and installation	Condition of design-build contract	F-B LGA Impact BIO #1: Effects on Special-Status Plant Species F-B LGA Impact BIO #2: Effects on Special-Status Wildlife F-B LGA Impact BIO #3: Effects on Special-Status Plant Communities F-B LGA Impact #5: Project Effects on Special-Status Plant Species F-B LGA Impact BIO #6: Project Effects on Special-Status Wildlife Species F-B LGA Impact BIO #7: Project Effects on Habitats of Concern
F-B LGA BIO-MM#8	Wildlife Exclusion	The Contractor, under the supervision of the Project Biologist, will install wildlife-specific exclusion barriers at the edge of the construction footprint. Exclusion barriers will be made of durable material, regularly maintained, and installed below-grade by the Contractor under the supervision of the Project Biologist. Wildlife exclusion fencing will be installed along the outer perimeter of ESAs and ERAs and below-grade (e.g., 6 to 10 inches below-grade). The design specifications of the exclusion fencing will be determined through consultation with USFWS and/or CDFW. The wildlife exclusion barrier will be monitored, maintained at regular intervals throughout construction, and removed after the completion of major construction activities. The Project Biologist will submit a memorandum to the Mitigation Manager to document compliance with this measure.	Pre-construction/ construction	Design/ surveying/ monitoring/ reporting	Monthly or as established by agency permit requirements	Authority/ Contractor/ Project Biologist/ Mitigation Manager	Authority/ Contractor/ Project Biologist/ Mitigation Manager	Install wildlife-specific exclusion barriers/ reporting to document compliance	Condition of design-build contract	F-B LGA Impact BIO #2: Effects on Special-Status Wildlife F-B LGA Impact BIO #6: Project Effects on Special-Status Wildlife Species
F-B LGA BIO-MM#9	Equipment Staging Areas	Before the start of ground-disturbing activities, the Project Biologist, Regulatory Specialist (Waters), and Project Botanist will confirm that staging areas for construction equipment are outside areas of sensitive biological resources, including habitat for special-status species, habitats of concern, and wildlife movement corridors, to the extent feasible. The Project Biologist, Regulatory Specialist (Waters), and Project Botanist will submit a memorandum to the Mitigation Manager to document compliance with this measure.	Pre-construction/ construction	Surveying/ monitoring/ reporting	Monthly or as established by agency permit requirements	Authority/ Contractor/ Project Biologist, Regulatory Specialist (Waters), and Project Botanist/ Mitigation Manager	Authority/ Contractor/ Project Biologist, Regulatory Specialist (Waters), and Project Botanist/ Mitigation Manager	Confirm construction equipment staging areas for are outside sensitive biological resources areas/ reporting to document compliance	Condition of design-build contract	F-B LGA Impact BIO #1: Effects on Special-Status Plant Species F-B LGA Impact BIO #2: Effects on Special-Status Wildlife F-B LGA Impact BIO #3: Effects on Special-Status Plant Communities F-B LGA Impact #5: Project Effects on Special-Status Plant Species F-B LGA Impact BIO #6: Project Effects on Special-Status Wildlife Species F-B LGA Impact BIO #7: Project Effects on Habitats of Concern

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
F-B LGA BIO-MM#10	Mono-Filament Netting	Before and during the implementation of ground-disturbing activities, the Project Biologist will verify that the Contractor is not using plastic mono-filament netting (erosion-control matting) or similar material in erosion control materials; acceptable substitutes include coconut coir matting, tackified hydroseeding compounds, rice straw wattles (e.g., Earthsaver wattles: biodegradable, photodegradable, burlap), and other reusable erosion, sediment, and wildlife control systems that may be approved by the regulatory agencies (e.g., ERTEC Environmental Systems products). The Project Biologist will submit memoranda to the Mitigation Manager to document compliance with this measure; the memoranda will be submitted monthly or as appropriate throughout project construction.	Pre-construction/ construction	Design/ surveying/ monitoring/ reporting	Prior to construction/ monthly reporting	Authority/ Contractor/ Project Biologist/ Mitigation Manager	Authority/ Contractor/ Project Biologist/ Mitigation Manager	Verify Contractor is not using plastic mono-filament netting or similar in erosion control materials/ monthly reporting to document compliance	Condition of design-build contract	F-B LGA Impact BIO #2: Effects on Special-Status Wildlife F-B LGA Impact BIO #6: Project Effects on Special-Status Wildlife Species
F-B LGA BIO-MM#11	Vehicle Traffic	During ground-disturbing activities, the contractor will restrict project vehicle traffic within the construction area to established roads, construction areas, and other designated areas. The contractor will establish vehicle traffic in locations disturbed by previous activities to prevent further adverse effects, require observance of a 15 mile per hour (mph) speed limit for construction areas with potential special-status species habitat, clearly flag and mark access routes, and prohibit off-road traffic. The Project Biologist will submit a memorandum to the Mitigation Manager to document compliance with this measure; memoranda will be submitted on a weekly basis or as appropriate throughout project construction.	Construction	Surveying/ monitoring/ reporting	Weekly reporting	Authority/ Contractor/ Project Biologist/ Mitigation Manager	Contractor/ Project Biologist/ Mitigation Manager	Restrict project vehicle traffic/ weekly reporting to document compliance	Condition of design-build contract	F-B LGA Impact BIO #1: Effects on Special-Status Plant Species F-B LGA Impact BIO #2: Effects on Special-Status Wildlife F-B LGA Impact BIO #3: Effects on Special-Status Plant Communities F-B LGA Impact #5: Project Effects on Special-Status Plant Species F-B LGA Impact BIO #6: Project Effects on Special-Status Wildlife Species F-B LGA Impact BIO #7: Project Effects on Habitats of Concern
F-B LGA BIO-MM#12	Entrapment Prevention	To prevent inadvertent entrapment of protected species, the Contractor, under the guidance of the Project Biologist, will cover all excavated, steep-sided holes or trenches more than 8 inches deep at the close of each work day with plywood or similar materials or provide a minimum of one escape ramp per 10 feet of trenching (with slopes no greater than a 3:1) constructed of earth fill or wooden planks. The Project Biologist will thoroughly inspect holes and trenches for trapped animals before leaving the construction site each day. The Contractor will either screen, cover, or store more than 1 foot off the ground all construction pipe, culverts, or similar structures with a diameter of 3 inches or greater that are stored at the construction site for one or more overnight periods and these pipes, culverts, and similar structures will be inspected by the Project Biologist for wildlife before the material is moved, buried, or capped. The Project Biologist will clear stored material reserved for common and special-status wildlife species before the pipe is subsequently buried, moved, or capped (covered). The Project Biologist will submit memoranda to the Mitigation Manager to document compliance with this measure; the memoranda will be submitted on a weekly basis or as appropriate throughout project construction.	Construction	Surveying/ monitoring/ reporting	Weekly reporting	Authority/ Contractor/ Project Biologist/ Mitigation Manager	Authority/ Contractor/ Project Biologist/ Mitigation Manager	Prevent entrapment of protected species by covering holes; provide escape ramps; inspect holes for trapped animals; cover pipe, culverts, and similar structures; check stored material for animals prior to use/ weekly reporting to document compliance	Condition of design-build contract	F-B LGA Impact BIO #2: Effects on Special-Status Wildlife F-B LGA Impact BIO #6: Project Effects on Special-Status Wildlife Species

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
F-B LGA BIO-MM#13	Work Stoppage	During ground-disturbing activities, the Project Biologist, Regulatory Specialist (Waters), Project Botanist or Biological Monitor will halt work in the event that a special-status wildlife species gains access to the construction footprint. This work stoppage will be coordinated with the resident engineer and/or the Authority or its designee. The Contractor will suspend ground-disturbing activities in the immediate construction area where the potential construction activity could result in "take" of special-status wildlife species or until non-listed species, including mammals, are relocated; work may continue in other areas. Written permission will be obtained from CDFW to relocate any non-listed mammals before their being relocated. The Contractor will continue the suspension until the individual leaves voluntarily, or is relocated to a release area using USFWS- and/or CDFW-approved handling techniques and relocation methods, or as required by USFWS or CDFW. The Project Biologist, Regulatory Specialist (Waters), and Project Botanist will submit a memorandum to the Mitigation Manager to document compliance within 1 day of the work stoppage and subsequent action.	Construction	Surveying/ monitoring/ reporting	1 day following work stoppage	Authority/ Contractor/ Project Biologist, Regulatory Specialist (Waters), Project Botanist or Biological Monitor/ Mitigation Manager	Authority/ Contractor/ Project Biologist, Regulatory Specialist (Waters), Project Botanist or Biological Monitor/ Mitigation Manager	Stop work if special-status wildlife species enters construction area/ relocate animal (if possible)/ report 1 day following work stoppage	Condition of design-build contract	F-B LGA Impact BIO #1: Effects on Special-Status Plant Species F-B LGA Impact BIO #2: Effects on Special-Status Wildlife F-B LGA Impact BIO #3: Effects on Special-Status Plant Communities F-B LGA Impact #5: Project Effects on Special-Status Plant Species F-B LGA Impact BIO #6: Project Effects on Special-Status Wildlife Species F-B LGA Impact BIO #7: Project Effects on Habitats of Concern
F-B LGA BIO-MM#14	"Take" Notification and Reporting	The Project Biologist, Regulatory Specialist (Water), or Project Botanist will immediately notify the Mitigation Manager in the event of an accidental death or injury to a federal- or state-listed species during project activities. The Project Biologist will then notify USFWS and/or CDFW within 24 hours in the event of an accidental death or injury to a federal- or state-listed species during project activities. The Project Biologist will submit a memorandum to the Mitigation Manager to document compliance with this measure. The memorandum will also identify suggested revisions to the construction activities or additional measures that will be implemented to minimize or prevent future impacts.	Construction	Surveying/ monitoring/ reporting	Immediately notify Mitigation Manager/ notify USFWS and/or CDFW within 24 hours	Authority/ Contractor/ Project Biologist, Regulatory Specialist (Water), or Project Botanist/ Mitigation Manager	Authority/ Contractor/ Project Biologist/ Mitigation Manager	Immediately notify Mitigation Manager of death or injury to a federal- or state-listed species/ notify USFWS and/or CDFW within 24 hours/ document compliance	Condition of design-build contract	F-B LGA Impact BIO #1: Effects on Special-Status Plant Species F-B LGA Impact BIO #2: Effects on Special-Status Wildlife F-B LGA Impact BIO #3: Effects on Special-Status Plant Communities F-B LGA Impact #5: Project Effects on Special-Status Plant Species F-B LGA Impact BIO #6: Project Effects on Special-Status Wildlife Species F-B LGA Impact BIO #7: Project Effects on Habitats of Concern
F-B LGA BIO-MM#15	Post-Construction Compliance Reports	After each construction package, construction phase, permitting phase, or other portion of the HSR section as defined by Authority is completed, the Mitigation Manager, or their designee, will submit post-construction compliance reports consistent with the requirements of the protocols of each appropriate agency (e.g., UFSWS, CDFW), including compliance with regulatory agency permits. The Mitigation Manager will submit a memorandum to the regulatory agencies to document compliance with this measure. The frequency of the memorandum compilation and submission will be consistent with the requirements in the regulatory agency permits.	Post-construction	Reporting	In accordance with reporting schedule established by agency permit requirements	Authority/ Contractor/ Mitigation Manager	Authority/ Contractor/ Mitigation Manager	Submit memorandum to regulatory agencies documenting compliance	Condition of design-build contract	F-B LGA Impact BIO #1: Effects on Special-Status Plant Species F-B LGA Impact BIO #2: Effects on Special-Status Wildlife F-B LGA Impact BIO #3: Effects on Special-Status Plant Communities F-B LGA Impact #5: Project Effects on Special-Status Plant Species F-B LGA Impact BIO #6: Project Effects on Special-Status Wildlife Species F-B LGA Impact BIO #7: Project Effects on Habitats of Concern

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
F-B LGA BIO-MM#16	Conduct Protocol-Level Pre-Construction Surveys for Special-Status Plant Species and Special Status Plant Communities	The Project Botanist will conduct protocol-level, Pre-construction botanical surveys for special-status plant species and special-status plant communities in all potentially suitable habitats where permission to enter was not granted during the spring and summer 2010 field surveys or 2011 supplemental surveys. The surveys will be conducted during the appropriate blooming period(s) for the species before the start of ground-disturbing activities for salvage and relocation activities. The Project Botanist will mark the locations of all special-status plant species and special-status plant communities observed for the Contractor to avoid. Before the start of ground-disturbing activities, all populations of special-status plant species and special-status plant communities identified during Pre-construction surveys within 100 feet of the construction footprint will be protected and delineated by the Contractor (directed by the Project Botanist) as ERAs. As appropriate, the Project Botanist will update the mapping of special-status species or habitats of concern within the construction limits based on resource agency permits. Portions of the construction footprint that support special-status plant species that will be temporarily disturbed will be restored onsite to Pre-construction conditions. Before disturbance, Pre-construction conditions, including species composition, species richness, and percent cover of key species will be documented, and photo points will be established. If special-status plant species cannot be avoided, mitigation for impacts on these species will be documented (density, percent cover, key habitat characteristics, including soil type, associated species, hydrology, topography, and photo documentation of Pre-construction conditions) and incorporated into are location/compensation program, as defined in BIO-MM#17. The Project Botanist will provide verification of survey results and report findings through a memorandum to the Mitigation Manager to document compliance with this measure.	Pre-construction	Surveying/ monitoring/ reporting	Report findings at least 30 days prior to ground disturbance	Authority/ Contractor/ Project Botanist/ Mitigation Manager	Authority/ Contractor/ Project Botanist/ Mitigation Manager	Conduct protocol-level surveys for special-status plant species and communities in areas not surveyed in 2010-2011/ report findings/ restore temporary disturbed areas	Condition of design-build contract following requirements established by regulatory compliance permits	F-B LGA Impact BIO #1: Effects on Special-Status Plant Species F-B LGA Impact BIO #3: Effects on Special-Status Plant Communities F-B LGA Impact #5: Project Effects on Special-Status Plant Species F-B LGA Impact BIO #7: Project Effects on Habitats of Concern
F-B LGA BIO-MM#17	Prepare and Implement Plan for Salvage, Relocation and/or Propagation of Special Status Plant Species	The Project Botanist will prepare a plan before the start of ground-disturbing activities to address monitoring, salvage, relocation, and propagation of special-status plant species. The relocation or propagation of plants and seeds will be performed at a suitable mitigation site approved by the appropriate regulatory agencies, and as appropriate per species. Documentation will include provisions that address the techniques, locations, and procedures required for the successful establishment of the plant populations. The plan will include provisions for performance that address survivability requirements, maintenance, monitoring, implementation, and the annual reporting requirements. Permit conditions issued by the appropriate resource agencies (e.g., USFWS, CDFW) will guide the development of the plan and performance standards. The Project Botanist will submit a memorandum to the Mitigation Manager to document compliance with this measure.	Pre-construction/ construction/ post-construction	Surveying/ monitoring/ reporting	In accordance with agency permit requirements	Authority/ Contractor/ Project Botanist/ Mitigation Manager	Authority/ Contractor/ Project Botanist/ Mitigation Manager	Prepare and implement monitoring, salvage, relocation, and propagation of special-status plant species/ report findings	Condition of design-build contract	F-B LGA Impact BIO #1: Effects on Special-Status Plant Species F-B LGA Impact BIO #3: Effects on Special-Status Plant Communities F-B LGA Impact #5: Project Effects on Special-Status Plant Species F-B LGA Impact BIO #7: Project Effects on Habitats of Concern

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
F-B LGA BIO-MM#22	Conduct Preconstruction Surveys for Special-Status Reptile and Amphibian Species	Before the start of ground-disturbing activities, the Project Biologist will conduct Pre-construction surveys in suitable habitats to determine the presence or absence of special-status reptiles and amphibian species within the construction footprint. Surveys will be conducted no more than 30 days before the start of ground-disturbing activities and will be phased with project build-out. The results of the Pre-construction survey will be used to guide the placement of the environmentally sensitive areas, ERAs, and wildlife exclusion fencing. The Project Biologist will submit a memorandum, on a weekly basis or at other appropriate intervals, to the Mitigation Manager to document compliance with this measure.	Pre-construction/ construction	Surveying/ monitoring/ reporting	Weekly or as established by regulatory compliance agencies	Authority/ Contractor/ Project Biologist/ Mitigation Manager	Authority/ Contractor/ Project Biologist/ Mitigation Manager	Presence-absence surveys of special-status reptiles and amphibian species within the construction footprint conducted pre-construction and during construction/ report findings	Condition of design-build contract	F-B LGA Impact BIO #2: Effects on Special-Status Wildlife F-B LGA Impact BIO #6: Project Effects on Special-Status Wildlife Species
F-B LGA BIO-MM#23	Conduct Special-Status Reptile and Amphibian Monitoring, Avoidance, and Relocation	During ground-disturbing activities, the Project Biological Monitor will observe all construction activities in habitat that supports special-status reptiles and amphibians. If suitable habitat is present and environmentally sensitive areas are deemed necessary, the Project Biological Monitor will conduct a clearance survey within the area for special-status reptiles and amphibians after wildlife exclusion fencing is installed. If a special-status reptile or amphibian is present during construction, the Contractor will avoid the special-status reptile or amphibian specie. Otherwise, the Project Biological Monitor will relocate special-status reptiles or amphibians (other than California tiger salamander) found in the Environmentally Sensitive Area or construction footprint to an area outside the construction area as determined through consultation with USFWS and/or CDFW. If necessary, clearance surveys will be conducted daily. The Project Biologist will submit a memorandum, on a weekly basis or at other appropriate intervals, to the Mitigation Manager to document compliance with this measure.	Construction	Surveying/ monitoring/ reporting	Weekly or as established by regulatory compliance agencies	Authority/ Contractor/ Project Biological Monitor/ Project Biologist/ Mitigation Manager	Authority/ Contractor/ Project Biological Monitor/ Project Biologist/ Mitigation Manager	Clearance surveys as needed for special-status reptiles and amphibians/ avoidance or relocation of such species/ report findings	Condition of design-build contract	F-B LGA Impact BIO #2: Effects on Special-Status Wildlife F-B LGA Impact BIO #6: Project Effects on Special-Status Wildlife Species
F-B LGA BIO-MM#29	Conduct Preconstruction Surveys and Delineate Active Nest Exclusion Areas for Other Breeding Birds	Before the start of ground-disturbing activities, the Project Biologist will conduct visual Pre-construction surveys where suitable habitats are present for nesting birds protected by the MBTA if construction and habitat removal activities are scheduled to occur during the bird breeding season (February 1 to August 15). In the event active bird nests are encountered during the Pre-construction survey, the Project Biologist in conjunction with the Contractor will establish nest avoidance buffer zones as appropriate. The buffer distances will be consistent with the intent of the MBTA. The Project Biologist will delineate nest avoidance buffers established for ground-nesting birds in a manner that does not create predatory bird perch points in close proximity (150 feet) to the active nest site. The Project Biologist or Biological Monitor will periodically monitor active bird nests. The Project Biologist will maintain the nest avoidance buffer zone until nestlings have fledged and are no longer reliant on the nest or parental care for survival or the nest is abandoned (as determined by the Project Biologist). The Project Biologist will submit a memorandum, on a weekly basis or at other appropriate intervals, to the Mitigation Manager to document compliance with this measure.	Pre-construction/ construction	Surveying/ monitoring/ reporting	Weekly or as established by regulatory compliance agencies	Authority/ Contractor/ Project Biologist/ Biological Monitor/ Mitigation Manager	Authority/ Contractor/ Project Biologist/ Biological Monitor/ Mitigation Manager	Visual pre-construction surveys in suitable habitats for nesting birds/ establish nest avoidance buffer zones/ monitor active bird nests/ report findings	Condition of design-build contract	F-B LGA Impact BIO #2: Effects on Special-Status Wildlife F-B LGA Impact BIO #6: Project Effects on Special-Status Wildlife Species

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
F-B LGA BIO-MM#30	Conduct Preconstruction Surveys and Monitoring for Raptors	No more than 14 days before the start of ground-disturbing activities, the Project Biologist will conduct visual Pre-construction surveys where suitable habitats are present for nesting raptors if construction and habitat removal activities are scheduled to occur during the bird-breeding season (February 1 to August 15). Surveys will be conducted in areas within the construction footprint and, where permissible, within 500 feet of the construction footprint for raptor species (not Fully Protected species) and 0.5 mile of the construction footprint for Fully Protected raptor species. The required survey dates will be modified based on local conditions. If breeding raptors with active nests are found, the Project Biologist in conjunction with the Contractor will establish a 500-foot buffer around the nest to be maintained until the young have fledged from the nest and are no longer reliant on the nest or parental care for survival or the nest fails (as determined by the Project Biologist). If fully protected raptors (e.g., white tailed-kite) with active nests are found, the Project Biologist in conjunction with Contractor will establish a 0.5-mile buffer around the nest to be maintained until the young have fledged from the nest or the nest fails (as determined by the Project Biologist). Adjustments to the buffer(s) will require prior approval by USFWS and/or CDFW. The Project Biologist will submit a memorandum, on a weekly basis or at other appropriate intervals, to the Mitigation Manager to document compliance with this measure.	Pre-construction/ construction	Surveying/ monitoring/ reporting	Weekly or as established by regulatory compliance agencies	Authority/ Contractor/ Project Biologist/ Mitigation Manager	Authority/ Contractor/ Project Biologist/ Mitigation Manager	Visual pre-construction surveys in suitable habitats for nesting raptors/ establish nest avoidance buffer zones/ monitor active raptor nests/ report findings	Condition of design-build contract	F-B LGA Impact BIO #2: Effects on Special-Status Wildlife F-B LGA Impact BIO #6: Project Effects on Special-Status Wildlife Species
F-B LGA BIO-MM#31	Bird Protection	During Final Design, the Project Biologist will verify that the catenary system, masts, and other structures such as fencing are designed to be bird and raptor-safe in accordance with the applicable recommendations presented in Suggested Practices for Raptor Protection on Power Lines: The State of the Art in 2006 (APLIC 2006) and Reducing Avian Collisions with Power Lines: State of the Art in 2012 (APLIC 2012). The Project Biologist will check the final design drawings and submit a memorandum to the Mitigation Manager to document compliance with this measure.	Pre-construction	Final design	After final design check	Authority/ Project Biologist/ Mitigation Manager	Authority/ Project Biologist/ Mitigation Manager	Verify structures are bird- and raptor-safe in accordance with APLIC guidance/ report findings	Condition of design-build contract/ condition of regulatory permits	F-B LGA Impact BIO #2: Effects on Special-Status Wildlife F-B LGA Impact BIO #6: Project Effects on Special-Status Wildlife Species
F-B LGA BIO-MM#32	Conduct Protocol and Preconstruction Surveys for Swainson's Hawks	The Project Biologist will conduct Pre-construction surveys for Swainson's hawks as described in the Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in California's Central Valley (Swainson's Hawk Technical Advisory Committee [SHTAC] 2000). Surveys will be performed during the nesting season (March 1 through August 1) in the year before ground-disturbing activities within the construction footprint and within a 0.5-mile buffer, where access is permitted. The Pre-construction nest surveys following the Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in California's Central Valley (Swainson's Hawk Technical Advisory Committee 2000) will be phased with project build-out. The Pre-construction surveys will determine the status (i.e., active, inactive) of observed nests. The Project Biologist will submit a memorandum, on a weekly basis or at other appropriate intervals, to the Mitigation Manager to document compliance with this measure.	Pre-construction/ construction	Surveying/ monitoring/ reporting	Weekly or as established by regulatory compliance agencies	Authority/ Contractor/ Project Biologist/ Mitigation Manager	Authority/ Contractor/ Project Biologist/ Mitigation Manager	Pre-construction surveys for nesting Swainson's hawks/ monitor active nests/ report findings	Condition of design-build contract/ condition of regulatory permits	F-B LGA Impact BIO #2: Effects on Special-Status Wildlife F-B LGA Impact BIO #6: Project Effects on Special-Status Wildlife Species

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
F-B LGA BIO-MM#33	Swainson's Hawk Nest Avoidance and Monitoring	If active Swainson's hawk nests (defined as a nest used one or more times in the last 5 years) are found within 0.5-mile of the construction footprint during the nesting season (March 1 to August 1), the active nests within the 0.50-mile buffer of the construction footprint will be monitored daily by the Project Biological Monitor to assess whether the nest is occupied. If the nest is occupied, the health and status of the nest will be monitored until the young fledge or for the length of construction, whichever occurs first. The Project Biologist in conjunction with the Contractor, will implement buffers restricting construction activities, following CDFW's Staff Report Regarding Mitigation for Impacts to Swainson's Hawks (<i>Buteo swainsoni</i>) in the Central Valley of California (CDFG 1994). Adjustments to the buffer(s) may be made in consultation with CDFW. The Project Biologist will submit a memorandum, on a weekly basis or at other appropriate intervals, to the Mitigation Manager to document compliance with this measure.	Construction	Surveying/ monitoring/ reporting	Weekly or as established by regulatory compliance agencies	Authority/ Contractor/ Project Biologist/ Project Biological Monitor/ Mitigation Manager	Authority/ Contractor/ Project Biologist/ Mitigation Manager	Monitor active Swainson's hawk nests/ establish nest avoidance buffer zones/ report findings	Condition of design-build contract/ condition of regulatory permits	F-B LGA Impact BIO #2: Effects on Special-Status Wildlife F-B LGA Impact BIO #6: Project Effects on Special-Status Wildlife Species
F-B LGA BIO-MM#34	Monitor Removal of Nest Trees for Swainson's Hawk	Before the start of ground-disturbing activities, the Project Biological Monitor will monitor nest trees for Swainson's hawks in the construction footprint following the guidelines and methods presented in the Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in California's Central Valley (SHTAC 2000). If an occupied Swainson's hawk nest must be removed, the Authority will obtain take authorization through a Section 2081 Incidental Take Permit (including compensatory mitigation to offset the loss of the nest tree) from CDFW. If ground-disturbing activities or other project activities may cause nest abandonment by a Swainson's hawk or forced fledging within the specified buffer area, monitoring of the nest site by the Project Biological Monitor will be conducted to determine if the nest is abandoned. Removal of nesting trees outside of the nesting season (generally between October 1 and February 1) does not require authorization under the Section 2081 Incidental Take Permit. The Project Biologist will submit a memorandum, on a weekly basis or at other appropriate intervals, to the Mitigation Manager to document compliance with this measure.	Pre-construction/ construction	Surveying/ monitoring/ reporting	Weekly or as established by regulatory compliance agencies	Authority/ Contractor/ Project Biologist/ Project Biological Monitor/ Mitigation Manager	Authority/ Contractor/ Project Biologist/ Project Biological Monitor/ Mitigation Manager	Monitor Swainson's hawk nest trees/ report findings	Condition of design-build contract/ condition of regulatory permits	F-B LGA Impact BIO #2: Effects on Special-Status Wildlife F-B LGA Impact BIO #6: Project Effects on Special-Status Wildlife Species
F-B LGA BIO-MM#35	Conduct Protocol Surveys for Burrowing Owls	Before the start of ground-disturbing activities a qualified, agency-approved biologist, designated by the Project Biologist, will conduct protocol-level surveys in accordance with CDFW's Staff Report on [Burrowing Owl] Mitigation [CDFW 2012]. The Project Biologist or designee will conduct these surveys at appropriate timeframes within suitable habitat located in the construction footprint. Results of the surveys will be used to inform BIO-MM#36. These surveys will be conducted within suitable habitat of the construction footprint and within a 150-meter (approximately 500-foot) buffer. The Project Biologist will submit a memorandum, on a weekly basis or at other appropriate intervals, to the Mitigation Manager to document compliance with this measure.	Pre-construction/ construction	Surveying/ monitoring/ reporting	Weekly or as established by regulatory compliance agencies	Authority/ Contractor/ Project Biologist/ Mitigation Manager	Authority/ Contractor/ Project Biologist/ Mitigation Manager	Protocol-level surveys for burrowing owls/ report findings	Condition of design-build contract/ condition of regulatory permits	F-B LGA Impact BIO #2: Effects on Special-Status Wildlife F-B LGA Impact BIO #6: Project Effects on Special-Status Wildlife Species

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
F-B LGA BIO-MM#36	Burrowing Owl Avoidance and Minimization	<p>The Project Biologist will implement burrowing owl avoidance and minimization measures following CDFW's Staff Report on Burrowing Owl Mitigation [CDFW 2012]. During the nesting season (February 1 through August 31) occupied burrowing owl burrows will not be disturbed unless it is verified that either the birds have not begun egg-laying and incubation or the juveniles from the occupied burrows are foraging independently and are capable of independent survival (as determined by the Project Biologist). Unless otherwise authorized by CDFW, the Project Biologist in conjunction with the Contractor, will establish buffers (as an ESA) between the construction work area and occupied burrowing owl nesting sites as described in Table 3.7-19 [of the Final EIR/EIS]. Adjustments to the buffer(s) will require prior approval by CDFW. Eviction of burrowing owls outside the nesting season may be permitted pending evaluation of eviction plans and receipt of formal written approval from the CDFW authorizing the eviction. If burrowing owls must be moved from the project area, the Project Biologist will undertake passive relocation measures, including monitoring, in accordance with CDFW's (CDFW 2012) guidelines. The Project Biologist will submit a memorandum, on a weekly basis or at other appropriate intervals, to the Mitigation Manager to document compliance with this measure. California Department of Fish and Wildlife recommended restricted activity dates and setback distances by level of disturbance for burrowing owls is noted below:</p> <ul style="list-style-type: none"> • Location Time of Year Level of Disturbance • Low Medium High • Nesting Sites April 1–Aug 15 200 meters 500 meters 500 meters • Nesting Sites Aug 16–Oct 15 200 meters 200 m 500 meters • Nesting Sites Oct 16–March 31 50 meters 100 meters 500 meters 	Pre-construction/ construction	Surveying/ monitoring/ reporting	Weekly or as established by regulatory compliance agencies	Authority/ Contractor/ Project Biologist/ Mitigation Manager	Authority/ Contractor/ Project Biologist/ Mitigation Manager	Establish buffers between work area and occupied burrowing owl nesting sites/ passive relocation as needed/ report findings	Condition of design-build contract/ condition of regulatory permits	F-B LGA Impact BIO #2: Effects on Special-Status Wildlife F-B LGA Impact BIO #6: Project Effects on Special-Status Wildlife Species
F-B LGA BIO-MM#37	Conduct Surveys for Nelson's Antelope Squirrel, Tipton Kangaroo Rat, Dulzura Pocket Mouse, and Tulare Grasshopper Mouse	<p>Before the start of construction, the Project Biologist will conduct a habitat assessment in potentially suitable habitat within the project footprint to determine presence of special-status small mammal species burrows or their signs. The habitat assessment surveys will be conducted within 2 years, and no more than 14 days before the start of construction or ground-disturbing activities and may be phased with project build-out. If no burrows or signs of special-status small mammal species are detected, no further measures will be required. The Project Biologist will submit a memorandum, on a weekly basis or at other appropriate intervals, to the Mitigation Manager to document compliance with this measure.</p>	Pre-construction/ construction	Surveying/ monitoring/ reporting	Weekly or as established by regulatory compliance agencies	Authority/ Contractor/ Project Biologist/ Mitigation Manager	Authority/ Contractor/ Project Biologist/ Mitigation Manager	Conduct habitat assessment surveys for special-status small mammal species/ report findings	Condition of design-build contract/ condition of regulatory permits	F-B LGA Impact BIO #2: Effects on Special-Status Wildlife F-B LGA Impact BIO #6: Project Effects on Special-Status Wildlife Species

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
F-B LGA BIO-MM#38	Implement Avoidance and Minimization Measures for Nelson's Antelope Squirrel, Tipton Kangaroo Rat, Dulzura Pocket Mouse, and Tulare Grasshopper Mouse	<p>If during the habitat assessment, burrows or signs of special-status small mammal species are detected, the Project Biologist will establish non-disturbance exclusion zones (i.e., wildlife exclusion fencing [e.g., a silt fence or similar material]) in areas where special-status small mammal species are believed to be present. Non-disturbance exclusion zones will be established at least 14 days before the start of ground-disturbing activities. The non-disturbance exclusion fence with one-way exit/escape points will be placed to exclude the special-status small mammals from the construction area. The wildlife exclusion fence will be established around burrows in a manner that allows state-listed species to leave the construction footprint. Additional measures such as one or both of the following will be implemented after the exclusion fencing is installed.</p> <ul style="list-style-type: none"> The Contractor will trim and clear vegetation to the ground by hand or using hand-operated equipment to discourage the presence of special-status small mammal species in the construction footprint. The cleared vegetation will remain undisturbed by project construction equipment for 14 days to allow species to passively relocate through the one-way exit/escape points along the wildlife exclusion fencing. A qualified, agency-approved biologist, designated by the Project Biologist, will conduct small-mammal trapping and relocation in general accordance with the survey protocols in the California Valley Solar Ranch Project: Plan for Relocation of Giant Kangaroo Rats (<i>Dipodomys ingens</i>) (H.T. Harvey & Associates 2011) or as determined in consultation with CDFW and USFWS. 	Pre-construction/ construction	Surveying/ monitoring/ reporting	Weekly or as established by regulatory compliance agencies	Authority/ Contractor/ Project Biologist/ Mitigation Manager	Authority/ Contractor/ Project Biologist/ Mitigation Manager	Establish non-disturbance exclusion zones if burrows or signs of special-status small mammal species are detected/ relocation as needed/ report findings	Condition of design-build contract/ condition of regulatory permits	F-B LGA Impact BIO #2: Effects on Special-Status Wildlife F-B LGA Impact BIO #6: Project Effects on Special-Status Wildlife Species
F-B LGA BIO-MM#40	Conduct Preconstruction Surveys for Special-Status Bat Species	Before the start of ground-disturbing activities, a qualified, agency-approved biologist, designated by the Project Biologist, will conduct a visual and acoustic Pre-construction survey for roosting bats. A minimum of one day and one evening will be included in the visual Pre-construction survey. The Project Biologist, in coordination with the Mitigation Manager and Authority, will contact CDFW if any hibernation roosts or active nurseries are identified within or immediately adjacent to the construction footprint, as appropriate. The Project Biologist will submit a memorandum, on a weekly basis or at other appropriate intervals, to the Mitigation Manager to document compliance with this measure.	Pre-construction/ construction	Surveying/ monitoring/ reporting	Weekly or as established by regulatory compliance agencies	Authority/ Contractor/ Project Biologist/ Mitigation Manager	Authority/ Contractor/ Project Biologist/ Mitigation Manager	Conduct visual and acoustic pre-construction survey for roosting bats/ report findings	Condition of design-build contract/ condition of regulatory permits	F-B LGA Impact BIO #2: Effects on Special-Status Wildlife F-B LGA Impact BIO #6: Project Effects on Special-Status Wildlife Species
F-B LGA BIO-MM#41	Bat Avoidance and Relocation	During ground-disturbing activities, if active or hibernation roosts are found, the Contractor will avoid them, if feasible, for the period of activity. If avoidance of the hibernation roost is not feasible, the Project Biologist, will prepare a relocation plan and coordinate the construction of an alternative bat roost with CDFW. The Contractor, under the direction of the Project Biologist will implement the Bat Roost Relocation Plan before the commencement of construction activities. The Contractor, under the supervision of the Biological Monitors, will remove roosts with approval from CDFW before hibernation begins (October 31), or after young are flying (July 31), using exclusion and deterrence techniques described in BIO-MM#42, below. The timeline to remove vacated roosts is between August 1 and October 31. All efforts to avoid disturbance to maternity roosts will be made during construction activities. The Project Biologist will submit a memorandum to the Mitigation Manager, on a weekly basis or at other appropriate intervals, to document compliance with this measure.	Pre-construction/ construction	Surveying/ monitoring/ reporting	Weekly or as established by regulatory compliance agencies	Authority/ Contractor/ Project Biologist/ Biological Monitors/ Mitigation Manager	Authority/ Contractor/ Project Biologist/ Mitigation Manager	Avoid active or hibernation roosts, if feasible/ if necessary, prepare and implement relocation plan for bat roosts/ report findings	Condition of design-build contract/ condition of regulatory permits	F-B LGA Impact BIO #2: Effects on Special-Status Wildlife F-B LGA Impact BIO #6: Project Effects on Special-Status Wildlife Species

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
F-B LGA BIO-MM#42	Bat Exclusion and Deterrence	During ground-disturbing activities, if non-breeding or non-hibernating individuals or groups of bats are found within the construction footprint, the Project Biologist will direct the Contractor to safely exclude the bats by either opening the roosting area to change the lighting and air-flow conditions or installing one-way doors or other appropriate methods specified by CDFW. The Contractor will leave the roost undisturbed by project activities for a minimum of 1 week after implementing exclusion and/or eviction activities. The Contractor will not implement exclusion measures to evict bats from established maternity roosts or occupied hibernation roosts. The Project Biologist will submit a memorandum, on a weekly basis or at other appropriate intervals, to the Mitigation Manager to document compliance with this measure.	Pre-construction/ construction	Surveying/ monitoring/ reporting	Weekly or as established by regulatory compliance agencies	Authority/ Contractor/ Project Biologist/ Mitigation Manager	Authority/ Contractor/ Project Biologist/ Mitigation Manager	Safely evict bats from roosts except for established maternity roosts and occupied hibernation roosts/ report findings	Condition of design-build contract/ condition of regulatory permits	F-B LGA Impact BIO #2: Effects on Special-Status Wildlife F-B LGA Impact BIO #6: Project Effects on Special-Status Wildlife Species
F-B LGA BIO-MM#43	Conduct Preconstruction Surveys for American Badger and Ringtail	Before the start of ground-disturbing activities, the Project Biologist will conduct Pre-construction surveys for den sites within suitable habitats in the construction footprint. These surveys will be conducted no more than 30 days before the start of ground-disturbing activities and phased with project build-out. The Project Biologist will submit a memorandum, on a weekly basis or at other appropriate intervals, to the Mitigation Manager to document compliance with this measure.	Pre-construction/ construction	Surveying/ monitoring/ reporting	Weekly or as established by regulatory compliance agencies	Authority/ Contractor/ Project Biologist/ Mitigation Manager	Authority/ Contractor/ Project Biologist/ Mitigation Manager	Conduct pre-construction surveys for American badger and ringtail den sites in suitable habitats/ report findings	Condition of design-build contract/ condition of regulatory permits	F-B LGA Impact BIO #2: Effects on Special-Status Wildlife F-B LGA Impact BIO #6: Project Effects on Special-Status Wildlife Species
F-B LGA BIO-MM#44	American Badger and Ringtail Avoidance	The Contractor, under the direction of the Project Biologist, will establish a 50-foot buffer around occupied dens. The Contractor and Project Biologist will establish a 100-foot buffer around maternity dens through the pup-rearing season (American badger: February 15 through July 1; Ringtail: May 1 through June 15). Adjustments to the buffer(s) will require prior approval by CDFW as coordinated by the Project Biologist, under the supervision of the Mitigation Manager. The Project Biologist will submit a memorandum, on a weekly basis or at other appropriate intervals, to the Mitigation Manager to document compliance with this measure.	Pre-construction/ construction	Surveying/ monitoring/ reporting	Weekly or as established by regulatory compliance agencies	Authority/ Contractor/ Project Biologist/ Mitigation Manager	Authority/ Contractor/ Project Biologist/ Mitigation Manager	Establish buffer around occupied American badger and ringtail dens/ report findings	Condition of design-build contract/ condition of regulatory permits	F-B LGA Impact BIO #2: Effects on Special-Status Wildlife F-B LGA Impact BIO #6: Project Effects on Special-Status Wildlife Species
F-B LGA BIO-MM#45	Conduct Preconstruction Surveys for San Joaquin Kit Fox	Before the start of ground-disturbing activities, the Project Biologist will conduct Preconstruction surveys in accordance with USFWS' San Joaquin Kit Fox Survey Protocol for the Northern Range (USFWS 1999b). Preconstruction surveys for the kitfox will be conducted between May 1 and September 30 within the study area in suitable habitat areas (alkali desert scrub, annual grassland, pasture, barren, and compatible-use agricultural lands) to identify known or potential San Joaquin kit fox dens. Pre-construction surveys will be conducted by a USFWS-approved project biologist within 30 days before the start of construction or ground-disturbing activities and will be phased with project build-out. The Project Biologist will submit a memorandum, on a weekly basis or at other appropriate intervals, to the Mitigation Manager to document compliance with this measure.	Pre-construction/ construction	Surveying/ monitoring/ reporting	Weekly or as established by regulatory compliance agencies	Authority/ Contractor/ Project Biologist/ Mitigation Manager	Authority/ Contractor/ Project Biologist/ Mitigation Manager	Conduct pre-construction surveys for San Joaquin kit fox dens/ report findings	Condition of design-build contract/ condition of regulatory permits	F-B LGA Impact BIO #2: Effects on Special-Status Wildlife F-B LGA Impact BIO #6: Project Effects on Special-Status Wildlife Species

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
F-B LGA BIO-MM#46	Minimize Impacts on San Joaquin Kit Fox	The Contractor, under direction of the Project Biologist, will implement USFWS' Standardized Recommendations for Protection of the San Joaquin Kit Fox Prior to or During Ground Disturbance [USFWS 2011] to minimize ground disturbance-related impacts on this species. The Project Biologist will submit a memorandum, on a weekly basis or at other appropriate intervals, to the Mitigation Manager to document compliance with this measure.	Pre-construction/ construction	Surveying/ monitoring/ reporting	Weekly or as established by regulatory compliance agencies	Authority/ Contractor/ Project Biologist/ Mitigation Manager	Authority/ Contractor/ Project Biologist/ Mitigation Manager	Implement USFWS's Standardized Recommendations for Protection of the San Joaquin Kit Fox Prior to or During Ground Disturbance (USFWS 2011)/ report findings	Condition of design-build contract/ condition of regulatory permits	F-B LGA Impact BIO #2: Effects on Special-Status Wildlife F-B LGA Impact BIO #6: Project Effects on Special-Status Wildlife Species
F-B LGA BIO-MM#48	Restore Temporary Impacts on Jurisdictional Waters	During or after the completion of construction, the Contractor, under direction of the Regulatory Specialist (Waters) and Project Botanist, will restore disturbed jurisdictional waters to original topography using stockpiled and segregated soils. In areas where gravel or geotextile fabrics have been placed to protect substrate and minimize impacts on jurisdictional waters, these materials will be removed and affected features will be restored. The Contractor, under supervision of the Project Botanist, will conduct revegetation using appropriate plants and seed mixes. The Authority will conduct maintenance monitoring consistent with the provisions in the RRP (BIO-MM#6). The Project Botanist will submit a memorandum, on a weekly basis or at other appropriate intervals, to the Mitigation Manager to document compliance with this measure.	Construction/ post-construction	Restoration/ monitoring/ reporting	Weekly or as established by regulatory compliance agencies	Authority/ Contractor/ Regulatory Specialist (Waters)/ Project Botanist/ Mitigation Manager	Authority/ Contractor/ Project Botanist/ Mitigation Manager	Restore disturbed jurisdictional waters/ conduct revegetation/ report findings	Condition of design-build contract/ condition of regulatory permits	F-B LGA Impact BIO #3: Effects on Special-Status Plant Communities F-B LGA Impact BIO #7: Project Effects on Habitats of Concern
F-B LGA BIO-MM#49	Monitor Construction Activities within Jurisdictional Waters	During ground-disturbing activities, the Regulatory Specialist (Waters) and Project Biological Monitor will conduct monitoring within and adjacent to jurisdictional waters, including monitoring of the installation of protective devices (silt fencing, sandbags, fencing, etc.), installation and/or removal of creek crossing fill, construction of access roads, vegetation removal, and other associated construction activities. The Project Biological Monitor will conduct biological monitoring to document adherence to habitat avoidance and minimization measures addressed in the project mitigation measures, including, but not limited to, the provisions outlined in BIO-MM#5, BIO-MM#7, BIO-MM#8, BIO-MM#10, BIO-MM#12 through BIO-MM#15, BIO-MM#47, and BIO-MM#48. The monitor will also document adherence to all relevant conservation measures as listed in the USFWS, CDFW, SWRCB, and USACE permits. The Regulatory Specialist (Waters) will submit a memorandum, on a weekly basis or at other appropriate intervals, to the Mitigation Manager to document compliance with this measure.	Construction/ post-construction	Surveying/ monitoring/ reporting	Weekly or as established by regulatory compliance agencies	Authority/ Contractor/ Regulatory Specialist (Waters)/ Project Biological Monitor/ Mitigation Manager	Authority/ Contractor/ Regulatory Specialist (Waters)/ Mitigation Manager	Conduct monitoring of construction activities in and adjacent to jurisdictional waters/ report findings	Condition of design-build contract/ condition of regulatory permits	F-B LGA Impact BIO #3: Effects on Special-Status Plant Communities F-B LGA Impact BIO #7: Project Effects on Habitats of Concern

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
F-B LGA BIO-MM#51	Install Flashing or Slats within Security Fencing	During construction, the Contractor, under the direction of the Project Biologist, will install permanent security fencing consistent with the final design along portions of the project that are adjacent to wildlife movement corridors and natural habitats (e.g., alkali desert scrub, annual grassland). The security fencing will be enhanced with flashing or slats for 6 inches below ground surface to 12 inches above to prevent special-status reptiles and mammals from moving into the right-of-way. The fencing flashing or slats will be maintained during operation of the HSR project. The Project Biologist will verify that the installation is consistent with the designated terms and conditions in the applicable permits. The design of the reptile and mammal-proof fencing and the exact locations where reptile and mammal-proof fencing will be installed will be determined in consultation with USFWS and CDFW. The Project Biologist will submit a memorandum, on a yearly basis or at other appropriate intervals, to the Mitigation Manager to document compliance with this measure.	Pre-construction/ construction	Final design/ surveying/ monitoring/ reporting	Yearly or at other appropriate intervals	Authority/ Contractor/ Project Biologist/ Mitigation Manager	Authority/ Contractor/ Project Biologist/ Mitigation Manager	Install permanent security fencing adjacent to wildlife movement corridors and natural habitats/ report findings	Condition of design-build contract/ condition of regulatory permits	F-B LGA Impact BIO #2: Effects on Special-Status Wildlife F-B LGA Impact BIO #6: Project Effects on Special-Status Wildlife Species F-B LGA Impact BIO #7: Project Effects on Habitats of Concern
F-B LGA BIO-MM#53	Compensate for Impacts on Special-Status Plant Species	Before final design, the Authority will mitigate the impacts on special-status plants in accordance with the USFWS Biological Opinion (USFWS 2013) by implementing the following measures: <ul style="list-style-type: none"> • Compensation for federally listed plant species that are observed within the project footprint and that cannot be avoided will be compensated at a 1:1 ratio based on actual acres of direct effects by the following: <ul style="list-style-type: none"> – Identification of suitable sites to receive the listed plants. <ul style="list-style-type: none"> ▪ Pixley National Wildlife Refuge, Allensworth Ecological Reserve/State Historic Park, Kern National Wildlife Refuge, Atwell Island, Alkali Sink Ecological Reserve, Semitropic Ecological Reserve, and Kern Water Bank. ▪ Authority-proposed permittee-responsible mitigation sites. ▪ Other locations approved by USFWS. – Collection of seeds, plant materials, and top soil from the project footprint before construction impacts. The Authority or its designee will submit a memorandum to the USFWS and or CDFW to document compliance with this measure. 	Pre-construction/ construction/ post-construction	Design/ final design/ surveying/ compensatory mitigation/ reporting	Monthly or as established by regulatory compliance agencies	Authority/ Contractor/ Project Biologist/ Mitigation Manager	Authority/ Contractor/ Project Biologist/ Mitigation Manager	Compensate impacts on special-status plants at a 1:1 ratio based on actual acres of direct effects/ report findings	Condition of design-build contract/ condition of regulatory permits	F-B LGA Impact BIO #1: Effects on Special-Status Plant Species F-B LGA Impact BIO #3: Effects on Special-Status Plant Communities F-B LGA Impact #5: Project Effects on Special-Status Plant Species F-B LGA Impact BIO #7: Project Effects on Habitats of Concern
F-B LGA BIO-MM#58	Compensate for Loss of Swainson's Hawk Nesting Trees	To compensate for the loss of occupied Swainson's hawk nesting trees or mortality to offspring, the Authority will provide project specific compensatory mitigation that replaces nesting trees and provides natural lands for foraging. Compensatory mitigation for Swainson's hawk will be based on the number of trees with "active" nests that are removed by construction activities, or where construction activities create a significant habitat modification that leads to a reduction in reproductive success, or nest abandonment. If project construction occurs within 0.5 mile of a documented or observed active nest, the Authority will acquire and preserve 150 acres of natural habitat, per active nest tree removed by construction activities, or where construction activities create a significant habitat modification that leads to reduce reproductive success or nest abandonment. At a minimum, the habitat preserved will contain trees suitable to support nesting and natural foraging habitat for Swainson's hawk. The Authority will submit a memorandum to the CDFW to document compliance with this measure.	Pre-construction/ construction/ post-construction	Design/ final design/ surveying/ compensatory mitigation/ reporting	Monthly or as established by regulatory compliance agencies	Authority/ Contractor/ Project Biologist/ Mitigation Manager	Authority/ Contractor/ Project Biologist/ Mitigation Manager	Compensatory mitigation that replaces Swainson's hawk nesting trees and provides natural lands for foraging/ report findings	Condition of design-build contract/ condition of regulatory permits	F-B LGA Impact BIO #2: Effects on Special-Status Wildlife F-B LGA Impact BIO #6: Project Effects on Special-Status Wildlife Species

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
F-B LGA BIO-MM#59	Compensate for Loss of Burrowing Owl Active Burrows and Habitat	To compensate for permanent impacts on nesting, occupied, and satellite burrows and/or burrowing owl habitat, the Authority will provide compensatory mitigation based on CDFW's (CDFG 2012) Staff Report on Burrowing Owl Mitigation. The Authority will submit a memorandum to the CDFW to document compliance with this measure.	Pre-construction/ construction/ post-construction	Design/ final design/ surveying/ compensatory mitigation/ reporting	Monthly or as established by regulatory compliance agencies	Authority/ Contractor/ Project Biologist/ Mitigation Manager	Authority/ Contractor/ Project Biologist/ Mitigation Manager	Compensate for permanent impacts burrowing owls/ report findings	Condition of design-build contract/ condition of regulatory permits	F-B LGA Impact BIO #2: Effects on Special-Status Wildlife F-B LGA Impact BIO #6: Project Effects on Special-Status Wildlife Species
F-B LGA BIO-MM#60	Compensate for Destruction of San Joaquin Kit Fox Habitat	The Authority will mitigate the destruction of San Joaquin kit fox habitat by the purchase of suitable, approved habitat (USFWS and CDFW). Habitat will be replaced at a minimum ratio of 1:1 for natural lands and a ratio of 0.1:1 for suitable urban or agricultural lands to provide additional protection and habitat in a location that is consistent with the recovery of the species. The Authority will mitigate the impacts on San Joaquin kit fox in accordance with the USFWS Biological Opinion (USFWS 2013) and/or CDFW 2081(b). The Authority will submit a memorandum to the USFWS and CDFW to document compliance with this measure.	Pre-construction/ construction/ post-construction	Design/ final design/ surveying/ compensatory mitigation/ reporting	Monthly or as established by regulatory compliance agencies	Authority/ Contractor/ Project Biologist/ Mitigation Manager	Authority/ Contractor/ Project Biologist/ Mitigation Manager	Mitigate for impacts to San Joaquin kit fox habitat/ report findings	Condition of design-build contract/ condition of regulatory permits	F-B LGA Impact BIO #2: Effects on Special-Status Wildlife F-B LGA Impact BIO #6: Project Effects on Special-Status Wildlife Species
F-B LGA BIO-MM#62	Prepare and Implement a Site-Specific Comprehensive Mitigation and Monitoring Plan	As part of the USFWS, USACE, SWRCB, and CDFW permit applications and before the start of ground-disturbing activities, the Authority will prepare a CMMP to mitigate for temporary and permanent impacts on biological resources (i.e., special-status wildlife, jurisdictional waters, and riparian areas). In the CMMP, performance standards, including percent cover of native species, survivability, tree height requirements, wildlife utilization, the acreage basis, restoration ratios, and the combination of onsite and/or offsite mitigation will be detailed; preference will be given to conducting the mitigation within the same HUC-8 or HUC-6 watershed where the impact occurs. The Project Biologist will work with the USACE, SWRCB, and CDFW to develop appropriate avoidance, minimization, mitigation, and monitoring measures to be incorporated into the CMMP. The CMMP will outline the intent to mitigate for the lost conditions, functions, and values of impacts on jurisdictional waters and state streambeds consistent with resource agency requirements and conditions presented in Sections 404 and 401 of the CWA and Section 1600 of the CFGC. The CMMP will incorporate the following standard requirements consistent with USACE, SWRCB, and CDFW guidelines: <ul style="list-style-type: none"> • Description of the project impact/site. • Goal(s) (i.e., functions and values or conditions) of the compensatory mitigation project. • Description of the proposed compensatory mitigation site. • Implementation plan for the proposed compensatory mitigation site. • Maintenance activities during the monitoring period. • Monitoring plan for the compensatory mitigation site. • Completion of compensatory mitigation. • Financial assurances. • Contingency measures. Also, the following will be included at a minimum for the implementation plan: <ul style="list-style-type: none"> • Site analysis for appropriate soils and hydrology. • Site preparation specifications based on site analysis, including but not limited to grading and weeding. • Soil and plant material salvage from impact areas, as appropriate to the timing of impact and restoration as well as the location of restoration sites. 	Pre-construction/ construction/ post-construction	Design/ final design/ surveying/ compensatory mitigation/ reporting	Yearly or as established by regulatory compliance agencies	Authority/ Contractor/ Project Biologist/ Mitigation Manager	Authority/ Contractor/ Project Biologist/ Mitigation Manager	Prepare and implement CMMP for temporary and permanent impacts on biological resources/ report findings	Condition of design-build contract/ condition of regulatory permits	F-B LGA Impact BIO #1: Effects on Special-Status Plant Species F-B LGA Impact BIO #2: Effects on Special-Status Wildlife F-B LGA Impact BIO #3: Effects on Special-Status Plant Communities F-B LGA Impact #5: Project Effects on Special-Status Plant Species F-B LGA Impact BIO #7: Project Effects on Habitats of Concern

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
		<ul style="list-style-type: none"> Specifications for plant and seed material appropriate to the locality of the mitigation site. Specifications for site maintenance to establish the habitats, including but not limited to weeding and temporary irrigation. <p>Habitat preservation, enhancement, and/or establishment or restoration activities will be conducted on some of the compensatory (i.e., selected permittee-responsible) mitigation sites to achieve the mitigation goals. A detailed design of the mitigation habitats will be created in coordination with the permitting agencies and be described in the CMMP. It is recognized that several CMMPs will be developed consistent with the selected mitigation sites and the resources mitigated at each. The primary engineering and construction Contractor will ensure, through coordination with the Project Biologist, that construction is implemented in a manner that minimizes disturbance of such areas. Temporary fencing will be used during construction to avoid sensitive biological resources that are located adjacent to construction areas and can be avoided. Performance standards are targets for determining the effectiveness of the mitigation and assessing the need for adaptive management (e.g., mitigation design or maintenance revisions). The performance standards are developed so that progress towards meeting final success criteria can be assessed on an annual basis; the standard for each year is progressively closer to the final criteria (e.g., vegetation cover standards may increase annually until reaching the success criteria objective in the final year of monitoring).</p> <p>Success criteria are formal criteria that must be met after a specific timeframe to meet regulatory requirements of the permitting agencies. Where applicable, replacement planting/seeding will be implemented if monitoring demonstrates that performance standards or success criteria are not met during a particular monitoring interval. The performance standards will be used to determine whether the habitat improvement is trending toward sustainability (i.e., reduced human intervention) and to assess the need for adaptive management. These standards must be met for the habitat improvement to be declared successful, both during a particular monitoring year and at the end of the establishment period.</p> <p>These performance standards will be developed in consultation with the permitting agencies and described in the CMMP. The final success criteria will be developed in coordination with the regulatory agencies and presented in the CMMP. Examples of success criteria, which could be included in the CMMP, and would be assessed at the end of the monitoring period (assumed to be 5 years or as directed by agencies), include:</p> <ul style="list-style-type: none"> Percent survival of planted trees (65–85%, depending on species and habitat). Percent absolute cover of highly invasive species, as defined by the California Invasive Plant Council (<5%). Percent total absolute cover of plant species (50-80%, depending on habitat type). Designed wetlands will meet U.S. Army Corps of Engineers criteria for hydrophytic vegetation, hydric soils, and hydrology as defined in the "Corps of Engineers wetland delineation manual" (Environmental Laboratory 1987). Designed vernal pools and seasonal wetlands will meet inundation and seasonal drying requirements as specified in the design and indicated by agencies. 								

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
		<ul style="list-style-type: none"> Species composition and community diversity, relative to reference sites, and/or as described in the guidelines issued by permitting agencies (e.g., USFWS conservation guidelines for valley elderberry longhorn beetle). <p>Performance standards and success criteria will be provided for each of the years of monitoring and will be specific to habitat types at each permittee-responsible mitigation site. The monitoring schedule will be detailed in the site-specific CMMPs.</p> <p>To be deemed successful, the site will be required to meet the performance standards established for the year in which monitoring is being conducted (e.g., monitoring conducted at intervals with increasing performance requirements). However, if performance standards are not met in specific years, remedial measures, such as regrading, adjustment to modify the hydrological regime, and/or replacement planting or seeding, must be implemented and that year's monitoring must be repeated the following year until the performance standards are met. The success criteria specified must be reached without human intervention (e.g., irrigation, replacement plantings) aside from maintenance practices described in the site-specific CMMPs for maintenance during the establishment period.</p> <p>The Project Biologist will oversee the implementation of all CMMP elements and monitor consistent with the prescribed maintenance and performance monitoring requirements. The Authority, or its designee, will prepare annual monitoring reports for 5 years (or less if success criteria are met as described earlier) and/or other documentation prescribed in the resource agency permits. The Authority will submit a memorandum to the regulatory agencies to document compliance with this measure.</p>								

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
F-B LGA BIO-MM#63	Compensate for Permanent and Temporary Impacts on Jurisdictional Waters	<p>The Authority will mitigate permanent and temporary wetland impacts through compensation determined in consultation with the USACE, SWRCB, USFWS, and CDFW, in order to be consistent with the CMMP (BIO-MM#62).</p> <p>Regulatory compliance for jurisdictional waters includes relevant terms and conditions from the USACE 404 Permit, SWRCB 401 Permit, and CDFW 1600 Streambed Alteration Agreement.</p> <p>Compensation shall include aquatic resources restoration, establishment, enhancement, or preservation through one or more of the following methods:</p> <ul style="list-style-type: none"> • Purchase of credits from an agency-approved mitigation bank. • Fee-title-acquisition of natural resource regulatory agency-approved property. • Permittee-responsible mitigation through the establishment, re-establishment, restoration, enhancement, or preservation of aquatic resources and the establishment of a conservation easement or other permanent site protection method, along with financial assurance for long-term management of the property-specific conservation values. <p>In lieu fee contribution determined through negotiation and consultation with the various natural resource regulatory agencies. The following ratios are proposed as a minimum for compensation for permanent impacts; final ratios will be determined in consultation with the appropriate agencies:</p> <ul style="list-style-type: none"> • Vernal pools: 2:1. • Seasonal wetlands: between 1.1:1 and 1.5:1 based on impact type and function and values lost; 1:1 offsite for permanent impacts; 1:1 onsite and 0.1:1 to 0.5:1 offsite for temporary impacts. The Authority will mitigate impacts on jurisdictional waters by replacing, creating, restoring, enhancing or preserving aquatic resource at the ratios presented above or other ratios, as determined in consultation with the appropriate agencies, which compensates for functions and values lost. The Authority will consider modifying the vernal pool mitigation ratios in the final permits based on site-specific conditions and the specific life history requirements of vernal pool branchiopods, California tiger salamander, and western spadefoot toad. Where an HSR alternative affects an existing conservation area (e.g., Allensworth ER), the Authority will modify the mitigation ratio to meet the vernal pool mitigation requirement. Either the affected portion of the conservation area will be relocated or compensation will be provided to the holder of Allensworth ER in accordance with the Uniform Relocation and Real Property Policy Act of 1970, as amended. • Through the CMMP reporting program and the applicable terms and conditions from the USACE 404 Permit, SWRCB 401 Permit, and the CDFW 1600 Streambed Alteration Agreement, the Authority, or its designee, will document compliance and submit it to the regulatory agencies. 	Pre-construction/ construction/ post-construction	Design/ final design/ surveying/ compensatory mitigation/ reporting	Yearly or as established by regulatory compliance agencies	Authority/ Contractor/ Project Biologist/ Mitigation Manager	Authority/ Contractor/ Project Biologist/ Mitigation Manager	Mitigate permanent and temporary wetland impacts through compensation/ report findings	Condition of design-build contract/ condition of regulatory permits	F-B LGA Impact BIO #3: Effects on Special-Status Plant Communities F-B LGA Impact BIO #7: Project Effects on Habitats of Concern

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
F-B LGA BIO-MM#64	Compensate for Impacts on Protected Trees	<p>The Authority will compensate for impacts, including removal or trimming of naturally occurring native protected trees and landscape or ornamental protected trees, in accordance with the local regulatory body (city or county government). The local regulations and laws allow for a number of potential mitigation opportunities. The Authority will provide mitigation commensurate with the regulations and laws in that jurisdiction such that the resulting impact on protected trees is less than significant and may include, but is not limited to, the following, depending on the local jurisdiction:</p> <ul style="list-style-type: none"> • Transplant directly affected protected trees that are judged by an arborist to be in good condition to a suitable site outside the zone of impact. • Replace directly affected protected trees at an onsite or offsite location, based on the number of protected trees removed, at a ratio not to exceed 3:1 for native trees or 1:1 for landscape or ornamental trees. • Contribute to a tree-planting fund. The Authority will submit a memorandum to the local regulatory body to document compliance with this measure. 	Pre-construction/ construction/ post-construction	Design/ final design/ surveying/ compensatory mitigation/ reporting	Yearly or as established by regulatory compliance agencies	Authority/ Contractor/ Project Biologist/ Mitigation Manager	Authority/ Contractor/ Project Biologist/ Mitigation Manager	Compensate for impacts on protected trees/ report findings	Condition of design-build contract/ local regulation requirement	F-B LGA Impact BIO #3: Effects on Special-Status Plant Communities F-B LGA Impact BIO #7: Project Effects on Habitats of Concern
F-B LGA BIO-MM#65	Offsite Habitat Restoration, Enhancement, and Preservation	<p>Before site preparation at a mitigation site, the Authority will consider the offsite habitat restoration, enhancement, and preservation program and identify short-term temporary and/or long-term permanent effects on the natural landscape. A determination will be made on any effects from the physical alteration of the site to onsite biological resources, including plant communities, land cover types, and the distribution of special-status plant and wildlife. Appropriate seasonal restrictions (e.g., breeding season) on activities that result in physical alteration of the site may be applicable if suitable habitats for special-status species and sensitive habitats exist onsite. Activities resulting in the physical alteration of the site include grading/modifications to onsite topography, stockpiling, storage of equipment, installation of temporary irrigation, removal of invasive species, and alterations to drainage features.</p> <p>In general, the long-term improvements to habitat functions and values will offset temporary effects during restoration, enhancement, and preservation activities.</p> <p>The offsite habitat restoration, enhancement, and preservation program will be designed, implemented, and monitored in ways that are consistent with the terms and conditions of the USACE Section 404 Permit, CDFW 1600 Streambed Alteration Agreement, and CESA and federal ESA as they apply to their jurisdiction and resources onsite. Potential effects on site-specific hydrology and the downstream resources will be evaluated as a result of implementation of the restoration-related activity. Site-specific BMPs and a Storm Water Pollution Prevention Plan (SWPPP) will be implemented as appropriate. The Authority will report on compliance with the permitting requirements. The Authority, or its designee, will be responsible for the monitoring and tracking of the program, will prepare a memorandum of compliance, and will submit it to the appropriate regulatory agency.</p>	Pre-construction/ construction/ post-construction	Design/ final design/ surveying/ compensatory mitigation/ reporting	Yearly or as established by regulatory compliance agencies	Authority/ Contractor/ Project Biologist/ Mitigation Manager	Authority/ Contractor/ Project Biologist/ Mitigation Manager	Conduct offsite habitat restoration, enhancement, and preservation program/ report findings	Condition of design-build contract/ condition of regulatory permits	F-B LGA Impact BIO #1: Effects on Special-Status Plant Species F-B LGA Impact BIO #2: Effects on Special-Status Wildlife F-B LGA Impact BIO #3: Effects on Special-Status Plant Communities F-B LGA Impact #5: Project Effects on Special-Status Plant Species F-B LGA Impact BIO #6: Project Effects on Special-Status Wildlife Species F-B LGA Impact BIO #7: Project Effects on Habitats of Concern

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
Geology, Soils, Seismicity, and Paleontological Resources										
F-B LGA CUL-MM #16	Engage a Paleontological Resources Specialist to Direct Monitoring during Construction	A paleontological resources specialist (PRS) will be designated for the project who will be responsible for determining where and when paleontological resources monitoring should be conducted. Paleontological resource monitors will be selected by the PRS based on their qualifications, and the scope and nature of their monitoring will be determined and directed based on the Paleontological Resource Monitoring and Mitigation Plan (PRMMP). The PRS will be responsible for developing Worker Environmental Awareness Program training. All management and supervisory personnel and construction workers involved with ground-disturbing activities will be required to take this training before beginning work on the project and will be provided with the necessary resources for responding in case paleontological resources are found during construction. The PRS will document any discoveries, as needed, evaluate the potential resource, and assess the significance of the find under the criteria set forth in CEQA Guidelines Section 15064.5.	Pre-construction/ construction	Reporting	Daily logs (during active monitoring)	Contractor	Contractor	Identify PRS at least 120 days prior to construction The PRS will document any discoveries, as needed, evaluate the potential resource, and assess the significance of the find	Paleontological Resource Monitoring and Mitigation Plan (PRMMP)	F-B LGA Impact GSSP #12: Sensitive Paleontological Resources
F-B LGA CUL-MM #17	Prepare and Implement a Paleontological Monitoring and Mitigation Plan	Paleontological monitoring and mitigation measures are restricted to those construction-related activities that will result in the disturbance of paleontologically sensitive sediments. The PRMMP will include a description of when and where construction monitoring will be required; emergency discovery procedures; sampling and data recovery procedures; procedures for the preparation, identification, analysis, and curation of fossil specimens and data recovered; and procedures for reporting the results of the monitoring and mitigation program. The monitoring program will be designed to accommodate site-specific construction of the selected option. The PRMMP will be consistent with Society of Vertebrate Paleontology (SVP 2010) guidelines for the mitigation of construction impacts on paleontological resources. The PRMMP will also be consistent with the SVP (1996) conditions for receivership of paleontological collections and any specific requirements of the designated repository for any fossils collected.	Construction	Reporting	Monthly	Contractor	Contractor	Construction/ monthly reporting	PRMMP/ Worker Environmental Awareness Program (WEAP) training	F-B LGA Impact GSSP #12: Sensitive Paleontological Resources
F-B LGA CUL-MM #18	Halt Construction When Paleontological Resources Are Found	If fossil or fossil-bearing deposits are discovered during construction, regardless of the individual making a paleontological discovery, construction activity in the immediate vicinity of the discovery will cease. This requirement will be spelled out in both the PRMMP and the WEAP. Construction activity may continue elsewhere provided that it continues to be monitored as appropriate. If the discovery is made by someone other than a Paleontological Resource Monitor or the PRS, a Paleontological Resource Monitor or the PRS would immediately be notified.	Construction	Reporting	Daily logs during active monitoring	Contractor	Contractor	Construction/ weekly reporting (if resource is identified during construction)	PRMMP/ WEAP	F-B LGA Impact GSSP #12: Sensitive Paleontological Resources
Hazardous Materials and Wastes										
F-B LGA HMW-MM#1	Limit Use of Extremely Hazardous Materials near Schools during Construction	The Contractor shall not handle or store an extremely hazardous substance (as defined in California Public Resources Code Section 21151.4) or a mixture containing extremely hazardous substances in a quantity equal to or greater than the state threshold quantity specified pursuant to subdivision (j) of Section 25532 of the Health and Safety Code within 0.25 mile of a school. Prior to construction activities, signage will be installed to delimit all work areas within 0.25 mile of a school, informing the Contractor not to bring extremely hazardous substances into the area. The Contractor would be required to monitor all use of extremely hazardous substances. The above construction mitigation measure for hazardous materials and wastes is consistent with California Public Resources Code Section 21151.4.	Pre-construction/ construction	Reporting/ monitoring	Weekly	Contractor/ Hazardous Materials Monitor	Contractor	Construction/ weekly reporting	Reporting contract requirements/ specifications	F-B LGA Impact HMW#4: Temporary Hazardous Material and Waste Activities in the Proximity of Schools

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Safety and Security										
F-B LGA S&S-MM#4	Halliburton-Specific Safety and Security	<p>The following site-specific mitigation shall be implemented in all subsequent property transactions for the Golden Empire Gleaners Facility:</p> <ul style="list-style-type: none"> • Upgrade of the fire alarm and suppression system to current fire code regulations, per Office of State Fire Marshall requirements and approval. • Prohibition of regulated amounts of hazardous materials in the structure. • Annual inspection by the Office of the State Fire Marshal. • Public ownership and control of the entire facility. This could be Authority ownership, or City of Bakersfield ownership with restrictions on use and access of the facility to enforce the above mitigations. Note: State-owned property requires additional conditions by the Office of the State Fire Marshal that must be incorporated. • Restrict access to the facility by uncontrolled or uninspected trucks or step vans. • Allow audits of security protocols and processes to ensure security measures continue the level of protection warranted. • Allows HSR security personnel access, with notice, to ensure security measures are being followed. • Allow only trucks that can be visually verified to be empty may be parked under the F-B LGA viaduct. These trucks include flatbeds and trucks with equipment that would not allow hidden materials. • Only passenger cars and small trucks and vans can be parked in the employee parking under the structure. • Any change of use would require reassessment and approval. 	Construction/ post-construction/ operation	Property acquisition and easement negotiation	Weekly	Authority/ Contractor	Authority/ Contractor	Property purchase and easement negotiation	Easement negotiation with outlined stipulations	F-B LGA Impact S&S#7: Risk of Fire and Explosions at Specific Parcels
Socioeconomics and Communities										
F-B LGA SO-MM#1	Implement Measures to Reduce Impacts Associated with the Division of Existing Communities in the Unincorporated Areas East of Hanford, Northeast of Corcoran, and South of Shafter	<p>The Authority will minimize impacts associated with the F-B LGA in the rural residential areas around the community of Oildale as well as in urban residential areas in Shafter and Bakersfield by conducting special outreach to affected homeowners and residents to fully understand their special relocation needs. The Authority will make every effort to locate suitable replacement properties that are comparable to those currently occupied by these residents, including constructing suitable replacement facilities if necessary.</p> <p>In cases where residents wish to remain in the immediate vicinity, the Authority will take measures to purchase vacant land or buildings in the area, and consult with local authorities over matters such as zoning, permits, moving of homes, and replacement of services and utilities, as appropriate.</p> <p>Before land acquisition, the Authority will conduct community workshops to obtain input from those homeowners whose property would not be acquired, but whose community would be substantially altered by construction of HSR facilities, including the loss of many neighbors, to identify measures that could be taken to mitigate impacts on those who remain (including placement of sound walls and landscaping, and potential uses for remnant parcels that could benefit the community in the long term).</p>	Pre-construction/ construction/ post-construction	Reporting	Monthly	Authority	Authority	Monthly reporting	The Authority will meet with affected residents and property owners and design appropriate measures to minimize impacts	<p>F-B LGA Impact SO #6: Disruption to Community Cohesion or Division of Existing Communities from Project Operation</p> <p>F-B LGA Impact SO #7: Effects to the Regional Agricultural Community</p>

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
F-B LGA SO-MM#3	Implement Measures to Reduce Impacts Associated with the Relocation of Important Facilities	The Authority will minimize impacts resulting from the disruption to key community facilities including the Mercado Latino Tianguis, Golden Empire Gleaners (a food bank), Bakersfield Homeless Center, Kern County Veterans Service Department, Iglesia de Dios Pentecostes La Hermosa (a religious facility). The Authority will consult with the appropriate respective parties before land acquisition to assess potential opportunities to reconfigure land use and buildings and/or relocate affected facilities, as necessary, to minimize the disruption of facility activities and services, and also to ensure relocation that allows the community currently served to continue to access these services. Because many of these community facilities are located in Hispanic communities, the Authority will continue to implement a comprehensive Spanish-language outreach program for these communities as land acquisition begins. This program will facilitate the identification of approaches that would maintain continuity of operation and allow space and access for the types of services currently provided and planned for these facilities. Also, to avoid disruption to these community amenities, the Authority will ensure that all reconfiguring of land uses or buildings, or relocating of community facilities is completed before the demolition of any existing structures.	Pre-construction/ construction/ post-construction	Reporting	Monthly	Authority	Authority	Monthly reporting	The Authority will meet with affected residents and property owners and design appropriate measures to minimize impacts	F-B LGA Impact SO #6: Disruption to Community Cohesion or Division of Existing Communities from Project Operation F-B LGA Impact SO #18: Potential for Physical Deterioration F-B LGA Impact SO #1: Disruption to Community Cohesion or Division of Existing Communities from Project Construction
F-B LGA SO-MM#5	Develop Measures to Minimize the Potential for Physical Deterioration.	The Authority will work with the communities on the design of project features consistent with Technical Memorandum 200.6, <i>Aesthetic Guidelines for Non-Station Structures</i> [Authority 2011a]. The guidelines for station and non-station structures allow for contextual design responses to site-specific or unique conditions, or “context sensitive solutions”. Context sensitive solutions mean structural aesthetics must respond to local settings with concern for the human scale, building scale, and the vantage points from which the structures will be viewed. Included in the Authority’s design principles is the requirement that the structures enhance local environments and community context. Landscaping will be used to visually integrate project structures into the local context with plantings that recreate the natural setting into which they are placed. The aesthetic design of project structures, in combination with landscape and urban design that serve the local community, can create a positive contribution to the surrounding visual context and minimize the potential for physical deterioration.	Pre-construction/ construction	Reporting/ monitoring	Monthly	Authority	Authority	Monthly reporting	The Authority will meet with affected residents and property owners and design appropriate measures to minimize impacts. The Authority will hold workshops and create reports based on workshop and design findings	F-B LGA Impact SO #6 – Disruption to Community Cohesion or Division of Existing Communities from Project Operation F-B LGA Impact SO #18: Potential for Physical Deterioration F-B LGA Impact SO #7: Effects to the Regional Agricultural Community
Parks, Recreation, and Open Space										
F-B LGA PP-MM#1	Temporary Closures of Park Property During Construction	Prior to temporary closures of linear park facilities, the Authority will ensure that connections to the unaffected park portions or nearby roadways are maintained. If a proposed linear park closure restricts connectivity, the Authority will provide alternative pedestrian and bicycle access via existing roadways or other public rights-of-way. The Authority will provide detour signage and lighting and will ensure that the alternative routes meet all public safety requirements.	Pre-construction/ construction	Maintenance of access to parks	Monthly	Authority	Authority	Monthly reporting	Authority will ensure access as outlined in mitigation text	F-B LGA Impact PK #1: Construction Impacts on Parks, Recreation, Open Space and School District Recreation Facilities
F-B LGA PP-MM#3	Collect Additional Maintenance Funds	The Authority will consult with affected jurisdictions to identify its share of funding to provide additional maintenance, labor, and repairs for the existing park areas to remedy any potential degradation of existing facilities that may result from increased facility use. Prior to project construction, the Authority will enter into an agreement with the affected jurisdictions (City of Bakersfield and Kern County) that establishes the funding share and describes the relative roles of the Authority and the affected jurisdictions in providing continuous maintenance of existing play areas, or compensation for play areas acquired in order to accommodate the project.	Pre-construction/ construction/ post-construction/ operations	Compensation	Monthly	Authority	Authority	Authority to coordinate with local jurisdictions	The Authority will coordinate with the affected jurisdictions to identify appropriate funding amounts	F-B LGA Impact PK #2: Project Acquisition of Parks, Recreation, and Open Space Resources

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Aesthetics and Visual Resources										
F-B LGA AVR-MM#1a	Minimize Visual Disruption from Construction Activities	<p>The project will adhere to local jurisdiction construction requirements (if applicable) regarding construction-related visual/aesthetic disruption. In order to minimize visual disruption, construction will employ the following activities:</p> <ul style="list-style-type: none"> Minimize pre-construction clearing to that necessary for construction. Limit the removal of buildings to those that would obstruct project components. When possible, preserve existing vegetation, particularly vegetation along the edge of construction areas that may help screen views. After construction, regrade areas disturbed by construction, staging, and storage to original contours and revegetate with plant material similar in replacement numbers and types to that which was removed based upon local jurisdictional requirements. If there are no local jurisdictional requirements, replace removed vegetation at a 1:1 replacement ratio for shrubs and small trees, and 2:1 replacement ratio for mature trees. For example, if 10 mature trees in an area are removed, replant 20 younger trees that after 5 to 15 years (depending upon the growth rates of the trees) would provide coverage similar to the coverage provided by the trees that were removed for construction. To the extent feasible, do not locate construction staging sites within the immediate foreground distance (0 to 500 feet) of existing residential, recreational, or other high-sensitivity receptors. Where such siting is unavoidable, staging sites will be screened from sensitive receptors using appropriate solid screening materials such as temporary fencing and walls. Any graffiti or visual defacement of temporary fencing and walls will be painted over or removed within 5 business days. 	Pre-construction/ construction/ post-construction	Reporting	Weekly	Contractor	Contractor	Construction/ weekly reporting	Contract requirements/ specifications	F-B LGA Impact AVR #2: Construction Impacts on Existing Visual Quality F-B LGA Impact PK #1: Construction Impacts on Parks, Recreation, Open Space and School District Recreation Facilities
F-B LGA AVR-MM#1b	Minimize Light Disturbance during Construction	Where construction lighting will be required during nighttime construction, the Contractor will be required to shield such lighting and direct it downward in such a manner that the light source is not visible offsite, and so that the light does not fall outside the boundaries of the project site to avoid light spill offsite.	Pre-construction/ construction/ post-construction	Reporting	Weekly	Contractor	Contractor	Construction/ weekly reporting	Contract requirements/ specifications	F-B LGA Impact AVR #3: Construction Impact from Light and Glare F-B LGA Impact PK #1: Construction Impacts on Parks, Recreation, Open Space and School District Recreation Facilities
F-B LGA AVR-MM#2a	Incorporate Design Criteria for Elevated and Station Elements That Can Adapt to Local Context	<p>During final design of the elevated guideways and the Fresno, Kings/Tulare Regional, and Bakersfield stations, the contractor partnering with the Authority will coordinate with local jurisdictions on the design of these facilities so that they are designed appropriately to fit in with the visual context of the areas near them. This will include the following activities:</p> <ul style="list-style-type: none"> For stations: During the station design process, establish a local consultation process with the Cities of Fresno and Bakersfield, and the cities and communities surrounding the Kings/Tulare Regional Station, as necessary, to identify and integrate local design features into the station design through a collaborative, context-sensitive solutions approach. The process will include activities to solicit community input in their respective station areas. This effort will be coordinated with the station area planning process that will be undertaken by those cities under their station area planning grants. For elevated guideways in cities or unincorporated communities: During the elevated guideway design process, establish a process with the city or county with jurisdiction over the land along the elevated guideway to advance the final design through a collaborative, context-sensitive solutions approach. Participants in the consultation process will meet on 	Pre-construction/ design	Reporting	During final design/ prior to construction/ monthly reporting	Contractor/ Authority	Contractor/ Authority	Final design and construction/ monthly reporting	Established local consultation process with communities along the alignment	F-B LGA Impact AVR #4: Lower Visual Quality in the East Bakersfield Landscape Unit F-B LGA Impact AVR#5: Visual Quality Effects to Schools F-B LGA Impact PK#4: Project Changes to Park Character

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
		<p>a regular basis to develop a consensus on the urban design elements that are to be incorporated into the final guideway designs. The process will include activities to solicit community input in the affected neighborhoods.</p> <ul style="list-style-type: none"> • Actions taken to help achieve integration with the local design context during the context-sensitive solutions process will include the following: • Design HSR stations and associated structures such as elevators, escalators, and walkways to be attractive architectural elements or features that add visual interest to the streetscapes near them. • Design HSR station parking structures and adjacent areas to integrate visually into the areas where they would be located. Where the city has adopted applicable downtown design guidelines, the parking structures and adjacent areas will be designed to be compatible with the policies and principles of those guidelines. • For the elevated guideways and columns, incorporate architectural elements, such as graceful curved or tapered sculptural forms and decorative surfaces, to provide visual interest. Include decorative texture treatments on large-scale concrete surfaces such as parapets and other portions of elevated guideways. Include a variety of texture, shadow lines, and other surface articulation to add visual and thematic interest. Closely coordinate the design of guideway columns and parapets with station and platform architecture to promote unity and coherence where guideways lie adjacent to stations. • Integrate trees and landscaping into the station streetscape and plaza plans where possible to soften and buffer the appearance of guideways, columns, and elevated stations. This will be consistent with the principles of crime prevention through environmental design. • For the stations, structures, and related open spaces: incorporate design features that provide interest and reflect the local design context. These features could include landscaping, lighting, and public art. • The designs in cities and unincorporated communities will reflect the results of the context-sensitive solutions design process. During the context-sensitive solutions design process, the HSR project's obligations and constraints related to planning, mitigation, engineering, performance, funding, and operational requirements will be taken into consideration. 								
F-B LGA AVR-MM#2b	Integrate Elevated Guideway into Affected Cities, Parks, Trail, and Urban Core Designs	During development of the final design, the Authority will work with the affected cities and counties to develop a project site and landscape design plan for the areas disturbed by the project. As a result of following these plans, the design features identified in [F-B LGA] AVR-MM#2a and the park mitigation measure [F-B LGA] PP-MM#3 will be implemented.	Pre-construction/ design	Reporting	Monthly	Contractor	Contractor and Authority	Construction/ monthly reporting	Contract requirements/ specifications Authority will meet with local jurisdictions during development of final design	F-B LGA Impact AVR #4: Lower Visual Quality in the East Bakersfield Landscape Unit F-B LGA Impact AVR#5: Visual Quality Effects to Schools

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
F-B LGA AVR-MM#2e	Provide Offsite Landscape Screening Where Appropriate	Where onsite landscape screening measures as described under [F-B LGA] AVR-MM#2d cannot provide effective screening to significantly affected high-sensitivity receptors such as nearby rural residential areas, provide offsite screening, as appropriate, if desired by affected residential owners.	Pre-construction/operation	Reporting	Monthly	Authority	Contractor/Environmental Compliance Manager/Mitigation Manager/Authority	Post - construction/ monthly reporting	Contract requirements/ specifications and landscaping and maintenance will be provided by the Contractor for its scope of work until substantial completion of the work at which time the Authority shall assume responsibility for landscaping or assign the responsibility to other third parties.	F-B LGA Impact AVR #4: Lower Visual Quality in the East Bakersfield Landscape Unit F-B LGA Impact AVR#5: Visual Quality Effects to Schools
F-B LGA AVR-MM#2f	Landscape Treatments along the HSR Project Overcrossings and Retained Fill Elements of the HSR	Upon the completion of construction, the contractor will plant the surface of the ground supporting the overpasses (slope-fill overpasses) and retained fill elements with vegetation consistent with the surrounding landscape in terms of vegetative type, color, texture, and form. During final design, the Authority will consult with the affected cities and counties regarding the landscaping program for planting the slopes of the overcrossings and retained fill. Plant species will be selected on the basis of their mature size and shape, growth rate, and drought tolerance. No species that is listed on the Invasive Species Council of California's list of invasive species will be planted. The landscaping will be continuously maintained and appropriate irrigation systems will be installed if needed. Where wall structures supporting the overpasses or retained fill are proposed, the structure will employ architectural details and low-maintenance trees and other vegetation to screen the structure, minimize graffiti, and reduce the effects of large walls. Surface coatings will be applied on wood and concrete to facilitate cleaning and the removal of graffiti. Any graffiti or visual defacement or damage of fencing and walls will be painted over or repaired within a reasonable time after notification.	Pre-construction/operation	Reporting	Monthly	Authority	Contractor/Environmental Compliance Manager/Mitigation Manager/Authority	Post - construction/ monthly reporting	Contract requirements/ specifications and landscaping and maintenance will be provided by the Contractor for its scope of work until substantial completion of the work at which time the Authority shall assume responsibility for landscaping or assign the responsibility to other third parties.	F-B LGA Impact AVR #4: Lower Visual Quality in the East Bakersfield Landscape Unit F-B LGA Impact AVR#5: Visual Quality Effects to Schools Impact AVQ #3: Permanent Impacts Related to Construction of a Large High-Speed Rail Structure

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
F-B LGA AVR-MM#2g	Provide Sound Barrier Treatments	<p>The contractor will design a range of sound barrier treatments for visually sensitive areas, such as those where residential views of open landscaped areas would change or in urban areas where sound barriers would adversely affect the existing character and setting (see the description of sound barriers in Table 3.16-2 [of the Fresno to Bakersfield Section Final EIR/EIS]). The Authority will develop the treatments during final design and integrate them into the final project design. The treatments will include, but are not limited to, the following:</p> <ul style="list-style-type: none"> • Sound barriers along elevated guideways may incorporate transparent materials where sensitive views would be adversely affected by solid sound barriers. • Sound barriers will use non-reflective materials and will be of a neutral color. • Surface design enhancements and vegetation appropriate to the visual context of the area will be installed with the sound barriers. Surface enhancements will be consistent with the design features developed under AVR-MM#2a, and will include architectural elements (i.e., stamped pattern, surface articulation, and decorative texture treatment as determined acceptable to the local jurisdiction. Surface coatings will be used on wood and concrete sound barriers to facilitate cleaning and the removal of graffiti. 	Pre-construction/ construction	Reporting	Monthly	Contractor	Contractor	Construction/ monthly reporting	Contract requirements/ specifications	F-B LGA Impact AVR #4: Lower Visual Quality in the East Bakersfield Landscape Unit F-B LGA Impact AVR#5: Visual Quality Effects to Schools
Cultural Resources										
F-B LGA CUL-MM #12	Prepare and Submit Additional Recordation and Documentation	<p>A BETP will identify specific historical resources that would be physically altered, damaged, relocated, or destroyed by the project that will be documented in detailed recordation that includes photography. This documentation may consist of preparation of updated recordation forms (DPR 523), or may be consistent with the Historic American Building Survey, the Historic American Engineering Record (HAER), or the Historic American Landscape Survey (HALS) programs; a Historic Structure Report; or other recordation methods stipulated in the MOA and described in the BETP. The recordation undertaken by this treatment would focus on the aspect of integrity that would be affected by the project for each historic property subject to this treatment. For example, historic properties in an urban setting that would experience an adverse visual effect would be photographed to capture exterior and contextual views; interior spaces would not be subject to recordation if they would not be affected.</p> <p>Consultation with the SHPO and the consulting parties will be conducted for the historic architectural resources to be documented. Recordation documents will follow the appropriate guidance for the recordation format and program selected.</p> <p>In addition to any copies required by a selected recordation program, additional copies of the documentation will be provided to the consulting parties and offered to the appropriate local governments, historical societies and agencies, or other public repositories, such as libraries. The documentation will also be offered in printed and electronic form to any repository or organization to which the SHPO, the Authority, and the local agency with jurisdiction over the property, through consultation, may agree. The electronic copy of the documentation may also be placed on an agency or organization's website.</p>	Pre-construction/ construction	Reporting	Monthly	Contractor, Authority to coordinate with SHPO	Contractor	Prior to construction/ monthly reporting	BETP/ Photographs and nomination document, HABS/ HAER/ HALS/ MOA	F-B LGA Impact CUL-2: Potential Adverse Effects on Historic Architectural [Built] Resources Due to Construction Activities: Introduction of Visual Elements

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
F-B LGA CUL-MM #13	Prepare Interpretive or Educational Materials	Based on the finalization of design and the completed inventory, the BETP will identify historic properties and historical resources that will be subject to historic interpretation or preparation of educational materials. Interpretive and educational materials will provide information regarding specific historic properties or historical resources and will address the aspect of the significance of the properties that would be affected by the project. Interpretive or educational materials could include, but are not limited to: brochures, videos, websites, study guides, teaching guides, articles or reports for general publication, commemorative plaques, or exhibits. Historic properties and historical resources subject to demolition by the project will be the subject of informative permanent metal plaques that will be installed at the site of the demolished historic property or at nearby public locations. Each plaque will provide a brief history of the subject property, its engineering/architectural features and characteristics, and the reasons for and the date of its demolition. The interpretive or educational materials will utilize images, narrative history, drawings, or other material produced for the mitigation described above, including the additional recordation prepared, or other archival sources. The interpretive or educational materials should be advertised, and made available to, and/or disseminated to the public. The interpretive materials may be made available in physical or digital formats at local libraries, historical societies, or public buildings.	Post-construction	Reporting	Annual	Authority	Authority, in consultation with SHPO and appropriate consulting parties	Post-construction/annual reporting	BETP/photographic documentation/plan for repairs to historic properties	F-B LGA Impact CUL-2: Potential Adverse Effects on Historic Architectural [Built] Resources Due to Construction Activities: Introduction of Visual Elements
Cumulative Impacts										
F-B LGA CUM-N&V-MM#1	Consult with Agencies Regarding Construction Activities	To minimize the potential overlapping noise-generating construction activities within the same area, the Authority would consult with local city and county planning departments and other agencies as determined necessary. Consultation would entail notifying the departments/agencies regarding the anticipated HSR construction schedule and would allow for adjustment of construction schedules for adjacent projects or projects in close proximity to the HSR alignment, to the extent feasible.	Pre-Construction/Construction	Notify and consult with departments/agencies	Monthly	Contractor/Authority	Contractor	Monthly, record keeping, and reporting	Meetings with departments/agencies	F-B LGA Impact CUM-N&V: Cumulative noise and vibration impacts of the HSR alternatives and other past, present, and reasonably foreseeable projects during construction

AQMD = Air Quality Management District
 ATP = Archaeological Treatment Plan
 Authority = California High-Speed Rail Authority
 BETP = built environment treatment plan
 BMP = best management practice
 BRMP = biological resources management plan
 CARB = California Air Resources Board
 CFR = Code of Federal Regulations
 CDFG = California Department of Fish and Game (former name of CDFW)
 CDFW = California Department of Fish and Wildlife
 CEQA = California Environmental Quality Act
 CESA = California Endangered Species Act
 CMP = Compensatory Mitigation Plan and also Bay Area AQMD's Carl Moyer Memorial Air Quality Standards Attainment Program
 CWA = Clean Water Act
 dBA = A-weighted decibels
 EIR/EIS = environmental impact report/environmental impact statement
 EMI = electromagnetic interference
 ESA = environmentally sensitive area
 F-B = Fresno to Bakersfield Project Section
 FRA = Federal Railroad Administration
 HAER = Historic American Engineering Record
 HABS = Historic American Building Survey

HALS = Historic American Landscape Survey
 HSR = high-speed rail
 LGA = locally generated alternative
 MOA = memorandum of agreement
 mph = miles per hour
 NEPA = National Environmental Policy Act
 O_x = nitrogen oxides
 PM = particulate matter
 RRP = Restoration and Revegetation Plan
 SHTAC = Swainson's Hawk Technical Advisory Committee
 SHPO = State Historic Preservation Officer
 SJVAB = San Joaquin Valley Air Basin
 SJVAPCD = San Joaquin Valley Air Pollution Control District
 SWPPP = Stormwater Pollution Prevention Plan
 SWRCB = State Water Resources Control Board
 USACE = U.S. Army Corps of Engineers
 USEPA = U.S. Environmental Protection Agency
 USFWS = U.S. Fish and Wildlife Service
 VERA = Voluntary Emission Reduction Agreement
 VOC = volatile organic compounds
 WEAP = worker environmental awareness program

Table 2 Bakersfield to Palmdale Project Section Mitigation Monitoring and Enforcement Plan (Measures That Apply to Entire Alignment)

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
Transportation										
TRAN-MM#2	Earthwork Haul Routes	<p>Prior to commencement of construction, the Authority will ensure that the Contractor reviews and refines earthwork haul routes and identifies the specific locations where flaggers and temporary traffic control personnel are required. Haul routes outside of project right-of-way will be identified.</p> <p>At a minimum, flaggers will be required at the following intersections:</p> <ul style="list-style-type: none"> • SR 184/Weedpatch Highway • East Brundage Lane • South Edison Road • Comanche Drive • East Tehachapi Boulevard • Highline Road • Tehachapi Willow Springs Road (all crossings) • Rosamond Boulevard • 60th Street West • Avenue A • SR 138 • West Avenue F • West Avenue G • West Avenue K • Columbia Way/East Avenue M • West Avenue N • West Avenue O <p>At a minimum, temporary traffic control personnel will be provided to control the major intersections along SR 138 between 25th Street West and 15th Street.</p> <p>These requirements will be incorporated into the Construction Transportation Plan (TR-IAMF#2).</p>	Pre-construction	Design	Prior to commencement of construction	Contractor	Contractor	Identify haul routes, flagger locations, and traffic control personnel prior to commencement of construction	Pre-construction haul routes, flagger locations, and traffic control personnel locations submitted to Authority	Impact TR #2: Circulation and Emergency Access During Construction
TRAN-MM#3	Intersection and Roadway Segment Improvements	<p>The following improvements are available for consideration to address traffic delay impacts under NEPA for the project. No mitigation is required under CEQA.</p> <ul style="list-style-type: none"> • SR 14 Southbound on-ramp at Rancho Vista Boulevard <ul style="list-style-type: none"> – Provide a traffic signal with westbound continuous green phase • 20th Street E at Avenue Q <ul style="list-style-type: none"> – Widen intersection and add an eastbound through lane • 50th Street E/47th Street E at Palmdale Boulevard <ul style="list-style-type: none"> – Reconfigure southbound approach to include an additional lane on each approach (shared through/right and left lane) – Reconfigure westbound approach to include an additional lane on each approach (shared through/left and right lane) • Fort Tejon Road/Pearblossom Highway at Pearblossom Highway/Avenue T <ul style="list-style-type: none"> – Provide eastbound right-turn overlap phasing – Provide westbound right-turn overlap phasing 	Pre-construction	Design	Prior to final design	Authority/ Contractor	Authority/ Contractor	Intersection and roadway segment improvements to address traffic delay impacts	MOU with City of Palmdale, as necessary/ contract with contractor	Impact TR #6: Roadway Levels-of-Service

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
		<ul style="list-style-type: none"> - Optimize cycle length - Optimize splits • U.S. Route 395 at Palmdale Road <ul style="list-style-type: none"> - Modify signal timing: optimize cycle length and splits • 3rd Street at Avenue Q <ul style="list-style-type: none"> - Provide traffic signal • 10th Street E Between Avenue R and Avenue S <ul style="list-style-type: none"> - Widen roadway from 2 to 4 lanes • Avenue Q Between 10th Street E and 20th Street E <ul style="list-style-type: none"> - Widen roadway from 2 to 4 lanes 								
Air Quality and Global Climate Change										
AQ-MM#1	Offset Project Construction Emissions through Off-Site Emission Reduction Programs	<p>The Authority shall enter into a contractual agreement with the San Joaquin Valley Air Pollution Control District (SJVAPCD) through a Memorandum of Understanding and a Voluntary Emission Reduction Agreement (VERA). The VERA mitigates (by offsetting) to net zero the project's actual emissions from construction equipment and vehicle exhaust emissions of volatile organic compound (VOC), NO_x, particulate matter (PM₁₀), and PM_{2.5}. The agreement will provide funds for the SJVAPCD's Emission Reduction Incentive Program (SJVAPCD 2011) to fund grants for projects that achieve emission reductions, with preference given to highly affected communities, thus offsetting project-related impacts on air quality. To lower overall cost, funding for the VERA program to cover estimated construction emissions for any funded construction phase will be provided at the beginning of the construction phase. At a minimum, mitigation/offsets will occur in the year of impact, or as otherwise permitted by 40 Code of Federal Regulations (C.F.R.) Part 93 Section 93.163.</p> <p>The Authority shall also enter into an agreement with the Antelope Valley Air Quality Management District (AVAQMD) and Eastern Kern Air Pollution Control District (EKAPCD) to mitigate (by offsetting) to net zero (to the extent that offsets are available) the project's actual emissions from construction equipment and vehicle exhaust emissions of VOC, NO_x, PM₁₀ and PM_{2.5}. In the AVAQMD, the Authority shall participate in the Air Quality Investment Program, which funds stationary- and mobile-source emission reduction strategies. In the EKAPCD, the Authority shall provide an application for the Emission Banking Certificate Program.</p>	Construction	Reporting/funding	Yearly	Authority/Contractor	Authority/Contractor	Offset project construction criteria air pollutant emissions through funding	Authority to coordinate purchase of offsets with SJVAPCD and other AQMDs per contractor reports	Impact AQ #1: Regional Air Quality Impacts during Construction Impact AQ #2: Compliance with Air Quality Plans during Construction Impact AQ #8: Cumulative Impacts during Construction Impact PK #2: Temporary Access, Air Quality, Noise, and Visual Impacts

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
Noise and Vibration										
N&V-MM#1	Construction Noise Mitigation Measures	<p>During construction, the contractor will monitor construction noise to verify compliance with the noise limits shown in Table 3.4-7 [of the Final EIR/EIS]. Prior to construction (any ground disturbing activities), the contractor shall prepare a noise-monitoring program for Authority approval. The noise-monitoring program shall describe how, during construction, the contractor will monitor construction noise to verify compliance with the noise limits (an 8-hour Leq dBA of 80 during the day and 70 at night for residential land use, 85 for both day and night for commercial land use, and 90 for both day and night for industrial land use) where a noise-sensitive receptor is present. The contractor would be given the flexibility to meet the FRA construction noise limits in the most efficient and cost-effective manner. This can be done by either prohibiting certain noise-generating activities during nighttime hours or providing additional noise control measures to meet the noise limits. In addition, the noise-monitoring program will describe the actions required of the contractor to meet required noise limits. These actions will include the following nighttime and daytime noise control mitigation measures, as necessary:</p> <ul style="list-style-type: none"> • Install a temporary construction site sound barrier near a noise source. • Avoid nighttime construction in residential neighborhoods. • Locate stationary construction equipment as far as possible from noise-sensitive sites. • Re-route construction truck traffic along roadways that will cause the least disturbance to residents. • During nighttime work, use smart back-up alarms, which automatically adjust the alarm level based on the background noise level, or switch off back-up alarms and replace with spotters. • Use low-noise emission equipment. • Implement noise-deadening measures for truck loading and operations. • Monitor and maintain equipment to meet noise limits. • Line or cover storage bins, conveyors, and chutes with sound-deadening material. • Use acoustic enclosures, shields, or shrouds for equipment and facilities. • Use high-grade engine exhaust silencers and engine-casing sound insulation. • Prohibit aboveground jackhammering and impact pile driving during nighttime hours. • Minimize the use of generators to power equipment. • Limit use of public address systems. • Grade surface irregularities on construction sites. • Use moveable sound barriers at the source of the construction activity. • Limit or avoid certain noisy activities during nighttime hours. • To mitigate noise related to pile driving, the use of an auger to install the piles instead of a pile driver would reduce noise levels substantially. If pile driving is necessary, limit the time of day that the activity can occur. 	Pre-construction/ construction	Design/ reporting	Prior to construction/ weekly monitoring	Authority/ Contractor	Contractor	Placement of sound barriers and construction equipment to mitigate construction noise and weekly monitoring construction noise	Contract requirements and specifications	Impact N&V #1: Construction Noise Impact PK #2: Temporary Access, Air Quality, Noise, and Visual Impacts F-B LGA Impact PK #1: Construction Impacts on Parks, Recreation, Open Space and School District Recreation Facilities

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
		<ul style="list-style-type: none"> The Authority will establish and maintain in operation until completion of construction a toll-free "hotline" regarding the project section construction activities. The Authority shall arrange for all incoming messages to be logged (with summaries of the contents of each message) and for a designated representative of the Authority to respond to hotline messages within 24 hours (excluding weekends and holidays). The Authority shall make a reasonable good faith effort to address all concerns and answer all questions, and shall include on the log its responses to all callers. The Authority shall make a log of the in-coming messages and the Authority's responsive actions publicly available on its website. <p>The contractor shall provide the Authority with an annual report by January 31 of the following year documenting how it implemented the noise-monitoring program.</p>								
N&V-MM#2	Construction Vibration Mitigation Measures	<p>Prior to construction involving impact pile driving within 50 feet of any building the contractor shall provide the Authority with a vibration technical memorandum documenting how project pile driving criteria will be met. Upon approval of the technical memorandum by the Authority, and where a noise-sensitive receptor is present, the Contractor shall comply with the vibration reduction methods described in that memorandum. Potential construction vibration building damage is only anticipated from impact pile driving at very close distances to buildings. If pile driving occurs more than 25 to 50 feet from buildings, or if alternative methods such as push piling or auger piling are used, damage from construction vibration is not expected to occur. When a construction scenario has been established, pre-construction surveys will be conducted by the Contractor at locations within 50 feet of pile driving to document the existing condition of buildings in case damage is reported during or after construction. The Contractor will arrange for the repair of damaged buildings or will pay compensation to the property owner.</p>	Pre-construction/ construction/ post-construction	Reporting/ funding	Pre-construction surveys to establish baseline/ weekly monitoring during construction/ post-construction repairs, as needed	Authority/ Contractor	Authority/ Contractor	Pre-construction surveys to establish baseline/ ongoing weekly monitoring during construction/ post-construction assessments and repairs building damage as needed	Contract requirements and specifications	Impact N&V #2: Construction Vibration Impact PK #2: Temporary Access, Air Quality, Noise, and Visual Impacts

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
N&V-MM#3	Implement California High-Speed Rail Project Noise Mitigation Guidelines	<p>Various options exist to address the potentially severe noise effects from high-speed train operations. The Authority has developed Noise Mitigation Guidelines for the statewide HSR system that sets forth three categories of mitigation measures to reduce or offset severe noise impacts from HSR operations: sound barriers, sound insulation, and noise easements. The Guidelines also set forth an implementation approach that considers multiple factors for determining the reasonableness of sound barriers as mitigation for severe noise impacts, including structural and seismic safety, cost, number of affected receptors, and effectiveness. Sound barrier mitigation would be designed to reduce the exterior noise level from HSR operations from severe to moderate, according to the provisions of the FRA noise and vibration manual (FRA 2012) and Figure 3.4-1 [of the Final EIR/EIS].</p> <p>The Noise Mitigation Guidelines, included as Appendix 3.4-B [of the Final EIR/EIS], describe the following mitigation measures and approach:</p> <p>Sound Barriers</p> <p>Prior to operation of the HSR, the Authority will install sound barriers where they can achieve between 5 and 15 dB of exterior noise reduction, depending on their height and location relative to the tracks. The primary requirements for an effective sound barrier are that the barrier must (1) be high enough and long enough to break the line-of-sight between the sound source and the receiver, (2) be of an impervious material with a minimum surface density of four pounds per square foot, and (3) not have any gaps or holes between the panels or at the bottom. Because many materials meet these requirements, aesthetics, durability, cost, and maintenance considerations usually determine the selection of materials for sound barriers. Depending on the situation, sound barriers can become visually intrusive. Typically, the sound barrier style is selected with input from the local jurisdiction to reduce the visual effect of barriers on adjacent lands uses, refer to Aesthetic Options for Non-Station Structures, 2017. For example, sound barriers could be solid or transparent, and made of various colors, materials, and surface treatments.</p> <p>Pursuant to the Noise Mitigation Guidelines, recommended sound barriers must meet the following criteria to be considered a reasonable and feasible mitigation measure:</p> <ul style="list-style-type: none"> • Achieve a minimum of 5 decibels (dB) of noise reduction. • The minimum number of affected sites should be at least 10. • The length should be at least 800 feet. • Must be cost-effective. <p>The maximum sound barrier height would be 14 feet for at-grade sections. Berm and berm/wall combinations are the preferred types of sound barriers where space and other environmental constraints permit. On aerial structures, the maximum sound barrier height would also be 14 feet, but barrier material would be limited by engineering weight restrictions for barriers on the structure. All sound barriers would be designed to be as low as possible to achieve a substantial noise reduction.</p> <p>Table 3.4-28 through Table 3.4-33 [of the Final EIR/EIS] show the reasonableness of each feasible sound barrier (achieve a minimum 5</p>	Pre-construction/post-construction	Design	Prior to final design/ prior to operation/ monthly reporting during operation	Authority/ Contractor	Authority/ Contractor	Implement sound barriers as needed or acquire easements on properties severely affected by noise	Contract requirements and specifications/ California High-Speed Rail Project Noise Mitigation Guidelines	Impact N&V #3: Moderate and Severe Noise Impacts from Project Operation to Sensitive Receivers Impact PK #6: Project Changes to Park or Recreation Facility Use or Character

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
		<p>dBA reduction) along with their height, approximate length, number of benefited receivers, total construction cost, number of unmitigated severe impacts, and number of residual impacts (with mitigation) for each barrier height. Sound barriers were determined to be reasonable when the cost to construct the barriers would not exceed combined dollar amount of each benefited receiver.</p> <p>Table 3.4-28 [of the Final EIR/EIS] shows that two sound barriers were evaluated under the Bakersfield Station—F-B LGA alignment. Sound Barrier Nos. 5 and 6 were determined to be both feasible and reasonable. Details of the sound barrier analysis are provided in the <i>Fresno to Bakersfield Section Noise and Vibration Technical Report</i> [Authority 2018].</p> <p>Table 3.4-29, Table 3.4-30, Table 3.4-31, and Table 3.4-32 [of the Final EIR/EIS] show that 14 sound barriers were evaluated under Alternatives 1, 2, 3, and 5, respectively, for the Bakersfield to Palmdale (Between Station Areas) alignment. For each alternative, 10 barriers were determined to be both feasible and reasonable.</p> <p>Table 3.4-33 [of the Final EIR/EIS] shows that three sound barriers were evaluated in the Palmdale Station area. Sound Barrier Nos. 15, 16 and 17 were determined to be both feasible and reasonable.</p> <p>Figures 3.4-B-10 through 3.4-B-13 in Appendix 3.4-A [of the Final EIR/EIS] show the proposed sound barrier locations. The Authority will work with the communities to identify how the use and height of sound barriers would be determined. Also, as shown in Table 3.4-28, Table 3.4-29, Table 3.4-30, Table 3.4-31, Table 3.4-32, and Table 3.4-33, some receptors have the potential to remain severely impacted after mitigation is considered, or in some cases, implemented. All such receptors would be classified as residual severe impacts. Table 3.4-34, Table 3.4-35, and Table 3.4-36 show the breakdown of receptors also classified as residual severe impacts, based on land use in each category, that were not evaluated with a sound barrier because they are located in areas that do not meet the minimum number of 10 severely impacted receivers and the minimum barrier length of 800 feet. As shown in Table 3.4-34, there are no residual severe impacts under the Bakersfield Station—F-B LGA Alignment. Table 3.4-35 and Table 3.4-36 show the residual severe impacts under the Bakersfield to Palmdale (Between Station Areas) Alignment and the Palmdale Station Alignment, respectively, for each B-P Build Alternative.</p> <p>As discussed under F-B LGA N&V-MM#6 and N&V-MM#6, below, an updated noise and vibration assessment will be completed in final design prior to the start of construction</p> <p>Install Building Sound Insulation</p> <p>If sound barriers are not proposed for receptors with severe impacts, or if proposed sound barriers would not reduce exterior sound levels to below a severe impact level, the Authority would consider building sound insulation as a potential additional mitigation measure on a case-by-case basis. Sound insulation of residences and institutional buildings to improve outdoor-to-indoor noise reduction is a mitigation measure that can be considered when the use of sound barriers is not feasible in providing a reasonable level (5 to 7 dBA) of noise reduction. Although this approach has no effect on noise in exterior areas, it may be the best choice for sites where sound barriers are not feasible or desirable and for buildings where indoor sensitivity is of most concern.</p>								

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
		<p>Substantial improvements in building sound insulation (on the order of 5 to 10 dBA) can often be achieved by adding an extra layer of glazing to windows, by sealing holes in exterior surfaces that act as sound leaks, and by providing forced ventilation and air conditioning so that windows do not need to be opened.</p> <p>Noise Easements</p> <p>If a substantial noise reduction cannot be completed through installation of sound barriers or building sound insulation, the Authority will consider acquiring a noise easement on properties with a severe impact on a case-by-case basis. An agreement between the Authority and the property owner can be established wherein the property owner releases the right to petition the Authority regarding the noise level and subsequent disruptions. This would take the form of an easement that would encompass the property boundaries to the right-of-way of the rail line. The Authority would consider this mitigation measure only in isolated cases where other mitigation is ineffective or infeasible.</p>								
N&V-MM#4	Vehicle Noise Specification	During high-speed rail (HSR) vehicle technology procurement, the Authority will require bidders to meet the federal regulations (40 C.F.R. Part 201.12/13) at the time of procurement for locomotives (currently a 90-dB-level standard) operating at speeds of greater than 45 mph.	Post-construction	HSR vehicle purchasing	HSR operation	Authority	Authority	HSR vehicle noise specification	Contract requirements and specifications	Impact N&V #3: Moderate and Severe Noise Impacts from Project Operation to Sensitive Receivers Impact N&V #5: Impacts from Project Vibration
N&V-MM#5	Special Trackwork	Prior to construction, the Contractor shall provide the Authority with an HSR operation noise technical report for review and approval. The report shall address the minimization/elimination of rail gaps at turnouts. Because the impacts of HSR wheels over rail gaps at turnouts increases HSR noise by approximately 6 dB over typical operations, turnouts can be a major source of noise impact. If the turnouts cannot be moved from sensitive areas, the noise technical report will recommend the use of special types of trackwork that eliminate the gap. The Authority will require the project design to follow the recommendations in the approved noise impact report.	Pre-construction	Design	Prior to construction	Authority/ Contractor	Authority/ Contractor	Provide operation noise technical report to determine if special trackwork is required	Contract requirements and specifications	Impact N&V #3: Moderate and Severe Noise Impacts from Project Operation to Sensitive Receivers Impact N&V #5: Impacts from Project Vibration
N&V-MM#6	Additional Noise and Vibration Analysis Following Final Design	Prior to construction, the contractor shall provide the Authority with an HSR operation noise technical report for review and approval. If final design or final vehicle specifications result in changes to the assumptions underlying the noise technical report, the Authority shall prepare necessary environmental documentation, as required by CEQA and NEPA, to reassess noise impacts and mitigation. Table 3.4-37 [of the Final EIR/EIS] shows potential vibration mitigation procedures.	Pre-construction	Design	Prior to construction/ final vehicle specification	Authority (vehicle)/ Contractor	Authority (vehicle)/ Contractor	Reassessment of noise and vibration impacts and recommended mitigation following final design	Submit assessment and supplemental environmental documentation	Impact N&V #3: Moderate and Severe Noise Impacts from Project Operation to Sensitive Receivers Impact N&V #5: Impacts from Project Vibration

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
N&V-MM#7	Station, Maintenance-of-Way Facility, and Traction Power Substation	<p>In order to reduce the noise from the facilities, the Authority will implement the following noise mitigation measures, which will be accomplished as part of facility design:</p> <ul style="list-style-type: none"> • Enclose as many of the activities within the facility as possible. • Eliminate windows in the building that would face toward noise-sensitive land uses adjacent to the facility. If windows are required to be located on the side of the facility facing noise-sensitive land uses, they should be the fixed type of windows with a sound transmission class rating of at least 35. If the windows must be operable, they should be closed during nighttime activities. • Close facility doors where the rails enter the facility during nighttime activities. • Locate tracks that cannot be located within the facility on the far side of the facility from adjacent noise-sensitive receivers. • For tracks that cannot be installed away from noise-sensitive receivers, install sound barrier along the tracks in order to protect the adjacent noise-sensitive receivers. • Locate all mechanical equipment (compressors, pumps, generators, etc.) within the facility structure. • Locate any mechanical equipment located exterior to the facility (compressors, pumps, generators, etc.) on the far side of the facility from adjacent noise-sensitive receivers. If this is not possible, this equipment should be located within noise enclosures to mitigate the noise during operation. • Point all ventilation ducting for the facility away from the adjacent noise-sensitive receivers. 	Pre-construction/operation	Design/ facility operation	During final design/ facility operation	Authority/ Contractor	Authority/ Contractor	Reduce noise from the facilities	Contract requirements and specification	Impact N&V #7: Noise Impacts from HSR Stationary Facilities
N&V-MM#8	Startle Effect Warning Signage	<p>The following signage will be posted along the Pacific Crest Trail:</p> <ul style="list-style-type: none"> ▪ A passive warning sign at approximately 1,300 feet or farther from the alignment warning of an upcoming train crossing ▪ An active warning sign at 60+ feet of the alignment warning users of an upcoming train crossing and the approximate time for the crossing (number of minutes) 	Construction	Install signage	Prior to operation	Contractor/ Authority	Contractor/ Authority	Install warning signage along the Pacific Crest Trail	Contract requirements and specifications	Impact N&V #4: Noise Effects on Wildlife and Domestic Animals

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
Electromagnetic Interference and Electromagnetic Fields										
EMI/EMF-MM#1	Protect Sensitive Equipment	<p>The Authority would contact entities where sensitive equipment is located to evaluate the potential impacts of both HSR Project-related EMF RF and EMI on imaging equipment prior to completion of final design. Where necessary to avoid interference, the final design would include suitable design provisions to prevent EMI. These design provisions may include establishing magnetic field shielding walls around sensitive equipment or installing RF filters into sensitive equipment.</p> <p>HSR-related EMI may affect highly susceptible, unshielded sensitive RF equipment such as older MRI systems and other measuring devices common to medical and research laboratories. Most of the devices manufactured today have adequate shielding from all potential EMI sources; however, the potential exists for older devices to be affected and require shielding.</p> <p>A shielded enclosure is very effective at preventing external EMI. Metallic materials are used for shielding (specifically high-conductivity metals for high-frequency interference, such as from HSR operation), and high-permeability metals are used for low-frequency interference. Often either the housing of the affected device is coated with a conductive layer or the housing itself is made conductive. In some situations, it may be necessary to reduce EMI for a suite of devices by creating a shielded room or rooms.</p> <p>Attenuation, or the effectiveness of EMI shielding, is the difference between an electromagnetic signal's intensity before and after shielding. Attenuation is the ratio between field strength with and without the presence of a protective medium measured in decibels (dB). This decibel range changes on a logarithmic scale, so an attenuation rating of 50 dB indicates a shielding strength 10 times that of 40 dB. In general, a shielding range between 60 dB and 90 dB represents a high level of protection, while 90 dB to 120 dB is exceptional.</p>	Pre-construction	Design	Prior to final design	Authority/ Contractor	Authority/ Contractor	Protect nearby equipment sensitive to EMF/EMI	Contract requirements and specifications	Impact EMI/EMF #1: Impacts During Construction Impact EMI/EMF #5: Effects on Sensitive Equipment from Electromagnetic Interference
Public Utilities and Energy										
PU&E-MM#1	Reconfigure or Relocate Substations and/or Substation Components	Reconfigure existing Magunden Substation ancillary components located approximately 250 feet north of the Union Pacific Railroad mainline in Bakersfield, south of Mills Drive.	Pre-construction	Design	Prior to final Design	Authority/ Contractor	Authority/ Contractor	Reconfigure existing Magunden Substation ancillary components	Contract requirements and specifications	Impact PU&E #6: Potential Conflicts with Existing Utilities
Biological and Aquatic Resources										
BIO-MM#1	Conduct Presence/Absence Pre-construction Surveys for Special-Status Plant Species and Special-Status Plant Communities	Prior to any ground disturbing activity, the Project Biologist will conduct presence/absence botanical field surveys for special-status plant species and special-status plant sensitive natural communities in all potentially suitable habitats within a Work Area. The surveys shall be consistent with Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities (CDFW 2018) and Guidelines for Conducting and Report Botanical Inventories for Federally Listed, Proposed and Candidate Plants (USFWS 2001). The Project Biologist will flag and record in GIS the locations of any observed special-status plant species and special-status plant sensitive natural communities and provide appropriate buffers for avoidance.	Pre-construction	Surveying/ monitoring/ reporting	Report findings at least 30 days prior to ground disturbance	Authority/ Contractor/ Project Biologist	Authority/ Contractor/ Project Biologist	Conduct protocol-level surveys for special-status plant species and communities/ report findings	Condition of design-build contract/ condition of regulatory permits	Impact BIO #1: Construction Impacts on Special-Status Plant Species Impact BIO #3: Construction Impacts on Special-Status Plant Communities

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
BIO-MM#2	Prepare and Implement Plan for Salvage and Relocation of Special-Status Plant Species	<p>Prior to any ground disturbing activity, the Project Biologist will collect seeds and plant materials and stockpile and segregate the top four inches of topsoil from locations within the Work Area where species listed as threatened or endangered under the FESA, threatened, endangered, or candidate for listing under CESA, state-designated "Rare" species, and California Rare Plant Rank 1B and 2 species were observed during surveys for use on off-site locations. Suitable sites to receive salvaged material include Authority mitigation sites, refuges, reserves, federal or state lands, and public/private mitigation banks. If relocation or propagation is required by authorizations issued under the FESA and/or CESA, the Project Biologist will prepare a plant species salvage plan to address monitoring, salvage, relocation and/or seed banking of federal or State-listed plant species</p> <p>The plan will include provisions that address the techniques, locations, and procedures required for the collection, storage, and relocation of seed or plant material; collection, stockpiling, and redistribution of topsoil and associated seed. The plan will also include requirements related to outcomes such as percent absolute cover of highly invasive species, as defined by the California Invasive Plant Council (less than documented baseline conditions), maintenance, monitoring, implementation, and the annual reporting. The plan will reflect conditions required under regulatory authorizations issued for federal or state-listed species. The Project Biologist will submit the plan to the Authority for review and approval.</p>	Pre-construction/ construction/ post-construction	Surveying/ monitoring/ reporting	In accordance with agency permit requirements	Authority/ Contractor/ Project Biologist	Authority/ Contractor/ Project Biologist	Prepare and implement monitoring, salvage, relocation, and propagation of special-status plant species/ report findings	Condition of design-build contract/ condition of regulatory permits	Impact BIO #1: Construction Impacts on Special-Status Plant Species
BIO-MM#6	Prepare and Implement a Restoration and Revegetation Plan	<p>Prior to any ground disturbing activity, the Project Biologist will prepare a Restoration and Revegetation Plan (RRP) to address temporary impacts resulting from ground disturbing activities within areas that potentially support special-status species, wetlands and/or other aquatic resources. Restoration activities may include, but not be limited to: grading landform contours to approximate pre-disturbance conditions, re-vegetating disturbed areas with native plant species, and using certified weed-free straw and mulch. The Authority will implement the RRP in all temporarily disturbed areas outside of the permanent right-of-way that potentially support special-status species, wetlands and/or other aquatic resources.</p> <p>Consistent with section 1415 of the Fixing America's Surface Transportation Act (FAST Act) restoration activities will provide habitat for native pollinators through plantings of native forbs and grasses. The Project Biologist will obtain a locally sourced native seed mix. The restoration success criteria will include limits on invasive species, as defined by the California Invasive Plant Council, to an increase no greater than 10 percent compared to the pre-disturbance condition, or to a level determined through a comparison with an appropriate reference site consisting of similar natural communities and management regimes. The RRP will outline at a minimum:</p> <ol style="list-style-type: none"> Procedures for documenting pre-construction conditions for restoration purposes. Sources of plant materials and methods of propagation. Specification of parameters for maintenance and monitoring of re-established habitats, including weed control measures, frequency of field checks, and monitoring reports for temporary disturbance areas. 	Pre-construction/ construction/ post-construction	Surveying/ monitoring/ reporting	In accordance with agency permit requirements	Authority/ Contractor/ Project Botanist	Authority/ Contractor/ Project Botanist	Prepare and implement RRP/ report findings	Condition of design-build contract/ condition of regulatory permits	Impact BIO #1: Construction Impacts on Special-Status Plant Species Impact BIO #3: Construction Impacts on Special-Status Plant Communities Impact BIO #4: Construction Impacts on Aquatic Resources Impact BIO #7: Operational Impacts on Special-Status Plant Species Impact BIO #9: Operation Impacts on Special-Status Plant Communities Impact BIO #10: Operation Impacts on Aquatic Resources

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
		<p>d. Specification of success criteria for re-established plant communities.</p> <p>e. Specification of the remedial measures to be taken if success criteria are not met.</p> <p>f. Methods and requirements for monitoring restoration/replacement efforts, which may involve a combination of qualitative and/or quantitative data gathering.</p> <p>g. Maintenance, monitoring, and reporting schedules, including an annual report due to the Authority by January 31st of the following year.</p> <p>The RRP will be submitted to the Authority and regulatory agencies, as defined in the conditions of regulatory authorizations, for review and approval.</p>								
BIO-MM#7	Conduct Pre-construction Surveys for Special-Status Reptile and Amphibian Species	Prior to any ground disturbing activities, the Project Biologist will conduct pre-construction surveys in suitable habitat to determine the presence or absence of special-status reptiles and amphibian species within the Work Area. These surveys will be conducted in accordance with any required protocols. Surveys will be conducted no more than 30 days before the start of ground-disturbing activities in a Work Area. The results of the pre-construction survey will be used to guide the placement of Environmentally Sensitive Areas (ESAs) or conduct species relocation.	Pre-construction/ construction	Surveying/ monitoring/ reporting	Weekly or as established by regulatory compliance agencies	Authority/ Contractor/ Project Biologist/	Authority/ Contractor/ Project Biologist/	Presence-absence surveys of special-status reptiles and amphibian species within the construction footprint conducted 30 days prior to ground disturbance/ report findings	Condition of design-build contract/ condition of regulatory permits	Impact BIO #2: Construction Impacts on Special-Status Wildlife Species
BIO-MM#8	Implement Avoidance and Minimization Measures for Special-Status Reptile and Amphibian Species	The Project Biologist will monitor all initial ground disturbing activities that occur within suitable habitat for special-status reptiles and amphibians, and will conduct clearance surveys of suitable habitat in the Work Area on a daily basis. If a special-status reptile or amphibian is observed, the Project Biologist will identify actions, to the extent feasible, sufficient to avoid impacts on the species and to allow it to leave the area on its own volition. Such actions may include establishing a temporary ESA in the area where a special-status reptile or amphibian has been observed and delineating a 50-foot no-work buffer around the ESA. In circumstances where a no-work buffer is not feasible the Project Biologist will relocate any of the species observed from the Work Area. For federal or state-listed species, relocations will be undertaken in accordance with regulatory authorizations issued under the FESA and/or CESA.	Construction	Surveying/ monitoring/ reporting	Weekly or as established by regulatory compliance agencies	Authority/ Contractor/ Project Biologist	Authority/ Contractor/ Project Biologist	Clearance surveys as needed for special-status reptiles and amphibians/ avoidance or relocation of such species/ report findings	Condition of design-build contract/ condition of regulatory permits	Impact BIO #2: Construction Impacts on Special-Status Wildlife Species

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
BIO-MM#11	Conduct Surveys for Blunt-Nosed Leopard Lizard	No more than twelve months before the start of any ground disturbing activity, in accordance with authorizations under FESA, a habitat assessment of the project footprint will be conducted by the Project Biologist in suitable habitat for the blunt-nosed leopard lizard to identify all habitat suitable for blunt-nosed leopard lizard within the project footprint. Within twelve months prior to any ground-disturbing activity, the Project Biologist will conduct surveys for blunt nosed leopard lizard in blunt-nosed lizard suitable habitats (e.g., areas containing burrows) within the Work Area. These surveys will be conducted in accordance with the Approved Survey Methodology for the Blunt-Nosed Leopard Lizard (CDFW 2019), or other more recent guidelines, if available. In instances where blunt-nosed leopard lizards are observed at any time during presence/absence surveys, pre-construction surveys, or construction monitoring, USFWS and CDFW will be notified of the occurrence within two business days.	Pre-construction/ construction	Surveying/ monitoring/ reporting	As established by regulatory compliance agencies/ notify USFWS and CDFW of occurrence within two business days	Authority/ Contractor/ Project Biologist	Authority/ Contractor/ Project Biologist	Habitat assessment in suitable habitat for blunt-nosed leopard lizard/ report findings	Condition of design-build contract/ condition of regulatory permits	Impact BIO #2: Construction Impacts on Special-Status Wildlife Species
BIO-MM#13	Implement Avoidance Measures for Blunt-Nosed Leopard Lizard	For Work Areas where surveys confirm that blunt-nosed leopard lizards are absent, the Project Biologist may install Wildlife Exclusion Fencing (WEF) along the perimeter of the Work Area. The WEF will be monitored daily and maintained. During the non-active season for blunt-nosed leopard lizards (October 16 through April 14), to the extent feasible, ground disturbing activities will not occur in areas where blunt-nosed leopard lizards or signs of the species have been observed and that contain burrows suitable for blunt-nosed leopard lizards. If ground disturbing activities are scheduled during the non-active season, suitable burrows identified during the surveys will be avoided through establishment of 50-foot no-work buffers. The Project Biologist may reduce the size of the no-work buffers if information indicates that the extent of the underground portion of burrows is less than 50 feet. During the active season when blunt-nosed leopard lizards are moving above-ground (April 15 through October 15), the following measures will be implemented in areas where blunt-nosed leopard lizards or signs of blunt-nosed leopard lizards have been observed: <ul style="list-style-type: none"> Establishment of No-Work Buffers. The Project Biologist will establish, monitor, and maintain 50-foot no-work buffers around burrows and egg clutch sites identified during surveys. The 50-foot no-work buffers will be established around burrows in a manner that allows for a connection between the burrow site and the suitable natural habitat adjacent to the Construction Footprint so that blunt-nosed leopard lizards and/ or hatchlings may leave the area after eggs have hatched. Construction activities will not occur within the 50-foot no-work buffers until such time as the eggs have hatched and blunt-nosed leopard lizards have left the area. Fencing of Work Areas. Prior to installing wildlife exclusion fence (WEF), the Project Biologist will confirm that no blunt-nosed leopard lizards are present within a Work Area by conducting focused blunt-nosed leopard lizard observational surveys for 12 days over the course of a 30 to 60-day period. At least one survey session will occur over 4 consecutive days. These observational surveys may be paired with scent detection dog surveys for blunt-nosed leopard lizard scat. 	Pre-construction/ construction	Surveying/ monitoring/ reporting	Weekly or as established by regulatory compliance agencies	Authority/ Contractor/ Project Biologist	Authority/ Contractor/ Project Biologist	Install WEF where surveys confirm blunt-nosed leopard lizard is absent/ monitor WEF daily/ establish no-work buffers/ report findings	Condition of design-build contract/ condition of regulatory permits	Impact BIO #2: Construction Impacts on Special-Status Wildlife Species

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
		<ul style="list-style-type: none"> – Within 3 days of completing these surveys with negative results, WEF will be installed in a configuration that accounts for burrow locations and enables blunt-nosed leopard lizards to leave the Work Area. The following day, the Project Biologist will conduct an observational survey. If no blunt-nosed leopard lizards are observed, the Project Biologist will install additional WEF to further enclose the Work Area. This Work Area will be monitored daily while the WEF is in place. – If blunt-nosed leopard lizards are observed prior to installing the last of the WEF, the Project Biologist will continue observational surveys until the lizard is observed leaving the Work Area or until 30 days elapse with no blunt-nosed leopard lizards observations within the Work Area. 								
BIO-MM#14	Conduct Pre-construction Surveys and Delineate Active Nest Exclusion Areas for Breeding Birds	<p>Prior to any ground-disturbing activity, including vegetation removal, staging, and site visits scheduled to occur during the bird breeding season (February 1 to September 1), the Project Biologist will conduct visual pre-construction surveys within the Work Area for nesting birds and active nests (nests with eggs or young) of non-raptor species listed under the Migratory Bird Treaty Act and/or the Fish and Game Code. These surveys will be conducted in accordance with any required protocols.</p> <p>In the event that active bird nests are observed during the pre-construction survey, the Project Biologist will delineate no-work buffers. No-work buffers will be set at a distance of 75 feet, unless a larger buffer is required pursuant to regulatory authorizations issued under the FESA and/or CESA. No-work zone buffers will be maintained until nestlings have fledged and are no longer reliant on the nest or parental care for survival or the Project Biologist determines that the nest has been abandoned. In circumstances where it is not feasible to maintain the standard no-work buffer, the no-work buffer may be reduced, provided that the Project Biologist monitors the active nest during the construction activity to ensure that the nesting birds do not become agitated. Additional measures that may be used when no-work buffers are reduced include visual screens and sound barriers. If established no-work zone buffers cannot be implemented, the Project Biologist will establish a new buffer.</p>	Pre-construction/ construction	Surveying/ monitoring/ reporting	Weekly or as established by regulatory compliance agencies	Authority/ Contractor/ Project Biologist	Authority/ Contractor/ Project Biologist	Visual pre-construction surveys in suitable habitats for nesting birds/ establish no-work buffers/ monitor active bird nests/ report findings	Condition of design-build contract/ condition of regulatory permits	Impact BIO #2: Construction Impacts on Special-Status Wildlife Species
BIO-MM#15	Conduct Pre-construction Surveys and Monitoring for Raptors	<p>If construction or other vegetation removal activities are scheduled to occur during the breeding season for raptors (January 1 to September 1), no more than 14 days before the start of the activities, the Project Biologist will conduct pre-construction surveys for nesting raptors in areas where suitable habitat is present. Specifically, such surveys will be conducted in habitat areas within the Construction Footprint and, where access is available, within 500 feet of the boundary of the Construction Footprint. If breeding raptors with active nests are found, the Project Biologist will delineate a 500-foot buffer (or as modified by regulatory authorizations for species listed under FESA and/or CESA) around the nest to be maintained until the young have fledged from the nest and are no longer reliant on the nest or parental care for survival or until such time as the Project Biologist determines that the nest has been abandoned. Nest buffers may be adjusted if the Project Biologist determines that smaller buffers would be sufficient to avoid impacts on nesting raptors. If established no-work zone buffers cannot be implemented, Project Biologist will establish a new buffer.</p>	Pre-construction/ construction	Surveying/ monitoring/ reporting	Weekly or as established by regulatory compliance agencies	Authority/ Contractor/ Project Biologist	Authority/ Contractor/ Project Biologist	Pre-construction surveys in suitable habitats for nesting raptors/ establish no-work buffers/ monitor active raptor nests/ report findings	Condition of design-build contract/ condition of regulatory permits	Impact BIO #2: Construction Impacts on Special-Status Wildlife Species

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
BIO-MM#16	Implement Avoidance Measures for California Condor	<p>During any ground-disturbing activities within the range of the California condor, as delineated in the USFWS database, the Authority will implement the following avoidance measures:</p> <ul style="list-style-type: none"> The Project Biologist will be present for construction activities occurring within two miles of known California condor roosting sites. If USFWS informs the Authority or if the Authority is otherwise made aware that California condors are roosting within 0.5 miles of a Work Area, no construction activity will occur during the period between one hour before sunset and one hour after sunrise. All construction materials located within Work Areas, including items that could pose a risk of entanglement, such as ropes and cables, will be properly stored, covered, and secured when not in use. Littering of trash and food waste is prohibited. All litter, small artificial items (screws, washers, nuts, bolts, etc.), and food waste will be collected and disposed of from Work Areas on at least a daily basis. All fuels and components with hazardous materials or wastes will be handled in accordance with applicable regulations. These materials will be kept in segregated, secured and/or secondary containment facilities as necessary. Any spills of liquid substances that could harm condors will be immediately addressed. Avoid the use of ethylene glycol-based anti-freeze or other ethylene glycol-based liquid substances. All parked vehicles/equipment will be kept free of leaks, particularly anti-freeze. Vehicles will be checked daily for leaks. Polychemical lines will not be used or stored on-site to preclude condors from obtaining and ingesting pieces of polychemical lines. If a California condor(s) lands in any Work Area, the Project Biologist will assess construction activities occurring at the time and determine whether those activities present a potential hazard to the individual California condor. Activities determined by the Project Biologist to present a potential hazard to the California condor will be stopped until the bird has abandoned the area. Methods approved by USFWS for hazing California condors to encourage abandonment of the construction site, Guidance on Hazing California Condors (September 2014), may be used as necessary. The Project Biologist will coordinate with USFWS prior to construction-related uses of helicopters to establish that no California condors are present in the area. If California condors are observed in the area in which helicopters will operate, helicopter use will not be permitted until the Project Biologist has determined that the California condors have left the area. 	Construction	Monitoring/ reporting	Weekly or as established by regulatory compliance agencies	Authority/ Contractor/ Project Biologist	Authority/ Contractor/ Project Biologist	Monitor construction within two miles of known California condor roosting sites/ limit construction hours if California condors are roosting within 0.5 mile of Work Area/ properly store construction materials in Work Areas that could pose a risk of entanglement/ coordinate with USFWS prior to construction-related uses of helicopters/ report findings	Condition of design-build contract/ condition of regulatory permits	Impact BIO #2: Construction Impacts on Special-Status Wildlife Species

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
BIO-MM#17	Conduct Surveys for Swainson's Hawk Nests and Implement Avoidance and Minimization Measures	Surveys must be performed no more than one year prior to the commencement of construction activities. The Project Biologist will conduct surveys for Swainson's hawk during the nesting season (March through August) within both the Work Area and a 0.5-mile buffer surrounding the Work Area, provided access to such areas is available. No sooner than 30 days prior to any ground disturbing activity, the Project Biologist will conduct pre-construction surveys of nests identified during the earlier surveys to determine if any are occupied. The initial nesting season surveys and subsequent pre-construction nest surveys will follow the protocols set out in the <i>Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in California's Central Valley</i> (Swainson's Hawk Technical Advisory Committee [SHTAC] 2000), and for the areas within the Antelope Valley, the <i>Swainson's Hawk Survey Protocols, Impact Avoidance, and Minimization Measures for Renewable Energy Projects in the Antelope Valley of Los Angeles and Kern Counties, California</i> (California Energy Commission and California Department of Fish and Game, 2010).	Pre-construction/ construction	Surveying/ monitoring/ reporting	Weekly or as established by regulatory compliance agencies	Authority/ Contractor/ Project Biologist	Authority/ Contractor/ Project Biologist	Pre-construction surveys for nesting Swainson's hawks/ monitor active nests/ report findings	Condition of design-build contract/ condition of regulatory permits	Impact BIO #2: Construction Impacts on Special-Status Wildlife Species
BIO-MM#18	Implement Avoidance and Minimization Measures for Swainson's Hawk Nests	Any active Swainson's hawk nests (defined as a nest used one or more times in the last five years) found within 0.5-mile of the boundary of the Work Area during the nesting season (February 1 to September 1) will be monitored daily by the Project Biologist to assess whether the nest is occupied. If the nest is occupied, the Project Biologist will establish no-work buffers following consultation with CDFW and CDFW's Staff Report Regarding Mitigation for Impacts to Swainson's hawks (<i>Buteo swainsoni</i>) in the Central Valley of California (CDFG 1994). The status of the nest will be monitored until the young fledge or for the length of construction activities, whichever occurs first. Adjustments to the buffer(s) may be made in consultation with CDFW. If an occupied Swainson's hawk nest tree is to be removed, an incidental take permit under CESA will be obtained and impacts will be minimized and fully mitigated.	Construction	Surveying/ monitoring/ reporting	Weekly or as established by regulatory compliance agencies	Authority/ Contractor/ Project Biologist	Authority/ Contractor/ Project Biologist	Monitor active Swainson's hawk nests/ establish nest avoidance buffer zones/ report findings	Condition of design-build contract/ condition of regulatory permits	Impact BIO #2: Construction Impacts on Special-Status Wildlife Species
BIO-MM#20	Conduct Protocol Surveys for Burrowing Owls	Prior to any ground disturbing activity, the Project Biologist will conduct protocol-level surveys for burrowing owl within suitable habitat located in the Work Area and/or extending 500 feet from the boundary of the Work Area, where access is available. Surveys will be conducted in accordance with guidelines in the CDFW Staff Report on Burrowing Owl Mitigation (CDFG 2012c).	Pre-construction	Surveying/ monitoring/ reporting	Weekly or as established by regulatory compliance agencies	Authority/ Contractor/ Project Biologist	Authority/ Contractor/ Project Biologist	Protocol-level surveys for burrowing owls/ report findings	Condition of design-build contract/ condition of regulatory permits	Impact BIO #2: Construction Impacts on Special-Status Wildlife Species
BIO-MM#21	Implement Avoidance and Minimization Measures for Burrowing Owl	Occupied burrowing owl burrows that will be directly affected by ground disturbing activities will be relocated in accordance with CDFW's Staff Report on Burrowing Owl Mitigation (CDFG 2012). To the extent feasible, the Project Biologist will establish 600-foot no-work buffers around occupied burrowing owl burrows in the Work Area during the nesting season (February 1 through September 1). If the no-work buffer is not feasible and occupied burrows will be relocated during the nesting season, relocation will occur either before the birds have begun egg-laying and incubation or after the Project Biologist has determined that the juveniles from the occupied burrows are foraging independently and are capable of independent survival.	Pre-construction/ construction	Surveying/ monitoring/ reporting	Weekly or as established by regulatory compliance agencies	Authority/ Contractor/ Project Biologist	Authority/ Contractor/ Project Biologist	Establish no-work buffers around occupied burrowing owl burrows/ relocation as needed/ report findings	Condition of design-build contract/ condition of regulatory permits	Impact BIO #2: Construction Impacts on Special-Status Wildlife Species

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
BIO-MM#22	Conduct Pre-Construction Surveys for Nelson's Antelope Squirrel, Tipton Kangaroo Rat, Dulzura Pocket Mouse, and Tulare Grasshopper Mouse	Prior to any ground disturbing activity, the Project Biologist will conduct pre-construction surveys in potentially suitable habitat within the Work Area to identify burrows or signs of presence of Nelson's antelope squirrel, Tipton kangaroo rat, Dulzura pocket mouse, or Tulare grasshopper mouse. The surveys will be conducted within two years of, and at least 14 days before, the start of ground disturbing activities in a Work Area. These surveys will be conducted in accordance with any required protocols.	Pre-construction	Surveying/ monitoring/ reporting	Weekly or as established by regulatory compliance agencies	Authority/ Contractor/ Project Biologist	Authority/ Contractor/ Project Biologist	Conduct habitat assessment surveys for special-status small mammal species/ report findings	Condition of design-build contract/ condition of regulatory permits	Impact BIO #2: Construction Impacts on Special-Status Wildlife Species
BIO-MM#23	Implement Avoidance and Minimization Measures for Nelson's Antelope Squirrel, Tipton Kangaroo Rat, Dulzura Pocket Mouse, and Tulare Grasshopper Mouse	If burrows or signs of Nelson's antelope squirrel, Tipton kangaroo rat, Dulzura pocket mouse, or Tulare grasshopper mouse are observed during pre-construction surveys, the Project Biologist will establish Environmentally Sensitive Areas (ESAs) and install Wildlife Exclusion Fencing at least 14 days before the start of ground disturbing activities in areas where burrows or signs were observed. To the extent feasible, no-work buffers extending 50 feet beyond the ESAs will be established. The WEF will be installed in a manner that provides for the exclusion of the special-status small mammals from the Work Area, but allows them to exit the area. After the WEF is installed, the Project Biologist will conduct trapping and relocation for Nelson's antelope squirrel, Tipton kangaroo rat, Dulzura pocket mouse, and Tulare grasshopper mouse, in coordination with CDFW and USFWS regarding appropriate methods and required permits.	Pre-construction/ construction	Surveying/ monitoring/ reporting	Weekly or as established by regulatory compliance agencies	Authority/ Contractor/ Project Biologist	Authority/ Contractor/ Project Biologist	Establish no-work buffers if burrows or signs of special-status small mammal species are detected/ relocation as needed/ report findings	Condition of design-build contract/ condition of regulatory permits	Impact BIO #2: Construction Impacts on Special-Status Wildlife Species
BIO-MM#25	Conduct Pre-construction Surveys for Special-Status Bat Species	No earlier than thirty days prior to the start of ground disturbing activities in a Work Area, the Project Biologist will conduct a visual and acoustic survey (over the course of one day and one evening at a minimum) for roosting bats in the Work Area and extending 500 feet from the boundary of the Work Area, where access is available. Such surveys will be conducted only in those areas in which bridges, abandoned structures, trees with large cavities or dense foliage are present within a half mile of the boundary of the Work Area.	Pre-construction	Surveying/ monitoring/ reporting	Weekly or as established by regulatory compliance agencies	Authority/ Contractor/ Project Biologist	Authority/ Contractor/ Project Biologist	Conduct visual and acoustic pre-construction survey for roosting bats/ report findings	Condition of design-build contract/ condition of regulatory permits	Impact BIO #2: Construction Impacts on Special-Status Wildlife Species

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
BIO-MM#26	Implement Bat Avoidance and Relocation Measures	<p>Prior to any ground-disturbing activity, the Project Biologist shall survey for active hibernacula or maternity roosts. If active hibernacula or maternity roosts are identified in the Work Area or 500 feet extending from the Work Area during pre-construction surveys, they will be avoided to the extent feasible. Clearing and grubbing will be prohibited adjacent to the roost site. Lighting use near the roost site where it would shine on the roost or interfere with bats entering or leaving the roost will also be prohibited. Operation of internal combustion equipment, such as generators, pumps and vehicles shall be prohibited within 300 feet of the roost site.</p> <p>If avoidance of a hibernacula is not feasible, through coordination with CDFW, portions of the features that provide naturalized habitat will be maintained to the greatest extent possible. In addition, improvements will be made to existing roost sites and/or new roost sites on buildings or within the project site area will be provided. New roosts will be in place prior to the initiation of project-related activities to allow enough time for bats to relocate.</p> <p>Additionally, if avoidance of a hibernacula is not feasible, the Project Biologist will prepare a relocation plan to remove the hibernacula and provide for construction of an alternative bat roost outside of the Work Area. The relocation plan will be submitted to CDFW for review prior to construction activities.</p> <p>The Project Biologist will implement the relocation plan before the commencement of any ground disturbing activities that will occur within 500 feet of the hibernacula. Removal of roosts will be guided by accepted exclusion and deterrent techniques.</p>	Pre-construction/ Construction	Surveying/ monitoring/ reporting	Weekly or as established by regulatory compliance agencies	Authority/ Contractor/ Project Biologist	Authority/ Contractor/ Project Biologist	Avoid active or hibernation roosts, if feasible/ if necessary, prepare and implement relocation plan for bat roosts/ report findings	Condition of design-build contract/ condition of regulatory permits	Impact BIO #2: Construction Impacts on Special-Status Wildlife Species
BIO-MM#27	Implement Bat Exclusion and Deterrence Measures	<p>If non-breeding or non-hibernating individuals or groups of bats are found roosting within the Work Area, the Project Biologist will facilitate the eviction of the bats by either opening the roosting area to change the lighting and airflow conditions, or installing one-way doors or other appropriate methods.</p> <p>To the extent feasible, the Authority will leave the roost undisturbed by project activities for a minimum of one week after implementing exclusion and/or eviction activities. Steps will not be taken to evict bats from active maternity or hibernacula; instead such features may be relocated pursuant to a relocation plan.</p>	Pre-construction/ construction	Surveying/ monitoring/ reporting	Weekly or as established by regulatory compliance agencies	Authority/ Contractor/ Project Biologist	Authority/ Contractor/ Project Biologist	Safely evict bats from roosts except for established maternity roosts and occupied hibernation roosts/ report findings	Condition of design-build contract/ condition of regulatory permits	Impact BIO #2: Construction Impacts on Special-Status Wildlife Species
BIO-MM#28	Conduct Pre-construction Surveys for Ringtail and Ringtail Den Sites and Implement Avoidance Measures	<p>Prior to any ground disturbing activity, the Project Biologist will conduct pre-construction surveys for ringtail and ringtail den sites within suitable habitat located within the Work Area. These surveys will be conducted no more than 30 days before the start of ground disturbing activities in a Work Area. The Project Biologist will establish 100-foot no-work buffers around occupied maternity dens throughout the pup-rearing season (May 1 through June 15) and a 50-foot no work buffer around occupied dens during other times of the year.</p>	Pre-construction/ construction	Surveying/ monitoring/ reporting	Weekly or as established by regulatory compliance agencies	Authority/ Contractor/ Project Biologist	Authority/ Contractor/ Project Biologist	Conduct pre-construction surveys for American badger and ringtail den sites in suitable habitats/ establish no-work buffer around occupied dens/ report findings	Condition of design-build contract/ condition of regulatory permits	Impact BIO #2: Construction Impacts on Special-Status Wildlife Species

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
BIO-MM#29	Conduct Pre-Construction Surveys for American Badger Den Sites and Implement Minimization Measures	Prior to any ground disturbing activity, the Project Biologist will conduct pre-construction surveys for American Badger den sites within suitable habitat located within the Work Area. These surveys will be conducted no less than 14 days and no more than 30 days prior to the start of ground disturbing activities in a Work Area. The Project Biologist will establish a 100-foot no-work buffer around occupied maternity dens throughout the pup-rearing season (February 15 through July 1) and a 50-foot no-work buffer around occupied dens during other times of the year. If non-maternity dens are found and cannot be avoided during construction activities, they will be monitored for badger activity. If the Project Biologist determines that dens may be occupied, passive den exclusion measures will be implemented for three to five days to discourage the use of these dens prior to project disturbance activities.	Pre-construction/ construction	Surveying/ monitoring/ reporting	Weekly or as established by regulatory compliance agencies	Authority/ Contractor/ Project Biologist	Authority/ Contractor/ Project Biologist	Conduct pre-construction surveys for American badger and ringtail den sites in suitable habitats/ establish no-work buffer around occupied dens/ conduct passive den exclusion for non-maternity dens/ report findings	Condition of design-build contract/ condition of regulatory permits	Impact BIO #2: Construction Impacts on Special-Status Wildlife Species
BIO-MM#30	Conduct Pre-construction Surveys for San Joaquin Kit Fox	Within 30 days prior to the start of any ground disturbing activity, the Project Biologist will conduct pre-construction surveys in modeled suitable habitat, including urban suitable habitat, within the Work Area. The surveys will be conducted in accordance with USFWS' San Joaquin Kit Fox Survey Protocol for the Northern Range (USFWS 1999) between May 1 and September 30 for the purpose of identifying potential San Joaquin kit fox dens. If any occupied or potential dens are found during pre-construction surveys, they will be flagged and a 50-foot no-work buffer will be established around the den until the den is cleared, if necessary to allow construction activities to proceed.	Pre-construction/ construction	Surveying/ monitoring/ reporting	Weekly or as established by regulatory compliance agencies	Authority/ Contractor/ Project Biologist	Authority/ Contractor/ Project Biologist	Conduct pre-construction surveys for San Joaquin kit fox dens/ report findings	Condition of design-build contract/ condition of regulatory permits	Impact BIO #2: Construction Impacts on Special-Status Wildlife Species
BIO-MM#31	Minimize Impacts on San Joaquin Kit Fox	The Authority will implement USFWS' <i>Standardized Recommendations for Protection of the San Joaquin Kit Fox Prior to or During Ground Disturbance</i> [USFWS 2011] to minimize impacts on this species, including: <ul style="list-style-type: none"> Disturbance to all kit fox dens will be avoided to the extent feasible. Construction activities that occur within 200 feet of any occupied dens will cease within one-half hour after sunset and will not begin earlier than one-half hour before sunrise, to the extent feasible. All construction pipes, culverts, or similar structures with a diameter of 4 inches or greater that are stored within the Construction Footprint for one or more overnight periods will be thoroughly inspected for kit foxes before the pipe is subsequently buried, capped, or otherwise used or moved. If a San Joaquin kit fox is detected within a Work Area during construction, the Project Biologist will request approval from the Service and CDFW to capture and relocate the kit fox if it does not safely leave the area by its own volition. To minimize the temporary impacts of WEF and construction exclusion fencing on kit fox and their movement/migration corridors during construction, artificial dens will be installed along the outer perimeter of WEF and construction exclusion fencing. Artificial dens or similar escape structures will also be installed at dedicated wildlife crossing structures to provide escape cover and protection against predation. The artificial dens will be located on parcels owned by the Authority or at locations where access is available. 	Pre-construction/ construction	Surveying/ monitoring/ reporting	Weekly or as established by regulatory compliance agencies	Authority/ Contractor/ Project Biologist/ Mitigation	Authority/ Contractor/ Project Biologist/ Mitigation	Implement USFWS's Standardized Recommendations for Protection of the San Joaquin Kit Fox Prior to or During Ground Disturbance (USFWS 2011)/ report findings	Condition of Design Build Contract Condition of regulatory permits	Impact BIO #2: Construction Impacts on Special-Status Wildlife Species

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
BIO-MM#32	Restore Temporary Riparian Habitat Impacts	Within ninety days of completing construction in a Work Area, the Project Biologist will direct the revegetation and recontouring, as necessary, of any riparian areas temporarily disturbed as a result of the construction activities, using appropriate native plants and seed mixes. Native plants and seed mixes will be obtained from stock originating from areas within the local watershed, to the extent feasible. The Project Biologist will monitor restoration activities consistent with provisions in the Restoration and Revegetation Plan (RRP) (BIO-MM#6).	Construction/post-construction	Restoration/monitoring/reporting	Weekly or as established by regulatory compliance agencies	Authority/Contractor/Project Biologist	Authority/Contractor/Project Biologist	Revegetate disturbed riparian areas/ report findings	Condition of design-build contract/condition of regulatory permits	Impact BIO #9: Operation Impacts on Special-Status Plant Communities Impact HWR #1: Temporary Construction Impacts to Floodplains and Floodways
BIO-MM#33	Restore Aquatic Resources Subject to Temporary Impacts	Within ninety day of the completion of construction activities in a Work Area, the Authority will begin to restore aquatic resources that were temporarily affected by the construction. Aquatic resources are those resources considered waters of the U.S. under the federal Clean Water Act and/or waters of the state under the Porter-Cologne Act. As set out in the Restoration and Revegetation Plan (RRP), such areas will be, to the extent feasible, restored to their natural topography. In areas where gravel or geotextile fabrics have been installed to protect substrate and to otherwise minimize impacts, the material will be removed and the affected features will be restored. The Authority will revegetate affected aquatic resources using appropriate native plants and seed mixes (from local vendors where available). The Authority will conduct maintenance monitoring consistent with the provisions of the RRP.	Construction/post-construction	Restoration/monitoring/reporting	Weekly or as established by regulatory compliance agencies	Authority/Contractor/Project Biologist	Authority/Contractor/Project Biologist	Restore disturbed aquatic resources/ conduct revegetation/ report findings	Condition of design-build contract/condition of regulatory permits	Impact BIO #4: Construction Impacts on Aquatic Resources Impact BIO #10: Operation Impacts on Aquatic Resources
BIO-MM#34	Monitor Construction Activities within Aquatic Resources	The Project Biologist will monitor construction activities that occur within or adjacent to aquatic resources, including activities associated with the installation of protective barriers (e.g., silt fencing, sandbags, fencing), install and/or removal of creek material to accommodate crossings, construction of access roads, and removal of vegetation. As part of this effort, the Project Biologist will document compliance with applicable avoidance and minimization measures including measures set forth in regulatory authorizations issued under the CWA and/or Porter-Cologne.	Construction/post-construction	Surveying/monitoring/reporting	Weekly or as established by regulatory compliance agencies	Authority/Contractor/Project Biologist	Authority/Contractor/Project Biologist	Conduct monitoring of construction activities in and adjacent to jurisdictional waters/ report findings	Condition of design-build contract/condition of regulatory permits	Impact BIO #4: Construction Impacts on Aquatic Resources Impact HWR #3: Temporary Construction Impacts to Surface Water Quality
BIO-MM#35	Implement Transplantation and Compensatory Mitigation Measures for Protected Trees	Prior to ground disturbing activities, the Project Biologist will conduct surveys in the Work Area to identify protected trees. The Project Biologist will establish ESAs around protected trees with the potential to be affected by construction activities, but do not require removal. The ESAs will extend outward five feet from the drip lines of such protected trees. The Authority will provide compensatory mitigation for impacts on protected trees, including impacts associated with removing or trimming a protected tree. Compensation will be based on requirements set out in applicable local government ordinances, policies and regulations. Compensatory mitigation may include, but is not limited to, the following: <ul style="list-style-type: none"> • Transplantation of protected trees to areas outside of the Work Area. • Replacement of protected trees at an off-site location, based on the number of protected trees impacted, at a ratio not to exceed 3:1 for native trees, 10:1 for heritage trees, or 1:1 for ornamental trees, unless higher ratios are required by local government ordinances or regulations. • Contribution to a tree-planting fund. 	Pre-construction/construction/post-construction	Surveying/monitoring/restoration/reporting	Monthly or as established by regulatory compliance agencies	Authority/Contractor/Project Biologist	Authority/Contractor/Project Biologist	Conduct protected trees surveys/ compensate for impacts and effects to protected tree resources/ prepare and implement a monitoring and maintenance program to monitor transplanted trees/ report findings	Condition of design-build contract	Impact BIO #6: Construction Impacts on Protected Trees Impact BIO #12: Operation Impacts on Protected Trees

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
BIO-MM#36	Install Aprons or Barriers within Security Fencing	<p>Prior to final construction design the Project Biologist will review the fencing plans along any portion of the permanent right-of-way that is adjacent to natural habitats (e.g., alkali desert scrub, annual grassland) and confirm that the permanent security fencing will be enhanced with a barrier (e.g., fine mesh fencing) that extends at least 12 inches below ground and 12 inches above ground to prevent special-status reptiles, amphibians and mammals from moving through or underneath the fencing and gaining access to areas within the right-of-way. At the 12-inch depth of the below grade portion of the apron, it will extend or be bent at an approximately 90-degree angle and oriented outward from the right-of-way a minimum of 12-inches, to prevent fossorial mammals, reptiles, and amphibians from digging or tunneling below the security fence and gaining access to the right-of-way. A climber barrier (e.g., rigid curved or bent overhang) will be installed at the top of the apron to prevent reptiles, amphibians and mammals from climbing over the apron.</p> <p>The Project Biologist will ensure that the selected apron material and climber barrier does not cause harm, injury, entanglement, or entrapment to wildlife species. The Authority will provide for quarterly inspection and repair of the fencing.</p> <p>The specific design and method for installation of an apron or barrier may vary as required by regulatory authorizations issued under FESA and/or CESA. Prior to operation the Project Biologist will field inspect the fencing along any portion of the permanent right-of-way that is adjacent to natural habitats (e.g., alkali desert scrub, annual grassland) and confirm that the fencing has been appropriately installed. Fencing plan review and field inspection will be documented in a memorandum from the Project Biologist and provided to the Authority.</p>	Pre-construction/ construction	Final design/ surveying/ monitoring/ reporting	Yearly or at other appropriate intervals	Authority/ Contractor/ Project Biologist	Authority/ Contractor/ Project Biologist	Install permanent aprons of barriers adjacent to prevent special-status reptiles, amphibians, and mammals from gaining access to right-of-way/ report findings	Condition of design- build contract/ condition of regulatory permits	Impact BIO #2: Construction Impacts on Special-Status Wildlife Species Impact BIO #5: Construction Impacts on Wildlife Movement Impact BIO #8: Operational Impacts on Special-Status Wildlife Species
BIO-MM#37	Minimize Effects to Wildlife Movement Corridors during Construction	To the extent feasible, the Authority will avoid placing fencing, either temporarily or permanently, within known wildlife movement corridors in those portions of the alignment where the tracks are elevated (e.g., viaducts or bridges). The Authority will avoid conducting ground disturbing activities in wildlife movement corridors during nighttime hours, to the extent feasible, and will shield nighttime lighting to avoid illuminating wildlife movement corridors in circumstances where avoidance of such activities is not feasible. Steps to minimize lighting effects to wildlife movement corridors during construction will be consistent with BIO-MM#86: Implement Lighting Minimization Measures During Construction.	Pre-construction/ construction	Final design/ surveying/ monitoring/ reporting	Yearly or at other appropriate intervals	Authority/ Contractor/ Project Biologist	Authority/ Contractor/ Project Biologist	Avoid placement of fencing adjacent to wildlife movement corridors/ report findings	Condition of Design Build Contract Construction	Impact BIO #5: Construction Impacts on Wildlife Movement

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
BIO-MM#38	Compensate for Impacts to Listed Plant Species	<p>The Authority will provide compensatory mitigation for direct impacts to federal and State-listed plant species based on the number of acres of plant habitat directly affected. Such mitigation will include the following measures:</p> <ul style="list-style-type: none"> • Compensatory mitigation will be provided at a 1:1 ratio to offset direct impacts to federally listed plant species habitat, unless a higher ratio is required pursuant to regulatory authorizations issued under FESA. • Compensatory mitigation will be provided at a 1:1 ratio to offset direct impacts to State-listed plant species habitat, unless a higher ratio is required pursuant to regulatory authorizations issued under CESA. <p>Compensatory mitigation will be provided using one or more of the methods described in the Compensatory Mitigation Plan, Bio-MM# 53.</p>	Pre-construction/ construction/ post-construction	Design/ final design/ surveying/ compensatory mitigation/ reporting	Monthly or as established by regulatory compliance agencies	Authority/ Contractor/ Project Biologist	Authority/ Contractor/ Project Biologist	Compensate impacts on special-status plants at a 1:1 ratio based on actual acres of direct effects/ report findings	Condition of design-build contract/ condition of regulatory permits	Impact BIO #1: Construction Impacts on Special-Status Plant Species
BIO-MM#42	Provide Compensatory Mitigation for Impacts on Habitat for Blunt-Nosed Leopard Lizard, Tipton Kangaroo Rat and Nelson's Antelope Squirrel	<p>The Authority will provide compensatory mitigation to offset the permanent and temporary loss of suitable habitat for the Tipton kangaroo rat and Nelson's antelope squirrel. Mitigation will be provided at a ratio of 1:1, unless a higher ratio is required by authorizations issued under FESA for Tipton kangaroo rat or blunt-nosed leopard lizard, or under CESA for Tipton kangaroo rat or Nelson's antelope squirrel. Compensatory mitigation will be provided using one or more of the methods described in the Compensatory Mitigation Plan, BIO-MM#53.</p>	Pre-construction/ construction/ post-construction	Design/ final design/ surveying/ compensatory mitigation/ reporting	Monthly or as established by regulatory compliance agencies	Authority/ Contractor/ Project Biologist	Authority/ Contractor/ Project Biologist	Compensate for permanent and temporary loss of suitable habitat for blunt-nosed leopard lizard, Tipton kangaroo rat and Nelson's antelope squirrel/ report findings	Condition of design-build contract/ condition of regulatory permits	<p>Impact BIO #2: Construction Impacts on Special-Status Wildlife Species</p> <p>Impact BIO #5: Construction Impacts on Wildlife Movement</p> <p>Impact BIO #8: Operational Impacts on Special-Status Wildlife Species</p>
BIO-MM#43	Provide Compensatory Mitigation for Loss of Swainson's Hawk Nesting Trees and Habitat	<p>To compensate for permanent impacts on active Swainson's hawk nest trees (i.e., trees in which Swainson's hawks were observed building nests during protocol-level surveys described in BIO-MM#48) and foraging habitat, the Authority would provide project-specific compensatory mitigation that replaces affected nest trees and provides foraging habitat. Lands proposed as compensatory mitigation for Swainson's hawk would meet the following minimum criteria:</p> <ul style="list-style-type: none"> • Support at least three mature native riparian trees suitable for Swainson's hawk nesting (i.e., valley oak, Fremont cottonwood, or willow) for each Swainson's hawk nest tree (native or nonnative) removed by construction of the project extent, which results in a 3:1 ratio. • Support at least one Swainson's hawk nesting territory in the last 5 years. • Contribute to the project extent's mitigation commitment for Swainson's hawk foraging habitat, which would be calculated based on the following ratios: <ul style="list-style-type: none"> – 1:1 for impacts on Active Primary Foraging Habitat – 0.75:1 for impacts on Active Secondary Foraging Habitat – 0.5:1 for impacts on Active Tertiary Foraging Habitat. 	Pre-construction/ construction/ post-construction	Design/ final design/ surveying/ compensatory mitigation/ reporting	Monthly or as established by regulatory compliance agencies	Authority/ Contractor/ Project Biologist	Authority/ Contractor/ Project Biologist	Compensatory mitigation that replaces Swainson's hawk nesting trees and provides natural lands for foraging/ report findings	Condition of design-build contract/ condition of regulatory permits	<p>Impact BIO #2: Construction Impacts on Special-Status Wildlife Species</p> <p>Impact BIO #8: Operational Impacts on Special-Status Wildlife Species</p>
BIO-MM#44	Provide Compensatory Mitigation for Loss of Active Burrowing Owl Burrows and Habitat	<p>To compensate for permanent impacts on nesting, occupied, and satellite burrows for burrowing owls and/or their habitat, the Authority will provide compensatory mitigation at a minimum ratio of 1:1 using one or more of the methods described in the Compensatory Mitigation Plan, BIO-MM#53.</p>	Pre-construction/ construction/ post-construction	Design/ final design/ surveying/ compensatory mitigation/ reporting	Monthly or as established by regulatory compliance agencies	Authority/ Contractor/ Project Biologist	Authority/ Contractor/ Project Biologist	Compensate for permanent impacts burrowing owls/ report findings	Condition of design-build contract/ condition of regulatory permits	<p>Impact BIO #2: Construction Impacts on Special-Status Wildlife Species</p> <p>Impact BIO #8: Operational Impacts on Special-Status Wildlife Species</p>

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
BIO-MM#45	Provide Compensatory Mitigation for Impacts on San Joaquin Kit Fox Habitat	The Authority will provide compensatory mitigation for impacts on modeled San Joaquin kit fox habitat through the acquisition of suitable habitat that is acceptable to USFWS and CDFW. Habitat will be replaced at a minimum ratio of 1:1 for natural lands and at a ratio of 3:1 for suitable urban or agricultural lands, unless a higher ratio is required by regulatory authorizations issued under FESA and/or CESA. Compensatory mitigation will be provided using one or more of the methods described in the Compensatory Mitigation Plan, Bio-MM# 53.	Pre-construction/ construction/ post-construction	Design/ final design/ surveying/ compensatory mitigation/ reporting	Monthly or as established by regulatory compliance agencies	Authority/ Contractor/ Project Biologist	Authority/ Contractor/ Project Biologist/ Mitigation Manager	Mitigate for impacts to San Joaquin kit fox habitat/ report findings	Condition of design-build contract/ condition of regulatory permits	Impact BIO #8: Operational Impacts on Special-Status Wildlife Species
BIO-MM#46	Provide Compensatory Mitigation for Permanent Impacts on Riparian Habitat	The Authority will compensate for permanent impacts on riparian habitats at a ratio of 2:1, unless a higher ratio is required by agencies with regulatory jurisdiction over the resource. Compensatory mitigation may occur through habitat restoration, the acquisition of credits from an approved mitigation bank, or participation in an in lieu fee program.	Pre-construction/ construction/ post-construction	Design/ final design/ surveying/ compensatory mitigation/ reporting	Yearly or as established by regulatory compliance agencies	Authority/ Contractor/ Project Biologist	Authority/ Contractor/ Project Biologist	Mitigate permanent riparian habitat impacts through compensation/ report findings	Condition of design-build contract/ condition of regulatory permits	Impact BIO #9: Operation Impacts on Special-Status Plant Communities
BIO-MM#47	Prepare and Implement a Compensatory Mitigation Plan (CMP) for Impacts on Aquatic Resources	The Authority will prepare and implement a Compensatory Mitigation Plan (CMP) that identifies mitigation to address temporary and permanent loss, including functions and values, of aquatic resources as defined as waters of the U.S. under the federal Clean Water Act (CWA) and/or waters of the State under the Porter-Cologne Act. Compensatory mitigation may involve the restoration, establishment, enhancement, and/or preservation of aquatic resources through one or more of the following methods: <ul style="list-style-type: none"> • Purchase of credits from an agency-approved mitigation bank. • Preservation of aquatic resources through acquisition of property. • Establishment, restoration, or enhancement of aquatic resources. • In lieu fee contribution determined through consultation with the applicable regulatory agencies. The following ratios will be used for compensatory mitigation unless a higher ratio is required pursuant to regulatory authorizations issued under Section 404 of the CWA and/or the Porter-Cologne Act: <ul style="list-style-type: none"> • Vernal pools: 2:1. • Seasonal wetlands: between 1.1:1 and 1.5:1 based on impact type, function and values lost. • 1:1 off-site for permanent impacts. • 1:1 on-site and 0.1:1 to 0.5:1 off-site for temporary impacts. For mitigation involving establishment, restoration, enhancement, or preservation of aquatic resources by the Authority, the CMP will contain the following information: <ul style="list-style-type: none"> • Objectives. A description of the resource types and amounts that will be provided, the type of compensation (i.e., restoration, establishment, enhancement, and/or preservation), and the manner in which the resource functions of the compensatory mitigation project will address the needs of the watershed or ecoregion. • Site selection. A description of the factors considered during the term sustainability of the resource. • Adaptive management plan. A management strategy to address changes in site conditions or other components of the compensatory mitigation project. 	Pre-construction/ construction/ post-construction	Design/ final design/ surveying/ compensatory mitigation/ reporting	Yearly or as established by regulatory compliance agencies	Authority/ Contractor/ Project Biologist	Authority/ Contractor/ Project Biologist	Prepare and implement CMP for temporary and permanent impact on aquatic resources/ report findings	Condition of design-build contract/ condition of regulatory permits	Impact BIO #1: Construction Impacts on Special-Status Plant Species Impact BIO #2: Construction Impacts on Special-Status Wildlife Species Impact BIO #3: Construction Impacts on Special-Status Plant Communities Impact BIO #4: Construction Impacts on Aquatic Resources Impact BIO #8: Operational Impacts on Special-Status Wildlife Species Impact BIO #9: Operation Impacts on Special-Status Plant Communities Impact BIO #10: Operation Impacts on Aquatic Resources

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		<ul style="list-style-type: none"> Financial assurances. A description of financial assurances that will be provided to ensure that the compensatory mitigation will be successful. <p>In circumstances where the Authority intends to fulfill compensatory mitigation obligations by securing credits from approved mitigation banks or in-lieu fee programs, the CMP need only include the name of the specific mitigation bank or in-lieu fee program to be used and the method for calculating credits.</p>								
BIO-MM#50	Implement Measures to Minimize Impacts during Off-Site Habitat Restoration, or Enhancement, or Creation on Mitigation Sites	<p>Prior to ground disturbing activities associated with habitat restoration, enhancement, and/or creation actions at a mitigation site, the Authority will conduct a site assessment of the Work Area to identify biological and aquatic resources, including plant communities, land cover types, and the distribution of special-status plants and wildlife.</p> <p>Based on the results of the site assessment, the Authority will obtain any necessary regulatory authorizations prior to conducting habitat restoration, enhancement and/or creation activities, including authorization under FESA or CESA, Fish and Game Code Section 1600 et seq., the Clean Water Act, and the Porter-Cologne Act.</p> <p>The Authority will implement the following measures to avoid or minimize impacts to species habitat and aquatic biological resources during habitat restoration, enhancement or creation activities:</p> <ul style="list-style-type: none"> IAMF: Prepare WEAP Training Materials and Conduct Construction Period WEAP Training IAMF: Establish Monofilament Restrictions IAMF: Prevent Entrapment in Construction Materials and Excavations IAMF: Delineate Equipment Staging Areas and Traffic Routes IAMF: Dispose of Construction Spoils and Waste IAMF: Clean Construction Equipment IAMF: Maintain Construction Sites MM: Conduct Pre-construction Surveys and Delineate Active Nest Buffers Exclusion Areas for Breeding Birds MM: Conduct Pre-construction Surveys and Monitoring for Raptors MM: Restore Temporary Riparian Habitat Impacts MM: Restore Aquatic Resources Subject to Temporary Impacts MM: Prepare and Implement a Weed Control Plan MM: Notify and Report on "Take" MM: Delineate Environmentally Sensitive Areas and Install Wildlife Exclusion Fencing MM: Limit Vehicle Traffic and Construction Site Speeds MM: Work Stoppage <p>The off-site habitat restoration, enhancement, and preservation program would be designed, implemented, and monitored consistent with the terms and conditions of the federal and State permit authorizations as they apply to their jurisdiction and resources on-site. Potential impacts on site-specific hydrology and the downstream resources would be evaluated as a result of implementation of the restoration-related activity. Site-specific BMPs and a stormwater pollution prevention plan would be implemented as appropriate.</p>	Pre-construction/ construction/ post-Construction	Design/ final design/ surveying/ compensatory mitigation/ reporting	Yearly or as established by regulatory compliance agencies	Authority/ Contractor/ Project Biologist	Authority/ Contractor/ Project Biologist	Implement measure to avoid and minimize impacts during off-site habitat restoration, enhancement, and creation/ report findings	Condition of design-build contract/ condition of regulatory permits	<p>Impact BIO #1: Construction Impacts on Special-Status Plant Species</p> <p>Impact BIO #2: Construction Impacts on Special-Status Wildlife Species</p> <p>Impact BIO #3: Construction Impacts on Special-Status Plant Communities</p> <p>Impact BIO #4: Construction Impacts on Aquatic Resources</p> <p>Impact BIO #5: Construction Impacts on Wildlife Movement</p> <p>Impact BIO #6: Construction Impacts on Protected Trees</p> <p>Impact BIO #7: Operational Impacts on Special-Status Plant Species</p> <p>Impact BIO #8: Operational Impacts on Special-Status Wildlife Species</p> <p>Impact BIO #9: Operation Impacts on Special-Status Plant Communities</p> <p>Impact BIO #10: Operation Impacts on Aquatic Resources</p> <p>Impact BIO #12: Operation Impacts on Protected Trees</p>

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
		The Authority or its designee would report on compliance with permitting requirements. The Authority, or its designee, would be responsible for the monitoring and tracking of the program, would prepare a memorandum of compliance, and would submit it to the appropriate regulatory agency.								
BIO-MM#53	Prepare a Compensatory Mitigation Plan (CMP) for Species and Species Habitat	<p>The Authority will prepare a Compensatory Mitigation Plan that sets out the compensatory mitigation that will be provided to offset permanent and temporary impacts to federal and State-listed species and their habitat, fish and wildlife resources regulated under Section 1600 et seq. of the Fish and Game Code, and certain other special-status species. The CMP will include the following:</p> <ul style="list-style-type: none"> • A description of the species and habitat types for which compensatory mitigation is being provided. • A description of the methods used to identify and evaluate mitigation options. Mitigation options will include one or more of the following: <ul style="list-style-type: none"> – Purchase of mitigation credits from an agency-approved mitigation bank. – Protection of habitat through acquisition of fee-title or conservation easement and funding for long-term management of the habitat. Title to lands acquired in fee will be transferred to CDFW and conservation easements will be held by an entity approved in writing by the applicable regulatory agency. In circumstances where the Authority protects habitat through a conservation easement, the terms of the conservation easement will be subject to approval of the applicable regulatory agencies, and the conservation easement will identify applicable regulatory agencies as third party beneficiaries with a right of access to the easement areas. – Payment to an existing in-lieu fee program. • A summary of the estimated direct permanent and temporary impacts to species and species habitat. • A description of the process that will be used to confirm impacts. Actual impacts to species and habitat could differ from estimates. Should this occur, adjustments will be made to the compensatory mitigation that will be provided. Adjustments to impact estimates and compensatory mitigation will occur in the following circumstances: <ul style="list-style-type: none"> – Impacts to species (typically measured as habitat loss) are reduced or increased as a result of changes in project design, – Pre-construction site assessments indicate that habitat features are absent (e.g., because of errors in land cover mapping or land cover conversion), – The habitat is determined to be unoccupied based on negative species surveys, or – Impacts initially categorized as permanent qualify as temporary impacts. • An overview of the strategy for mitigating effects to species. The overview will include the ratios to be applied to determine mitigation levels and the resulting mitigation totals. 	Pre-construction/ construction	Design/ final design/ mitigation	Yearly or as established by regulatory compliance agencies	Authority/ Contractor/ Project Biologist	Authority/ Contractor/ Project Biologist	Prepare CMP for temporary and permanent impacts on special-status species and their habitat	Condition of design-build contract/ condition of regulatory permits	Impact BIO #1: Construction Impacts on Special-Status Plant Species Impact BIO #2: Construction Impacts on Special-Status Wildlife Species Impact BIO #3: Construction Impacts on Special-Status Plant Communities Impact BIO #7: Operational Impacts on Special-Status Plant Species Impact BIO #8: Operational Impacts on Special-Status Wildlife Species Impact BIO #9: Operation Impacts on Special-Status Plant Communities

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
		<ul style="list-style-type: none"> • A description of habitat restoration or enhancement projects, if any, that will contribute to compensatory mitigation commitments. • A description of the success criteria that will be used to evaluate the performance of habitat restoration or enhancement projects, and a description of the types of monitoring that will be used to verify that such criteria have been met. • A description of the management actions that will be used to maintain the habitat on the mitigation sites, and the funding mechanisms for long-term management. • A description of adaptive management approaches, if applicable, that will be used in the management of species habitat. • A description of financial assurances that will be provided to demonstrate that the funding to implement mitigation is assured. 								
BIO-MM#54	Prepare and Implement an Annual Vegetation Control Plan	<p>Prior to the operation and maintenance of the HSR, the Authority will prepare an Annual Vegetation Control Plan (VCP) to address vegetation removal for the purpose of maintaining clear areas around facilities, reducing the risk of fire, and controlling invasive weeds during the operational phase. The Authority will generally follow the procedures established in Chapter C2 of the Caltrans Maintenance Manual to manage vegetation on Authority property (California Department of Transportation [Caltrans] [2014]). Vegetation will be controlled by chemical, thermal, biological, cultural, mechanical, structural, and manual methods. The VCP will be updated each winter and completed in time to be implemented no later than April 1 of each year. The annual update to the VCP would include a section addressing issues encountered during the prior year and changes to be incorporated into the VCP. The plan will describe site-specific vegetation control methods, as outlined below:</p> <ul style="list-style-type: none"> • Chemical vegetation control methods • Mowing program consistent with Section 1415 of the FAST Act • Other non-chemical vegetation control • Other chemical pest control methods (e.g., insects, snail, rodent) <p>Only Caltrans-approved herbicides may be used in the vegetation control program. Pesticide application will be conducted in accordance with all requirements of the California Department of Pesticide Regulation and County Agricultural Commissioners by certified pesticide applicators. Noxious/invasive weeds will be treated where requested by County Agricultural Commissioners. The Authority will cooperate in area-wide efforts to control of noxious/invasive weeds if such programs have been established by local agencies.</p>	Pre-construction/ construction/ post-construction	Design/ final design/ compensatory mitigation/ reporting	Yearly or as established by regulatory compliance agencies	Authority/ Contractor/ Project Biologist	Authority/ Contractor/ Project Biologist	Prepare and implement VCP for vegetation removal for the purpose of maintaining clear areas/ report findings	Condition of design-build contract/ condition of regulatory permits	<p>Impact BIO #3: Construction Impacts on Special-Status Plant Communities</p> <p>Impact BIO #7: Operational Impacts on Special-Status Plant Species</p> <p>Impact BIO #9: Operation Impacts on Special-Status Plant Communities</p>

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
BIO-MM#55	Prepare and Implement a Weed Control Plan	<p>Prior to any ground disturbing activity during the construction phase, the Project Biologist will develop a Weed Control Plan (WCP), subject to review and approval by the Authority and the SWRCB. The purpose of the WCP is to establish approaches to minimize and avoid the spread of invasive weeds during ground disturbing activities during construction and operations and maintenance.</p> <p>The WCP will include, at a minimum, the following:</p> <ul style="list-style-type: none"> • A requirement to delineate Environmentally Sensitive Areas (ESAs) in the field prior to weed control activities. • A schedule for weed surveys to be conducted in coordination with the BRMP. • Success criteria for invasive weed control. The success criteria would be linked to the BRMP standards for on-site work during ground disturbing activities. In particular, the criteria would establish limits on the introduction and spread of invasive species, as defined by the California Invasive Plant Council (Cal-IPC), to less than or equal to the pre-disturbance conditions in the area temporarily affected by ground disturbing activities. If invasive species cover is found to exceed pre-disturbance conditions by greater than 10 percent or is 10percent greater than levels at a similar, nearby reference site, a control effort will be implemented. If the target, or other success criteria identified in the WCP, has not been met by the end of the WCP monitoring and implementation period, the Authority will continue the monitoring and control efforts, and remedial actions will be identified and implemented until the success criteria are met. • Provisions to ensure consistency between the WCP and the RRP, including verification that the RRP includes measures to minimize the risk of the spread and/or establishment of invasive species and reflects the same revegetation performance standards as the WCP. • Identification of weed control treatments, including permitted herbicides and manual and mechanical removal methods. • Timeframes for weed control treatment for each plant species. • Identification of fire prevention measures. 	Pre-construction/ construction/ post-construction	Design/ final design/ compensatory mitigation/ reporting	Yearly or as established by regulatory compliance agencies	Authority/ Contractor/ Project Biologist	Authority/ Contractor/ Project Biologist	Prepare and implement WCP minimize and avoid the spread of invasive weeds/ report findings	Condition of design-build contract/ condition of regulatory permits	<p>Impact BIO #1: Construction Impacts on Special-Status Plant Species</p> <p>Impact BIO #2: Construction Impacts on Special-Status Wildlife Species</p> <p>Impact BIO #8: Operational Impacts on Special-Status Wildlife Species</p>
BIO-MM#56	Conduct Monitoring of Construction Activities	<p>During any initial ground disturbing activity, the Project Biologist will be present in the Work Area to verify compliance with avoidance and minimization measures, to establish ESAs, and install wildlife exclusion fencing (WEF) and construction exclusion fencing (exclusion fencing).</p>	Construction	Monitoring/ reporting	Weekly or as established by regulatory compliance agencies	Authority/ Contractor/ Project Biologist	Authority/ Contractor/ Project Biologist	Project Biologist will be present in Work Area to verify compliance with avoidance and minimization measures	Condition of design-build contract/ condition of regulatory permits	<p>Impact BIO #1: Construction Impacts on Special-Status Plant Species</p> <p>Impact BIO #2: Construction Impacts on Special-Status Wildlife Species</p> <p>Impact BIO #5: Construction Impacts on Wildlife Movement</p> <p>Impact BIO #6: Construction Impacts on Protected Trees</p> <p>Impact BIO #8: Operational Impacts on Special-Status Wildlife Species</p>

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
BIO-MM#58	Establish Environmentally Sensitive Areas and Non-Disturbance Zones	<p>Prior to any ground disturbing activity in a Work Area, the Project Biologist will use flagging to mark Environmentally Sensitive Areas (ESAs) that support special-status species or aquatic resources and are subject to seasonal restrictions or other avoidance and minimization measures. The Project Biologist will also direct the installation of Wildlife Exclusion Fencing (WEF) to prevent special-status wildlife species from entering Work Areas. The WEF will have exit doors to allow animals that may be inside an enclosed area to leave the area. The Project Biologist will also direct the installation of construction exclusionary fencing (exclusionary fencing) at the boundary of the Work Area, as appropriate, to avoid and minimize impacts to special-status species or aquatic resources outside of the Work Area during the construction period. The ESAs, WEF, and exclusionary fencing will be delineated by the Project Biologist based on the results of habitat mapping or modeling and any pre-construction surveys, and in coordination with the Authority. The ESA, WEF, and exclusionary fencing will be regularly inspected and maintained by the Project Biologist.</p> <p>The ESA, WEF, and exclusionary fencing locations will be identified and depicted on an exclusion fencing exhibit. The purpose of the ESAs and WEF will be explained at WEAP training and the locations of the ESA and WEF areas will be noted during worker tailgate sessions.</p>	Pre-construction/ construction	Monitoring/ reporting	Weekly or as established by regulatory compliance agencies	Authority/ Contractor/ Project Biologist	Authority/ Contractor/ Project Biologist	Demarcate ESAs and No-Work areas	Condition of design-build contract/ condition of regulatory permits	<p>Impact BIO #1: Construction Impacts on Special-Status Plant Species</p> <p>Impact BIO #2: Construction Impacts on Special-Status Wildlife Species</p> <p>Impact BIO #3: Construction Impacts on Special-Status Plant Communities</p> <p>Impact BIO #4: Construction Impacts on Aquatic Resources</p> <p>Impact BIO #6: Construction Impacts on Protected Trees</p> <p>Impact BIO #10: Operation Impacts on Aquatic Resources</p>
BIO-MM#60	Limit Vehicle Traffic and Construction Site Speeds	<p>Prior to any ground disturbing activities, the Project Biologist will ensure that appropriate measures have been instituted to restrict project vehicle traffic within the Construction Footprint to established roads, construction areas, and other permissible areas. The Project Biologist will establish vehicle speed limits of no more than 15 mph for unimproved access roads and for temporary and permanent construction areas within the Construction Footprint. The Project Biologist will also direct that access routes be flagged and marked and that measures be adopted to prevent off-road vehicle traffic.</p>	Pre-construction/ construction	Monitoring/ reporting	Weekly or as established by regulatory compliance agencies	Authority/ Contractor/ Project Biologist	Authority/ Contractor/ Project Biologist	Establish and demarcate vehicle access routes and speed limits/ report findings	Condition of design-build contract/ condition of regulatory permits	<p>Impact BIO #2: Construction Impacts on Special-Status Wildlife Species</p> <p>Impact BIO #7: Operational Impacts on Special-Status Plant Species</p>

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
BIO-MM#61	Establish and Implement a Compliance Reporting Program	<p>The Project Biologist will prepare monthly and annual reports documenting compliance with all IAMFs, mitigation measures, and requirements set forth in regulatory agency authorizations. The Authority will review and approve all compliance reports prior to submittal to the regulatory agencies. Reports will be prepared in compliance with the content requirements outlined in the regulatory agency authorizations.</p> <p>Pre-activity survey reports will be submitted within 15 days of completing the surveys and will include:</p> <ul style="list-style-type: none"> • Location(s) of where pre-activity surveys were completed, including latitude and longitude, Assessor Parcel Number, and HSR parcel number. • Written description of the surveyed area. A figure of each surveyed location will be provided that depicts the surveyed area and survey buffers over an aerial image. • Date, time, and weather conditions observed at each location. • Personnel who conducted the pre-activity surveys. • Verification of the accuracy of the Authority's habitat mapping at each location, provided in writing and on a figure. • Observations made during the survey, including the type and locations (written and GIS) of any sensitive resources detected. • Identification of relevant measures from the BRMP to be implemented as a result of the survey observations. <p>Daily Compliance Reports will be submitted to the Authority via EMMA within 24 hours of each monitoring day. Non-compliance events will be reported to the Authority the day of the occurrence. Daily Compliance Reports will include:</p> <ul style="list-style-type: none"> • Date, time, and weather conditions observed at each location where monitoring occurred. • Personnel who conducted compliance monitoring. • Project activities monitored, including construction equipment in use. • Compliance conditions implemented successfully. • Non-compliance events observed. <p>Daily Compliance Reports will also be included in the Monthly Compliance Reports, which will be submitted to the Authority by the 10th of each month and will include:</p> <ul style="list-style-type: none"> • Summary of construction activities and locations during the reporting month, including any non-compliance events and their resolution, work stoppages, and take of threatened or endangered species. • Summary of anticipated project activities and Work Areas for the upcoming month. • Tracking of impacts to suitable habitats for each threatened and endangered species identified in USFWS and CDFW authorizations, including: <ul style="list-style-type: none"> – An accounting of the number of acres of habitats for which we provide compensatory mitigation that has been disturbed during the reporting month, and 	Pre-construction/ construction	Monitoring/ reporting	Monthly and annually	Authority/ Contractor/ Project Biologist	Authority/ Contractor/ Project Biologist	Establish and implement compliance reporting program/ report findings	Condition of design- build contract/ condition of regulatory permits	Impact BIO #1: Construction Impacts on Special-Status Plant Species Impact BIO #2: Construction Impacts on Special-Status Wildlife Species Impact BIO #3: Construction Impacts on Special-Status Plant Communities Impact BIO #4: Construction Impacts on Aquatic Resources Impact BIO #6: Construction Impacts on Protected Trees

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
		<ul style="list-style-type: none"> - An accounting of the cumulative total number of acres of threatened and endangered species habitat that has been disturbed during the project period. • Up-to-date GIS layers, associated metadata, and photo documentation used to track acreages disturbed. • Copies of all pre-activity survey reports, daily compliance reports, and non-compliance/ work stoppage reports for the reporting month. <p>Annual Reports will be submitted to the Authority by the 20th of January and will include:</p> <ul style="list-style-type: none"> • Summary of all Monthly Compliance Reports for the reporting year. • A general description of the status of the project, including projected completion dates. • All available information about project-related incidental take of threatened and endangered species. • Information about other project impacts on the threatened and endangered species. • A summary of findings from pre-construction surveys (e.g., number of times a threatened or endangered species or a den, burrow, or nest was encountered, location, if avoidance was achieved, if not, what other measures were implemented). • Written description of disturbances to threatened and endangered species habitat within Work Areas, both for the preceding 12 months and in total since issuance of regulatory authorizations by USFWS and CDFW, and updated maps of all land disturbances and updated maps of identified habitat features suitable for threatened and endangered species within the project area. • Written compliance with the reporting requirements established by any WDRs that have been issued. <p>In addition to the compliance reporting requirements outlined above, the following items will be provided for compliance documentation purposes:</p> <ul style="list-style-type: none"> • If agency personnel visit the Construction Footprint in accordance with BIO-IAMF#2, the Project Biologist will prepare a memorandum within one day of the visit that memorializes the issues raised during the field meeting. This memorandum will be submitted to the Authority via EMMA. Any issues regarding regulatory compliance raised by agency personnel will be reported to the Authority and the Contractor. • Compliance reporting will be submitted to the Authority via EMMA in accordance with the report schedule. The Project Biologist will prepare and submit compliance reports that document the following: <ul style="list-style-type: none"> - Implementation and performance of the Restoration and Revegetation Plan described in BIO-MM. - Summary of progress made regarding the implementation of the Weed Control Plan described in BIO-MM. - Compliance with work window restrictions described in BIO-IAMF. The memorandum will be provided to the Authority for compliance monitoring documentation purposes. 								

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
		<ul style="list-style-type: none"> – Compliance with BIO-MM: Notify and Report on “Take”. – Compliance with BIO-MM: Establish Environmentally Sensitive Areas and Non-Disturbance Zones and Install Wildlife Exclusion Fencing. – Compliance with BIO-IAMF: Establish Monofilament Restrictions; the Project Biologist. – Compliance with BIO-IAMF: Prevent Entrapment in Construction Materials and Excavations. – Compliance with BIO-IAMF: Delineate Equipment Staging Areas. – Compliance with BIO-IAMF: Clean Construction Equipment. – Compliance with BIO-MM: Limit Vehicle Traffic and Construction Site Speed. – Compliance with BIO-IAMF: Design the Project to be Bird Safe. – Compliance with BIO-IAMF: Dispose of Construction Spoils and Waste has been properly disposed. – BMP field manual implementation and any recommended changes to construction site housekeeping practices outlined in BIO-IAMF: Maintain Construction Sites. • Work stoppages and measures taken under BIO-MM: Stop Work and Remove Special Status Species from Construction Sites will be documented in a memorandum prepared by the Project Biologist and submitted to the Authority within two business days of the work stoppage. 								
BIO-MM#62	Prepare Plan for Dewatering and Water Diversions	Prior to initiating any construction activity that occurs within open or flowing water, the Authority will prepare a dewatering plan, which will be subject to the review and approval by the applicable regulatory agencies. The plan will incorporate measures to minimize turbidity and siltation. The Project Biologist will monitor the dewatering and/or water diversion sites, including collection of water quality data, as applicable. Prior to the dewatering or diverting of water from a site, the Project Biologist will conduct pre-activity surveys to determine the presence or absence of special-status species within the affected waterbody. In the event that special-status species are detected during pre-activity surveys, the Project Biologist will relocate the species (unless the species is Fully Protected under State law), with any regulatory authorizations applicable to the species.	Pre-construction/ construction	Design/ final design/ monitoring/ reporting	Weekly or as established by regulatory compliance agencies	Authority/ Contractor/ Project Biologist	Authority/ Contractor/ Project Biologist	Prepare and implement dewatering and waste diversion plan/ report findings	Condition of design-build contract/ condition of regulatory permits	Impact BIO #2: Construction Impacts on Special-Status Wildlife Species Impact BIO #4: Construction Impacts on Aquatic Resources Impact HWR #3: Temporary Construction Impacts to Surface Water Quality
BIO-MM#63	Work Stoppage	In the event that any special-status wildlife species is found in a Work Area, the Project Biologist will have the authority to halt work to prevent the death or injury to the species. Any such work stoppage will be limited to the area necessary to protect the species and work may be resumed once the Project Biologist determines that the individuals of the species have moved out of harm’s way or the Project Biologist has relocated them out of the Work Area. Any such work stoppages and the measures taken to facilitate the removal of the species, if any, will be documented in a memorandum prepared by the Project Biologist and submitted to the Authority within two business days of the work stoppage.	Construction	Monitoring/ reporting	Weekly or as established by regulatory compliance agencies	Authority/ Contractor/ Project Biologist	Authority/ Contractor/ Project Biologist	Halt work to relocate special-status wildlife species (if possible)/ report findings	Condition of design-build contract/ condition of regulatory permits	Impact BIO #2: Construction Impacts on Special-Status Wildlife Species

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
BIO-MM#64	Establish Wildlife Crossings	<p>The Authority will create dedicated wildlife crossings to accommodate wildlife movement across permanently fenced infrastructure (consistent with any wildlife corridor assessment prepared), where wildlife movement would be significantly reduced. Prior to final construction design the Project Biologist shall confirm appropriate placement and dimensions of wildlife crossings.</p> <p>For terrestrial wildlife, all crossings will conform to the minimum spacing and dimensions identified in the Wildlife Corridor Assessment (Appendix I of the <i>Biological and Aquatic Resources Technical Report</i>), unless different dimensions are specified in authorizations issued under FESA or CESA.</p> <p>To the extent feasible, all wildlife crossings created specifically for terrestrial species will include the following features and design considerations:</p> <ul style="list-style-type: none"> • Native earthen bottom • Ledges or tunnels will be incorporated into the design to facilitate safe passage of small mammals • Unobstructed entrances (e.g., no riprap, energy dissipaters, grates), although vegetative cover, adjacent to and near the entrances of crossings, is permissible • Openness and clear line of sight from end to end • Year-round absence of water for a portion of the width of the crossing (i.e., no flowing water) • Slight grade at approaches to prevent flooding • Limited open space between crossing and cover/habitat • Separation from human use areas (e.g., trails, multiuse undercrossings) • Avoidance of artificial light at approaches to wildlife crossings (Steps to minimize lighting effects to wildlife crossings will be consistent with BIO-MM#86: Implement Lighting Minimization Measures During Construction, and BIO-MM#87: Implement Lighting Minimization Measures for Operations.) • Implement the following noise minimization measures as identified in the Wildlife Corridor Assessment: <ul style="list-style-type: none"> – Implement Proposed California High-Speed Train Project Noise Mitigation Guidelines (www.hsr.ca.gov/). – Install sound barriers to minimize noise impacts, as follows; <ul style="list-style-type: none"> ▪ Peak train sound exposure levels (SEL) that exceed 100 dBA at a distance of 50 feet beyond the perimeter fence along the full extent of all at-grade rail segments within the Tehachapi Linkage Design. ▪ Peak train SEL less than 100 dBA below or within 200 feet of any viaduct sections passing through areas of natural vegetation. ▪ Peak train SEL less than 80 dBA at the entrance or approach to smaller crossing structures (bridges or culverts). Although 100 dBA is the generally accepted threshold for impacts to wildlife, most humans are “highly annoyed” by 80 dBA noise. The Occupational Safety and Health Administration requires that hearing protection be available to workers in environments that exceed 85 dBA 	Pre-construction/ Construction	Design/ final design/ monitoring/ reporting	Weekly or as established by regulatory compliance agencies	Authority/ Contractor/ Project Biologist	Authority/ Contractor/ Project Biologist	Establish wildlife crossings/ report findings	Condition of design-build contract/ condition of regulatory permits	Impact BIO #5: Construction Impacts on Wildlife Movement Impact BIO #11: Operation Impacts on Wildlife Movement

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
		<p>and that workers use hearing protection at 90 dBA. Therefore, an 80 dBA threshold is appropriate for confined structures intended to facilitate animal movement.</p> <ul style="list-style-type: none"> ▪ Berms and berm/wall combinations will be used to shield nearby natural habitat and/or crossing structures from loud noise that exceeds 100 dBA at distances greater than 50 feet from the perimeter fence. <p>In addition, the Authority will incorporate features to accommodate wildlife movement into the design of bridges and culverts that are replaced or modified as part of project construction, wherever feasible. Project Biologist review of final construction design for consistency with placement and dimensions of wildlife crossings will be verified in a memorandum provided to the Authority.</p> <p>The Authority would also develop a monitoring and adaptive management plan to monitor the effectiveness and use of crossing designs. The plan would include the following minimum components:</p> <ul style="list-style-type: none"> • Monitoring methods. Consistent with local monitoring efforts, which primarily use camera stations and other remote sensing equipment to document use, monitoring would focus on crossings within defined wildlife movement corridors. To the extent feasible, the Authority could also contribute funding to local organizations currently conducting wildlife movement monitoring to meet monitoring requirements outlined in the measure, provided the efforts are occurring within the same defined wildlife movement corridors. • Monitoring. Monitoring would start no less than 2 years following construction (to allow time for habituation), and total initial monitoring period would not exceed 5 years following construction. Additional monitoring associated with adaptive management would be confined to the location triggering the adaptive management and would not exceed 5 years. • Success criteria. Success criteria would be based on the expected use by movement guild representatives known to be present in the region. • Adaptive management. Adaptive management would include modifications to design features, if feasible, such as cover and substrate; use of new technologies to attract animals to the crossing; fencing; adjacent land management changes, if feasible; or other measures that may be determined to be feasible in the future. <p>The monitoring and adaptive management plan would be developed in coordination with wildlife agency staff and local wildlife movement stakeholders.</p>								

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
BIO-MM#65	Conduct Pre-construction Surveys and Monitoring for Bald and Golden Eagles	At least one year prior to the start of any ground disturbing activities and construction, the Project Biologists will conduct nesting season surveys for eagles. Surveys for bald and golden eagle nests will be conducted within 4 miles of any construction areas supporting suitable nesting habitat and important eagle roost sites and foraging areas. Surveys will be conducted in accordance with the USFWS Interim Golden Eagle Inventory and Monitoring Protocols [Pagel et al. 2010], and CDFW's Bald Eagle Breeding Survey Instructions [CDFW 2017], or current guidance. A nesting territory or inventoried habitat will be considered unoccupied by golden eagles only after completing at least two full surveys in a single breeding season. Prior to initial construction activities, the Project Biologist will conduct a pre-construction sweep of the project site for golden eagle use and will provide no-work zone buffers where active nests are identified.	Pre-construction/ construction	Surveying/ monitoring/ reporting	Weekly or as established by regulatory compliance agencies	Authority/ Contractor/ Project Biologist	Authority/ Contractor/ Project Biologist	Pre-construction nesting surveys for eagles/ report findings	Condition of design-build contract/ condition of regulatory permits	Impact BIO #2: Construction Impacts on Special-Status Wildlife Species
BIO-MM#66	Implement Avoidance Measures for Active Eagle Nests	<p>Prior to the start of any ground disturbing activity, if an occupied nest (as defined by Pagel et al., 2010) is detected within 4 miles of the work areas, the Authority will implement a 1-mile line-of-sight and 0.5 mile no line-of-sight no work buffer during the breeding season (January 1 through August 31) to ensure that construction activities do not result in injury or disturbance to eagles.</p> <p>The no work buffer will be maintained throughout the breeding season or until the young have fledged and are no longer dependent upon the nest or parental care that includes nest use for survival. Factors to be considered for determining buffer size will include: the presence of natural buffers provided by vegetation or topography; nest height; locations of foraging territory; and baseline levels of noise and human activity. Buffers will be maintained and nests monitored until the Project Biologist has determined that young have fledged and are no longer reliant upon the nest or parental care that includes nest use for survival.</p> <p>Eagle nest exclusion zones may be removed if monitoring reveals the nest to be inactive as determined by the Project Biologist. An inactive eagle nest is one that is "no longer being used by eagles as determined by the continuing absence of any adult, egg, or dependent young at the nest for at least 10 consecutive days prior to, and including, at present" (USFWS 2016). Monitoring to demonstrate inactivity of eagle nests will follow observational procedures described by Pagel et al. (2010).</p> <p>In bald and golden eagle nesting territories, the Project Biologist will examine debris piles daily and determine if there is a potential to attract prey species. If the Project Biologist determines debris piles may attract prey species and pose a danger to eagles, the debris piles will be removed or moved.</p>	Pre-construction/ Construction	Surveying/ monitoring/ reporting	Weekly or established by regulatory compliance agencies	Authority/ Contractor/ Project Biologist	Authority/ Contractor/ Project Biologist	Implement and maintain no line-of-sight no-work buffer during the breeding season/ report findings	Condition of design-build contract/ condition of regulatory permits	Impact BIO #2: Construction Impacts on Special-Status Wildlife Species

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
BIO-MM#67	Provide Compensatory Mitigation for Loss of Eagle Nests	<p>If preconstruction surveys identify active eagle nests in the permanent impact area, the Authority, in consultation with the USFWS and the CDFW, will develop a nest relocation or replacement plan for the affected nest(s). The plan will describe why there is no practicable alternative to nest removal while enabling project extent construction. Any relocation or replacement of eagle nests will be in accordance with the Bald and Golden Eagle Protection Act and subject to the following minimum requirements:</p> <ul style="list-style-type: none"> The nest will be relocated, or a suitable nest will be provided, within the same territory to provide a viable nesting option for the affected eagle pair. Post construction monitoring to confirm continued nesting within the affected nesting territory will occur for a minimum of 3 years using observation procedures described by Pagel et al. (2010). 	Pre-construction/ construction/ post-construction	Design/ final design/ surveying/ monitoring/ compensatory mitigation/ reporting	Weekly or as established by regulatory compliance agencies	Authority/ Contractor/ Project Biologist/ Mitigation Manager	Authority/ Contractor/ Project Biologist/ Mitigation Manager	Compensatory mitigation that replaces eagle nests/ report findings	Condition of design-build contract/ condition of regulatory permits	Impact BIO #2: Construction Impacts on Special-Status Wildlife Species Impact BIO #8: Operational Impacts on Special-Status Wildlife Species
BIO-MM#68	Avoid and Minimize Impacts to White-tailed kite	<p>If construction activities are scheduled to occur between February 1 and August 31, the Project Biologist will conduct surveys for white-tailed kite. Surveys will cover a minimum of a 0.5-mile radius around the construction area. If nesting white-tailed kites are detected, the Project Biologist will establish a 0.25 mile no disturbance buffer unless the Project Biologist determines that smaller buffers would be sufficient to avoid impacts, with agency consultation. Buffers will be maintained until the Project Biologist has determined that the young have fledged and are no longer reliant upon the nest or parental care that includes nest use for survival.</p>	Pre-construction/ construction	Surveying/ monitoring/ compensatory mitigation/ reporting	Weekly or as established by regulatory compliance agencies	Authority/ Contractor/ Project Biologist/ Mitigation Manager	Authority/ Contractor/ Project Biologist/ Mitigation Manager	Pre-construction surveys for white-tailed kite/ establish no-disturbance buffer/ report findings	Condition of design-build contract/ condition of regulatory permits	Impact BIO #2: Construction Impacts on Special-Status Wildlife Species
BIO-MM#69	Conduct Surveys and Implement Avoidance Measures for Active Tricolored Blackbird Nest Colonies	<p>Prior to initiation of construction at any location within 300 feet of suitable nesting habitat, the Project Biologist with experience surveying for and observing tricolored blackbird will conduct preconstruction surveys to establish use of nesting habitat by tricolored blackbird colonies. Surveys will be conducted in suitable habitat within 300 feet of proposed construction areas, where access allows, during the nesting season (February 1–September 15).</p> <p>If construction is initiated near suitable habitat during the nesting season, pre-construction nesting surveys will be conducted within 10 days prior to construction. If active tricolored blackbird nesting colonies are identified, construction activities will avoid the nesting colonies during the breeding season (February 1–September 15) to the extent practicable within 300 feet of the colony, consistent with the CDFW's Staff Guidance Regarding Avoidance of Impacts to Tricolored Blackbird Breeding Colonies on Agricultural Fields in 2015 (CDFW 2015). This minimum buffer may be reduced in areas with dense forest, buildings, or other habitat features between the construction activities and the active nest colony, or where there is sufficient topographic relief to protect the colony from excessive noise or visual disturbance as determined through coordination with CDFW. If tricolored blackbirds colonize habitat adjacent to construction after construction has been initiated, the Authority will coordinate with CDFW to determine the best course of action to avoid impacts.</p>	Pre-construction/ construction	Surveying/ monitoring/ compensatory mitigation/ reporting	Weekly or as established by regulatory compliance agencies	Authority/ Contractor/ Project Biologist/ Mitigation Manager	Authority/ Contractor/ Project Biologist/ Mitigation Manager	Pre-construction surveys for tricolored blackbird colonies/ establish no-disturbance buffer/ report findings	Condition of design-build contract/ condition of regulatory permits	Impact BIO #2: Construction Impacts on Special-Status Wildlife Species

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
BIO-MM#70	Provide Compensatory Mitigation for Impacts on Tricolored Blackbird Habitat	The Authority will provide compensatory mitigation to offset impacts on tricolored blackbird. Compensatory mitigation will replace permanent loss of habitat with habitat that is commensurate with the type (nesting, roosting, and foraging) and amount of habitat lost. Suitable tricolored blackbird nesting habitat will be permanently protected or restored and managed at a ratio of 3:1 (protected or restored: affected) at a location subject to CDFW approval, and in close proximity to the nearest breeding colony observed within the past 15 years, if possible. Suitable breeding season foraging habitat will be protected and managed at a ratio of 1:1 (protected: affected) at a location subject to CDFW approval. Suitable roosting habitat will be protected or restored at a ratio of 1:1 (protected: affected) if not occupied, and a ratio of 2:1 (protected: affected) if occupied by tricolored blackbirds. Compensatory mitigation will be provided using one or more of the methods described in the Compensatory Mitigation Plan, BIO-MM#53.	Pre-construction/ construction/ post-construction	Design/ final design/ surveying/ compensatory mitigation/ reporting	Monthly or as established by regulatory compliance agencies	Authority/ Contractor/ Project Biologist	Authority/ Contractor/ Project Biologist	Compensatory mitigation to replace permanent loss of tricolored blackbird nesting habitat/ report findings	Condition of design-build contract/ condition of regulatory permits	Impact BIO #2: Construction Impacts on Special-Status Wildlife Species Impact BIO #8: Operational Impacts on Special-Status Wildlife Species
BIO-MM#71	Implement California Condor Avoidance Measures during Helicopter Use	Prior to construction-related uses of helicopters, the Project Biologist will coordinate with USFWS to establish that no California condors are present in the area. If California condors are observed in the area in which helicopters will operate, including the helicopter's flight pattern from its origination, during construction use and the return flight, helicopter use will not be permitted until the Project Biologist has determined that the California condors have left the area.	Pre-construction/ construction	Monitoring/ reporting	Weekly or as established by regulatory compliance agencies	Authority/ Contractor/ Project Biologist	Authority/ Contractor/ Project Biologist	Coordinate with USFWS prior to construction-related uses of helicopters/ ensure no California condor in helicopter use area/ report findings	Condition of design-build contract/ condition of regulatory permits	Impact BIO #2: Construction Impacts on Special-Status Wildlife Species Impact BIO #8: Operational Impacts on Special-Status Wildlife Species
BIO-MM#72	Implement Avoidance of Nighttime Light Disturbance for California Condor	Nighttime light disturbance will be minimized in and adjacent to suitable habitat where California condor may be present. In the event that nighttime lighting is required, it will be focused, shielded, and directed away from adjacent suitable habitat including nighttime roost areas. During construction, the Project Biologist will be on site during nighttime light use to determine if the lighting poses a risk or otherwise disturbs or harms condors.	Construction	Monitoring/ reporting	Weekly or as established by regulatory compliance agencies	Authority/ Contractor/ Project Biologist	Authority/ Contractor/ Project Biologist	Nighttime lighting shall be focused, shielded, and directed away from adjacent suitable California condor habitat/ report findings	Condition of design-build contract/ condition of regulatory permits	Impact BIO #2: Construction Impacts on Special-Status Wildlife Species
BIO-MM#73	Implement Removal of Carrion that may Attract Condors and Eagles	During operation and within California condor foraging areas, automated security monitoring and track inspections will be used to detect fence failures and/or the presence of a carcass (carrion) within the right-of-way that could be an attractant to condors and eagles. Dead and injured wildlife found in the right-of-way will be removed during construction and during operations when the train is not in operation.	Construction/ operation	Monitoring/ reporting	Weekly or as established by regulatory compliance agencies	Authority/ Contractor/ Project Biologist	Authority/ Contractor/ Project Biologist	Remove carrion from right-of-way/ report findings	Condition of design-build contract/ condition of regulatory permits	Impact BIO #8: Operational Impacts on Special-Status Wildlife Species
BIO-MM#74	Implement Bird Nest and Avian Special Status Species Avoidance Measures for Helicopter-Based Construction Activities	For construction activities involving the use of a helicopter, the buffer for nesting birds will be 200-feet horizontal and 150-feet vertical. Buffers will be measured from the location of the nest. If a nest is located on a tower or a tree the vertical buffer begins from the nest location. For raptors, that are not state or federal special status raptors the default buffer is 300-feet.	Construction	Monitoring/ reporting	Weekly or as established by regulatory compliance agencies	Authority/ Contractor/ Project Biologist	Authority/ Contractor/ Project Biologist	Maintain helicopter buffer for nesting birds/ report findings	Condition of design-build contract/ condition of regulatory permits	Impact BIO #2: Construction Impacts on Special-Status Wildlife Species

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
BIO-MM#75	Minimize Impacts on Kern Primrose Sphinx Moth Host Plants	<p>Prior to ground disturbing activity in areas that Kern primrose sphinx moths are found, the following additional measures will be implemented:</p> <ul style="list-style-type: none"> All Biological Monitors will be trained on the life history and identification of Kern primrose sphinx moth. As necessary, conduct an additional survey(s) for Kern primrose sphinx moth host and nectaring plants in areas where adults are observed. To the maximum extent feasible, host and nectaring plants will be flagged and a 25-foot buffer shall be installed to avoid when eggs and/or larvae may be present (February through May). Larval host plants include evening primrose (<i>Camissonia contorta epilobiodes</i>) and filaree (<i>Erodium cicutarium</i>). Initial ground or vegetation disturbing activities will be avoided in areas where Kern primrose sphinx have been observed until the flight and larval seasons (cumulatively, February 1 through May 31) are passed to allow sufficient time for the adults to lay eggs and for the larvae to pupate. 	Pre-construction/ construction	Surveying/ monitoring/ reporting	Weekly or as established by regulatory compliance agencies	Authority/ Contractor/ Project Biologist	Authority/ Contractor/ Project Biologist	Pre-construction survey for Kern primrose sphinx moth host and nectaring plants/ avoid areas where moth has been observed/ report findings	Condition of design-build contract/ condition of regulatory permits	Impact BIO #1: Construction Impacts on Special-Status Plant Species Impact BIO #3: Construction Impacts on Special-Status Plant Communities
BIO-MM#76	Implement Wildlife Rescue Measures	<p>During construction, maintenance and operation if an injured or trapped wildlife species, including but not limited to birds and raptors, are observed the Project Biologist shall be notified immediately to determine if it is appropriate to release or take the wildlife species to the nearest CDFW permitted rehabilitation center. The Project Biologist will follow all relevant guidelines for federal and state listed species. If an injured or trapped bird is incidentally observed during maintenance or construction, personnel will notify the Project Biologist immediately to determine if it is appropriate to release or take the bird to the nearest CDFW permitted rehabilitation center.</p>	Construction/ post-construction/ operation	Monitoring/ reporting	Weekly or as established by regulatory compliance agencies	Authority/ Contractor/ Project Biologist	Authority/ Contractor/ Project Biologist	Notify CDFW of injured or trapped wildlife species/ report findings	Condition of design-build contract/ condition of regulatory permits	Impact BIO #2: Construction Impacts on Special-Status Wildlife Species Impact BIO #8: Operational Impacts on Special-Status Wildlife Species Impact BIO #11: Operation Impacts on Wildlife Movement
BIO-MM#77	Implement Wildlife Height Requirements for Enhanced Security Fencing	<p>Prior to final construction design the Project Biologist shall review the fencing plans to confirm Security Fencing design will prevent access into the right-of-way and tracks by mountain lion. Security fencing height will be increased to a minimum of 10-feet tall in mountain lion suitable habitat as identified in the Wildlife Corridor Assessment and determined by the Project Biologist. If the fence is placed on a slope, the fence height will be adjusted (increased) to ensure that mountain lion and mule deer cannot jump from an upslope position over the fence; fence height on slopes will be determined by Project Biologist. During the fencing plan review the Project Biologist will evaluate the fence design for the purpose of avoiding harm, injury, entanglement or entrapment to wildlife species. Prior to operation, the Project Biologist will field inspect the fencing along any portion where increased height was determined necessary during the plan review. Fencing plan review and field inspection shall be documented in a memorandum from the Project Biologist and provided to the Authority.</p>	Pre-construction/ construction	Design/ final design/ reporting	Weekly or as established by regulatory compliance agencies	Authority/ Contractor/ Project Biologist	Authority/ Contractor/ Project Biologist	Review and implement fencing plans to prevent access into right-of-way and tracks by mountain lion/ report findings	Condition of design-build contract/ condition of regulatory permits	Impact BIO #2: Construction Impacts on Special-Status Wildlife Species Impact BIO #5: Construction Impacts on Wildlife Movement Impact BIO #8: Operational Impacts on Special-Status Wildlife Species Impact BIO #11: Operation Impacts on Wildlife Movement

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
BIO-MM#78	Install Wildlife Jump-outs	Prior to final construction design the Project Biologist shall review the fencing plans for placement of wildlife jump-outs. In areas with documented ungulate or other large mammal movement, where terrain or project design (e.g., at-grade crossings) could allow these large animals to enter the right-of-way, features to reduce access (e.g., taller fencing or wildlife barriers at crossings) or features to allow large animals to escape from the fenced right-of-way (e.g., wildlife jump-outs or escape ramps) would be incorporated into the project at these locations. Specific locations of these features would be based on the behavior of target species (e.g. mule deer, mountain lion, black bear), adjacent habitat and terrain, and other design constraints as determined by the Project Biologist and Project Engineer. Prior to operation, the Project Biologist will field inspect the fencing for appropriate placement of jump-outs as determined necessary during the plan review. Fencing plan review and field inspection shall be documented in a memorandum from the Project Biologist and provided to the Authority.	Pre-construction/ construction	Design/ final design/ monitoring/ reporting	Weekly or as established by regulatory compliance agencies	Authority/ Contractor/ Project Biologist	Authority/ Contractor/ Project Biologist	Review the fencing plans for placement of wildlife jump-outs/ report findings	Condition of design-build contract/ condition of regulatory permits	Impact BIO #2: Construction Impacts on Special-Status Wildlife Species Impact BIO #5: Construction Impacts on Wildlife Movement Impact BIO #8: Operational Impacts on Special-Status Wildlife Species Impact BIO #11: Operation Impacts on Wildlife Movement
BIO-MM#79	Mitigation for Desert Tortoise	In addition to the IAMFs and Standard Biological Mitigation Measures discussed previously in this section and other sections, such as Section 3.3: Air Quality and Global Climate Change and Section 3.8: Hydrology and Water Resources, the following mitigation would be implemented to avoid and minimize effects of the proposed action on desert tortoise during construction and O&M activities. These measures include, worker environmental awareness program (WEAP) trainings; biological monitoring during all ground-and vegetation-disturbing activities; wildlife exclusion barriers and fencing of environmentally sensitive areas; monofilament netting restrictions; specific entrapment avoidance procedures for open holes and trenches; establishment of vehicle traffic routes and construction site speed limits; the authority for the biological monitor(s) to halt work in the event a listed species is identified; and the configuration of wildlife crossing infrastructure. The preparation and implementation of the following plans will also be integrated into the project; Restoration and Revegetation Plan; Biological Resources Management Plan; Annual Vegetation Management Plan; Weed Control Plan; BMP Field Manual for construction site housekeeping that includes trash containment and disposal; a Fugitive Dust Control Plan; a Construction Management Plan that addresses spill prevention; and a Construction Stormwater Pollution Prevention Plan. In addition, the following species-specific mitigation measures will be implemented to further avoid and minimize potential adverse effects of the proposed action on desert tortoise: <ul style="list-style-type: none"> Prior to construction activities, a project-specific Desert Tortoise Translocation/Relocation Plan will be prepared for incorporation in to the project's Biological Resources Management Plan (Plan). The Plan will provide details on desert tortoise clearance surveys and relocation, including procedures to follow in the event that a tortoise becomes trapped. These will be consistent with Guidelines for Handling Desert Tortoise during Construction Projects, or other current USFWS guidelines [USFWS 2010]. The Plan will also include methodology for visual desert tortoise body condition assessments, in accordance with the Health Assessment Handbook or most up-to-date USFWS guideline. 	Pre-construction/ construction	Monitoring/ reporting	Weekly or as established by regulatory compliance agencies	Authority/ Contractor/ Project Biologist	Authority/ Contractor/ Project Biologist	Prepare a Desert Tortoise Translocation-Relocation Plan/ conduct pre-activity clearance surveys for desert tortoise/ establish and maintain non-disturbance buffer around desert tortoise burrows/ avoid injury and death to desert tortoises/ report findings	Condition of design-build contract/ condition of regulatory permits	Impact BIO #2: Construction Impacts on Special-Status Wildlife Species Impact BIO #8: Operational Impacts on Special-Status Wildlife Species

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
		<ul style="list-style-type: none"> Conduct phased, focused pre-activity clearance surveys prior to the start of ground or vegetation disturbing activities in modeled suitable habitat for desert tortoise, or areas of documented occurrences if outside of modeled habitat. The survey(s) shall be conducted by Project Biologist(s) or their designee familiar with desert tortoise and their sign. The surveys shall be conducted in general accordance with the USFWS protocol <i>Preparing for Any Action That May Occur within the Range of the Mojave Desert Tortoise (Gopherus agassizii)</i> (USFWS 2010). The survey will occur no more than 48 hours before planned activity and may be conducted during any time of year, but preferably during the desert tortoise active period (i.e., early March through early November). It will consist of transect surveys spaced no greater than 15 feet and include a 50-foot buffer. All burrows that could provide shelter for desert tortoise will be avoided to the greatest extent practical. If active burrows are identified in the project footprint, a 50-foot non-disturbance buffer will be established, maintained, and monitored. The buffer will be established by routing the ESA fence and wildlife exclusion fencing (WEF) around the active burrows in a manner that allows for desert tortoise to leave the project footprint. Burrows that cannot be avoided will be excavated during the clearance survey by the Project Biologist or their designee. Following the pre-activity survey(s): <ul style="list-style-type: none"> Where construction activities will occur for more than one consecutive month, desert tortoise exclusionary fencing, and barriers will be installed and maintained to avoid take of desert tortoise, including destruction of nests, or their potential habitat within the project footprint. ESA fencing and WEF will be used to delineate the area (in accordance with BIO-MM#36). The WEF will be maintained and monitored daily during the desert tortoise activity period (i.e., early March through early November) to ensure it is maintained in good condition, and to determine if tortoises are “trapped” along the fence searching for a way to access the other side. Outside of the desert tortoise activity period, fence inspections will occur at least once weekly. Where construction activities will be of short duration (i.e., less than one month), full-time monitoring by the Biological Monitor may be used in lieu of fencing. In these situations, a daily pre-activity clearance sweep will be conducted by the Biological Monitor prior to start of daily construction activities. If any project vehicle must drive off established routes in suitable tortoise habitat, the route or work location will be walked immediately prior to, or in front of vehicle being driven by the Biological Monitor. The Biological Monitor shall visually account for 100 percent of the footprint of the route or work location plus a 15-foot buffer on each side. Any construction pipe, culvert, or similar structure with a diameter greater than three inches stored less than eight inches aboveground, outside a fenced area of desert tortoise habitat, and left unattended for any length of time during the desert tortoise active period (i.e., early March through early June, and September 								

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
		<p>through early November) will be inspected for desert tortoise before the material is moved, buried, or capped. As an alternative, all such structures may be capped prior to staging or placed on pipe racks.</p> <ul style="list-style-type: none"> Any time a vehicle or construction equipment is parked for more than 10 minutes outside of the fenced area, the ground under the vehicle will be inspected for the presence of desert tortoise before the vehicle/equipment is moved. If a desert tortoise is present, the vehicle/equipment will not be moved until the desert tortoise moves on its own away from the vehicle/equipment. If it does not move in 15 minutes during construction, the Biological Monitor may capture and relocate the animal to a safe location according to USFWS protocol and in accordance with the Desert Tortoise Relocation Plan. During O&M, trained and approved personnel may move a desert tortoise out of harm's way that does not move on its own, in accordance with the approved Desert Tortoise Relocation Plan. To the extent feasible, nighttime light disturbance will be minimized in and adjacent to suitable habitat where desert tortoise may be present. In the event that nighttime lighting is required, the lighting will be focused, shielded, and directed away from adjacent suitable habitat. Measures will be implemented to ensure that construction and O&M activities do not attract common ravens to the ROW by providing food or water subsidies, perch sites, roost sites, or nest sites. All activity work areas will be kept free of trash and debris. Particular attention will be paid to remove and avoid accumulation of "micro-trash" (including such small items as screws, nuts, washers, nails, coins, rags, small electrical components, small pieces of plastic, glass or wire, and any debris or trash that is colorful or shiny) and organic waste that may attract or subsidize predators. All trash will be covered, kept in closed containers, or otherwise removed from the project site at the end of each day or at regular intervals prior to periods when workers are not present at the site. Dead and injured wildlife found in the project footprint will be removed, as needed, to reduce attraction of opportunistic predators. Dead and injured wildlife will be handled and removed in accordance with any applicable project permits and plans. The ESA fence, the WEF, and the O&M Security Fence Maintenance Plan will include provisions for reptiles and mammals (e.g., enhanced with barriers, such as flashing or slats, for six inches below ground surface to 12 inches above) along portions of the project that are adjacent to modeled suitable habitat to prevent individuals from gaining access to the alignment ROW. Water or dust palliatives will be applied to the construction ROW, dirt roads, trenches, spoil piles, and other areas where ground disturbance takes place to minimize dust emissions and topsoil erosion. Dust palliatives will be nontoxic to wildlife and plants. For construction within suitable habitat for listed species, the Biological Monitor will patrol areas of disturbance to ensure that water does not puddle for long periods and attract listed species, common ravens, or other wildlife to the project site. Operational ponding will be avoided through careful grading and hydrologic design. 								

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
BIO-MM#80	Conduct Surveys and Implement Avoidance Measures for Crotch Bumble Bee	<p>Surveys for Crotch bumble bee in suitable habitat (identified by species habitat suitability modeling) in the project footprint would be conducted by qualified biologists within 1 year prior to the start of construction. Surveys would be conducted during four evenly spaced sampling periods during the flight season (March–September) (Thorp et al. 1983). For each sampling event, the biologist(s) would survey suitable habitat within the project footprint and, as access outside the footprint permits, a 100-foot buffer surrounding the project footprint using nonlethal netting methods for 1 person-hour per 3 acres of the highest quality habitat or until 150 bumble bees are sighted, whichever comes first. If initial sampling of a given habitat area indicates that the habitat is of low quality or nonexistent, no further sampling of that area would be required. General guidelines and best practices for bumble bee surveys would follow USFWS' <i>Survey Protocols for the Rusty Patched Bumble Bee (Bombus affinis)</i> (USFWS 2019), which are consistent with other bumble bee survey protocols used by The Xerces Society (Hatfield et al. 2017; Washington Department of Fish and Wildlife et al. 2019).</p> <p>If surveys conducted within 1 year prior to construction identify occupied Crotch bumble bee habitat within the project footprint or the 100-foot buffer, the project biologist would then conduct additional pre-construction surveys of such habitat for active bee nest colonies and associated floral resources (i.e., flowering vegetation on which bees from the colony are observed foraging) no more than 30 days prior to any ground disturbance between March and September. The purpose of this pre-construction survey would be to identify active nest colonies and associated floral resources outside of impact areas that could be avoided by construction personnel. The project biologist would establish, monitor, and maintain no-work buffers around nest colonies and floral resources identified during surveys. The size and configuration of the no-work buffer would be based on best professional judgment of the project biologist. At a minimum, the buffer would provide at least 50 feet of clearance around nest entrances and maintain disturbance-free airspace between the nest and nearby floral resources. Construction activities would not occur within the no-work buffers until the colony is no longer active (i.e., no bees are seen flying in or out of the nest for three consecutive days, indicating the colony has completed its nesting season and the next season's queen has dispersed from the colony).</p>	Pre-construction/ construction	Surveying/ monitoring/ reporting	Weekly or as established by regulatory compliance agencies	Authority/ Contractor/ Project Biologist	Authority/ Contractor/ Project Biologist	Pre-construction surveys of Crotch bumblebee habitat/ establish, and maintain no-work buffer/ report findings	Condition of design-build contract/ condition of regulatory permits	Impact BIO #2: Construction Impacts on Special-Status Wildlife Species
BIO-MM#81	Provide Compensatory Mitigation for Impacts on Crotch Bumble Bee	<p>The Authority would provide compensatory mitigation for impacts on habitat for Crotch bumble bee. Impacts on occupied habitat (confirmed through presence/absence surveys as described in BIO-MM#80) would be compensated for at a ratio of 3:1, unless a higher ratio is required pursuant to an authorization issued under CESA, through the purchase of CDFW-approved bank credits (if available) or through preservation of habitat in perpetuity, including suitable habitat currently preserved by the Authority.</p>	Pre-construction/ construction/ post-construction	Design/ final design/ compensatory mitigation/ reporting	Monthly or as established by regulatory compliance agencies	Authority/ Contractor/ Project Biologist	Authority/ Contractor/ Project Biologist	Compensate for impacts to habitat for Crotch bumblebee/ report findings	Condition of design-build contract/ condition of regulatory permits	Impact BIO #8: Operational Impacts on Special-Status Wildlife Species

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
BIO-MM#82	Avoid Direct Impacts on Monarch Butterfly Host Plants	Prior to any ground-disturbing activities, the Project Biologist would survey for monarch butterfly larval host plants (native milkweed species) within suitable habitat. If host plants are found, the Project Biologist would conduct surveys for adult butterflies during the peak flight period for Southern California (approximately October 1 through March 15) to determine presence/absence or presence may be assumed. Where adult butterflies are present or assumed to be present, construction personnel would avoid host plants in temporary impact areas where feasible. In the event host plants are impacted in temporary impact areas, native milkweed species would be replanted.	Pre-construction/ construction	Surveying/ monitoring/ reporting	Monthly or as established by regulatory compliance agencies	Authority/ Contractor/ Project Biologist	Authority/ Contractor/ Project Biologist	Pre-construction surveys of monarch butterfly larval host plants (native milkweed species), and maintain no-work buffer/ report findings	Condition of design-build contract/ condition of regulatory permits	Impact BIO#2: Construction Impacts on Special-Status Wildlife Species
BIO-MM#83	Provide Compensatory Mitigation for Impacts on Monarch Butterfly Breeding and Foraging Habitat	The Authority would provide compensatory mitigation to offset impacts on breeding and foraging habitat for monarch butterfly at a ratio of 2 to 1. Compensatory mitigation could include one or more methods as described in BIO-MM#53.	Pre-construction/ construction/ post-construction	Design/ final design/ compensatory mitigation/ reporting	Monthly or as established by regulatory compliance agencies	Authority/ Contractor/ Project Biologist	Authority/ Contractor/ Project Biologist	Compensate for impacts to habitat for Monarch Butterfly/ report findings	Condition of design-build contract/ condition of regulatory permits	Impact BIO#2: Construction Impacts on Special-Status Wildlife Species Impact BIO #8: Operational Impacts on Special-Status Wildlife Species
BIO-MM#84	Conduct Pre-Construction Surveys and Implement Avoidance and Minimization Measures for Mountain Lion Dens	It is recognized that mountain lions are secretive and difficult to survey and can change den locations every couple of weeks. Prior to the initiation of construction, the Authority would consult with the CDFW and other mountain lion experts to develop a survey protocol to locate and identify denning mountain lions in and adjacent to the project to avoid adversely disturbing the mother and kittens. Prior to any ground-disturbing activity, regardless of the time of year, the Project Biologist would conduct pre-construction surveys for known or potential mountain lion dens within suitable habitat located within the work area and within 2,000 feet of the work area, where access is permitted. These surveys would be conducted no less than 14 days and no more than 30 days prior to the start of ground-disturbing activities in a work area. The definition for known, and potential, mountain lion den types is as follows; <ul style="list-style-type: none"> ▪ Known Den. Any existing natural den or human-made structure that is used or has been used at any time in the past by a mountain lion. Evidence of use may include historical records; past or current radio telemetry or tracking study data; mountain lion sign, such as tracks, scat, and/or prey remains; or other reasonable proof that a given den is being or has been used by a mountain lion; ▪ Potential Den. Any thick vegetation, boulder piles, rocky outcrops, or undercut cliffs within the species' range for which available evidence is insufficient to conclude that it is being used or has been used by a mountain lion. Potential dens will include the following characteristics: 1) refuge from predators (coyotes, golden eagles, other mountain lions) or 2) shielding of the litter from heavy rain and hot sun. The Project Biologist will use location-specific survey methods to identify known and potential dens. The survey method will consider topography, vegetation density, safety, and other factors. Surveys will be conducted by a qualified biologist (i.e., a biologist with demonstrated experience in mountain lion biology, identification, and survey techniques) and may involve the establishment of camera stations, scent stations, pedestrian surveys (looking for tracks, caches,	Pre-construction/ construction	Surveying/ monitoring/ reporting	Monthly or as established by regulatory compliance agencies	Authority/ Contractor/ Project Biologist	Authority/ Contractor/ Project Biologist	Pre-construction coordination with CDFW to develop a survey protocol and surveys of mountain lion dens and maintain no-work buffer/ report findings	Condition of design-build contract/ condition of regulatory permits	Impact BIO#2: Construction Impacts on Special-Status Wildlife Species

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
		<p>etc.), or other appropriate methods. Survey methods used will be designed to avoid the disturbance of known or potential dens to the extent feasible.</p> <p>If known, or potential, mountain lion dens are identified or observed during pre-construction surveys, mountain lion dens will be assumed to have kittens present until the Project Biologist can document that they are not present and/or that the den is not being used. A nondisturbance buffer of at least 2,000 feet will be established around the known or potential den until the Project Biologist can document and confirm that the den is not occupied. If the den is determined to be occupied, the 2,000-foot nondisturbance buffer will be maintained until the den is confirmed abandoned by the Project Biologist. Construction may proceed if the Project Biologist determines that the den is not being used by mountain lions. However, ground disturbance would be limited to those days between October 1 and January 31 within 2,000 feet of known or potential dens to the extent feasible. Mountain lions can breed year-round; however, most breeding activity and births occur during the spring and summer months between February 1 and September 30.</p>								
BIO-MM#85	Provide Compensatory Mitigation for Impacts on Mountain Lion Core and Patch Habitat	The Authority would provide compensatory mitigation for impacts on mountain lion core and patch habitat through the preservation of suitable habitat that is acceptable to CDFW. Habitat would be replaced at a minimum ratio of 2:1 for permanent impacts on breeding/foraging habitat and high-priority foraging and dispersal habitat, and at a ratio of 1:1 for low-priority foraging and dispersal habitat, unless a higher ratio is required by regulatory authorizations issued under the California Endangered Species Act. Compensatory mitigation would be provided using one or more of the methods described in BIO-MM#53 and would, where feasible and acceptable to CDFW, contribute to preserving important movement lands across the HSR alignment.	Pre-construction/ construction/ post-construction	Design/ final design/ compensatory mitigation/ reporting	Monthly or as established by regulatory compliance agencies	Authority/ Contractor/ Project Biologist	Authority/ Contractor/ Project Biologist	Compensate for impacts to habitat for mountain lion core and patch habitat	Condition of design-build contract/ condition of regulatory permits	Impact BIO#2: Construction Impacts on Special-Status Wildlife Species Impact BIO #8: Operational Impacts on Special-Status Wildlife Species
BIO-MM#86	Implement Lighting Minimization Measures During Construction	<p>The Authority would avoid conducting ground-disturbing activities within known wildlife habitat during nighttime hours, to the extent feasible. If nighttime work is necessary, the Authority would minimize impacts to adjacent habitat by:</p> <ul style="list-style-type: none"> • Conducting nightwork only within the boundaries of previously disturbed, cleared and grubbed areas, • Shielding and directing nighttime lighting to avoid illuminating wildlife habitat, including movement corridors, • Using the minimum lighting levels approved by OSHA (29 CFR 1926.56) for general construction (i.e., 5 foot-candles or 54 lux), • Minimizing the direction of construction vehicle headlights towards offsite locations and use low beams or turn off headlights when safety considerations permit, and • Minimizing the duration of lighting by using remote monitoring systems or other methods to ensure security of the construction site during hours it is not in use. 	Construction	Reporting	Weekly	Contractor	Contractor	Construction/ weekly reporting	Contract requirements/ specifications	Impact BIO#2: Construction Impacts on Special-Status Wildlife Species Impact BIO #5: Construction Impacts on Wildlife Movement

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
BIO-MM#87	Implement Lighting Minimization Measures for Operations	<p>To address the permanent and intermittent impacts from lighting, the Authority would implement measures to minimize the intensity and duration of operational lighting of permanent facilities (e.g., traction power facilities, radio sites, and maintenance facilities), as well as intermittent train lighting, to the extent feasible:</p> <ul style="list-style-type: none"> Outdoor lighting at operational facilities would be consistent with minimum OSHA requirements established by 29 CFR 1926.56 when the facilities are in use. To the extent feasible, the Authority would minimize the duration of lighting at operational facilities by using methods other than lighting (e.g., remote monitoring systems), to ensure security of facilities during nighttime hours they are not in use, Nighttime lighting will have shields or cowls (or other devices to limit lighting) installed to direct the light downward to reduce the standard luminous intensity distribution curve to contain the light to the boundaries of the project site to the extent practicable, <p>Train headlights would use the minimum standard allowed by the FRA under 49 CFR 229.125 (a single headlight of at least 200,000 candelas) within non-tunnel portions of the project section.</p>	Operations	Reporting and monitoring	Monthly	Authority/contractor	Contractor	Implement measures to minimize the intensity and duration of operational lighting of permanent facilities and intermittent train lighting	Reporting contract requirements/specifications	Impact BIO #8: Operational Impacts on Special-Status Wildlife Species Impact BIO #11: Operation Impacts on Wildlife Movement
Hydrology and Water Resources										
WQ-MM#1	Floodplain Protection: Construction	<p>The Bakersfield to Palmdale Project Section would implement the following measures during the construction period:</p> <ul style="list-style-type: none"> Standard floodplain measures would be implemented, including revegetation BMPs during construction. BMPs may include preservation of existing vegetation to the maximum extent practicable, limiting the number of equipment trips across floodplain crossing, selecting equipment that exerts the least amount of ground surface pressure, use of vegetated buffers on slopes, application of hydraulic mulch on disturbed streambanks, and restoration of floodplains impacted by construction activities. Weather would be monitored by construction works for heavy storms and potential flood flows. If a heavy storm or flood event is identified, construction equipment would be relocated outside of the floodplain. 	Construction	Reporting and monitoring	Weekly	Contractor/ local districts	Contractor	Construction/ weekly reporting	Reporting contract requirements/specifications	Impact HWR #1: Temporary Construction Impacts to Floodplains and Floodways
WQ-MM#2	Regional Dewatering Permits	<p>The Bakersfield to Palmdale Project Section would be required to comply with statewide and regional Dewatering Permits per SWRCB and RWQCB requirements. For portions of the project section under the jurisdiction of the Central Valley RWQCB, the Central Valley RWQCB Dewatering Permits would apply:</p> <ul style="list-style-type: none"> The Central Valley RWQCB's Order No. R5-2013-0074, NPDES No. CAG995001, Waste Discharge Requirements General Order for Dewatering and Other Low Threat Discharges to Surface Waters, allows discharges provided they do not contain significant quantities of pollutants and either (1) the discharge is four months or less in duration, or (2) the average dry-weather discharge does not exceed 0.25 million gallons per day. The Central Valley RWQCB's Resolution No. R5-2013-0145, Approving Waiver of Reports of Waste Discharge and Waste Discharge Requirements for Specific Types of Discharge within the Central Valley Region, covers discharges to land from dewatering activities. 	Pre-construction/ construction/ post-construction	Reporting and monitoring	Weekly	Contractor	Contractor/ Authority	Weekly reporting	Reporting contract requirements/specifications	Impact HWR #3: Temporary Construction Impacts to Surface Water Quality

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
		<p>For portions of the project section under the jurisdiction of the Lahontan RWQCB, the Lahontan RWQCB Dewatering Permits would apply:</p> <ul style="list-style-type: none"> The Lahontan RWQCB's Order No. R6T-2014-0049, NPDES No. CAG996001, Renewed Waste Discharge Requirements and General Permit for Limited Threat Discharges to Surface Waters, encourages the disposal of wastewater on land, where practicable, and requires applicants for this general permit to evaluate land disposal as the first alternative. This general permit covers discharges provided that the discharge does not contain significant quantities of pollutants. The Lahontan RWQCB's Order No. R6T-2010-0024, NPDES No. CA G916001, Waste Discharge Requirements for Surface Water Disposal of Treated Groundwater, covers discharges of water from a groundwater treatment unit to surface waters. 								
WQ-MM#3	Tunnel Constructability and Hydrogeological Monitoring	<p>The Authority would implement the following measures during tunnel construction:</p> <ul style="list-style-type: none"> Excavation of the tunnels would include continuous probing ahead of the tunnel face to assess the ground and groundwater conditions. Pre-excavation grouting would be used to control groundwater inflows and provide face stability where applicable. All tunnels would be waterproofed. The tunneling and lining methods chosen, the pretreatment of the ground mass, and the tunnel lining design, would be implemented to reduce groundwater inflows. The tunnel lining would be inspected regularly throughout the construction phase to monitor for potential leaks. Should leaks be found, the lining would be repaired immediately and assessed for future integrity. Any freestanding water that leaks into the tunnel would be treated prior to discharge to minimize impacts from pollutants such as sediment or other contamination. All construction water shall be captured and treated prior to discharge to minimize impacts from pollutants such as sediment or other contamination. In the event that any active wells would be affected by tunnel construction activities, the wells would be re-drilled deeper to reach the groundwater level, relocated to different location, or the water reinjected. Hydrogeological modeling would be conducted to assess the potential impacts of removing groundwater from bedrock storage during construction (including long term drainage into the tunnel). Groundwater depth, flow, and quality would be monitored at nearby domestic wells, springs, and seeps prior, during, and after construction. Monitoring of groundwater, if impacted, would continue until the water system has normalized to pre-construction conditions. The Authority would implement a Groundwater Adaptive Management and Monitoring Program (AMMP) to minimize potential impacts on water resources supported by groundwater resources, including springs and seeps, as well as from surface water resources supported by groundwater, the Authority proposes 	Pre-construction/ construction/ post-construction	Reporting and monitoring/ design	Weekly	Contractor	Authority/ Contractor	Weekly reporting	Reporting contract requirements/ specifications	Impact HWR #4: Temporary Construction Impacts to Groundwater Volume, Quality, and Recharge

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
		<p>to implement a long-term Groundwater Adaptive Management and Monitoring Program (AMMP), which will include ongoing monitoring, management, and reporting activities to detect, address, and remedy groundwater and hydrology impacts that may arise during and after tunneling in a timely manner.</p> <p>The AMMP would advance a flexible strategy to respond to monitoring information that indicates changes to existing conditions resulting from project activities. In addition, if monitoring demonstrates that adaptive management actions taken to address such changes are not achieving the intended outcomes, management actions will be modified, or other strategies implemented to meet the objectives. The AMMP would include the following components, at a minimum, to avoid or minimize and address impacts on water resources supported by groundwater, including seeps/springs:</p> <ul style="list-style-type: none"> – Groundwater Modeling: —The Authority would develop a groundwater model that can be used to predict where groundwater and surface water impacts are likely to occur. The model would be updated during construction with additional geological information generated during tunnel construction, and the updated model would be used to predict potential changes in groundwater conditions and anticipate adaptive management needs. o – Monitoring Program: —The Authority would develop a monitoring program to detect real-time changes in groundwater and surface water conditions and vegetation cover and special-status species habitat most likely to be affected by tunnel construction during and after construction through comparison to baseline conditions and use of paired reference sites. – Numeric Triggers: —The Authority would establish numeric triggers that require implementation of adaptive management measures to avoid or reduce impacts on groundwater and surface water resources and associated habitat for special-status species during construction. Adaptive management measures may include modifying construction methods, providing supplemental water to affected resources, and other feasible measures that would reduce or avoid a predicted impact. – Water Quality Treatment: —To the extent feasible, the Authority would provide water quality treatment for groundwater inflows and beneficially reuse groundwater inflows as part of the adaptive management program or discharge treated groundwater to receiving waterbodies. 								

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
WQ-MM#4	Floodplain Protection: Operation	<p>The project would be designed to remain operational during flood events and to minimize increases in base flood elevations. Measures for floodplain protection would include the following:</p> <ul style="list-style-type: none"> • HSR system sites and critical facilities would be located above the 500-year flood elevation. • If the floodplain cannot be spanned, a Conditional Letter of Map Revision and Letter of Map Revision would be required to be processed through the Central Valley Flood Protection Board and FEMA during final design where the increase in water surface elevation exceeds a 1-foot rise in the 100-year base flood elevation. All floodplain crossings would be analyzed in more detail for FEMA compliance during subsequent engineering phases. • Embankment fill would be protected with slope protection such as rock-slope protection or gabions. • A Spill, Prevention, Containment and Control Plan would be implemented to reduce the amount of sediment deposited within 100-year floodplains and reduce the potential for released chemicals to migrate into flood zones during operation. • In cases where piers or column support structures would need to be placed within the flow channel to support the aerial or bridge structure, analysis of the flow within the channel and analysis of the scour at the piers would be performed. The results of this analysis would determine the optimal shape and depth of the piers and pier footings to mitigate the impacts flood waters would have on the structure supports. Backwater would be minimized by optimizing the pier's shape and minimizing the number of piers within the channel. 	Pre-construction/ construction/ post-construction	Reporting and monitoring	Weekly	Contractor	Contractor/ Authority	Construction/ weekly reporting	Reporting contract requirements/ specifications	Impact HWR #5: Permanent Operation Impacts to Floodplains and Floodways Impact HWR #7: Permanent Operation Impacts to Surface Water Quality
Hazardous Materials and Wastes										
HMW-MM#1	Limit Use of Extremely Hazardous Materials near Schools during Construction	<p>Prior to Construction, the Contractor will prepare a memorandum regarding hazardous materials best management practices related to construction activity for approval by the Authority. The memorandum will confirm that the Contractor will not handle or store an extremely hazardous substance (as defined in California Public Resources Code § 21151.4) or a mixture containing extremely hazardous substances in a quantity equal to or greater than the state threshold quantity specified pursuant to subdivision (j) of § 25532 of the Health and Safety Code within 0.25 mile of a school. The memorandum will acknowledge that prior to construction activities, signage would be installed to delimit all work areas within 0.25 mile of a school, informing the Contractor not to bring extremely hazardous substances into the area. The Contractor would be required to monitor all use of extremely hazardous substances. The above construction mitigation measure for hazardous materials and wastes is consistent with California Public Resources Code § 21151.4. The memorandum will be submitted to the Authority prior to any construction involving an extremely hazardous substance.</p>	Pre-construction/ construction	Reporting and monitoring	Memorandum approved 30 days prior to start of construction. During construction, submit weekly reports or reporting requirements as established by the approved memorandum	Contractor Hazardous Materials Monitor	Contractor	Hazardous materials memorandum/ weekly reporting	Hazardous materials memorandum	Impact HMW#4: Temporary Hazardous Materials and Waste Activities near Schools

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
Safety and Security										
S&S-MM#1	Emergency Response of Local Fire, Rescue, and Emergency Service Providers to Incidents at Stations and Provide a Fair-Share Cost of Service	<p>During the first three years of operation and maintenance, the Authority shall begin monitoring response of local fire, rescue, and emergency service providers to incidents at stations and provide a fair share of cost of service. Monitoring also should begin 1 year prior to opening of an HSR station. Service levels consist of the monthly volume of calls for fire and police protection, as well as county, city- or fire protection district-funded emergency medical technician (EMT)/ambulance calls that occur in the station site service areas.</p> <p>Prior to operation of the stations for HSR service, the Authority will enter into an agreement with the public service providers of fire, police, and emergency services to fund the Authority's fair share the cost of services above the average baseline service demand level f or the station and LMF service areas (as established during the monitoring period). The fair share will be based on projected passenger use for the first year of operations, with a growth factor for the first 5 years of operation. This cost-sharing agreement will include provisions for ongoing monitoring and future negotiated amendments as the stations are expanded or passenger use increases. Such amendments will be made on a regular basis for the first 5 years of station operation, as will be provided in the agreement. To ensure that services are made available, impact fees will not constitute the sole funding mechanism, although they may be used to fund capital improvements or fixtures (a police substation, additional fire vehicles, on-site defibrillators, etc.) necessary for service delivery.</p> <p>After the first 5 years of operation, the Authority will enter into a new or revised agreement with the public-service providers of fire, police, and emergency services to fund the Authority's fair share of services on an ongoing basis. The fair share will take into account the volume of ridership, past record and trends in service demand at the stations and LMF site, new local revenues derived from station area development, and any services that the Authority may be providing at the station.</p>	Construction/ post-construction/ operation	Monitor/ Fair Share Agreement	Annually	Authority	Authority	Monitoring of service levels during construction and operation to determine baseline service demands, Fair share agreement	Authority to fund through fair share of services agreement	Impact S&S #12: Need for Expansion of Existing Fire, Rescue, and Emergency Services Facilities
Socioeconomics and Communities										
SO-MM#3	Implement Measures to Reduce Impacts Associated with the Relocation of Important Facilities	<p>Prior to Construction, the Authority will minimize impacts resulting from the acquisition, displacement, and/or relocation of key community facilities</p> <p>The Authority will consult with the appropriate parties before land acquisition to assess potential opportunities to reconfigure land use and buildings and/or relocate affected facilities, as necessary, to minimize the disruption of facility activities and services, and to provide for relocation that allows the community currently being served to continue to use these services.</p> <p>The Authority will continue to implement a comprehensive non-English speaking language outreach program as land acquisition begins. This program will facilitate the identification of approaches that would maintain continuity of operation and allow space and access for the types of services currently provided and planned for these facilities. To avoid disruption to these community amenities, the Authority will provide for reconfiguring land uses or buildings, or relocation of community facilities is completed before the demolishing existing structures. The Authority shall document compliance with this measure through annual reporting.</p>	Pre-construction/ construction/ post-construction	Reporting	Monthly	Authority	Authority	Monthly reporting	The Authority will meet with affected residents and property owners and design appropriate measures to minimize impacts	Impact SO #1: Temporary Disruption to Community Cohesion or Division of Existing Communities from Project Construction Impact SO #7: Permanent Displacement and Relocation of Community Facilities from Construction

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
SO-MM#4	Provide Access Modifications to Affected Farmlands	Prior to Construction in cases where partial-property acquisitions result in division of agricultural parcels by the HSR alignment or facilities, the Authority will evaluate with the property owner's input modified access, including the effectiveness of providing overcrossings or undercrossings of the HSR track to allow continued use of agricultural lands and facilities. This could include the design of overcrossings or undercrossings to allow farm equipment passage. The Contractor shall prepare a technical memorandum for Authority review and approval detailing outreach to affected property owners, evaluation results and what measures were implemented to address bifurcated agricultural properties.	Pre-construction/ construction/ post-construction	Reporting and monitoring; design	Monthly	Contractor	Contractor	Monthly reporting	Final design and construction/ monthly reporting	Impact SO #21: Permanent Agricultural Access Impacts and Road Closures from Operation Impact AG #6: Permanent Indirect Impacts to Important Farmland from Parcel Severance
Agricultural Farmland										
AG-MM#1	Conserve Important Farmland (Prime Farmland, Farmland of Statewide Importance, Farmland of Local Importance, and Unique Farmland)	The Authority has entered into an agreement with the Department of Conservation California Farmland Conservancy Program to implement agricultural land mitigation for the California High-Speed Rail Project. The Authority 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 lands that are permanently converted to non-agricultural use by the project. In addition to mitigation for Important Farmlands that are permanently converted to nonagricultural use, the Authority will fund the purchase of an additional increment of acreage for agricultural conservation easements at a ratio of not less than 0.5:1 for Important Farmland within a 25-foot wide area adjacent to HSR permanently fenced infrastructure. The Authority shall document implementation of this measure through issuance of a compliance memorandum annually.	Pre-construction	Compliance reporting	Monthly	Authority and California Farmland Conservancy	Authority	Monthly reporting prior to construction	The Authority has entered into an agreement with the DOC and its California Farmland Conservancy Program to implement agricultural land mitigation for the HSR system.	Impact AG #5: Permanent Conversion of Important Farmland to Nonagricultural Use Impact AG #6: Permanent Indirect Impacts to Important Farmland from Parcel Severance Impact AG #7: Permanent Impacts to Important Farmland under Williamson Act or Farmland Security Zone Contracts, Local Zoning, or Agricultural Conservation Easement Lands
Parks, Recreation, and Open Space										
PC-MM#1	Temporary Use of Land from Park, Recreation, or School Play Areas During Construction	<ul style="list-style-type: none"> Temporary Impact Areas—During final design, the California High-Speed Rail Authority's (Authority) Project Engineer shall evaluate all proposed temporary impact areas in parks, recreation resources, and school play areas and shall identify opportunities to further reduce the sizes of those temporary impact areas. All temporary impact areas in parks, recreation resources, and school play areas shown on the project plans and specifications would specify that the Design-Build Contractor cannot increase the size of any of those areas without consultation with and approval by the Project Engineer. Temporary Impact Areas—The Authority would compensate for the temporary loss of parks, recreation resources, and school play areas caused by temporary impact areas during construction using one or more of the following methods: (1) providing substitute land for comparable recreational uses; or (2) providing financial compensation for the development of land suitable for comparable recreational uses; or (3) enhancing the unaffected land to ensure that the property retains equivalent usefulness. During final design, the Authority's Project Engineer shall consult with the affected jurisdictions and property owners to discuss the temporary impact 	Pre-construction/ construction	Design/ reporting/ funding	Prior to final design	Authority	Authority	Before final design	Condition of design build contract/ Authority to provide compensation	Impact PK #1: Temporary Impact Areas, Temporary Facility Closures, or Temporary Detours

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
		<p>areas needed for construction of the High-Speed Rail (HSR) project and to determine the appropriate level of compensation for the use of land from park, recreation, or school play areas for the temporary impact areas. The Authority shall provide compensatory mitigation to fully mitigate the loss of recreational resources during project construction. It is anticipated that the compensation shall be payments for the temporary use of land from those resources for the period of time that land is used for temporary impact areas during project construction.</p> <ul style="list-style-type: none"> • Access Restrictions at Temporary Impact Areas—The Authority's Project Engineer shall require the Design-Build Contractor to fence and gate all land in parks, recreation facilities, and school play areas used for temporary impact areas. The temporary impact areas would be appropriately signed to restrict access to those areas by park and recreation resource patrons and users of school play areas. The Authority's Project Engineer would require the Design-Build Contractor to maintain the fencing throughout the time period each temporary impact area is used and to remove the fencing only after all construction activity in an area is completed, the temporary impact area is no longer needed, and the land is ready to be returned to the property owner. • Signing of Fenced Temporary Impact Areas—The Authority's Project Engineer shall require the Design-Build Contractor to provide signing at each temporary impact area explaining why the area is fenced and access to the temporary impact area is restricted, the anticipated completion date of the use of the land for the temporary impact area, and contact information (for both the Authority's Project Engineer and the Design-Build Contractor) for the public to solicit further information regarding the temporary impact area and the project. • Modifications to Recreation Uses—In the event a temporary impact area requires the temporary use of land at a park, recreation resource, or school play area, and it is determined that the loss will be compensated for by providing replacement uses, the Authority's Project Engineer shall consult with the property owner/operator (1) on whether the property owner/operator wants those recreation uses replaced temporarily or permanently elsewhere on the property, and (2) if temporary or permanent replacement of those recreation uses is desired, on modifications that could be made to the remaining recreation area on the property to temporarily or permanently replace the recreation uses displaced by the temporary impact area. Any modifications to recreation areas outside the limits of a temporary impact area would be constructed/implemented prior to fencing and use of the temporary impact area. 								

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
PP-MM#1	Permanent Acquisition of Property from Publicly Owned Parks Under the California Park Preservation Act	<p>Per Public Resources Code Division 5, Chapter 2.5, Section 5401 of the California Park Preservation Act, the Authority would provide compensation or land, or both, for all permanent acquisitions of property for HSR improvements from publicly owned parks, consistent with the requirements of the California Park Preservation Act of 1971. The California Park Preservation Act requires that the compensation or land, or both, for the taking of the park land and facilities be equal to one of the following:</p> <ul style="list-style-type: none"> • The cost of acquiring substitute park land of comparable characteristics, substantially equal size, and condition • Substitute park land of comparable characteristics, substantially equal size, and condition • Any combination of substitute park land and compensation in an amount sufficient to provide substitute park land of comparable characteristics, substantially equal size, and condition <p>During the right-of-way acquisition process, the Authority would consult with the public agency with jurisdiction over any publicly owned park from which the Authority requires permanent acquisition of property regarding the specific conditions of acquisition and compensation for, or replacement or enhancement of, other park property for the land that would be acquired.</p>	Pre-construction	Prior to final design	Prior to final design	Authority	Authority	Authority to provide compensation or land or both per Public Resources Code Division 5, Chapter 2.5, Section 5401 of the California Park Preservation Act	Authority to provide compensation as required	<p>Impact PK #3: Permanent Partial Acquisition of Property from Parks, Recreation, and School Play Area Resources</p> <p>Impact PK #4: Permanent Acquisition of Property from Publicly Owned Parks</p>

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
PCT-MM#1	Temporary and Permanent Effects on the Pacific Crest Trail	<ul style="list-style-type: none"> The Authority would continue to work with the U.S. Forest Service (USFS), the Bureau of Land Management (BLM), and Pacific Crest Trail Association to advance the final design through a collaborative, context-sensitive solutions approach. Participants in the consultation process would meet on a regular basis to develop a consensus on the urban design elements to be incorporated into the final guideway design. The process would include activities to solicit community input in the affected trail segment. The Authority would realign approximately 2,110 linear feet of the 2,650-mile-long trail west of the proposed viaduct to allow the trail to cross under the bridge structure at one location under Alternatives 1, 2, and 5. This proposed realignment is based on consultation to date with the USFS, the BLM, and the Pacific Crest Trail Association and is shown on Figure 3.15-4 [of the Final EIR/EIS], Proposed Pacific Crest Trail Realignment. Figure 3.15-4 [of the Final EIR/EIS] delineates the permanent and temporary impact areas for the project in purple and yellow, respectively. It also depicts the proposed trail realignment. Use construction best management practices to control dust and noise (Section 3.3, Air Quality and Global Climate Change; Section 3.4, Noise and Vibration) during construction. Where exposed to trail users, screen stockpiled material and construction excavations through the use of temporary construction barriers and other screens. Restore areas affected by construction to preconstruction conditions immediately after construction. Use native plant materials for revegetation where appropriate. During construction, the Design-Build Contractor would monitor construction noise to verify compliance with the established FRA construction noise limits. The Contractor would be given the flexibility to meet the FRA construction noise limits in the most efficient and cost-effective manner. Compliance with these limits can be accomplished by either prohibiting certain noise-generating activities during nighttime hours or providing additional noise-control measures to meet the noise limits. The following noise control mitigation measures would be implemented as necessary for nighttime and daytime construction: <ul style="list-style-type: none"> Install a temporary construction site sound barrier near a noise source. Locate stationary construction equipment as far as possible from noise-sensitive sites. Use low-noise-emission equipment. Implement noise-deadening measures for truck loading and operations. Monitor and maintain equipment to meet noise limits. Line or cover storage bins, conveyors, and chutes with sound-deadening material. Use acoustic enclosures, shields, or shrouds for equipment and facilities. Use high-grade engine exhaust silencers and engine-casing sound insulation. 	Pre-construction/ construction	Final design/ consultation	Prior to final design/ monthly reporting	Authority/ Contractor	Authority/ Contractor	Before final design/ monthly	Authority to consult as required/ monthly reporting	Impact PK #1: Temporary Impact Areas, Temporary Facility Closures, or Temporary Detours Impact PK #6: Project Changes to Park or Recreation Facility Use or Character Impact AVQ #3: Permanent Impacts Related to Construction of a Large High-Speed Rail Structure

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
		<ul style="list-style-type: none"> - Minimize the use of generators to power equipment. - Limit the use of public address systems - Grade surface irregularities on construction sites - Use moveable sound barriers at the source of the construction activity. - Limit or avoid certain noisy activities during nighttime hours. - To mitigate noise related to pile driving, the use of an auger to install the piles instead of a pile driver would reduce noise levels substantially. If pile driving is necessary, limit the time of day that the activity can occur. - In the procurement of a HSR vehicle technology, the Authority would require bidders to meet the federal regulations (40 Code of Federal Regulations 201.12/13) at the time of procurement for locomotives (currently a 90-decibel standard) for cars operating at speeds greater than 45 miles per hour. • Coordinate with the private property owner, the USFS, and the BLM regarding compensation for the maintenance easement to access the HSR facility and the areas under the viaduct during operation of the HSR project. • Work with the USFS and the BLM to prepare final design documents that minimize the visual impacts of the HSR future alignment on the Pacific Crest Trail users. This could include landscaping or other acceptable design features. • Use sound-attenuating measures along the guideway to minimize noise during operation of the HSR project. • Make the area under the viaduct accessible for equestrian use during operation of the HSR project. The area under the viaduct will provide at least 50 feet of vertical clearance to ensure equestrian accessibility during operation of the HSR project. <ul style="list-style-type: none"> ▪ Vegetation of the artificial slope planned for the vicinity of Tehachapi Willow Springs Road will conform to Mitigation Measure BIO-MM#6. This will require a Project Biologist to prepare a Restoration and Revegetation Plan to address impacts resulting from ground disturbing activities. ▪ The timing of construction adjacent to the PCT should avoid the 6-week peak-use time by through hikers and equestrians (April through mid-May) to the extent feasible. ▪ Specific mitigation (N&V-MM#8) would be implemented to reduce startle effect impacts on equestrian users on the PCT by providing advance warning signage ahead of the PCT crossing under the HSR viaduct. ▪ The Authority will enter into an agreement with the USFS, as identified in the USFS concurrence letter, to provide compensatory mitigation for impacts to the PCT from the train realignment, the HSR project crossing the PCT once, and the maintenance easement. 								

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
PCT-MM#2	Temporary Trail Closures and Detours on the Pacific Crest Trail	<ul style="list-style-type: none"> • The trail shall remain open to hikers and equestrian users during construction by providing detours to maintain connectivity if construction requires temporary closures with collaboration between the USFS, BLM, and Authority. Provide clear signage and direction for alternative access routes and access points, and coordinate with local groups and jurisdictions using a variety of media to communicate the construction schedule and anticipated closures and detours. <ul style="list-style-type: none"> – During final design, the Authority's project engineer would require the design-build contractor to develop a Trail Facilities Plan addressing the short-term project impacts on the segment of the PCT within the construction limits of the project. That plan would address: <ul style="list-style-type: none"> ▪ Identification of trail segments that would be closed temporarily and detoured during construction ▪ Preparing a public awareness and notification plan ▪ Temporary closing trails during construction ▪ Developing and implementing detours for the temporarily closed trail segment ▪ Phasing of temporary trail closures to allow for effective detours to maintain connectivity of the facility around the construction areas ▪ Coordinating the trail closures and detours with the USFS and BLM ▪ Criteria for identifying detour routes and facilities ▪ Information signing for closures and detours ▪ Maintaining signing for closures and detours throughout the closure period and replacing lost or damaged signing ▪ Restoring trail segments to their original or better condition at the completion of project construction as outlined in the Pacific Crest Trail Design and Construction Standards found at: http://www.pcta.org ▪ Accommodation for hiker and equestrian use of selected detour routes <p>Timing of construction should avoid the 6-week peak-use time by through-hikers and equestrians (April through mid-May) to the extent feasible</p> <ul style="list-style-type: none"> – Prior to any temporary closures of the PCT, the Authority's project engineer would require the design-build contractor to coordinate with the USFS and BLM directors, or their representatives, to review the location of and need for each temporary trail closure. The Authority's project engineer would require the design-build contractor to develop detours for each closure in consultation with the USFS and BLM directors or their representatives. Prior to and during construction activities that would require the temporary closure of the trail, the Authority's project engineer would require the design-build contractor to comply with and implement the procedures in the Trail Facilities Plan, described above, for the affected PCT segment. 	Pre-construction/ construction	Prepare Trail Facilities Plan	Prior to final design/ monthly reporting	Authority/ Contractor	Authority/ Contractor	Before final design/ monthly	Requirement of design build contract/ specifications	Impact PK #1: Temporary Impact Areas, Temporary Facility Closures, or Temporary Detours

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
		<ul style="list-style-type: none"> – Signing for Trail Detours and Closures. The Authority’s project engineer would require the design-build contractor to develop detour signs, in consultation with the USFS and BLM, notifying trail users of the upcoming temporary facility closure and directing the trail users to the temporary detour routes with estimated time frames. Appropriate directional and informational signage would be provided by the project design-build contractor prior to each closure and far enough in advance of the closure so trail users would not have to backtrack to get to the detour routes. – Contact Information at Trail Detours. The Authority’s project engineer would require the design-build contractor to provide detour signing that includes contact information for the Authority’s project engineer and the design-build contractor, and that informs trail users to contact the project engineer and/or the design-build contractor with questions or concerns regarding upcoming or active temporary trail closures. – Restoration of Impacted Trail Segments. The Authority’s project engineer would require the design-build contractor to return trail segments closed temporarily during construction to their original, or better, condition after completion of construction, prior to their return to the control of the USFS and BLM. After project construction, the Authority’s project engineer would require the design-build contractor to document that access to and connectivity of the affected trails were restored. – Compliance with the Trails Facilities Plan. Compliance with the Trails Facilities Plan would be documented in the environmental commitments record with text, photographs, maps, and correspondence, as appropriate. 								

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
Aesthetics and Visual Resources										
AVQ-MM#1	Minimize Visual Disruption from Construction Activities	<p>Prior to Construction (any ground-disturbing activity), the Contractor shall prepare a technical memorandum identifying how the project would minimize construction-related visual/aesthetic disruption and include the following activities:</p> <ul style="list-style-type: none"> Minimize pre-construction clearing to that necessary for construction. Limit the removal of buildings to those that would obstruct project components. When possible, preserve existing vegetation, particularly vegetation along the edge of construction areas that may help screen views. After construction, regrade areas disturbed by construction, staging, and storage to original contours and revegetate with plant material similar in numbers and types to that which was removed, based upon local jurisdictional requirements. If no local jurisdictional requirements exist, replace removed vegetation at a 1:1 replacement ratio for shrubs and small trees, and 2:1 replacement ratio for mature trees. For example, if the Contractor removes 10 mature trees in an area, replant 20 younger trees that after 5 to 15 years (depending upon the growth rates of the trees) would be of a height and spread to provide visual screening similar to the visual screening provided by the trees that were removed for construction. Replaced shrubs shall be a minimum 5 gallon and replaced trees shall be a minimum 24-inch box in size and minimum 8 feet in height. Trees should be maintained and periodically monitored by the Authority for five to seven years to ensure survival and their continued health as they mature. To the extent feasible, do not locate construction staging sites in the immediate foreground distance (0 to 500 feet) of existing residential neighborhoods, recreational areas, or other land uses that include high-sensitivity viewers. Where such siting is unavoidable, screen staging sites from viewers using appropriate solid screening materials such as temporary fencing and walls. Paint over or remove any graffiti or visual defacement of temporary fencing and walls within five business days of it occurring. <p>The technical memorandum shall be submitted to the Authority for review and approval.</p>	Pre-construction/ construction/ post-construction	Prepare technical memorandum	Prior to construction	Contractor	Contractor	Prior to construction	Contract requirements and specifications	Impact AVQ #1: Temporary Impacts Associated with Construction Staging, Equipment, Lighting, and Spoils Impact PK #2: Temporary Access, Air Quality, Noise, and Visual Impacts
AVQ-MM#2	Minimize Light Disturbance during Construction	<p>Prior to Construction (any ground disturbing activity requiring nighttime construction), the Contractor shall prepare a technical memorandum verifying how the Contractor shall shield nighttime construction lighting and direct it downward in such a manner to minimize the light that falls outside the construction site boundaries. The technical memorandum shall be submitted to the Authority for review and approval.</p>	Pre-construction/ construction	Prepare technical memorandum	Prior to construction	Contractor	Contractor	Prior to construction	Contract requirements and specifications	Impact AVQ #1: Temporary Impacts Associated with Construction Staging, Equipment, Lighting, and Spoils Impact PK #2: Temporary Access, Air Quality, Noise, and Visual Impacts

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
AVQ-MM#3	Incorporate Design Criteria for Elevated Guideways That Can Adapt to Local Context	<p>Prior to Construction (any ground-disturbing activity), the Contractor shall work with the Authority and local jurisdictions to incorporate the Authority-approved aesthetic preferences for non-station structures into final design and construction. Refer to <i>Aesthetic Guidelines for Non-Station Structures</i> [Authority 2011a]. This shall include the following activities:</p> <ul style="list-style-type: none"> • During the elevated guideway design process, establish a process with the affected jurisdiction over the land along the elevated guideway to advance the final design through a collaborative, context-sensitive solutions approach. Participants in the consultation process shall meet on a regular basis to develop a consensus on the urban design elements that are to be incorporated into the final guideway designs. The process shall include activities to solicit community input in the affected neighborhoods. <p>Actions taken to help achieve integration with the local design context during the context-sensitive solutions process shall include the following:</p> <ul style="list-style-type: none"> • Incorporate architectural elements, such as graceful curved or tapered sculptural forms and decorative surfaces, to provide visual interest. Include decorative texture treatments on large-scale concrete surfaces such as parapets and other portions of the elevated guideways. Also include a variety of textures, shadow lines, and other surface articulations to add visual and thematic interest. Closely coordinate the design of guideway columns and parapets with station and platform architecture to promote unity and coherence where guideways lie adjacent to stations. • Integrate trees and landscaping where possible to soften and buffer the appearance of guideways, columns, and elevated stations. This will be consistent with the principles of crime prevention through environmental design. • The designs in cities and unincorporated communities shall reflect the results of the context-sensitive solutions design process. During the context-sensitive solutions design process, the HSR project's obligations and constraints related to planning, mitigation, engineering, performance, funding, and operational requirements shall be taken into consideration. <p>The technical memorandum shall be submitted to the Authority to document compliance.</p>	Pre-construction/ construction	Compliance report	Prior to construction	Contractor	Contractor	Prior to construction	Contract requirements and specifications	<p>Impact AVQ #3: Permanent Impacts Related to Construction of a Large High-Speed Rail Structure</p> <p>Impact CUL-2: Permanent Construction-Period Potential Adverse Impacts on Built Resources due to Construction Activities</p> <p>Impact PK #6: Project Changes to Park or Recreation Facility Use or Character</p>

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
AVQ-MM#4	Provide Vegetation Screening along At-Grade and Elevated Guideways Adjacent to Residential Areas	<p>Prior to operation and maintenance of HSR, the Contractor shall plant trees (minimum 24-inch box and 8 feet in height) or other vegetation along the edges of the HSR rights-of-way in locations adjacent to residential areas to visually screen the elevated guideway and the residential area. The species of trees to be installed shall be selected based on their mature size and shape, growth rate, hardiness, and drought tolerance. Trees shall be visually consistent with surrounding vegetation in terms of vegetative type, color, texture, and form. No species on the Invasive Species Council of California's list of invasive species shall be planted. Upon maturity, the crowns of trees used shall be tall enough to partially, or fully, screen views of the elevated guideway from adjacent at-grade areas. Upon maturity, trees shall allow ground-level views under the crowns (with pruning if necessary) and will not interfere with the 15-foot clearance requirement for the guideway. The trees shall be maintained and periodically monitored by the Authority for five to seven years to ensure survival and their continued health as they mature. Irrigation systems shall be installed within the tree planting areas.</p> <p>The Contractor shall prepare a technical memorandum within 90 days of completing any construction section or segment documenting the species of trees that were incorporated into the edges of the HSR right-of-way adjacent to residential uses. The technical memorandum shall be submitted to the Authority to document compliance.</p>	Construction/ post-construction	Plant trees/ compliance report	Prior to operation planting trees/ 90 days of completing any construction section or segment documenting the species of trees that were incorporated into design	Contractor	Contractor	Prior to operation, planting trees/ 90 days of completing any construction section or segment documenting the species of trees that were incorporated into design	Contract requirements, specifications; landscaping, and maintenance will be provided by the Contractor for its scope of work until completion of the work at which time the Authority shall assume responsibility for landscaping or assign the responsibility to other third parties	Impact AVQ #3: Permanent Impacts Related to Construction of a Large High-Speed Rail Structure
AVQ-MM#5	Replant Unused Portions of Lands Acquired for the HSR	<p>Prior to operation and maintenance, the Contractor shall plant vegetation within land acquired for the project (e.g., shifting roadways) that are not used for the HSR or related supporting infrastructure, or other higher or better use. Plantings shall allow adequate space between the vegetation and the HSR alignment and catenary lines. All street trees and other visually important vegetation removed in these areas during construction shall be replaced with similar vegetation that, upon maturity, shall be similar in size and character to the removed vegetation. Replaced shrubs shall be minimum 5 gallon and trees shall be minimum 24-inch box and 8 feet in height. The Authority shall provide for continuous maintenance with appropriate irrigation systems. The Contractor shall install the irrigation system within the planting areas. No species listed on the Invasive Species Council of California's list of invasive species shall be planted.</p>	Post-construction/ operations	Plant vegetation/ reporting	Prior to operation and maintenance planting trees/ monthly reporting	Authority	Authority	Prior to operation and maintenance planting trees/ monthly reporting	Authority to implement appropriate landscape and maintenance plan	Impact AVQ #3: Permanent Impacts Related to Construction of a Large High-Speed Rail Structure

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
AVQ-MM#6	Landscape Treatments along the HSR Overcrossings and Retained Fill Elements	<p>During final design, the Authority shall consult with the affected local jurisdictions regarding the landscaping program for planting the slopes of overheads, embankments, and retained fill elements. Within 90 days from the completion of construction, the Contractor shall plant the surface of the ground below overheads (slope-fill overheads), embankments, and retained fill elements with plant species that are consistent with the surrounding landscape (in terms of vegetative type, color, texture, and form) and based on their mature size and shape, growth rate, and drought tolerance. No species on the list from the Invasive Species Council of California shall be planted. The landscaping shall be continuously maintained and appropriate irrigation systems shall be installed if needed.</p> <p>Where wall structures supporting the overheads or retained fill are proposed, the structure shall employ architectural details and low-maintenance trees and other vegetation to screen the structure, minimize graffiti, and reduce the effects of large walls. Surface coatings shall be applied on wood and concrete to facilitate cleaning and the removal of graffiti. Any graffiti or visual defacement or damage of fencing and walls shall be painted over or repaired within a reasonable time (approximately 10 business days) after notification. The Contractor shall prepare a technical memorandum documenting implementation and submit it to the Authority to demonstrate compliance.</p>	Construction/ final design	Landscaping program implemented/ compliance reporting	During final design implement landscaping program/ monthly reporting	Authority	Contractor	During final design implement landscaping program/ monthly reporting	Contract requirements and specifications; landscaping and maintenance will be provided by the Contractor for its scope of work until completion of the work at which time the Authority shall assume responsibility for landscaping or assign the responsibility to other third parties	Impact AVQ #3: Permanent Impacts Related to Construction of a Large High-Speed Rail Structure
AVQ-MM#7	Provide Sound Barrier Treatments	<p>Prior to Construction (any ground-disturbing activity), the Contractor shall design a range of sound barrier treatments for visually sensitive areas, such as those areas where residential views of open landscaped areas would change or in urban areas where sound barriers would adversely affect the existing character and setting. The Contractor shall develop the treatments during the final design process and integrate them into the final project design. The treatments shall include, but are not limited to, the following:</p> <ul style="list-style-type: none"> • Sound barriers along elevated guideways that may incorporate transparent materials where sensitive views would be adversely affected by opaque sound barriers. • Sound barriers made with nonreflective materials and of a neutral color. • Surface design enhancements and vegetation appropriate to the visual context of the area shall be installed with the sound barriers. Vegetation shall be installed consistent with the provisions of Project Mitigation Measure AVQ-MM#5. Surface enhancements shall be consistent with the design features developed for Project Mitigation Measure AVQ-MM#3 and shall include architectural elements (e.g., stamped pattern, surface articulation, decorative texture treatment), as determined acceptable to the local jurisdiction. Surface coatings shall be used on wood and concrete sound barriers to facilitate cleaning and the removal of graffiti. <p>The Contractor shall prepare a technical memorandum documenting implementation and submit it to the Authority to demonstrate compliance.</p>	Pre-construction/ construction	Reporting	Monthly	Contractor	Contractor	Construction/ monthly	Contract requirements/ specifications	Impact AVQ #3: Permanent Impacts Related to Construction of a Large High-Speed Rail Structure

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
AVQ-MM#8	Minimize Vertical Cut-Slopes in Tehachapi Mountains with Retaining Walls	Where high-sensitivity views or viewers could be strongly affected by tall, highly exposed, vertical cut slopes needed to accommodate at-grade segments in the Tehachapi Mountains, the Contractor shall incorporate retaining walls to avoid or reduce those impacts. Locations where this measure could be considered include cut-slopes in the vicinity of the Tehachapi Loop (station 18685), Golden Hills (station 18925), and Tehachapi Valley (station 19010). Where such walls are implemented, wall texture and color treatments shall be applied to minimize visual contrast and reflectivity and to blend with the surrounding setting. The Contractor shall prepare a technical memorandum documenting implementation and submit it to the Authority to demonstrate compliance.	Pre-construction/ Construction	Preparation of memorandum/ reporting	Monthly	Contractor/ Authority	Contractor/ Authority	Final design	Contract Requirements/ specifications	Impact AVQ #3: Permanent Impacts Related to Construction of a Large High-Speed Rail Structure
AVQ-MM#9	Screen Traction Power Distribution Substations and Radio Communication Towers	Within 90 days of completing traction power substation or radio tower construction, the Contractor shall screen from public view the traction power substations (located at approximately 30-mile intervals along the HSR guideway), including radio towers where required, through the use of landscaping or solid walls/fences. This shall consist of context-appropriate landscaping of a type and scale that does not draw attention to the station or feature. Plant species shall be selected based on their mature size and shape, growth rate, hardiness, and drought tolerance. Planted shrubs shall be a minimum 5 gallon and trees shall be a minimum 24-inch box and 8 feet in height. No species on the Invasive Species Council of California's list shall be planted. The landscaping shall be continuously maintained and appropriate irrigation systems shall be installed within the landscaped areas. Walls shall be constructed of cinder-block or similar material and shall be painted a neutral color to blend in with the surrounding context. If a chain-link or cyclone fence is used, it shall include slats in the fencing. Any graffiti or visual defacement or damage of fencing and walls shall be painted over or repaired within a reasonable period, as agreed between the Authority and the local jurisdiction. The Contractor shall prepare a technical memorandum documenting how the requirements in this measure were implemented. The technical memorandum shall be submitted to the Authority to document compliance.	Construction/ post-construction	Reporting	Monthly	Contractor/ Authority	Contractor	Construction/ monthly reporting	Contract requirements/ specifications	Impact AVQ #7: Permanent Impacts from Construction of Electric Power Utility Improvements

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
Cultural Resources										
CUL-MM#1	Mitigate Adverse Effects to Archaeological and Built Environment Resources Identified During Phased Identification. Comply with the Stipulations Regarding the Treatment of Archaeological and Historic Built Resources in the Programmatic Agreement (PA) and Memorandum of Agreement (MOA)	<p>Once parcels are accessible and surveys have been completed, including consultation as stipulated in the MOA, additional archaeological may be identified. Unless design advances during the design-build phase require the APE to be modified, all built resources surveys were completed for the Bakersfield to Palmdale Project Section. For newly identified eligible properties that would be adversely affected, the following process would be followed, which would be presented in detail in the BETP and ATP:</p> <ul style="list-style-type: none"> The Authority would consult with the MOA signatories and concurring parties to determine the preferred treatment of the properties/resources and appropriate mitigation measures. For CRHR-eligible archaeological resources, the Authority shall determine if these resources can feasibly be preserved in place, or if data recovery is necessary. The methods of preservation in place shall be considered in the order of priority provided in CEQA Guidelines § 15126.4(b)(3). If data recovery is the only feasible treatment the Authority shall adopt a data recovery plan as required under CEQA Guidelines § 15126.4(b)(3)(C). Should data recovery be necessary, the Contractor's Principal Investigator (PI), in consultation with the MOA signatories and consulting parties, would prepare a data recovery plan, for approval from the Authority and in consultation with the MOA signatories. Upon approval, the Contractor's PI would implement the plan. For archaeological resources the Authority shall also determine if the resource is a unique archaeological site under CEQA. If the resource is not a historical resource but is an archaeological site, the resource shall be treated as required in California Public Resources Code 21083.2 by following protection, data recovery, and/or other appropriate steps outlined in the ATP. The review and approval requirements for these documents would be outlined in the ATP. For historic built resources, the Contractor's PI would amend the BETP to include the treatment and mitigation measures identified by the Authority in consultation with the MOA signatories and concurring parties. The Contractor's PI would implement the treatment and mitigation measures accordingly. 	Pre-construction/ construction	Reporting	Weekly	Contractor/ Authority	Contractor/ Authority	Pre-construction surveys and construction/ weekly reporting or as dictated by the ATP and the MOA	PA	<p>Impact CUL-1: Permanent Construction-Period Potential Adverse Impacts on Archaeological Resources Due to Construction Activities</p> <p>Impact CUL-2: Permanent Construction-Period Potential Adverse Impacts on Built Resources due to Construction Activities</p>

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
CUL-MM#2	Halt Work in the Event of an Archaeological Discovery and Comply with the Programmatic Agreement (PA), Memorandum of Agreement (MOA), Archaeological Treatment Plan (ATP), and all State and Federal Laws, as applicable	<p>During construction (any ground disturbing activities, including clearing and grubbing) should there be an unanticipated discovery, the Contractor shall follow the procedures for unanticipated discoveries as stipulated in the PA, MOA, and associated ATP. The procedures must also be consistent with the following: the SOI Standards and Guidelines for Archaeology and Historic Preservation (48 FR 44716-42), as amended (National Park Service); and Guidelines for the Implementation of CEQA, as amended (Title 14 CCR Chapter 3, Article 9, Sections 15120–15132). Should the discovery include human remains, the Contractor, the Authority, and the FRA shall comply with federal and state regulations and guidelines regarding the treatment of human remains, including relevant sections of the Native American Graves Protection and Repatriation Act (§3(c)(d)); California Health and Safety Code, Section 8010 et seq.; and CPRC Section 5097.98; and consult with the Native American Heritage Commission, tribal groups, and the SHPO.</p> <p>In the event of an unanticipated archaeological discovery, the contractor would cease work in the immediate vicinity of the find, based on the direction of the archaeological monitor or the apparent location of cultural resources if no monitor is present. If no qualified archaeologist is present, no work can commence until it is approved by the qualified archaeologist in accordance with the MOA, ATP, and monitoring plan prepared for the specific archaeological discovery. The contractor's qualified archaeologist would assess the potential significance of the find and make recommendations for further evaluation and treatment as necessary. These steps may include evaluation for the CRHR and NRHP and necessary treatment to resolve significant effects if the resource is an historical resource or historic property. If, after documentation is reviewed and approved by the Authority, and they determine it is a historic property, and the SHPO concurs that the resource is eligible for the NRHP, or the Authority determines it is eligible for the CRHR, preservation in place shall be considered by the Authority in the order of priority provided in CEQA Guidelines § 15126.4(b)(3) and in consultation with the signatories and consulting parties to the MOA. If data recovery is the only feasible mitigation the contractor's qualified Principal Investigator (PI) shall prepare a data recovery plan as required under CEQA Guidelines § 15126.4(b)(3)(C), the MOA, and ATP, for the Authority's approval.</p> <p>The contractor shall notify the Authority, who shall notify the California State Lands Commission (CSLC), if the find is a cultural resource on or in the submerged lands of California and consequently under the jurisdiction of the CSLC. The Authority would comply with all applicable rules and regulations promulgated by CSLC with respect to cultural resources in submerged lands.</p> <p>If human remains are discovered on state-owned or private lands the contractor shall contact the relevant County Coroner to allow the Coroner to determine if an investigation regarding the cause of death is required. If no investigation is required and the remains are of Native American origin the Authority shall contact the Native American Heritage Commission to identify the most likely descendant (MLD). The MLD shall be empowered to reinter the remains with appropriate dignity. If the MLD fails to make a recommendation, the remains shall</p>	Construction	Reporting	During construction	Contractor/ Authority	Contractor	Daily logs (during active monitoring)	ATP/MOA	Impact CUL-1: Permanent Construction-Period Potential Adverse Impacts on Archaeological Resources Due to Construction Activities

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
		<p>be reentered in a location not subject to further disturbance and the location shall be recorded with the Native American Heritage Commission and relevant information center of the California Historical Resources Information System.</p> <p>If human remains are part of an archaeological site, the Authority and contractor shall, in consultation with the MLD and other consulting parties, consider preservation in place as the first option, in the order of priority called for in CEQA Guidelines Section 15126.4(b)(3).</p> <p>In consultation with the relevant Native American Tribes, the Authority may conduct scientific analysis on the human remains if called for under a data recovery plan and amenable to all consulting parties. The Authority would work with the MLD to satisfy the requirements of California Public Resources Code Section 5097.98. Performance tracking of this mitigation measure would be based on successful implementation and approval acceptance of the documentation by the SHPO and appropriate consulting parties.</p>								
CUL-MM#3	Other Mitigation for Effects to Pre-Contact Archaeological Sites	<p>Due to limited access to private properties during the environmental review phase of this project, the FRA's and Authority's ability to fully identify and evaluate archaeological resources within the APE has, correspondingly, also been limited. Thus, the majority of the project APE has not been subject to archaeological field inventories. As pedestrian field surveys are a necessary component of the archaeological resource identification and evaluation effort, the commitment to complete the field surveys, prior to ground disturbing activities associated with the project, are codified in the Memorandum of Agreement (MOA) that has been executed as a condition of this Final EIR/EIS.</p> <p>Access to previously inaccessible properties to complete the archaeological resource identification effort is expected to be available after the Record of Decision, during the design-build phase of the project. However, due to the design constraints associated with constructing a high-speed train, the ability to shift the alignment to avoid any newly identified archaeological resources at this late phase of the project delivery process is substantially limited and/or unlikely, as the alignment is already established. As such, impacts/effects to as-yet-undiscovered significant archaeological resources as a result of this project are anticipated; however, the nature and quantity of such effects remains unknown until completion of the archaeological field identification and evaluation effort.</p> <p>Protocols for the identification, evaluation, treatment, and data-recovery mitigation of as-yet-undiscovered archaeological resources are addressed in the MOA and Archaeological Treatment Plan. Efforts to develop meaningful mitigation measures for effects to as-yet-undiscovered Native American archaeological resources that cannot be avoided will be negotiated with the tribal Consulting Parties. Measures that are negotiated among the MOA signatories and tribal Consulting Parties will be the responsibility of the Authority to implement.</p>	Pre-construction	Pre-construction surveys	Prior to ground-disturbing activities	Authority	Authority	Prior to ground-disturbing activities	ATP/ MOA	Impact CUL-1: Permanent Construction-Period Potential Adverse Impacts on Archaeological Resources Due to Construction Activities

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
CUL-MM#7	Prepare Interpretive or Educational Materials	<p>The MOA and BETP would identify historic properties and historical resources that would be subject to historic interpretation or preparation of educational materials. Interpretive and educational materials would address the significance of the properties that would be affected by the project. Interpretive or educational materials could include, but are not limited to: brochures, videos, websites, study guides, teaching guides, articles or reports for general publication, commemorative plaques, or exhibits. The agreed-upon method of interpretation would be specified in the BETP for each property, resulting from consultation with the State Historic Preservation Officer (SHPO), MOA signatories and concurring parties. The contractor would be responsible for assembling the appropriate interdisciplinary team to fulfill the mitigation. The required professionals and their qualifications would be specified in the BETP.</p> <p>In the preparation of the interpretive or educational materials, the contractor's team would utilize previous research included in the environmental technical documents, images, narrative history, drawings, or other material produced for the mitigation described above. The interpretive or educational materials should be made available to the public in physical or digital formats, at local libraries, historical societies, or public buildings, as specified in the BETP.</p>	Post-construction	Reporting	Annual	Authority	Post-construction/annual reporting	Authority, in consultation with SHPO and appropriate consulting parties	BETP, Photographic documentation, plan for repairs to historic properties	<p>Impact CUL-2: Permanent Construction-Period Potential Adverse Impacts on Built Resources due to Construction Activities</p> <p>Impact CUL-4: Permanent Operations—Potential Adverse Impacts on Built Resources</p>
CUL-MM#9	Visual Screening	<p>The MOA and BETP would identify historic properties and historical resources that would be subject to visual screening. Visual screening would be installed by the Contractor and consist of plant material that would minimize the view of the project from the property subject to mitigation. This treatment would minimize adverse effects on historic properties/historical resources. Plant species would be selected by the Contractor's interdisciplinary team of architectural historians and landscape architects based on species' mature size and shape, growth rate, appropriateness to the historic property, fire resistance, and drought tolerance. The design and recommended plant make-up of the screen would be reviewed and approved by the Authority in consultation with the MOA signatories and land owner or land-owning agency. No species that is listed on the Invasive Species Council of California's list of invasive species would be planted. The Contractor would arrange to have the landscaping continuously maintained for a period specified in the plan and appropriate irrigation systems would be installed if the landscape architect determines it is needed. The plan would define the terms of replacement should the plants die.</p>	Construction/post-construction	Reporting	Annual	Authority	Authority	Post-construction/annual reporting	BETP photographic documentation/visual screening plan	<p>Impact CUL-2: Permanent Construction-Period Potential Adverse Impacts on Built Resources due to Construction Activities</p> <p>Impact CUL-4: Permanent Operations—Potential Adverse Impacts on Built Resources</p>

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
CUL-MM#11	Statewide Historical Interpretation Program	<p>Prior to operation the Contractor shall provide the Authority with a cultural resources rail passenger visual and narrative electronic device application. Prior to preparing the application the Contractor shall obtain Authority approval of the application outline and content. The initial application shall be designed within a statewide context addressing the first operating segment with the ability to add future segments prior to their operation. Contractors of additional segments shall embellish the initial application and add relevant new segment cultural resource material. The cultural resources technical studies prepared to support the findings and effects identified in the environmental documents for each project section include prehistoric, Native American ethnographic, and historic contexts. The Authority is using these contexts as the foundation for a geographically referenced historical visual and narrative "application" for the total rail alignment, to be enjoyed by rail passengers through their smart phones or tablets, or other electronic devices.</p> <p>The MOA and BETP for each project section would identify historic themes to be developed for the application, as well as identify any properties to be specifically referenced, as agreed upon in consultation with the SHPO, MOA signatories, and consulting parties. In consultation with the Authority, the Contractor would be responsible for assembling the appropriate interdisciplinary team to synthesize the information and provide electronic files of exhibits found in the cultural resources studies that may be used for such a program. The required professionals and their qualifications would be specified in the BETP, as would the number, type, and format of required exhibits. Bibliographies for the technical documents may be used as a tool to locate additional visual material for the application. In the gathering of visual materials, the Contractor's team would also utilize any research, as appropriate, included in material produced for other interpretive mitigation. The contractor would ensure that all exhibits provided as recommended for use in the application be licensed or otherwise legally reproducible for such use.</p>	Post-construction	Reporting	Annual	Contractor/ Authority	Contractor/ Authority	Post-construction/ annual reporting	BETP/ MOA	Impact CUL-2: Permanent Construction-Period Potential Adverse Impacts on Built Resources due to Construction Activities
Cumulative Impacts										
CUM-SO-MM#1	Coordination with Cumulative Construction Project Sponsors	<p>During construction of the HSR project section, coordination would occur with the project sponsors or other entities, including local or regional governments, to coordinate construction schedules and potential closures, detours, and other elements of construction, to the greatest extent feasible, in order to minimize impacts on surrounding communities. Such coordination would include planning for vehicular, pedestrian, and bicycle detours; performing community outreach to ensure residents and businesses are aware of potential issues in advance; and allowing for public input and feedback in planning for construction.</p>	Pre-Construction/ Construction	Notify and consult with departments/ agencies	Monthly	Contractor/ Authority	Contractor	Monthly, record keeping, and reporting	Meetings with departments/ agencies	Cumulative Construction Impacts to Population and Communities

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
Environmental Justice										
EJ-MM#1	EJ Community-Inclusive Process for Development of Aesthetic Treatments in Edison	The Authority shall follow its aesthetic options and aesthetic review procedures outlined in AVQ-IAMF#1 (Aesthetic Options) and AVQ-IAMF#2 (Aesthetic Review Process) for key non-station structures. In addition to seeking input from the City of Edison on aesthetic preferences and to minimize disproportionate visual or related community cohesion impacts, the Authority shall also seek input on aesthetic preferences for potential treatments from the visually impacted EJ communities residing within the EJ resource study area on Jacober Avenue and School Street in Edison. Visually impacted communities and the EJ resource study area are defined in Chapter 5 of the FEIS/FEIR.	Pre-Construction	Reporting	At incorporation or completion of design/monthly reporting during construction	Contractor	Contractor	Prepare aesthetics and aesthetics review technical memoranda	Condition of Authority's acceptance of the technical memoranda	Disproportionate visual/community cohesion impact findings described in Chapter 5 Environmental Justice, Section 5.9
EJ-MM#2	Equity Noise Analysis	Prior to Construction, the Authority's Contractor will prepare an operation noise technical report for Authority review and approval, as described in N&V-MM#6. As described in N&V MM#3, sound treatments will be proposed to impacted receptors based on the recommendations in the approved noise impact report. To minimize EJ impacts, the final technical report will include an assessment of whether remaining severe noise impacts, after application of recommended noise treatments and mitigations, may disproportionately impact EJ communities. If the report finds that disproportionate impacts may result, the Authority's contractor will prepare an additional report to assess whether any additional practicable measures may be undertaken to avoid, eliminate, or reduce the disproportionate noise impacts. The Authority will seek and consider the input of affected EJ sensitive receptors prior to finalizing the report.	Pre-Construction	Design	Prior to final design	Authority/Contractor	Authority/Contractor	Provide equity analysis in final operation noise technical report to determine if additional study or measures are needed.	Submit assessment as a part of N&V MM#3 and N&V MM#6	Disproportionate noise impact findings described in Chapter 5 Environmental Justice, Section 5.9

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
EJ-MM#3	EJ Relocation/Displacement Assistance	<p>As described in SOCIO-IAMF#3 Relocation Mitigation Plan, the Authority will develop a relocation mitigation plan before any acquisitions occur, in consultation with affected cities and counties and property owners. The Plan will be designed to meet the objectives described in SOCIO-IAMF#3.</p> <p>To avoid or minimize disproportionate EJ impacts, the Plan will also include: (1) EJ Impact Minimization Measures: A description of measures taken or proposed to minimize adverse community cohesion effects of displacement and relocation on EJ communities, including a description of measures to relocate displacees in close proximity to their same community and an assessment of whether disproportionate effects remain after application of these measures; (2) EJ Outreach: The Authority shall seek and consider input from impacted EJ communities prior to finalizing the Authority's Plan; and (3) EJ Ombudsman: Creation of an additional ombudsman's position to address needs of EJ communities identified in Palmdale, Lancaster, and Bakersfield as disproportionately affected by displacements or relocations. The position will act as a single point of contact for property owners, residents, and tenants in EJ communities with potential disproportionate relocation impacts. EJ communities with potential disproportionate relocation impacts are geographically defined in the findings of Chapter 5 of the FEIR/FEIS.</p>	Design/Construction	Prepare plan with identified EJ elements	Prior to acquisitions	Authority	Authority	Develop and include in relocation mitigation plan	Condition of design-build contract	Disproportionate relocation impact findings described in Chapter 5 Environmental Justice, Section 5.9

AQMD = Air Quality Management District
 AVAQMD = Antelope Valley Air Quality Management District
 APE = Area of Potential Effect
 ATP = Archaeological Treatment Plan
 Authority = California High-Speed Rail Authority
 BETP = built environment treatment plan
 BLM = Bureau of Land Management
 BMP = best management practice
 BRMP = biological resources management plan
 CCR = California Code of Regulations
 C.F.R. = Code of Federal Regulations
 CDFG = California Department of Fish and Game (former name of CDFW)
 CDFW = California Department of Fish and Wildlife
 CEQA = California Environmental Quality Act
 CESA = California Endangered Species Act
 CMP = Compensatory Mitigation Plan and also Bay Area AQMD's Carl Moyer Memorial Air Quality Standards Attainment Program
 CPRC = California Public Resources Code
 CRHR = California Register of Historical Resources
 CSLC = California State Lands Commission
 CWA = Clean Water Act
 dBA = A-weighted decibels
 DOC = Department of Conservation
 EIR/EIS = environmental impact report/environmental impact statement
 EKAPCD = Eastern Kern Air Pollution Control District
 EMI = electromagnetic interference
 EMMA = Environmental Mitigation Management and Assessment system
 ESA = environmentally sensitive area
 FAST = Fixing America's Surface Transportation Act
 F-B = Fresno to Bakersfield Project Section
 FEMA = Federal Emergency Management Agency
 FESA = Federal Endangered Species Act
 FR = Federal Register
 FRA = Federal Railroad Administration
 GIS = geographic information system
 HAER = Historic American Engineering Record
 HABS = Historic American Building Survey
 HALS = Historic American Landscape Survey
 HSR = high-speed rail

LGA = locally generated alternative
 MLA = most likely descendant
 MOA = memorandum of agreement
 MOU = memorandum of understanding
 mph = miles per hour
 MRI = magnetic resonance imaging
 NEPA = National Environmental Policy Act
 NPDES = National Pollutant Discharge Elimination System
 NRHP = National Register of Historic Places
 O_x = nitrogen oxides
 PA = Programmatic Agreement
 PCT = Pacific Coast Trail
 PI = Principal Investigator
 PM = particulate matter
 RF = radio frequency
 RFQ = requests for qualifications
 RRP = Restoration and Revegetation Plan
 ROD = record of decision
 RWQCB = Regional Water Quality Control Board
 SHPO = State Historic Preservation Officer
 SHTAC = Swainson's Hawk Technical Advisory Committee
 SJVAB = San Joaquin Valley Air Basin
 SJVAPCD = San Joaquin Valley Air Pollution Control District
 SOI = Secretary of the Interior
 SOIS = Secretary of the Interior's Standards
 SOQ = Statement of Qualification
 SR = State Route
 SWRCB = State Water Resources Control Board
 USACE = U.S. Army Corps of Engineers
 USEPA = U.S. Environmental Protection Agency
 USFWS = U.S. Fish and Wildlife Service
 VERA = Voluntary Emission Reduction Agreement
 VCP = Vegetation Control Plan
 VOC = volatile organic compounds
 WCP = Weed Control Plan
 WEAP = worker environmental awareness program
 WEF = wildlife exclusion fencing

Table 3 Bakersfield to Palmdale Project Section: Impact Avoidance and Minimization Features

IAMF	Title	IAMF Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Title
Air Quality and Global Climate Change										
AQ-IAMF#1	Fugitive Dust Emissions	<p>During construction, the Contractor shall employ the following measures to minimize and control fugitive dust emissions. The Contractor shall prepare a fugitive dust control plan for each distinct construction segment. At a minimum, the plan shall describe how each measure would be employed and identify an individual responsible for ensuring implementation. At a minimum, the plan shall address the following components unless alternative measures are approved by the applicable air quality management district.</p> <ul style="list-style-type: none"> Cover all vehicle loads transported on public roads to limit visible dust emissions, and maintain at least 6 inches of freeboard space from the top of the container or truck bed. Clean all trucks and equipment before exiting the construction site using an appropriate cleaning station that does not allow runoff to leave the site or mud to be carried on tires off the site. Water exposed surfaces and unpaved roads at a minimum three times daily with adequate volume to result in wetting of the top 1 inch of soil but avoiding overland flow. Rain events may result in adequate wetting of top 1 inch of soil thereby alleviating the need to manually apply water. Limit vehicle travel speed on unpaved roads to 15 miles per hour (mph). Suspend any dust-generating activities when average wind speed exceeds 25 mph. Stabilize all disturbed areas, including storage piles that are not being used on a daily basis for construction purposes, by using water, a chemical stabilizer/suppressant, hydro mulch or by covering with a tarp or other suitable cover or vegetative ground cover, to control fugitive dust emissions effectively. In areas adjacent to organic farms, the Authority would use non-chemical means of dust suppression. Stabilize all on-site unpaved roads and off-site unpaved access roads, using water or a chemical stabilizer/suppressant, to effectively control fugitive dust emissions. In areas adjacent to organic farms, the Authority would use non-chemical means of dust suppression. Carry out watering or presoaking for all land clearing, grubbing, scraping, excavation, land leveling, grading, cut and fill, and demolition activities. For buildings up to 6 stories in height, wet all exterior surfaces of buildings during demolition. Limit or expeditiously remove the accumulation of mud or dirt from adjacent public streets at a minimum of once daily, using a vacuum type sweeper. After the addition of materials to or the removal of materials from surface or outdoor storage piles, apply sufficient water or a chemical stabilizer/suppressant. 	Construction	Prepare plan/Reporting	Weekly	Contractor	Contractor	Prepare a fugitive dust control plan	Condition of design-build contract	<p>Impact AQ #1: Regional Air Quality Impacts during Construction</p> <p>Impact AQ #2: Compliance with Air Quality Plans during Construction</p> <p>Impact AQ #18: Cumulative Impacts during Operation</p> <p>Impact AVQ #1: Temporary Impacts Associated with Construction Staging, Equipment, Lighting, and Spoils</p> <p>Impact S&S #5: Temporary Exposure to Valley Fever</p> <p>Impact SO#1: Temporary Disruption to Community Cohesion or Division of Existing Communities from Project Construction</p> <p>Impact SO#16: Temporary Effects on Children's Health and Safety from Construction</p> <p>Impact LU #1: Potential for Construction to Temporarily Alter Existing Land Use Patterns</p>

IAMF	Title	IAMF Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Title
AQ-IAMF#2	Selection of Coatings	<p>During construction, the Contractor shall use:</p> <ul style="list-style-type: none"> • Low-volatile organic compound (VOC) paint that contains less than 10 percent of VOC contents (VOC, 10%). • Super-compliant or Clean Air paint that has a lower VOC content than that required by San Joaquin Valley Unified Air Pollution Control District Rule 4601, Eastern Kern Air Pollution Control District Rule 410, and Antelope Valley Air Quality Management District Rule 1113, when available. If not available, the Contractor shall document lack of availability, recommend alternative measure(s) to comply with Rule 4601, 410, and 1113, or disclose absence of measure(s) for full compliance and obtain concurrence from the Authority. 	Construction	Low VOC-paint use	Monthly	Contractor	Contractor	Use of low-VOC paint during construction	Condition of design-build contract	<p>Impact AQ #2: Compliance with Air Quality Plans during Construction</p> <p>Impact SO#1: Temporary Disruption to Community Cohesion or Division of Existing Communities from Project Construction</p> <p>Impact SO#16: Temporary Effects on Children’s Health and Safety from Construction</p> <p>Impact LU #1: Potential for Construction to Temporarily Alter Existing Land Use Patterns</p>
AQ-IAMF#3	Renewable Diesel	<p>During construction, the Contractor would use renewable diesel fuel to minimize and control exhaust emissions from all heavy-duty diesel-fueled construction diesel equipment and on-road diesel trucks. Renewable diesel must meet the most recent ASTM D975 specification for Ultra Low Sulfur Diesel and have a carbon intensity no greater than 50% of diesel with the lowest carbon intensity among petroleum fuels sold in California. The Contractor would provide the Authority with monthly and annual reports, through the Environmental Mitigation Management and Application (EMMA) system, of renewable diesel purchase records and equipment and vehicle fuel consumption. Exemptions to use traditional diesel can be made where renewable diesel is not available from suppliers within 200 miles of the project site. The construction contract must identify the quantity of traditional diesel purchased and fully document the availability and price of renewable diesel to meet project demand.</p>	Construction	Renewable diesel fuel use	Monthly	Contractor	Contractor	Use of renewable diesel fuel during construction	Contract requirements and specifications	<p>Impact AQ #1: Regional Air Quality Impacts during Construction</p> <p>Impact AQ #3: Greenhouse Gas Emissions during Construction</p>
AQ-IAMF#4	Reduce Criteria Exhaust Emissions from Construction Equipment	<p>Prior to issuance of construction contracts, the Authority would incorporate the following construction equipment exhaust emissions requirements into the contract specifications:</p> <ol style="list-style-type: none"> 1. All heavy-duty off-road construction diesel equipment used during the construction phase would meet Tier 4 engine requirements. 2. A copy of each unit’s certified tier specification and any required CARB or air pollution control district operating permit would be made available to the Authority at the time of mobilization of each piece of equipment. 3. The contractor would keep a written record (supported by equipment-hour meters where available) of equipment usage during project construction for each piece of equipment. 4. The contractor would provide the Authority with monthly reports of equipment operating hours (through the Environmental Mitigation Management and Assessment [EMMA] system) and annual reports documenting compliance. 	Pre-construction	Contract specifications	Prior to construction	Authority	Authority	Exhaust emissions requirements incorporated into contract specifications	Contract requirements and specifications	<p>Impact AQ #1: Regional Air Quality Impacts during Construction</p> <p>Impact AQ #2: Compliance with Air Quality Plans during Construction</p> <p>Impact AQ #8: Cumulative Impacts during Construction</p>

IAMF	Title	IAMF Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Title
AQ-IAMF#5	Reduce Criteria Exhaust Emissions from On-Road Construction Equipment	<p>Prior to issuance of construction contracts, the Authority would incorporate the following material hauling truck fleet mix requirements into the contract specifications:</p> <ol style="list-style-type: none"> All on-road trucks used to haul construction materials, including fill, ballast, rail ties, and steel, would consist of a fleet mix of equipment model year 2010 or newer, but no less than the average fleet mix for the current calendar year as set forth in the CARB's EMFAC 2014 database. The contractor would provide documentation to the Authority of efforts to secure such a fleet mix. The contractor would keep a written record of equipment usage during project construction for each piece of equipment and provide the Authority with monthly reports of VMT (through EMMA) and annual reports documenting compliance. 	Pre-construction	Contract specifications	Prior to construction	Authority	Authority	Material hauling truck fleet mix requirements incorporated into contract specifications	Contract requirements and specifications	<p>Impact AQ #1: Regional Air Quality Impacts during Construction</p> <p>Impact AQ #2: Compliance with Air Quality Plans during Construction</p> <p>Impact AQ #8: Cumulative Impacts during Construction</p>
AQ-IAMF#6	Reduce the Potential Impact of Concrete Batch Plants	<p>Prior to construction of any concrete batch plant, the contractor would provide the Authority with a technical memorandum documenting consistency with the Authority's concrete batch plant siting criteria and utilization of typical control measures. Concrete batch plants would be sited at least 1,000 feet from sensitive receptors, including places such as daycare centers, hospitals, senior care facilities, residences, parks, and other areas where people may congregate. The concrete batch plant would implement typical control measures to reduce fugitive dust such as water sprays, enclosures, hoods, curtains, shrouds, movable and telescoping chutes, central dust collection systems, and other suitable technology, to reduce emissions to be equivalent to the USEPA AP-42 controlled emission factors for concrete batch plants. The contractor would provide to the Authority documentation that each batch plant meets this standard during operation.</p>	Construction	Prepare plan/ Reporting	Prior to construction of concrete batch plants	Contractor	Contractor	Preparation of a concrete batch plant technical memorandum	Contract requirements and specifications	<p>Impact AQ #2: Compliance with Air Quality Plans during Construction</p> <p>Impact AQ #7: Localized Air Quality Impacts from Concrete Batch Plants</p> <p>Impact AQ #18: Cumulative Impacts during Operation</p>
Noise and Vibration										
NV-IAMF#1	Noise and Vibration	<p>Prior to construction, the contractor shall prepare and submit to the Authority a noise and vibration technical memorandum documenting how the FTA and FRA guidelines for minimizing construction noise and vibration impacts would be employed when work is being conducted within 1,000 feet of sensitive receptors. Typical construction practices contained in the FTA and FRA guidelines for minimizing construction noise and vibration impacts include the following:</p> <ul style="list-style-type: none"> Construct sound barriers, such as temporary walls or piles on excavated material, between noisy activities and noise sensitive resources. Route truck traffic away from residential streets, when possible. Construct walled enclosures around especially noisy activities or around clusters of noisy equipment. Combine noisy operations so that they occur in the same period. Phase demolition, earthmoving, and ground-impacting operations so as not to occur in the same time period. Avoid impact pile driving where possible in vibration sensitive areas. 	Pre-construction/ Construction	Prepare technical memorandum/ Compliance reporting	Monthly	Contractor	Contractor	Prepare a construction noise and vibration technical memorandum	Condition of design-build contract	<p>Impact N&V #1: Construction Noise</p> <p>Impact N&V #2: Construction Vibration</p> <p>Impact SO#1: Temporary Disruption to Community Cohesion or Division of Existing Communities from Project Construction</p> <p>Impact LU #1: Potential for Construction to Temporarily Alter Existing Land Use Patterns</p>

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Electromagnetic Interference and Electromagnetic Fields										
EMF/EMI-IAMF#1	Preventing Interference with Adjacent Railroads	<p><i>Technical Memorandum 3.00.10. Implementation Stage Electromagnetic Compatibility Program Plan</i> requires coordination with adjacent railroads. During Project Design, the Contractor would work with the engineering departments of railroads that operate parallel the HSR system to apply standard design practices to prevent interference with the electronic equipment operated by these railroads. Prior to Operation and Maintenance of each operating segment, the Contractor shall certify through issuance of a technical memorandum to the Authority that design provisions to prevent interference have been established and have been determined to be effective prior to the activation of potentially interfering systems of the HSR.</p> <p>The contractor would work with the railroad engineering departments where these railways parallel the HSR to apply the standard design practices to prevent interference with the electronic equipment operated by these railroads. Design provisions to prevent interference would be put in place and determined to be adequately effective by a qualified electrical engineering professional prior to the HSR activation of potentially interfering systems. The Authority's Design Criteria Manual Chapter 26 summarizes the applicable EMI/EMF design standards that the Authority would use for the project.</p>	Design/Construction	Prepare technical memorandum/ Compliance reporting	Monthly	Contractor	Contractor/ Authority	Prepare electromagnetic compatibility technical memorandum	Condition of design-build contract	Impact EMI/EMF #1—Impacts During Construction Impact EMI/EMF #9—Effects on Adjacent Existing Rail Lines
EMF/EMI-IAMF#2	Controlling Electromagnetic Fields/ Electromagnetic Interference	<p>Prior to construction, the contractor would prepare an EMI/EMF technical memorandum for review and approval by the Authority. The California HSR project shall adhere to international guidelines and comply with applicable federal and state laws and regulations. The HSR project design would follow Technical Memorandum 300.10, Implementation Stage Electromagnetic Compatibility Program Plan, the HSR Design Criteria Manual Chapter 26, which provides detailed electromagnetic compatibility (EMC) design criteria for the HSR systems and equipment, and HSR Design Criteria Manual Chapter 22, which addresses grounding requirements for third-party metallic structures, including fences and pipelines, which are parallel and adjacent to the California HSR System right-of-way. These documents describe the design practices to avoid EMI and to provide for HSR operational safety. Some measures of the ISEP include:</p> <ul style="list-style-type: none"> • During the planning stage through system design, the Authority would perform EMC/EMI safety analyses, which would include identification of existing nearby radio systems, design of systems to prevent EMI with identified neighboring uses, and incorporation of these design requirements into bid specifications used to procure radio systems. • Pipelines and other linear metallic objects that are not sufficiently grounded through the direct contact with earth would be separately grounded in coordination with the affected owner or utility to avoid possible shock hazards. For cases where metallic fences are purposely electrified to inhibit livestock or wildlife from traversing the barrier, specific insulation design measures would be implemented. • HSR standard corrosion protection measures would be implemented to eliminate risk of substantial corrosion of nearby metal objects. 	Design/Construction	Prepare technical memorandum/ Compliance reporting	Monthly	Contractor	Contractor/ Authority	Prepare EMI/EMF technical memorandum	Condition of design-build contract	Impact EMI/EMF #3—People with Implanted Medical Devices and Exposure to Electromagnetic Fields Impact EMI/EMF #5—Effects on Sensitive Equipment from Electromagnetic Interference Impact EMI/EMF #6—Electromagnetic Interference Effects on Schools Impact EMI/EMF #7—Potential for Corrosion of Underground Pipelines and Cables and Adjoining Rail Impact EMI/EMF #8—Potential for Nuisance Shocks Impact EMI/EMF #10—Wind Farm Electromagnetic Interference Effects Impact EMI/EMF #10—Wind Farm Electromagnetic Interference Effects

IAMF	Title	IAMF Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Title
Public Utilities and Energy										
PUE-IAMF#1	Design Measures	The HSR project design incorporates utilities and design elements that minimize electricity consumption (e.g., using regenerative braking, energy-saving equipment on rolling stock and at station facilities, implementing energy saving measures during construction, and automatic train operations to maximize energy efficiency during operations). Thus, the project would not overburden utility services. The design elements are included in the design-build contract. Additionally, the Authority has adopted a sustainability policy that establishes project design and construction requirements that avoid and minimize impacts.	Design/ Construction	Reporting	At incorporation or completion of design/monthly reporting (during construction)	Contractor	Contractor	Incorporation of utilities and design elements that minimize electrical consumption into design	Condition of design-build contract	Impact PU&E #16: Construction Energy Consumption Impact PU&E #17: Operational Energy Demand
PUE-IAMF#2	Irrigation Facility Relocation	Where relocating an irrigation facility is necessary, the Contractor would verify the new facility is operational prior to disconnecting the original facility, where feasible. Irrigation facility relocation preferences are included in the design-build contract and reduce unnecessary impacts on continued operation of irrigation facilities. The Contractor shall document all relocations in a memorandum for Authority review and approval.	Design/ Pre-construction	Reporting	Monthly	Contractor	Contractor	Verify new irrigation facilities are operational prior to disconnecting original facility	Condition of design-build contract	Impact PU&E #6: Conflicts with Existing Utilities
PUE-IAMF#3	Public Notifications	Prior to construction in areas where utility service interruptions are unavoidable, the Contractor would notify the public through a combination of communication media (e.g., by phone, email, mail, newspaper notices, or other means) within that jurisdiction and the affected service providers of the planned outage. The notification would specify the estimated duration of the planned outage and would be published no fewer than 7 days prior to the outage. Construction would be coordinated to avoid interruptions of utility service to hospitals and other critical users. The Contractor would submit the public communication plan to the Authority 60 days in advance of the work for verification that appropriate messaging and notification are to be provided.	Pre-construction/ Construction	Public notification	Monthly	Contractor	Contractor	Public notification of utility service interruptions 60 days in advance of work for verification	Condition of design-build contract	Impact AG #3: Temporary Utility and Infrastructure Disruption Impact PU&E #1: Planned Temporary Interruption of Utility Service Impact PU&E #2: Accidental Disruption of Services Impact PU&E #8: Effects from Upgrade or Construction of Power Lines
PUE-IAMF#4	Utilities and Energy	Prior to construction, the Contractor shall prepare a technical memorandum documenting how construction activities would be coordinated with service providers to minimize or avoid interruptions. It would include upgrades of existing power lines to connect the HSR system to existing utility substations. The technical memorandum shall be provided to the Authority for review and approval.	Design/ Pre-construction	Prepare a technical memorandum	At incorporation or completion of design/monthly reporting (during construction)	Contractor	Contractor	Prepare service provider coordination technical memorandum	Condition of design-build contract	Impact AG #3: Temporary Utility and Infrastructure Disruption Impact PU&E #1: Planned Temporary Interruption of Utility Service Impact PU&E #2: Accidental Disruption of Services

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Biological and Aquatic Resources										
BIO-IAMF#1	Designate Project Biologist, Designated Biologists, Species-Specific Biological Monitors and General Biological Monitors	<p>At least 15 business days prior to commencement of any ground-disturbing activity (including but not limited to geotechnical investigations, utility realignments, creation of staging areas, or initial clearing and grubbing), the Authority will submit the name(s) and qualifications of project biologists, designated biologists, species-specific biological monitors, and general biological monitors retained to conduct biological resource monitoring activities and implement avoidance and minimization measures.</p> <p>No ground-disturbing activity would begin until the Authority has received written approval from the USFWS, the NMFS, where applicable, and the CDFW that the biologists and monitors have been approved to conduct the specified work. The project biologist is responsible for ensuring the timely implementation of the biological avoidance and minimization measures, as outlined in the Biological Resources Management Plan (BRMP), and for guiding and directing the work of the designated biologists and Biological Monitors. Designated biologists will be responsible for directly overseeing and reporting the implementation of general and species-specific conservation measures. In some instances, designated biologists will only be approved for specific species, in which case they will only be authorized to conduct surveys and implement measures for the species for which they have been approved. Species-specific biological monitors will be responsible for implementation of species-specific measures for the species for which they have been approved and will report directly to a designated biologist. General biological monitors will report directly to a designated biologist or to the project biologist. General biological monitors will be responsible for conducting Worker Environmental Awareness Program (WEAP) training, implementing general conservation measures, conducting general compliance monitoring, and reporting on compliance monitoring activities.</p> <p>The term “project biologist” is used in these IAMFs to mean the project biologist, designated biologists, species-specific biological monitors, and general biological monitors, as appropriate. When the Authority is specified as implementing an IAMF, it is assumed that the Authority, or its contractor or agent, is implementing the IAMF under the supervision of biologists and biological monitors, as appropriate.</p>	Pre-construction	Compliance reporting	15-days prior to ground disturbance	Authority	Authority	Submit names of biologists and monitors to regulatory agencies	EMMA	Impact BIO #1: Construction Impacts on Special-Status Plant Species Impact BIO#2: Construction Impacts on Special-Status Wildlife Species Impact BIO #3: Construction Impacts on Special-Status Plant Communities Impact BIO #4: Construction Impacts on Aquatic Resources Impact BIO #5: Construction Impacts on Wildlife Movement Impact BIO #6: Construction Impacts on Protected Trees
BIO-IAMF#2	Facilitate Agency Access	<p>Throughout the construction period, the Authority will allow access by the USFWS, NMFS, USACE, CDFW, and SWRCB to the project site. Because of safety concerns, all visitors will check in with the Authority’s resident engineer prior to entering the project footprint. In the event that agency personnel visit the project footprint, the project biologist will prepare a memorandum within 3 business days after the visit documenting the issues raised during the field meeting. The project biologist will report any issues regarding regulatory compliance raised by agency personnel to the Authority.</p>	Construction	Compliance reporting	3 days after regulatory agency site visit	Contractor	Contractor	Prepare memorandum documenting agency site visit	Condition of design-build contract	Impact BIO #1: Construction Impacts on Special-Status Plant Species Impact BIO#2: Construction Impacts on Special-Status Wildlife Species Impact BIO #3: Construction Impacts on Special-Status Plant Communities Impact BIO #4: Construction Impacts on Aquatic Resources Impact BIO #5: Construction Impacts on Wildlife Movement Impact BIO #6: Construction Impacts on Protected Trees

IAMF	Title	IAMF Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Title
BIO-IAMF#3	Prepare Worker Environmental Awareness Program (WEAP) Training Materials and Conduct Construction Period WEAP Training	<p>Prior to any ground-disturbing activity, the project biologist will prepare a WEAP for the purpose of training construction crews to recognize and identify sensitive biological resources that may be encountered in the project vicinity. The WEAP training materials will be submitted to the Authority for review and approval. A video of the WEAP training prepared and presented by the project biologist and approved by the Authority may be used if the project biologist is not available to present the training in person.</p> <p>At a minimum, WEAP training materials will include the following information: key provisions of FESA, CESA, the Bald and Golden Eagle Protection Act (BGEPA), the MBTA, Cal. Fish and Game Code 1600, Porter-Cologne, and the CWA; the consequences and penalties for violation of or noncompliance with these laws, regulations, and project authorizations; identification and characteristics of special-status plants, special-status wildlife, jurisdictional waters, and special-status plant communities, and explanations about their ecological value; hazardous substance spill prevention and containment measures; the contact person in the event of the discovery of a dead or injured wildlife species; and review of avoidance, minimization, and mitigation measures.</p> <p>The project biologist will present WEAP training to all construction personnel before they work in the project footprint. As part of the WEAP training, construction timing in relation to species' habitat and life-stage requirements will be detailed and discussed on project maps, which will show areas of planned minimization and avoidance measures. Crews will be informed during the WEAP training that, except when necessary as determined in consultation with the project biologist, travel within the project footprint is restricted to established roadbeds, which include all pre-existing and project-constructed unimproved and improved roads. A fact sheet conveying this information will be prepared by the project biologist for distribution to the construction crews and others who enter the project footprint. Fact sheet information will be duplicated in a wallet-sized format and will be provided in other languages as necessary to accommodate non-English-speaking workers. All construction staff will attend the WEAP training prior to beginning work on-site and will attend the WEAP training on an annual basis thereafter.</p> <p>Upon completion of the WEAP training, each member of the construction crew will sign a form stating that they attended the training, understand the information presented, and agree to comply with the requirements set out in the WEAP training. The project biologist will submit the signed WEAP training forms to the Authority on a monthly basis. On an annual basis, the Authority will certify that WEAP training has been provided to all construction personnel. On a monthly basis, the project biologist will provide updates relevant to the training to construction personnel during the daily safety ("tailgate") meeting.</p>	Pre-construction	Training program/ Reporting	Annual (training)/ Monthly (reporting)	Contractor/ Authority	Contractor/ Authority	Prepare WEAP/Annual (training)/ monthly (reporting)	WEAP	<p>Impact BIO #1: Construction Impacts on Special-Status Plant Species</p> <p>Impact BIO#2: Construction Impacts on Special-Status Wildlife Species</p> <p>Impact BIO #3: Construction Impacts on Special-Status Plant Communities</p> <p>Impact BIO #4: Construction Impacts on Aquatic Resources</p> <p>Impact BIO #5: Construction Impacts on Wildlife Movement</p> <p>Impact BIO #6: Construction Impacts on Protected Trees</p>

IAMF	Title	IAMF Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Title
BIO-IAMF#4	Conduct Operation and Maintenance Period Worker Environmental Awareness Program (WEAP) Training	<p>Prior to initiating operation and maintenance (O&M) activities, O&M personnel will attend a WEAP training session arranged by the Authority.</p> <p>At a minimum, O&M WEAP training materials will include the following information: key provisions of FESA, CESA, the BGEPA, the MBTA, Porter-Cologne, and the CWA; the consequences and penalties for violation of/noncompliance with these laws and regulations and project authorizations; identification and characteristics of special-status plants, special-status wildlife, jurisdictional waters, and special-status plant communities and explanations about their ecological value; hazardous substance spill prevention and containment measures; and the contact person in the event of the discovery of a dead or injured wildlife species. The training will include an overview of provisions of the biological resources management plan, annual vegetation, and management plan, weed control plan, and security fencing and wildlife exclusion fencing maintenance plans pertinent to O&M activities. A fact sheet prepared by the Authority's environmental compliance staff will be prepared for distribution to the O&M employees. The training will be provided by the Authority's environmental compliance staff. The training sessions will be provided to employees prior to their involvement in any O&M activity and will be repeated for all O&M employees on an annual basis. Upon completion of the WEAP training, O&M employees will, in writing, verify their attendance at the training sessions and confirm their willingness to comply with the requirements set out in those sessions.</p>	Post-construction	Training program/Reporting	Annual	Contractor/Authority	Contractor/Authority	WEAP Training/Annual reporting	WEAP	Impact BIO #7: Operational Impacts on Special-Status Plant Species Impact BIO #8: Operational Impacts on Special-Status Wildlife Species Impact BIO #9: Operation Impacts on Special-Status Plant Communities Impact BIO #10: Operation Impacts on Aquatic Resources Impact BIO #11: Operation Impacts on Wildlife Movement Impact BIO #12: Operation Impacts on Protected Trees
BIO-IAMF#5	Prepare and Implement a Biological Resources Management Plan	<p>Prior to any ground-disturbing activity, the project biologist will prepare the BRMP, which would include a compilation of the biological resources avoidance and minimization measures applicable to the HSR section. All project environmental plans, such as the Restoration and Revegetation Plan (RPP) and Weed Control Plan (WCP), will be included as appendices to the BRMP. The BRMP is intended to serve as a comprehensive document that sets out the range of avoidance and minimization measures to support the appropriate and timely implementation of those measures. The implementation of these measures will be tracked through the final design, construction, and operation phases. The BRMP will contain, but not be limited to, the following information:</p> <ul style="list-style-type: none"> • A master schedule that shows construction of the project, pre-construction surveys, and establishment of buffers and exclusions zones to protect sensitive biological resources. • Specific measures for the protection of special-status species. • Identification (on construction plans) of the locations and quantity of habitats to be avoided or removed, along with the locations where habitats are to be restored. • Identification of agency-approved project biologists(s) and biological monitors(s), including those responsible for notification and report of injury or death of federally or State-listed species. • Measures to preserve topsoil and control erosion. • Design of protective fencing around environmentally sensitive areas (ESA) and the construction staging areas. • Locations of trees to be protected as wildlife habitat (roosting sites) and locations for planting replacement trees. 	Pre-construction	Prepare plan	Prior to any ground-disturbing activity	Contractor	Contractor	Prepare BRMP	USFWS, USACE, SWRCB, and CDFW permits	Impact BIO #1: Construction Impacts on Special-Status Plant Species Impact BIO #2: Construction Impacts on Special-Status Wildlife Species Impact BIO #3: Construction Impacts on Special-Status Plant Communities Impact BIO #4: Construction Impacts on Aquatic Resources Impact BIO #5: Construction Impacts on Wildlife Movement Impact BIO #6: Construction Impacts on Protected Trees

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		<ul style="list-style-type: none"> • Specification of the purpose, type, frequency, and extent of chemical use for insect and disease control operations as part of vegetative maintenance within sensitive habitat areas. • Specific measures for the protection of vernal pool habitat and riparian areas. These measures may include erosion and siltation control measures, protective fencing guidelines, dust control measures, grading techniques, construction area limits, and biological monitoring requirements. • Provisions for biological monitoring during ground-disturbing activities to confirm compliance and success of protective measures. The monitoring will: (1) identify specific locations of wildlife habitat and sensitive species to be monitored; (2) identify the frequency of monitoring and the monitoring methods (for each habitat and sensitive species to be monitored); (3) list required qualifications of biological monitor(s); (4) identify the reporting requirements; and (5) provide an accounting of impacts to special-status species habitat compared to pre-construction impact estimates. <p>The BRMP will be submitted to the Authority for review and approval prior to any ground-disturbing activity.</p>								
BIO-IAMF#6	Establish Monofilament Restrictions	<p>Prior to any ground-disturbing activity, the project biologist will verify that plastic monofilament netting (erosion control matting) or similar material is not being used as part of erosion control activities. The project biologist will identify acceptable material for such use, including: geomembranes, coconut coir matting, tackified hydroseeding compounds, and rice straw wattles (e.g., Earthsaver™ wattles: biodegradable, photodegradable, burlap). Within developed or urban areas, the project biologist may allow exceptions to the restrictions on the type of erosion control material if the project biologist determines that the construction area is of sufficient distance from natural areas to ensure the avoidance of potential impacts on wildlife.</p>	Pre-construction	Compliance reporting	Monthly	Contractor	Contractor	Monthly reporting	Condition of design-build contract	<p>Impact BIO#2: Construction Impacts on Special-Status Wildlife Species</p> <p>Impact BIO #4: Construction Impacts on Aquatic Resources</p> <p>Impact BIO #5: Construction Impacts on Wildlife Movement</p> <p>Impact BIO #6: Construction Impacts on Protected Trees</p>
BIO-IAMF#7	Prevent Entrapment in Construction Materials and Excavations	<p>At the end of each work day during construction, the Authority will cover all excavated, steep-sided holes or trenches more than 8 inches deep and that have sidewalls steeper than 1:1 (45-degree) slope with plywood or similar materials, or provide a minimum of one escape ramp per 100 feet of trenching (with slopes no greater than 3:1) constructed of earth fill or wooden planks. The Project Biologist will thoroughly inspect holes and trenches for trapped animals at the start and end of each work day.</p> <p>The Authority will screen, cover, or elevate at least 1 foot above ground all construction pipe, culverts, or similar structures with a diameter of 3 inches or greater that are stored overnight within the project footprint. These pipes, culverts, and similar structures will be inspected by the Project Biologist for wildlife before such material is moved, buried, or capped.</p>	Construction	Monitoring/ Compliance reporting	Daily monitoring/ Monthly reporting	Contractor	Contractor	Daily monitoring/ monthly reporting	Condition of design-build contract	<p>Impact BIO#2: Construction Impacts on Special-Status Wildlife Species</p> <p>Impact BIO #4: Construction Impacts on Aquatic Resources</p> <p>Impact BIO #5: Construction Impacts on Wildlife Movement</p> <p>Impact BIO #6: Construction Impacts on Protected Trees</p>

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BIO-IAMF#8	Delineate Equipment Staging Areas and Traffic Routes	Prior to any ground-disturbing activity, the Authority will establish staging areas for construction equipment in areas that minimize effects on sensitive biological resources, including habitat for special-status species, seasonal wetlands, and wildlife movement corridors. Staging areas (including any temporary material storage areas) will be located in areas that would be occupied by permanent facilities, where practicable. Equipment staging areas will be identified on final project construction plans. The Authority will flag and mark access routes to ensure that vehicle traffic within the project footprint is restricted to established roads, construction areas, and other designated areas.	Pre-construction	Compliance reporting	Monthly	Contractor	Contractor	Monthly reporting	Condition of design-build contract	Impact BIO#2: Construction Impacts on Special-Status Wildlife Species Impact BIO #4: Construction Impacts on Aquatic Resources Impact BIO #5: Construction Impacts on Wildlife Movement Impact BIO #6: Construction Impacts on Protected Trees Impact HWR #3: Temporary Construction Impacts to Surface Water Quality
BIO-IAMF#9	Dispose of Construction Spoils and Waste	During ground-disturbing activities, the Authority may temporarily store excavated materials produced by construction activities in areas at or near construction sites within the project footprint. Where practicable, the Authority will return excavated soil to its original location to be used as backfill. Any excavated waste materials unsuitable for treatment and reuse will be disposed at an off-site location, in conformance with applicable State and federal laws.	Construction	Compliance reporting	Monthly	Contractor	Contractor	Monthly reporting	Condition of design-build contract	Impact BIO#2: Construction Impacts on Special-Status Wildlife Species Impact BIO #4: Construction Impacts on Aquatic Resources Impact BIO #5: Construction Impacts on Wildlife Movement Impact BIO #6: Construction Impacts on Protected Trees Impact HWR #3: Temporary Construction Impacts to Surface Water Quality
BIO-IAMF#10	Clean Construction Equipment	Prior to any ground-disturbing activity, the Authority will ensure that all equipment entering the Work Area is free of mud and plant materials. The Authority will establish vehicle cleaning locations designed to isolate and contain organic materials and minimize opportunities for weeds and invasive species to move in and out of the project footprint. Cleaning may be done by washing with water, blowing with compressed air, brushing, or other hand cleaning. The cleaning areas will be located so as to avoid impacts on surface waters and appropriate Stormwater Pollution Prevention Plan (SWPPP) best management practices (BMP) will be implemented so as to further control any potential for the spread of weeds or other invasive species. Cleaning stations will be inspected regularly (at least monthly).	Pre-construction	Compliance reporting	Monthly	Contractor	Contractor	Monthly reporting	Condition of design-build contract	Impact BIO#2: Construction Impacts on Special-Status Wildlife Species Impact BIO #4: Construction Impacts on Aquatic Resources Impact BIO #5: Construction Impacts on Wildlife Movement Impact BIO #6: Construction Impacts on Protected Trees
BIO-IAMF#11	Maintain Construction Sites	Prior to any ground-disturbing activity, the Authority will prepare a construction site BMP field manual. The manual will contain standard construction site housekeeping practices required to be implemented by construction personnel. The manual will identify BMPs for the following topics: temporary soil stabilization, temporary sediment control, wind erosion control, non-stormwater management, waste management and materials control, rodenticide use, and other general construction site cleanliness measures. All construction personnel will receive training on BMP field manual implementation prior to working within the project footprint. All personnel will acknowledge, in writing, their understanding of the BMP field manual implementation requirements. The BMP field manual will be updated by January 31 of each year. The Authority will provide, on an annual basis, training updates to all construction personnel.	Pre-construction	Reporting	Monthly	Contractor	Contractor	Monthly reporting	Condition of design-build contract	Impact BIO #1: Construction Impacts on Special-Status Plant Species Impact BIO#2: Construction Impacts on Special-Status Wildlife Species Impact BIO #3: Construction Impacts on Special-Status Plant Communities Impact BIO #4: Construction Impacts on Aquatic Resources Impact BIO #5: Construction Impacts on Wildlife Movement Impact BIO #6: Construction Impacts on Protected Trees Impact HWR #3: Temporary Construction Impacts to Surface Water Quality

IAMF	Title	IAMF Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Title
BIO-IAMF#12	Design the Project to be Bird Safe	<p>Prior to final construction design, the Authority will ensure that the catenary system, masts, and other structures such as fencing are designed to be bird and raptor-safe in accordance with the applicable recommendations presented in <i>Suggested Practices for Raptor Protection on Power Lines: The State of the Art in 2006 (APLIC 2006)</i> and <i>Reducing Avian Collisions with Power Lines: State of the Art in 2012 (APLIC 2012)</i>. Applicable APLIC recommendations include, but are not limited to:</p> <ul style="list-style-type: none"> • Ensuring sufficient spacing of phase conductors to prevent bird electrocution • Configuring lines to reduce vertical spread of lines and/or decreasing the span length if such options are feasible • Marking lines and fences (e.g. Bird Flight Diverter for fencing and lines) to increase the visibility of lines and reduce the potential for collision. Where fencing is necessary, using bird compatible design standards to increase visibility of fences to prevent collision and entanglement. • Installing perch guards to discourage avian presence on and near project facilities • Minimizing the use of guywires. Where the use of guywires is unavoidable, demarcating guywires using the best available methods to minimize avian strikes (e.g. line markers). • Reusing or co-locating new transmission facilities and other ancillary facilities with existing facilities and disturbed areas to minimize habitat impacts and avoid collision risks • Structures will be monopole or dual-pole design versus lattice tower design to minimize perching and nesting opportunities. Communication towers will conform to Recommended Best Practices for Communication Tower Design, Siting, Construction, Operation, Maintenance, and Decommissioning (USFWS 2018). • Use of facility lighting that does not attract birds or their prey to project sites. These include using non-steady burning lights (red, dual red and white strobe, strobe-like flashing lights) to meet Federal Aviation Administration requirements, using motion or heat sensors and switches to reduce the time when lights are illuminated, using appropriate shielding to reduce horizontal or skyward illumination, and avoiding the use of high-intensity lights (e.g., sodium vapor, quartz, and halogen). Lighting will not be installed under viaduct and bridge structures in riparian habitat areas. • Ensuring poles do not have openings that could entrap birds; including sealing or capping all openings in poles or providing for escape routes (e.g., openings accommodating escape for various species). • Designing aerial structures (e.g., viaducts and bridges) and tunnel portals to discourage birds and bats from roosting in expansion joints or other crevices. • Insulated wire or tree wire will be used for all electrical conduits to increase visibility of wires. <p>Additional bird operational actions would be required for dry lakes and playas, Audubon Important Bird Areas and documented avian movement corridors. These measures include:</p>	Pre-construction	Design	Prior to final design	Authority	Authority	Bird and raptor-safe design catenary system, masts, and other structures such as fencing	Condition of design-build contract	Impact BIO#2: Construction Impacts on Special-Status Wildlife Species

IAMF	Title	IAMF Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Title
		<ul style="list-style-type: none"> Avoid, to the extent feasible, siting transmission lines across canyons or on ridgelines to prevent bird and raptor collisions. Install bird flight diverters on all facilities spanning or within 1,000 feet of stream and wash channels, canals, ponds, and any other natural or artificial body of water. Fencing or other type of flight diverter will be installed on all viaduct structures to encourage birds and raptors to fly over the HSR and avoid flying directly in the path of on-coming trains. 								
WM-IAMF#1	Impediments to Movement	During ground-disturbing activities, the Contractor will keep wildlife crossing structures, land above tunnels, and other movement areas, as free possible of equipment, storage materials, construction materials, and other potential impediments. Before ground-disturbing activities, the Contractor will submit a construction avoidance and minimization plan for potential wildlife movement areas to the Project Biologist for concurrence. For the purposes of this section, "potential wildlife movement areas" include all lands dominated by native vegetation that are outside the final project footprint, where the final project footprint includes all fenced facilities and permanent cut and full slopes.	Pre-construction/ Construction	Monitoring/ reporting	Monthly	Authority/ Contractor/ Project Biologist	Authority/ Contractor/ Project Biologist	Submit construction avoidance and minimization plan; keep wildlife crossing structures free of impediments	Condition of design-build contract	Impact BIO #5: Construction Impacts on Wildlife Movement
WM-IAMF#2	Night Lighting	Contractors will minimize nighttime construction and keep night lighting (e.g., for security) from spilling into potential wildlife movement areas. If night work is required, lighting will avoid illuminating natural lands through directional lighting and shielding. Most terrestrial mammals that move at night will avoid areas with artificial night lighting (Rich and Longcore 2006). Artificial night lighting can impair the ability of nocturnal animals to navigate through areas (Beier 2006) and has been implicated in decline of reptile populations (Perry and Fisher 2006)	Construction	Monitoring/ reporting	Weekly or as established by regulatory compliance agencies	Authority/ Contractor/ Project Biologist	Authority/ Contractor/ Project Biologist	Nighttime lighting shall be focused, shielded, and directed away from wildlife movement areas	Condition of design-build contract	Impact BIO #5: Construction Impacts on Wildlife Movement
WM-IAMF#3	Noise	<p>The Authority will monitor construction noise to verify compliance with FRA noise limits (FRA 2005). The Contractor can meet the FRA construction noise limits in the most efficient and cost-effective manner. The Contractor would have the flexibility of either prohibiting certain noise-generating activities during nighttime hours or providing additional noise control measures to meet the noise limits. To meet required noise limits, the following noise control minimization measures will be implemented as necessary, during both daytime and nighttime hours, in all potential wildlife movement areas:</p> <ul style="list-style-type: none"> Install a temporary construction site sound barrier near a noise source. Avoid nighttime construction. Locate stationary construction equipment as far as possible from potential wildlife movement areas, especially areas intended to become part of permanent wildlife crossing structures. Re-route construction-related truck traffic along roadways that will cause the least disturbance to wildlife. Use low-noise equipment. Implement noise-deadening measures for truck loading and operations. Monitor and maintain equipment to meet noise limits. Line or cover storage bins, conveyors, and chutes with sound-deadening material. 	Construction	Monitoring	Monthly	Authority/ Contractor/ Project Biologist/ Mitigation Manager	Authority/ Contractor/ Project Biologist/ Mitigation Manager	Monitor construction noise to verify compliance, implement noise control measures in wildlife movement areas	Condition of design-build contract	Impact BIO #5: Construction Impacts on Wildlife Movement

IAMF	Title	IAMF Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Title
		<ul style="list-style-type: none"> • Use acoustic enclosures, shields, or shrouds for equipment and facilities. • Use high-grade engine exhaust silencers and engine-casing sound insulation. • Prohibit aboveground jackhammering and impact pile driving during nighttime hours. • Minimize the use of generators to power equipment. • Limit use of public address systems. • Use moveable sound barriers at the source of the construction activity. • Limit or avoid certain noisy activities during nighttime hours. • When possible, use an auger to install piles instead of a pile driver. If pile driving is necessary, limit the time of day the activity can occur to minimize effects on wildlife movement. 								
WM-IAMF#4	Wildlife Exclusion Fencing	The Contractor will use wildlife-proof fencing to separate construction zones from natural habitats and agriculture. Exclusion barriers (e.g., silt fences) will be installed at the edge of the construction footprint. The design specifications of the exclusion fencing will be determined through consultation with the USFWS and/or the CDFW.	Pre-construction/ construction	Design/ surveying/ monitoring/ reporting	Monthly or as established by agency permit requirements	Authority/ Contractor/ Project Biologist/ Mitigation Manager	Authority/ Contractor/ Project Biologist/ Mitigation Manager	Install wildlife-specific exclusion barriers/ reporting to document compliance	Condition of design-build contract	Impact BIO #5: Construction Impacts on Wildlife Movement
WM-IAMF#5	Vehicle Traffic	Prior to any ground-disturbing activities, the Contractor will obtain confirmation from the Project Biologist that appropriate best management practices are in place to restrict project vehicle traffic within the construction area to established roads, construction areas, and other designated areas. The Contractor will establish vehicle traffic in locations disturbed by previous activities to prevent further adverse ground-disturbing effects, require observance of a 15 mph speed limit for construction areas in known or potential wildlife movement areas (adjacent to natural habitats) or areas with potential special-status species habitat, clearly flag and mark access routes, and prohibit off-road traffic. The Project Biologist will submit a memorandum to the Mitigation Manager and Authority to document compliance with this measure on a monthly basis.	Construction	Surveying/ monitoring/ reporting	Weekly reporting	Authority/ Contractor/ Project Biologist/ Mitigation Manager	Contractor/ Project Biologist/ Mitigation Manager	Restrict project vehicle traffic/ weekly reporting to document compliance	Condition of design-build contract	Impact BIO #5: Construction Impacts on Wildlife Movement
WM-IAMF#6	Restoration and Revegetation Plan for Wildlife Movement Corridors	<p>Prior to any ground-disturbing activity, the Contractor's Project Biologist will prepare a Restoration and Revegetation Plan for ground-disturbances within areas within natural areas and agriculture that could provide movement corridors for wildlife. The Restoration and Revegetation Plan will also include:</p> <ul style="list-style-type: none"> • Steps to remove temporary roads in a way that will discourage public access, • Steps to remove temporary fences and construction facilities, • Steps to remove construction debris and fill piles and restore natural soil profile and semi- natural grade, • Steps to restore hydrology, • Steps to restore natural vegetation using seed stock, cuttings and plants salvaged from the construction footprint, • Steps to monitor success of restoration efforts and follow up with additional treatments as needed. 	Pre-construction	Prepare plan	Prior to construction/ monthly reporting	Project Biologist	Contractor/ Project Biologist	Prepare and implement Restoration and Revegetation Plan	Condition of design-build contract	Impact BIO #5: Construction Impacts on Wildlife Movement

IAMF	Title	IAMF Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Title
Hydrology and Water Resources										
HYD-IAMF#1	Stormwater Management	Prior to construction, the contractor shall prepare a stormwater management and treatment plan for review and approval by the Authority. During the detailed design phase, each receiving stormwater system's capacity to accommodate project runoff would be evaluated. As necessary, on-site stormwater management measures, such as detention or selected upgrades to the receiving system, would be designed to provide adequate capacity and to comply with the design standards in the latest version of Authority Technical Memorandum 2.6.5 <i>Hydraulics and Hydrology Guidelines</i> . On-site stormwater management facilities would be designed and constructed to capture runoff and provide treatment prior to discharge of pollutant-generating surfaces, including station parking areas, access roads, new road over- and underpasses, reconstructed interchanges, and new or relocated roads and highways. Low-impact development techniques would be used to detain runoff on site and to reduce off site runoff such as constructed wetland systems, biofiltration and bioretention systems, wet ponds, organic mulch layers, planting soil beds, and vegetated systems (biofilters), such as vegetated swales and grass filter strips, would be used where appropriate.	Design/	Prepare plan	At incorporation or completion of design	Contractor	Contractor	Prepare a stormwater management and treatment plan	Condition of design-build contract	Impact HWR #6: Permanent Operation Impacts to Drainage Patterns, Stormwater Runoff, and Hydraulic Capacity Impact HWR #7: Permanent Operation Impacts to Surface Water Quality Impact HWR #8: Permanent Operation Impacts to Groundwater Volume, Quality, and Recharge Impact BIO #1: Construction Impacts on Special-Status Plant Species Impact BIO#2: Construction Impacts on Special-Status Wildlife Species Impact BIO #3: Construction Impacts on Special-Status Plant Communities Impact BIO #4: Construction Impacts on Aquatic Resources Impact BIO #5: Construction Impacts on Wildlife Movement Impact BIO #6: Construction Impacts on Protected Trees Impact BIO #10: Operation Impacts on Aquatic Resources Impact PU&E #6: Conflicts with Existing Utilities Impact PU&E #13: Effects on Storm Drain Facilities
HYD-IAMF#2	Flood Protection	Prior to construction, the contractor shall prepare a flood protection plan for Authority review and approval. The project would be designed both to remain operational during flood events and to minimize increases in 100-year or 200-year flood elevations, as applicable to locale. Design standards will include the following: <ul style="list-style-type: none"> Establish track elevation to prevent saturation and infiltration of stormwater into the sub-ballast. Minimize development within the floodplain, to such an extent that water surface elevation in the floodplain would not increase by more than 1 foot, or as required by state or local agencies, during the 100-year or 200-year flood flow [as applicable to locale]. Avoid placement of facilities in the floodplain or raise the ground with fill above the base-flood elevation. Design the floodplain crossings to maintain a 100-year floodwater surface elevation of no greater than 1 foot above current levels, or as required by state or local agencies, and project features within the floodway itself would not increase existing 100-year floodwater surface elevations in Federal Emergency Management Agency-designated floodways, or as otherwise agreed upon with the county floodplains manager. The following design standards would minimize the effects of pier placement on floodplains and floodways:	Design	Prepare plan	At incorporation or completion of design	Contractor	Contractor	Prepare flood protection plan	Condition of design-build contract	Impact HWR #5: Permanent Operation Impacts to Floodplains and Floodways Impact BIO #1: Construction Impacts on Special-Status Plant Species Impact BIO#2: Construction Impacts on Special-Status Wildlife Species Impact BIO #3: Construction Impacts on Special-Status Plant Communities Impact BIO #4: Construction Impacts on Aquatic Resources Impact BIO #5: Construction Impacts on Wildlife Movement Impact BIO #6: Construction Impacts on Protected Trees Impact BIO #7: Operational Impacts on Special-Status Plant Species Impact BIO #8: Operational Impacts on Special-Status Wildlife Species Impact BIO #9: Operation Impacts on Special-Status Plant Communities Impact BIO #10: Operation Impacts on

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		<ul style="list-style-type: none"> Design site crossings to be as nearly perpendicular to the channel as feasible to minimize bridge length. Orient piers to be parallel to the expected high-water flow direction to minimize flow disturbance. Elevate bridge crossings at least 3 feet above the high-water surface elevation to provide adequate clearance for floating debris, or as required by local agencies. Conduct engineering analyses of channel scour depths at each crossing to evaluate the depth for burying the bridge piers and abutments. Implement scour-control measures to reduce erosion potential. Use quarry stone, cobblestone, or their equivalent for erosion control along rivers and streams, complimented with native riparian plantings or other natural stabilization alternatives that would restore and maintain a natural riparian corridor. Place bedding materials under the stone protection at locations where the underlying soils require stabilization as a result of stream flow velocity. 								<p>Aquatic Resources</p> <p>Impact BIO #11: Operation Impacts on Wildlife Movement</p> <p>Impact BIO #12: Operation Impacts on Protected Trees</p>
HYD-IAMF#3	Prepare and Implement a Construction Stormwater Pollution Prevention Plan	<p>Although the project is not required to obtain coverage under the SWRCB Construction General Permit, prior to construction (any ground-disturbing activities), the contractor shall comply with the SWRCB Construction General Permit requiring preparation and implementation of a SWPPP. The Construction SWPPP would propose BMPs to minimize potential short-term increases in sediment transport caused by construction, including erosion control requirements, stormwater management, and channel dewatering for affected stream crossings. These BMPs would include measures to incorporate permeable surfaces into facility design plans where feasible, and how treated stormwater would be retained or detained on site. Other BMPs shall include strategies to manage the amount and quality of overall stormwater runoff. The Construction SWPPP would include measures to address, but are not limited to, the following:</p> <ul style="list-style-type: none"> Hydromodification management to verify maintenance of pre-project hydrology by emphasizing on-site retention of stormwater runoff using measures such as flow dispersion, infiltration, and evaporation (supplemented by detention where required). Additional flow control measures would be implemented where local regulations or drainage requirements dictate. Implementing practices to minimize the contact of construction materials, equipment, and maintenance supplies with stormwater. Limiting fueling and other activities using hazardous materials to areas distant from surface water, providing drip pans under equipment, and daily checks for vehicle condition. Implementing practices to reduce erosion of exposed soil, including soil stabilization, regular watering for dust control, perimeter siltation fences, and sediment catchment basins. Implementing practices to maintain current water quality, including siltation fencing, wattle barriers, stabilized construction entrances, grass buffer strips, ponding areas, organic mulch layers, inlet protection, storage tanks, and sediment traps to arrest and settle sediment. 	Pre-construction/ Construction	Permit compliance	At incorporation or completion of design/during monthly construction report	Contractor	Contractor	Prepare construction SWPPP	Condition of design-build contract	<p>Impact HWR #1: Temporary Construction Impacts to Floodplains and Floodways</p> <p>Impact HWR #2: Temporary Construction Impacts to Drainage Patterns, Stormwater Runoff, and Hydraulic Capacity</p> <p>Impact HWR #3: Temporary Construction Impacts to Surface Water Quality</p> <p>Impact HWR #4: Temporary Construction Impacts to Groundwater Volume, Quality, and Recharge</p> <p>Impact PU&E #4: Effects from Stormwater during Construction</p> <p>Impact HMW#2: Temporary Effects Due to Reasonably Foreseeable Upset and Accident Conditions that Involve the Release of Hazardous Materials</p>

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		<ul style="list-style-type: none"> Where feasible, avoiding areas that may have substantial erosion risk, including areas with erosive soils and steep slopes. Using diversion ditches to intercept surface runoff from off-site. Where feasible, limiting construction to dry periods when flows in waterbodies are low or absent. Implementing practices to capture and provide proper off-site disposal of concrete wash water, including isolation of runoff from fresh concrete during curing to prevent it from reaching the local drainage system, and possible treatments (e.g., dry ice). Developing and implementing a spill prevention and emergency response plan to handle potential fuel and/or hazardous material spills. <p>Implementation of a SWPPP would be performed by the construction contractor as directed by the contractor's Qualified SWPPP Practitioner or designee. As part of that responsibility, the effectiveness of construction BMPs must be monitored before, during and after storm events. Records of these inspections and monitoring results will be maintained by the construction contractor.</p>								
HYD-IAMF#4	Prepare and Implement an Industrial Stormwater Pollution Prevention Plan	<p>Prior to construction of any facility classified as an industrial facility, the contractor shall comply with existing water quality regulations. The stormwater general permit requires preparation of a SWPPP Error! Bookmark not defined. and a monitoring plan for industrial facilities that discharge stormwater from the site, including vehicle maintenance facilities associated with transportation operations. The permit includes performance standards for pollution control.</p>	Design/ Operation	Permit compliance	At incorporation or completion of design/during monthly operation report	Contractor	Contractor	Prepare operational SWPPP	Condition of design-build contract	<p>Impact HWR #6: Permanent Operation Impacts to Drainage Patterns, Stormwater Runoff and Hydraulic Capacity</p> <p>Impact HWR #7: Permanent Operation Impacts to Surface Water Quality</p>

IAMF	Title	IAMF Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Title
Geologic, Soils, Seismicity, and Paleontological Resources										
GEO-IAMF#1	Geologic Hazards	<p>Prior to construction, the Contractor shall prepare a Construction Management Plan (CMP) addressing how the Contractor would address geologic constraints and minimize or avoid impacts on geologic hazards during construction. The plan would be submitted to the Authority for review and approval. At a minimum, the plan would address the following geological and geotechnical constraints/resources:</p> <ol style="list-style-type: none"> Groundwater Withdrawal — Controlling the amount of groundwater withdrawal from the project, by re-inject groundwater at specific locations if necessary, or use alternate foundation designs to offset the potential for settlement. This control is important for locations with retained cuts in areas where high groundwater exists, and where existing buildings are located near the depressed track section. Unstable Soils — Employing various methods to mitigate for the risk of ground failure from unstable soils. If soft or loose soils are encountered at shallow depths, they can be excavated and replaced with competent soils. To limit the excavation depth, replacement materials can also be strengthened using geosynthetics. Where unsuitable soils are deeper, ground improvement methods, such as stone columns, cement deep-soil-mixing, or jet-grouting, can be used. Alternatively, if sufficient construction time is available, preloading—in combination with prefabricated vertical drains (wicks) and staged construction—can be used to gradually improve the strength of the soil without causing bearing-capacity failures. Subsidence — The Authority addresses subsidence in its design and construction processes. For the initial design, survey monuments were installed to establish a datum and set an initial track profile. In the construction phase, the design-build contractors for track bed preparation would conduct topographic surveys for preparation of final design. Because subsidence could have occurred since the original benchmarks (survey monuments) were established, the design-build contractor’s topographic surveys would be used to help determine whether subsidence has occurred. The updated topographic surveys would also be used to establish the top of rail elevations for final design where the HSR system is outside established floodplain areas and above water surface elevations. Where the HSR system is in floodplain areas susceptible to flooding, consideration would be given to overbuild the height of the rail bed in anticipation of future subsidence. Water and Wind Erosion — The Contractor would implement erosion control methods as appropriate from the various erosion control methods documented in the Construction SWPPP (see HYD-IAMF#3), the Caltrans Construction Manuals, and the construction technical memorandum (see GEO-IAMF#6), and in coordination with other erosion, sediment, stormwater management and fugitive dust control efforts. Water and wind erosion control methods may include, but are not limited to, use of revegetation, stabilizers, mulches, and biodegradable geotextiles. 	Design/ Construction	Prepare plan	At incorporation or completion of design/during monthly construction report	Contractor	Contractor	Prepare Construction Management Plan (CMP)	Condition of design-build contract	<p>Impact GSS #1—Encountering Unstable Soils During Construction Impact</p> <p>Impact GSS #2—Soil Settlement at Structures or Along Trackway During Construction</p> <p>Impact GSS #3—Soil Erosion During Construction</p> <p>Impact GSS #4—Difficult Excavations Due to Bedrock and Hardpan During Construction</p> <p>Impact GSS #8—Effects of Unstable Soils During Operations</p> <p>Impact GSS #9—Effects of Soil Settlement During Operations</p> <p>Impact GSS #10—Effects of Moderate to High Shrink-Swell Potential During Operations</p> <p>Impact GSS #11—Effects of Moderately to Highly Corrosive Soils During Operations</p> <p>Impact GSS #12—Effects of Slope Failure During Operations</p> <p>HWR #4: Temporary Construction Impacts to Groundwater Volume, Quality, and Recharge</p>

IAMF	Title	IAMF Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Title
		<p>e. Soils with Shrink-Swell Potential — In locations where shrink-swell potential is marginally unacceptable, soil additives would be mixed with existing soil to reduce the shrink-swell potential. Construction specifications would be based upon the decision whether to remove or treat the soil. This decision is based on the soils, specific shrink-swell characteristics, the additional costs for treatment versus excavation and replacement, as well as the long-term performance characteristics of the treated soil.</p> <p>f. Soils with Corrosive Potential — In locations where soils have a potential to be corrosive to steel and concrete, the soils would be removed and buried structures would be designed for corrosive conditions, and corrosion-protected materials would be used in infrastructure.</p>								
GEO-IAMF#2	Slope Monitoring	During O&M, the Authority shall incorporate slope monitoring by a Registered Engineering Geologist into the Operations and Maintenance procedures. The procedures shall be implemented at sites identified in the Construction Management Plan (CMP) where a potential for long-term instability exists from gravity or seismic loading including but not limited to at-grade sections where slope failure could result in loss of track support or where slope failure could result in additional earth loading to foundations supporting elevated structures.	Operation	Prepare plan/ Monitoring	Monthly during operation	Contractor	Contractor	Slope monitoring during operation	Condition of design-build contract	Impact GSS #12—Effects of Slope Failure During Operations Impact GSS #13—Effects of Seismicity during Operations Impact Paleo-1: Geologic Units Sensitive to Unknown Paleontological Resources
GEO-IAMF#3	Gas Monitoring	Prior to Construction, the Contractor shall prepare a CMP addressing how gas monitoring would be incorporated into construction best management practices. The CMP would be submitted to the Authority for review and approval. Hazards related to potential migration of hazardous gases due to the presence of known oil and gas fields, areas of active or historic landfills, or other subsurface sources can be reduced or eliminated by following strict federal and state Occupational Safety & Health Administration (OSHA/Cal-OSHA) regulatory requirements for excavations, and by consulting with other agencies as appropriate, such as the Department of Conservation (Division of Oil and Gas) and the California Environmental Protection Agency, Department of Toxic Substances Control, regarding known areas of concern.	Design/ Construction	Prepare plan/ Design	Prior to construction	Contractor	Contractor	Preparation of a Construction Management Plan	Condition of design-build contract	Impact GSS #5—Potential Exposure to Hazardous Gas During Construction
GEO-IAMF#4	Historic or Abandoned Mines	<p>Prior to Construction, the Contractor shall prepare a CMP addressing how historic and abandoned mines would be incorporated into construction BMPs. The CMP would be submitted to the Authority for review and approval. Depending on the properties of an individual mine, mitigations to address historic or abandoned mines could include:</p> <ul style="list-style-type: none"> • Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Cleanup. Environmental cleanups at sites that are releasing or threatening to release hazardous substances such as heavy metals from acid mine drainage. • Non-CERCLA Cleanup. Cleanups of non-hazardous substance-related surface disturbance such as revegetation of disturbed areas, stabilization of mine tailings, reconstruction of stream channels and floodplains. • Safety Mitigation. Mitigation of physical safety hazards such as closure of adits and shafts and removal of dangerous structures. 	Design/ Construction	Prepare plan/ Design	Prior to construction	Contractor	Contractor	Preparation of a Construction Management Plan	Condition of design-build contract	Impact GSS #6—Potential Encounters with Abandoned Mines During Construction

IAMF	Title	IAMF Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Title
GEO-IAMF#5	Hazardous Materials	Prior to Construction, the Contractor shall prepare a CMP addressing how the contractor would minimize or avoid impacts related to hazardous minerals (i.e., radon, mercury, and naturally occurring asbestos [NOA]) during construction. The CMP would be submitted to the Authority for review and approval. The CMP shall include appropriate provisions for handling hazardous mineral including, but not limited to, dust control, control of soil erosion and water runoff, and testing and proper disposal of excavated material.	Design/ Construction	Design/ Monitoring/ Reporting	Prior to construction	Contractor	Contractor	Preparation of a Construction Management Plan	Condition of design-build contract	Impact GSS #7—Potential Exposure to Hazardous Minerals During Construction
GEO-IAMF#6	Ground Rupture Early Warning Systems	Prior to Construction, the Contractor shall document how the project design incorporates installation of early warning systems, triggered by strong ground motion association with ground rupture. Known nearby active faults would be monitored. Linear monitoring systems, such as time domain reflectometers or similar technology, shall be installed along rail lines in the zone of potential ground rupture. These devices emit electronic information that is processed in a centralized location and would be used to temporarily control trains, thus reducing accidents due to fault creep. Damage to infrastructure from fault creep can be mitigated with routine maintenance, including minor realignment.	Design/ Construction	Design/ Monitoring	Prior to construction	Contractor	Contractor	Preparation of a Construction Management Plan	Condition of design-build contract	Impact GSS #13—Effects of Seismicity during Operations Impact Paleo-1: Geologic Units Sensitive to Unknown Paleontological Resources
GEO-IAMF#7	Evaluate and Design for Large Seismic Ground Shaking	Prior to Construction, the Contractor shall document through preparation of a technical memorandum how all HSR components were evaluated and designed for large seismic ground shaking. Prior to final design, the Contractor would conduct additional seismic studies to establish up-to-date estimation of levels of ground motion. The most current Caltrans seismic design criteria at the time of design would be used in the design of any structures supported in or on the ground. These design procedures and features reduce to the greatest practical extent for potential movements, shear forces, and displacements that result from inertial response of the structure. In critical locations, pendulum base isolators may be used to reduce the levels of inertial forces. New composite materials may also be used to enhance seismic performance.	Design	Design/Studies	Prior to construction	Contractor/ Authority	Contractor/ Authority	At incorporation or completion of design	Seismic ground shaking design technical memorandum	Impact GSS #13—Effects of Seismicity during Operations Impact Paleo-1: Geologic Units Sensitive to Unknown Paleontological Resources
GEO-IAMF#8	Suspension of Operations during an Earthquake	Prior to O&M activities, the Contractor shall document in a technical memorandum how suspension of operations during or after an earthquake was addressed in project design. Motion-sensing instruments to provide ground-motion data and a control system to shut down HSR operations temporarily during or after a potentially damaging earthquake would be incorporated into final design. Monitoring equipment would be installed at select locations where high ground motions could occur. The system would then be inspected for damage due to ground motion and/or ground deformation, and then returned to service when appropriate.	Design/ Construction/ Operation	Reporting	As needed based on an earthquake event	Contractor/ Authority	Contractor/ Authority	At incorporation or completion of design/during monthly construction report	Technical memorandum prepared as needed based on an earthquake event	Impact GSS #13—Effects of Seismicity during Operations Impact Paleo-1: Geologic Units Sensitive to Unknown Paleontological Resources

IAMF	Title	IAMF Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Title
GEO-IAMF#9	Subsidence Monitoring	Prior to Operations and Maintenance, the Authority shall develop a stringent track monitoring program. Once tracks are operational, a remote monitoring program would be implemented to monitor the effects of ongoing subsidence. Track inspection systems would provide early warning of reduced track integrity. HSR train sets would be equipped with autonomous equipment for daily track surveys. This specification would be added to HSR train bid packages. If monitoring indicates that track tolerances are not met, trains would operate at reduced speed until track tolerances are restored. In addition, the contractor responsible for wayside maintenance would be required to implement a stringent program for track maintenance.	Design/ Operation	Program development	Monthly	Contractor	Contractor	Develop a stringent track monitoring program	Condition of design-build contract	Impact Paleo-1: Geologic Units Sensitive to Unknown Paleontological Resources
GEO-IAMF#10	Geology and Soils	<p>Prior to construction, the Contractor shall document through issuance of a technical memorandum how the following guidelines and standards have been incorporated into facility design and construction:</p> <ul style="list-style-type: none"> 2015 American Association of State Highway and Transportation Officials (AASHTO) Load and Resistance Factor Bridge Design Specifications and the 2015 AASHTO Guide Specifications for Load and Resistance Factor Seismic Bridge Design, or their most recent versions. These documents provide guidance for characterization of soils, as well as methods to be used in the design of bridge foundations and structures, retaining walls, and buried structures. These design specifications would provide minimum specifications for evaluating the seismic response of the soil and structures. Federal Highway Administration (FHWA) Circulars and Reference Manuals: These documents provide detailed guidance on the characterization of geotechnical conditions at sites, methods for performing foundation design, and recommendations on foundation construction. These guidance documents include methods for designing retaining walls used for retained cuts and retained fills, foundations for elevated structures, and at-grade segments. Some of the documents include guidance on methods of mitigating geologic hazards that are encountered during design. American Railway Engineering and Maintenance-of-Way Association (AREMA) Manual: These guidelines deal with rail systems. Although they cover many of the same general topics as American Association of State Highway and Transportation Officials manuals, they are more focused on best practices for rail systems. The manual includes principles, data, specifications, plans, and economics pertaining to the engineering, design, and construction of railways. California Building Code: The code is based on 2015 International Building Code (IBC). This code contains general building design and construction requirements relating to fire and life safety, structural safety, and access compliance. International Building Code and American Society of Civil Engineers (ASCE)-7: These codes and standards provide minimum design loads for buildings and other structures. They would be used for the design of the maintenance facilities and stations. Sections in IBC and ASCE-7 provide minimum requirements for geotechnical investigations, levels of earthquake 	Design/ Construction/ Operation	Design/ Reporting	At incorporation or completion of design/during monthly construction reporting	Contractor	Contractor	Prepare technical memorandum/ Implementation of guidelines during design, construction, and operation phases	Condition of design-build contract	Impact GSS #1—Encountering Unstable Soils During Construction Impact GSS #2—Soil Settlement at Structures or Along Trackway During Construction Impact GSS #3—Soil Erosion During Construction Impact GSS #4—Difficult Excavations Due to Bedrock and Hardpan During Construction Impact GSS #8—Effects of Unstable Soils During Operations Impact GSS #9—Effects of Soil Settlement During Operations Impact GSS #10—Effects of Moderate to High Shrink-Swell Potential During Operations Impact GSS #12—Effects of Slope Failure During Operations Impact GSS #13—Effects of Seismicity during Operations

IAMF	Title	IAMF Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Title
		<p>ground shaking, minimum standards for structural design, and inspection and testing requirements.</p> <ul style="list-style-type: none"> • Caltrans Design Standards: Caltrans has specific minimum design and construction standards for all aspects of transportation system design, ranging from geotechnical explorations to construction practices. These amendments provide specific guidance for the design of deep foundations that are used to support elevated structures, for design of mechanically stabilized earth (MSE) walls used for retained fills, and for design of various types of cantilever (e.g., soldier pile, secant pile, and tangent pile) and tie-back walls used for retained cuts. • Caltrans Construction Manuals: Caltrans has a number of manuals including Field Guide to Construction Dewatering, Caltrans Construction Site BMPs Manual and Construction Site BMP Field Manual and Troubleshooting Guide. These provide guidance and best management practices for dewatering options and management, erosion control and soil stabilization, non-stormwater management, and waste management at construction sites. • American Society for Testing and Materials (ASTM): ASTM has developed standards and guidelines for all types of material testing, from soil compaction testing to concrete-strength testing. The ASTM standards also include minimum performance requirements for materials. 								
GEO-IAMF#11	Engage a Qualified Paleontological Resources Specialist	<p>Prior to the 90 percent design milestone for each construction package (CP) within the Project Section, the Contractor would retain a Paleontological Resources Specialist (PRS) responsible for:</p> <ul style="list-style-type: none"> • Reviewing the final design for the CP. • Developing a detailed Paleontological Resources Monitoring and Mitigation Plan (PRMMP) for the CP • The PRS would be responsible for implementing the PRMMP, including development and delivery of WEAP training, supervision of Paleontological Resource Monitors (PRMs), and evaluation and treatment of finds, if any, and preparation of a final paleontological mitigation report, per the PRMMP and for each CP. <p>Retention of PRS staff would occur in a timely manner, in advance of the 90 percent design milestone for each CP, such that the PRS is on board and can review the 90 percent design submittal without delay when it becomes available. If feasible, the same PRS would be responsible for all CPs within a given Project Section.</p> <p>All PRS staff shall meet or exceed the qualifications for a Principal Paleontologist as defined in the Caltrans current <i>Standard Environmental Reference</i>, Chapter 8 (Caltrans 2012). Appointment of PRS staff would be subject to review and approval by the Authority.</p>	Design	Contractor would retain paleontological resources specialist	Prior 90 percent design milestone for each CP	Contractor	Contractor	Retain Paleontological Resources Specialist (PRS)	Condition of design-build contract	Impact Paleo-1: Geologic Units Sensitive to Unknown Paleontological Resources

IAMF	Title	IAMF Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Title
GEO-IAMF#12	Perform Final Design Review and Triggers Evaluation	<p>For each CP within the Project Section, the responsible PRS would evaluate the 90 percent design submittal to identify the portions of the CP that would involve work in paleontologically sensitive geologic units (either at the surface or in the subsurface), based on findings of the final Paleontological Resources Technical Report (TR) prepared for the Project Section. Evaluation would consider the location, areal extent, and anticipated depth of ground disturbance, the construction techniques that are planned/proposed, and the geology (i.e., location of geologic units with high paleontological resources) of the CP and vicinity. The evaluation and resulting recommendations would be consistent with guidance in the Society of Vertebrate Paleontology (SVP) <i>Standard Procedures for the Assessment and Mitigation of Adverse Impacts to Paleontological Resources</i> (SVP Impact Mitigation Guidelines Revision Committee 2010), <i>the SVP Conditions of Receivership for Paleontologic Salvage Collections</i> (SVP Conformable Impact Mitigation Guidelines Committee 1996), and relevant guidance from Chapter 8 of the current <i>Caltrans Standard Environmental Reference</i> (Caltrans 2012).</p> <p>The purpose of the Final Design Review and Triggers Evaluation would be to develop specific language detailing the location and duration of paleontological monitoring and other requirements for paleontological resources applicable to each CP within the Project Section. Paleontological protection requirements identified through the Final Design Review and Triggers Evaluation would be recorded in a concise technical memorandum ("Final Design Review Requirements for Paleontological Resources Protection"), which would then be incorporated in full detail into the PRMMP for each CP. Those portions of the CP requiring paleontological monitoring would also be clearly delineated in the project construction documents for each CP.</p>	Design	Reporting	Each CP	Contractor	Contractor	CP reporting	Condition of design-build contract	Impact Paleo-1: Geologic Units Sensitive to Unknown Paleontological Resources

IAMF	Title	IAMF Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Title
GEO-IAMF#13	Prepare and Implement Paleontological Resources Monitoring and Mitigation Plan (PRMMP)	<p>Following the Final Design Review and Triggers Evaluation for each CP, the PRS would develop a CP-specific PRMMP. For greater efficiency, PRMMPs may be written such that they cover more than one CP, as long as the specific requirements of the IAMFs are satisfied explicitly and in detail for each CP included.</p> <p>The PRMMP for each CP would incorporate the findings of the Design Review and Triggers Evaluation for that CP and would be consistent with the SVP <i>Standard Procedures for the Assessment and Mitigation of Adverse Impacts to Paleontological Resources</i> (SVP Impact Mitigation Guidelines Revision Committee 2010), the SVP <i>Conditions of Receivership for Paleontologic Salvage Collections</i> (SVP Conformable Impact Mitigation Guidelines Committee 1996), and relevant guidance from Chapter 8 of the current <i>Caltrans Standard Environmental Reference</i> (Caltrans 2012). As such, the PRMMP would provide for at least the following:</p> <ul style="list-style-type: none"> – Implementation of the PRMMP by qualified personnel, including the following positions: <ul style="list-style-type: none"> • Paleontological Resource Specialist: The PRS will be required to meet or exceed Principal Paleontologist Qualifications per Chapter 8 of the current Caltrans Standard Environmental Reference (Caltrans 2012). The Supervising Paleontologist may, but not necessarily, be the PRS who prepares the PRMMP. • Development of pre-construction and construction-period coordination procedures and communications protocols. • Evaluation as to whether a pre-construction survey by qualified personnel is warranted for the CP. In general, pre-construction surveys are beneficial if there is a strong possibility that significant paleontological resources (e.g., concentrations of vertebrate fossils) are exposed at the ground surface and would be destroyed during the initial clearing and grubbing phase of earthwork. Such a determination can usually be made during preparation of the paleontological resources TR. • Requirements for paleontological monitoring by qualified personnel of all ground-disturbing activities known to affect, or potentially affect, highly sensitive geologic units and for ground-disturbing activities affecting other geologic units in any areas where the PRS considers it warranted based on the findings of the Paleontological Resources TR or any pre-construction surveys. In all areas of the CP subject to monitoring, monitoring would initially be conducted full-time for all ground-disturbing activities. However, the PRMMP may provide for monitoring frequency in any given location to be reduced once approximately 50 percent of the ground-disturbing activity in locations has been completed, if the reduction is appropriate based on the implementing PRS' professional judgment in consideration of actual site conditions. • Provisions, if recommended by the PRS for paleontological monitoring of specific construction drilling operations. In general, small-diameter (i.e., less than 18 inches) drilling operations or drilling activities operations using bucket augers tend to pulverize impacted sediments and any contained fossils and are typically not monitored. The section in the PRMMP addressing monitoring program for drilling operations would rely, in part, on the information supplied by the CP design and geotechnical teams but 	Design	Reporting	Each CP	Contractor	Contractor	CP reporting	Condition of design-build contract	Impact Paleo-1: Geologic Units Sensitive to Unknown Paleontological Resources

IAMF	Title	IAMF Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Title
		<p>would also take into consideration of the nature, depth, and location of drilling needed, and the anticipated equipment and staging configurations.</p> <ul style="list-style-type: none"> • Provisions for the content development and delivery of paleontological resources Worker Environmental Awareness Program (WEAP) training. • Provisions for in-progress documentation of monitoring (and, if applicable, salvage/recovery operations) via “construction dailies” or a similar approved means. • Provisions for a “stop work, evaluate, and treat appropriately” response in the event of a known or potential paleontological discovery, including finds in highly sensitive geologic units, as well as finds, if any, in geologic units identified as less sensitive, or nonsensitive, for paleontological resources. • Provisions for sampling and recovery of unearthed fossils consistent with <i>SVP Standard Procedures</i> (SVP Impact Mitigation Guidelines Revision Committee 2010) and the <i>SVP Conditions of Receivership</i> (SVP Conformable Impact Mitigation Guidelines Committee 1996). Recovery procedures would provide for recovery of both macrofossils and microfossils. • Provisions for acquiring a repository agreement from an approved regional repository for the curation, care, and storage of recovered materials, consistent with the <i>SVP Conditions of Receivership</i> (SVP Conformable Impact Mitigation Guidelines Committee 1996). If more than one repository institution is designated, separate repository agreements must be provided. • Provisions for preparation of a final monitoring and mitigation report that meets the requirements of the Caltrans <i>Standard Environmental Reference</i> Chapter 8 provisions for the Paleontological Monitoring Report and Paleontological Stewardship Summary (Caltrans 2012). • Provisions for the preparation, identification, and analysis and curation of fossil specimens and data recovered, consistent with the <i>SVP Conditions of Receivership</i> (SVP Conformable Impact Mitigation Guidelines Committee 1996) and any specific requirements of the designated repository institution(s). 								
GEO-IAMF#14	Provide WEAP Training for Paleontological Resources	<p>Prior to groundbreaking for each CP within the Project Section, the Contractor would provide paleontological resources WEAP training delivered by the PRS. All management and supervisory personnel and construction workers involved with ground-disturbing activities would be required to take this training before beginning work on the project. Refresher training would also be made available to management and supervisory personnel and workers as needed, based on the judgment of the PRS.</p> <p>At a minimum, paleontological resources WEAP training would include information on:</p> <ul style="list-style-type: none"> • The coordination between construction staff and paleontological staff, • The construction and paleontological staff roles and responsibilities in implementing the PRMMP, • The possibility of encountering fossils during construction, 	Pre-construction	Training program/ Reporting	Annual (training)/ Monthly (reporting)	Contractor/ Authority	Contractor/ Authority	WEAP training	Condition of design-build contract	Impact Paleo-1: Geologic Units Sensitive to Unknown Paleontological Resources

IAMF	Title	IAMF Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Title
		<ul style="list-style-type: none"> The types of fossils that may be seen and how to recognize them, and The proper procedures in the event fossils are encountered, including the requirement to halt work in the vicinity of the find and procedures for notifying responsible parties in the event of a find. <p>Training materials and formats may include, but are not necessarily limited to, in-person training, prerecorded videos, posters, and informational brochures that provide contacts and summarize procedures in the event paleontological resources are encountered. WEAP training contents would be subject to review and approval by the Authority. Paleontological resources WEAP training may be provided concurrently with cultural resources WEAP training. Upon completion of any WEAP training, the Contractor would require workers to sign a form stating that they attended the training and understand and would comply with the information presented. Verification of paleontological resources WEAP training will be provided to the Authority by the Contractor.</p>								
GEO-IAMF#15	Halt Construction, Evaluate, and Treat if Paleontological Resources Are Found	<p>Consistent with the PRMMP, if fossil materials are discovered during construction, regardless of the individual making the discovery, all activity in the immediate vicinity of the discovery would halt and the find would be protected from further disturbance. If the discovery is made by someone other than the PRS or Paleontological Resource Monitors, the person who made the discovery would immediately notify construction supervisory personnel, who would in turn notify the PRS. Notification to the PRS would take place promptly (prior to the close of work the same day as the find), and the PRS would evaluate the find and prescribe appropriate treatment as soon as feasible. Work may continue on other portions of the CP while evaluation (and, if needed, treatment) takes place, as long as the find can be adequately protected in the judgment of the PRS.</p> <p>If the PRS determines that treatment (i.e., recovery and documentation) of unearthened fossil(s) is warranted, such treatment and any required reporting would proceed consistent with the PRMMP. The Contractor would be responsible for ensuring prompt and accurate implementation, subject to verification by the Authority. The stop work requirement does not apply to drilling operations because drilling typically cannot be suspended in mid-course. However, if finds are made during drilling, the same notification and other follow-up requirements would apply. The PRS would coordinate with construction supervisory and drilling staff regarding the handling of recovered fossils. The requirements of this IAMF would be detailed in the PRMMP and presented as part of the paleontological resources WEAP training.</p>	Construction	Reporting	Daily logs during active monitoring	Contractor	Contractor	Weekly reporting (if resource is identified during construction)	PRMMP, WEAP	Impact Paleo-1: Geologic Units Sensitive to Unknown Paleontological Resources

IAMF	Title	IAMF Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Title
Hazardous Materials and Wastes										
HMW-IAMF#1	Property Acquisition Phase 1 and Phase 2 Environmental Site Assessments	During the right-of-way acquisition phase, Phase I environmental site assessments (ESA) shall be conducted in accordance with standard ASTM methodologies to characterize each parcel. The determination of parcels that require a Phase II ESA (e.g., soil, groundwater, soil vapor subsurface investigations) would be informed by a Phase I ESA and may require coordination with state and local agency officials. If the Phase II ESA concludes that the site is impacted, remediation or corrective action (e.g., removal of contamination, in-situ treatment, or soil capping) would be conducted with state and local agency officials (as necessary) and in full compliance with applicable state and federal laws and regulations.	Pre-construction/Construction	Prepare plan	Monthly	Contractor	Contractor	Prepare Phase 1 ESA	Condition of design-build contract	Impact HMW#2: Temporary Effects Due to Reasonably Foreseeable Upset and Accident Conditions that Involve the Release of Hazardous Materials Impact HMW#3: Temporary Effects Due to Project Location on Potential Environmental Concern Sites or Sites on the Cortese List Impact HMW#4: Temporary Hazardous Materials and Waste Activities near Schools
HMW-IAMF#2	Work Barriers	Prior to construction (any ground-disturbing activities), the Contractor shall verify to the Authority through preparation of a technical memorandum the use of work barriers. Nominal design variances, such as the addition of a plastic barrier beneath the ballast material to limit the potential release of volatile subsurface contaminants, may be implemented in conjunction with site investigation and remediation.	Pre-construction/Construction	Prepare technical memorandum	Monthly	Contractor	Contractor	Prepare work barrier technical memorandum	Condition of design-build contract	Impact HMW#2: Temporary Effects Due to Reasonably Foreseeable Upset and Accident Conditions that Involve the Release of Hazardous Materials
HMW-IAMF#3	Undocumented Contamination	Prior to construction, the Contractor shall prepare a CMP addressing provisions for the disturbance of undocumented contamination. The plan would be submitted to the Authority for review and approval. Undocumented contamination could be encountered during construction activities and the Contractor would work closely with local agencies to resolve any such encounters and address necessary clean-up or disposal. Copies of all required hazardous material documentation shall be provided within 30 days to the Authority.	Pre-construction/Construction	Prepare plan/Reporting	As needed	Contractor	Contractor	Prepare CMP/Reporting as needed	Condition of design-build contract	Impact HMW#2: Temporary Effects Due to Reasonably Foreseeable Upset and Accident Conditions that Involve the Release of Hazardous Materials Impact HMW#3: Temporary Effects Due to Project Location on Potential Environmental Concern Sites or Sites on the Cortese List
HMW-IAMF#4	Demolition Plans	Prior to Construction that involves demolition, the Contractor shall prepare demolition plans for the safe dismantling and removal of building components and debris. The demolition plans would include a plan for lead and asbestos abatement and an assessment of other building materials that may contain hazardous materials, such as mercury and polychlorinated biphenyls. The plans shall be submitted to the Project Construction Manager (PCM) on behalf of the Authority for verification that appropriate demolition practices have been followed consistent with federal and state regulations regarding abatement of asbestos, lead paint, and other hazardous materials.	Pre-construction/Construction	Prepare plan/Reporting	As needed	Contractor	Contractor	Prepare demolition plans/Reporting as needed	Condition of design-build contract	Impact HMW#1: Temporary Effects from the Routine Transport, Use, or Disposal of Hazardous Materials and Wastes Impact HMW#2: Temporary Effects Due to Reasonably Foreseeable Upset and Accident Conditions that Involve the Release of Hazardous Materials
HMW-IAMF#5	Spill Prevention	Prior to Construction (any ground disturbing activities), the Contractor shall prepare a CMP addressing spill prevention. A Spill Prevention, Control, and Countermeasure (SPCC) plan (or Soil Prevention and Response Plan if the total aboveground oil storage capacity is less than 1,320 gallons in storage containers greater than or equal to 55-gallons) shall prescribe BMPs to follow to prevent hazardous material releases and clean-up of any hazardous material releases that may occur. The plans would be prepared and submitted to the PCM on behalf of the Authority and shall be implemented during Construction.	Pre-construction/Construction	Prepare plan/Reporting	As needed	Contractor	Contractor	Prepare CMP/Reporting as needed	Condition of design-build contract	Impact HMW#2: Temporary Effects Due to Reasonably Foreseeable Upset and Accident Conditions that Involve the Release of Hazardous Materials

IAMF	Title	IAMF Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Title
HMW-IAMF#6	Transport of Materials	During Construction, the Contractor would comply with applicable state and federal regulations, such as the Resource Conservation and Recovery Act (RCRA), Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), the Hazardous Materials Release Response Plans and Inventory Law, and the Hazardous Waste Control Act. Prior to Construction the Contractor would provide the Authority with a hazardous materials and waste plan describing responsible parties and procedures for hazardous waste and hazardous materials transport	Pre-construction/ Construction	Regulation compliance/ Reporting	Monthly	Contractor	Contractor	Weekly record keeping/monthly reporting	Condition of design-build contract	Impact HMW#1: Temporary Effects from the Routine Transport, Use, or Disposal of Hazardous Materials and Wastes Impact HMW#2: Temporary Effects Due to Reasonably Foreseeable Upset and Accident Conditions that Involve the Release of Hazardous Materials Impact HWR #3: Temporary Construction Impacts to Surface Water Quality Impact PU&E #15: Effects from Hazardous Waste Generation Impact SO#16: Temporary Effects on Children's Health and Safety from Construction
HMW-IAMF#7	Permit Conditions	During Construction, the Contractor would comply with the State Water Resources Control Board Construction Clean Water Act Section 402 General Permit conditions and requirements for transport, labeling, containment, cover, and other BMPs for storage of hazardous materials during construction. Prior to Construction, the Contractor shall provide the Authority with a hazardous materials and waste plan describing responsible parties and procedures for hazardous waste and hazardous materials transport, containment, and storage BMPs that would be implemented during Construction.	Pre-construction/ Construction	Prepare plan	Prior to construction	Contractor	Contractor	Prepare hazardous materials and waste plan	Condition of design-build contract	Impact HMW#1: Temporary Effects from the Routine Transport, Use, or Disposal of Hazardous Materials and Wastes Impact HMW#2: Temporary Effects Due to Reasonably Foreseeable Upset and Accident Conditions that Involve the Release of Hazardous Materials Impact HWR #3: Temporary Construction Impacts to Surface Water Quality
HMW-IAMF#8	Environmental Management System	To the extent feasible, the Authority is committed to identifying, avoiding, and minimizing hazardous substances in the material selection process for construction, operation, and maintenance of the HSR system. The Authority would use an Environmental Management System to describe the process that would be used to evaluate the full inventory of hazardous materials as defined by federal and state law employed on an annual basis and would replace hazardous substances with nonhazardous materials. The Contractor shall implement the material substitution recommendation contained in the annual inventory.	Pre-construction/ Construction	Reporting	Annual	Contractor	Contractor	Annual reporting	Condition of design-build contract/EMS	Impact HMW#1: Temporary Effects from the Routine Transport, Use, or Disposal of Hazardous Materials and Wastes Impact HMW#2: Temporary Effects Due to Reasonably Foreseeable Upset and Accident Conditions that Involve the Release of Hazardous Materials Impact HMW#5: Intermittent Effects Due to the Routine Transport, Use, or Disposal of Hazardous Materials and Wastes Impact HWR #3: Temporary Construction Impacts to Surface Water Quality
HMW-IAMF#9	Hazardous Materials Plans	Prior to Operations and Maintenance activities, the Authority shall prepare hazardous materials business plans, such as a plan defined in Title 19 California Code of Regulations or a SPCC Plan.	Post-construction	Prepare plans	Prior to operations	Authority	Authority	Prepare hazardous materials monitoring plans	Condition of design-build contract	Impact HMW#5: Intermittent Effects Due to the Routine Transport, Use, or Disposal of Hazardous Materials and Wastes Impact HMW#6: Intermittent Effects Due to Reasonably Foreseeable Upset and Accident Conditions that Involve the Release of Hazardous Materials

IAMF	Title	IAMF Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Title
Safety and Security										
S&S-IAMF#1	Construction Safety Transportation Management Plan	Prior to construction (any ground-disturbing activity), the Contractor shall prepare for submittal to the Authority a Construction Safety Transportation Management Plan. The plan would describe the Contractor's coordination efforts with local jurisdictions for maintaining emergency vehicle access. The plan would also specify the Contractor's procedures for implementing temporary road closures, including access to residences and businesses during construction, lane closures, signage and flag persons, temporary detour provisions, alternative bus and delivery routes, emergency vehicle access, and alternative access locations. The Contractor shall prepare and submit monthly reports to the Authority documenting construction transportation plan implementation activities for compliance monitoring.	Pre-construction/ Construction	Prepare plan	Monthly	Contractor	Contractor	Prepare Construction Safety Transportation Management Plan	Condition of design-build contract	Impact S&S #2: Accidents Associated with Construction-Related Detours Impact S&S #4: Increased Response Times for Fire, Rescue, and Emergency Services from Temporary Road Closures
S&S-IAMF#2	Safety and Security Management Plan	<p>Sixty days after receiving from the Authority a construction notice to proceed, the Contractor shall provide the Authority with a technical memorandum documenting how the following requirements, plans, programs and guidelines were considered in design, construction, and eventual operation to protect the safety and security of construction workers and users of the HSR. The Contractor shall be responsible for implementing all construction-related safety and security plans and the Authority shall be responsible for implementing all safety and security plans related to HSR operation.</p> <ul style="list-style-type: none"> Workplace worker safety is generally governed by the Occupational Health and Safety Act of 1970, which established the OSHA. OSHA establishes standards and oversees compliance with workplace safety and reporting of injuries and illnesses of employed workers. In California, OSHA enforcement of workplace requirements is performed by Ca- OSHA. Under Cal-OSHA regulations, as of July 1, 1991, every employer must establish, implement, and maintain an injury and illness prevention program. The Authority has adopted a Safety and Security Management Plan to guide the safety and security activities, processes, and responsibilities during design, construction and implementation phases of the project to protect the safety and security of construction workers and the public. A Systems Safety Program Plan (SSPP) and a System Security Plan would be implemented prior to the start of revenue service to guide the safety and security of the operation of the HSR system. Prior to construction, the Contractor shall provide the Authority with a Safety and Security Management Plan documenting how they would implement the Authority's safety and security requirements within their project scope. Implement site-specific health and safety plans and site-specific security plans to establish minimum safety and security guidelines for contractors of, and visitors to, construction projects. Contractors would be required to develop and implement site-specific measures that address regulatory requirements to protect human health and property at construction sites. Preparation of a Valley fever action plan that includes: (1) information on causes, preventative measures, symptoms, and 	Pre-construction/ Construction	Prepare plan	Sixty days after receiving a construction notice to proceed	Contractor/ Authority	Contractor/ Authority	Prepare technical memorandum documenting compliance with safety requirements, plans, programs, and guidelines	Condition of design-build contract	Impact S&S #1: Accidents at Construction Sites Impact S&S #5: Temporary Exposure to Valley Fever

IAMF	Title	IAMF Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Title
		<p>treatments for Valley fever to individuals who could potentially be exposed through construction activities (i.e., construction workers, monitors, managers, and support personnel); (2) continued outreach and coordination with California Department of Public Health; (3) coordination with county departments of public health to ensure that the above-referenced information concerning Valley fever is readily available to nearby residents, schools, and businesses and to obtain area information about Valley fever outbreaks and hotspots; and (4) provide a qualified person dedicated to overseeing implementation of the Valley fever prevention measures to encourage a culture of safety of the contractors and subcontractors. The Valley Fever Health and Safety designee shall coordinate with the county Public Health Officer and oversee and manage the implementation of Valley Fever control measures. The designee is responsible for ensuring the implementation of measures in coordination with the county Public Health Officer. Medical information would be maintained following applicable and appropriate confidentiality protections. The Valley Fever Health and Safety designee, in coordination with the county Public Health Officer, would determine what measures would be added to the requirements for the Safety and Security Management Plan regarding preventive measures to avoid Valley fever exposure. Measures shall include, but are not limited to, the following: (1) train workers and supervisors on how to recognize symptoms of illness and ways to minimize exposure, such as washing hands at the end of shifts; (2) provide washing facilities nearby for washing at the end of shifts; (3) provide vehicles with enclosed, air conditioned cabs and make sure workers keep the windows closed; (4) equip heavy equipment cabs with high-efficiency particulate air (HEPA) filters; and (5) make NIOSH-approved respiratory protection with particulate filters as recommended by the California Department of Public Health available to workers who request them.</p> <ul style="list-style-type: none"> • System safety program plans incorporate FRA requirements and are implemented upon Authority approval. FRA's Systems Safety Program Plans requirements would be determined in FRA's new System Safety Regulation (49 C.F.R. 270). • Rail systems must comply with FRA requirements for tracks, equipment, railroad operating rules and practices, passenger safety, emergency response, and passenger equipment safety standards found in 49 C.F.R. Parts 200-299. • The <i>HSR Urban Design Guidelines</i> [Authority 2011b]) require implementing the principles of crime prevention through environmental design. The contractor shall consider four basic principles of crime prevention through environmental design during station design and site planning: (1) territoriality (design physical elements that express ownership of the station or site); (2) natural surveillance (arrange physical features to maximize visibility); (3) improved sightlines (provide clear views of surrounding areas); and (4) access control (provide physical guidance for people coming and going from a space). The HSR design includes emergency access to the rail right-of-way, and elevated HSR structure design includes emergency egress points. 								

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		<ul style="list-style-type: none"> Implement fire/life safety and security programs that promote fire and life safety and security in system design, construction, and implementation. The fire and life safety program is coordinated with local emergency response organizations to provide them with an understanding of the rail system, facilities, and operations, and to obtain their input for modifications to emergency response operations and facilities, such as evacuation routes. The Authority would establish fire/life safety and security committees throughout the HSR section. Implement system security plans that address design features intended to maintain security at the stations within the track right-of-way, at stations, and onboard trains. A dedicated police force would ensure that the security needs of the HSR system are met. The design standards and guidelines require emergency walkways on both sides of the tracks for both elevated and at-grade sections and the provision of appropriate space as defined by fire and safety codes along at-grade sections of the alignment to allow for emergency response access. Implement standard operating procedures and emergency operating procedures, such as the FRA-mandated Roadway Worker Protection Program to address the day-to-day operation and emergency situations that would maintain the safety of employees, passengers, and the public. 								
S&S-IAMF#3	Hazard Analyses	<p>The Authority's hazard management program includes the identification of hazards, assessment of associated risk, and application of control measures (mitigation) to reduce the risk to an acceptable level. Hazard assessment includes a preliminary hazard analysis and threat and vulnerability assessment.</p> <ul style="list-style-type: none"> The Authority's programmatic preliminary hazard analyses are developed in conformance with the FRA's <i>Collision Hazard Analysis Guide: Commuter and Intercity Passenger Service</i> (FRA 2007) and the U.S. Department of Defense's <i>System Safety Program Plan</i> (MIL-STD-882) to identify and determine the facility hazards and vulnerabilities so that they can be addressed—and either eliminated or minimized—by the design. Threat and vulnerability assessments establish provisions for the deterrence and detection of, as well as the response to, criminal and terrorist acts for rail facilities and system operations. Provisions include right-of-way fencing, intrusion detection, security lighting, security procedures and training, and closed-circuit televisions. Intrusion-detection technology could also alert to the presence of inert objects, such as toppled tall structures or derailed freight trains, and stop HSR operations to avoid collisions. During design and construction, the Contractor would conduct site-specific preliminary hazard analysis and threat and vulnerability assessments to apply the programmatic work to their specific project designs. <p>The Authority's safety and security committees would be responsible for implementing the recommendations contained in the hazard analysis during HSR operation.</p>	Pre-construction/ Construction	Reporting	Monthly	Authority	Authority	Monthly reporting	Condition of design-build contract	Impact S&S #14: Hazards to the High-Speed Rail from Nearby Facilities

IAMF	Title	IAMF Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Title
S&S-IAMF#4	Oil and Gas Wells	Prior to ground-disturbing activities, the Contractor shall identify and inspect all active and abandoned oil and gas wells within 200 feet of the HSR tracks. Any active wells would be abandoned and relocated by the Contractor in accordance with the California Department of Conservation, Division of Oil, and Gas and Geothermal Resources (DOGGR) standards in coordination with the well owners. In the event that relocated wells do not attain the current production rates of the now-abandoned active wells, the Authority would be responsible for compensating the well owner for lost production. All abandoned wells within 200 feet of the HSR tracks would be inspected and re-abandoned, as necessary, in accordance with DOGGR standards and in coordination with the well owner. The Contractor would provide the Authority with documentation that the identification and inspection of the wells has occurred prior to construction.	Pre-construction	Regulatory Compliance/ Reporting	Monthly	Authority	Authority	Compliance with DOGGR standards/ Monthly reporting	Condition of design-build contract	Impact S&S #1: Accidents at Construction Sites Impact PU&E #9: Potential Conflicts with Oil Wells Impact HMW#3: Temporary Effects Due to Project Location on Potential Environmental Concern Sites or Sites on the Cortese List
Socioeconomics and Communities										
SOCIO-IAMF#1	Construction Management Plan	Prior to construction, the Contractor shall prepare a CMP providing measures that minimize impacts on low-income households and minority populations. The plan shall be submitted to the Authority for review and approval. The plan would include actions pertaining to communications, visual protection, air quality, safety controls, noise controls, and traffic controls to minimize impacts on low-income households and minority populations. The plan would verify that property access is maintained for local businesses, residences, and emergency services. This plan would include maintaining customer and vendor access to local businesses throughout construction by using signs to instruct customers about access to businesses during construction. In addition, the plan would include efforts to consult with local transit providers to minimize impacts on local and regional bus routes in affected communities.	Design/ Construction	Prepare plan	At incorporation or completion of design/monthly reporting (during construction)	Contractor	Contractor	Prepare CMP	Condition of design-build contract	Impact SO#1: Temporary Disruption to Community Cohesion or Division of Existing Communities from Project Construction Impact SO#16: Temporary Effects on Children's Health and Safety from Construction Impact TR #1: Temporary Road Closures during Construction
SOCIO-IAMF#2	Compliance with Uniform Relocation Assistance and Real Property Acquisition Policies Act	The Authority must comply with the Uniform Act. The provisions of the Uniform Act, a federally mandated program, would apply to all acquisitions of real property or displacements of persons resulting from this federally assisted project. It was created to provide for fair and equitable treatment of all affected persons. Additionally, the Fifth Amendment of the U.S. Constitution provides that private property may not be taken for a public use without payment of "just compensation." The Uniform Act requires that the owning agency provide notification to all affected property owners of the agency's intent to acquire an interest in their property. This notification includes a written offer letter of just compensation. A right-of-way specialist is assigned to each property owner to assist him or her through the acquisition process. The Uniform Act also provides benefits to displaced individuals to assist them financially and with advisory services related to relocating their residence or business operation. Benefits are available to both owner occupants and tenants of either residential or business properties. The Uniform Act requires provision of relocation benefits to all eligible persons regardless of race, color, religion, sex, or national origin. Benefits to which eligible owners or tenants may be entitled are determined on an individual basis and explained in detail by an assigned right-of-way specialist.	Design/ Construction/ Operation	Reporting and meeting with interested parties	Monthly	Authority	Authority	Comply with Uniform Act/Monthly reporting and record keeping	Compliance with acts, creation of ombudsman office and reporting	Impact SO#2: Permanent Disruption to Community Cohesion or Division of Existing Communities from Project Construction Impact SO#4: Permanent Displacement and Relocation of Local Residents from Construction Impact SO#5: Permanent Displacement and Relocation of Local Businesses from Construction Impact SO#7: Permanent Displacement and Relocation of Community Facilities from Construction Impact SO#10: Permanent Changes in School District Funding from Construction Impact SO#13: Permanent Property and Sales Tax Revenue Losses from Construction Impact SO#16: Temporary Effects on Children's Health and Safety from Construction Impact SO#20: Permanent Changes in

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		<p>The California Relocation Assistance Act essentially mirrors the Uniform Act and also provides for consistent and fair treatment of property owners. However, because the Project would receive federal funding, the Uniform Act takes precedence. Owners of private property have federal and state constitutional guarantees that their property would not be acquired or damaged for public use unless owners first receive just compensation. Just compensation is measured by the "fair market value," where the property value is considered to be the highest price that would be negotiated on the date of valuation. The value must be agreed upon by a seller who is willing, not obliged to sell, but under no particular or urgent necessity and by a buyer who is ready, willing, and able to buy but under no particular necessity. Both the owner and the buyer must deal with the other with the full knowledge of all the uses and purposes for which the property is reasonably adaptable and available (Code of Civil Procedure Section 1263.320a).</p> <p>More detailed information about how the Authority plans to comply with the Uniform Act and the California Relocation Assistance Act is provided in the following three detailed relocation assistance documents modeled after Caltrans versions:</p> <ul style="list-style-type: none"> Your Rights and Benefits as a Displacee under the Uniform Relocation Assistance Program (Residential) Your Rights and Benefits as a Displacee under the Uniform Relocation Assistance Program (Mobile Home) Your Rights and Benefits as a Displaced Business, Farm, or Nonprofit Organization under the Uniform Relocation Assistance Program 								<p>School District Funding from Operation</p> <p>Impact LU #2: Potential for Construction to Permanently Alter Existing Land Use Patterns</p> <p>Impact TR #3: Permanent Road Closures during Operation</p> <p>Impact PU&E #10: Potential Conflicts with Renewable Energy Facilities</p>
SOCIO-IAMF#3	Relocation Mitigation Plan	<p>Before any acquisitions occur, the Authority would develop a relocation mitigation plan, in consultation with affected cities and counties and property owners. In addition to establishing a program to minimize the economic disruption related to relocation, relocation mitigation plan would be written in a style that also enables it to be used as a public-information document.</p> <p>The relocation mitigation plan would be designed to meet the following objectives:</p> <ul style="list-style-type: none"> Provide affected property and business owners and tenants a high level of individualized assistance in situations when acquisition is necessary and the property owner desires to relocate the existing land use. Coordinate relocation activities with other agencies acquiring property resulting in displacements in the study area to provide for all displaced persons and businesses to receive fair and consistent relocation benefits. Make a best effort to minimize the permanent closure of businesses and nonprofit agencies as a result of property acquisition. Within the limits established by law and regulation, minimize the economic disruption caused to property owners by relocation. In individual situations, where warranted, consider the cost of obtaining the entitlement permits necessary to relocate to a suitable location and take those costs into account when establishing the fair market value of the property. 	Design/ Construction	Prepare plan	Prior to acquisitions	Authority	Authority	Develop relocation mitigation plan	Condition of design-build contract	<p>Impact SO#2: Permanent Disruption to Community Cohesion or Division of Existing Communities from Project Construction</p> <p>Impact SO#4: Permanent Displacement and Relocation of Local Residents from Construction</p> <p>Impact SO#5: Permanent Displacement and Relocation of Local Businesses from Construction</p> <p>Impact SO#7: Permanent Displacement and Relocation of Community Facilities from Construction</p> <p>Impact SO#10: Permanent Changes in School District Funding from Construction</p> <p>Impact SO#13: Permanent Property and Sales Tax Revenue Losses from Construction</p> <p>Impact SO#14: Potential for Permanent Physical Deterioration from Construction</p> <p>Impact SO#20: Permanent Changes in School District Funding from Operation</p> <p>Impact LU #2: Potential for Construction to Permanently Alter Existing Land Use</p>

IAMF	Title	IAMF Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Title
		<ul style="list-style-type: none"> Provide those business owners who require complex permitting with regulatory compliance assistance. <p>The relocation mitigation plan would include the following components:</p> <ul style="list-style-type: none"> A description of the appraisal, acquisition, and relocation process as well as a description of the activities of the appraisal and relocation specialists. A means of assigning appraisal and relocation staff to affected property owners, tenants, or other residents on an individual basis. Individualized assistance to affected property owners, tenants, or other residents in applying for funding, including research to summarize loans, grants, and federal aid available, and research areas for relocation. Creation of an ombudsman's position to act as a single point of contact for property owners, residents, and tenants with questions about the relocation process. The ombudsman would also act to address concerns about the relocation process as it applies to the individual situations of property owners, tenants, and other residents. 								Patterns Impact PU&E #10: Potential Conflicts with Renewable Energy Facilities
Station Planning, Land Use, and Development										
LU-IAMF#1	HSR Station Area Development General Principals and Guidelines	Prior to Operation and Maintenance, the Authority shall prepare a memorandum for each station describing how the Authority's station area development principles and guidelines are applied to achieve the anticipated benefits of station area development. Refer to HSR Station Area Development: General Principles and Guidelines, February 3, 2011 [Authority 2011c]	Post-construction	Reporting	For each station	Authority	Authority	Authority would prepare a technical memorandum for each station	Condition of design-build contract	Impact LU #2: Potential for Construction to Permanently Alter Existing Land Use Patterns
LU-IAMF#2	Station Area and Local Agency Coordination	Prior to Operation and Maintenance, the Authority shall prepare a memorandum for each station describing the local agency coordination and station area planning conducted to prepare the station area for HSR operations. Refer to HSR Station Area Development: General Principles and Guidelines, February 3, 2011 [Authority 2011c].	Post-construction	Reporting	For each station	Authority	Authority	Authority would prepare a technical memorandum for each station	Condition of design-build contract	Impact LU #2: Potential for Construction to Permanently Alter Existing Land Use Patterns Impact LU #3: Permanent Conversion of Existing and Planned Land Uses to Transportation Use
LU-IAMF#3	Restoration of Land Used Temporarily During Construction	Prior to any ground disturbing activities at the site of land to be used temporarily during construction, the Contractor shall prepare a restoration plan addressing specific actions, sequence of implementation, parties responsible for implementation and successful achievement of restoration for temporary impacts. Before beginning construction use of land, the Contractor shall submit the restoration plan to the Authority for review and obtain Authority approval. The restoration plan shall include time-stamped photo documentation of the pre-construction conditions of all temporary staging areas. All construction access, mobilization, material laydown, and staging areas would be returned to a condition equal to the pre-construction staging condition. This requirement is included in the design-build construction contract requirements.	Pre-construction	Prepare restoration plan	Prior to construction	Contractor	Contractor	Contractor would prepare a restoration plan	Condition of design-build contract	Impact LU #1: Potential for Construction to Temporarily Alter Existing Land Use Patterns Impact LU #3: Permanent Conversion of Existing and Planned Land Uses to Transportation Use Impact PK #1: Temporary Impact Areas, Temporary Facility Closures, or Temporary Detours

IAMF	Title	IAMF Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Title
Agricultural Farmland and Forest Land										
AG-IAMF#1	Restoration of Important Farmland 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 shall prepare a restoration plan addressing specific actions, sequence of implementation, parties responsible for implementation, and successful achievement of restoration for temporary impacts. Actions shall 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 shall submit the restoration plan to the Authority for review and obtain Authority (and if applicable, the landowner) approval. The restoration plan shall include time-stamped photo documentation of the pre-construction conditions of all temporary staging areas. All construction access, mobilization, material laydown, and staging areas on Important Farmlands would be returned to a condition equal to the pre-construction staging condition. This requirement is included in the design-build construction contract requirements.	Pre-construction	Reporting	At incorporation or completion of design	Contractor	Contractor	Prepare restoration plan	Condition of design-build contract	Impact AG #1: Temporary Use of Important Farmland Impact AG #2: Temporary Use of Important Farmland under Williamson Act Contracts
AG-IAMF#3	Farmland Consolidation Program	The Authority would establish and administer a farmland consolidation program to sell remnant parcels to neighboring landowners for consolidation with adjacent farmland properties. In addition, the program would assist the owners of remnant parcels in selling those remnants to adjacent landowners, upon request. The goal of the program is to provide for continued agricultural use on the maximum feasible amount of remnant parcels that otherwise may not be economic to farm. The program would focus on severed remainder parcels, including those that were under Williamson Act or Farmland Security Act contract at the time of right-of-way acquisition and have become too small to remain in the local Williamson Act or Farmland Security Act program. The program would assist landowners in obtaining lot line adjustments where appropriate to incorporate remnant parcels into a larger parcel that is consistent with size requirements under the local government regulations. The program will operate for a minimum of 5 years after construction of the project section is completed. The Authority shall document implementation of this measure through issuance of a compliance memorandum, after the minimum operation period of 5 years has elapsed. The document shall be filed with Environmental Mitigation Management and Assessment System.	Operation	Establish program	Program would operate for a minimum of 5 years after construction of the project section is completed	Authority	Authority	Establish farmland consolidation program	Condition of design-build contract	Impact AG #6: Creation of Remnant Parcels of Important Farmland Impact SO#21: Permanent Agricultural Access Impact and Road Closures from Operation
AG-IAMF#4	Notification to Agricultural Property Owners	Prior to the start of any construction activity adjacent to farmland, the Authority shall provide written notification to agricultural property owners or leaseholders immediately adjacent to the disturbance limits for the HSR project section. The notification is to indicate the intent to begin construction, including an estimated date for the start of construction. In order to provide agricultural property owners or leaseholders sufficient lead time to make any changes to their operations due to project section construction, this notification shall be provided at least 3 months, but no more than 12 months, prior to the start of construction activity	Pre-construction	Public notification	Monthly	Authority	Authority	Notification to adjacent property owners and leaseholders at least 3 months, but no more than 12 months, prior to the start of construction activity	Condition of design-build contract	Impact AG #3: Temporary Utility and Infrastructure Disruption

IAMF	Title	IAMF Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Title
AG-IAMF#5	Temporary Livestock and Equipment Crossings	Prior to the start of any construction activity adjacent to any farmland, the Authority shall coordinate with agricultural property owners or leaseholders to provide temporary livestock and equipment crossings to minimize impacts to livestock movement, as well as routine operations and normal business activities, during project construction.	Pre-construction	Public coordination/ Project design	Monthly	Authority	Authority	Coordination with agricultural property owners and leaseholders, design of livestock and equipment crossings	Condition of design-build contract	Impact AG #3: Temporary Utility and Infrastructure Disruption
AG-IAMF#6	Equipment Crossings	During final design, and in coordination with the property owners of land in use for agricultural operations, the Authority shall finalize the realignments of any affected access roads to provide equipment crossings to minimize impediments to routine agricultural operations and normal business activities that may result from long-term project operation.	Final design	Public coordination	Monthly	Authority	Authority	Coordination with agricultural property owners and leaseholders, design of agricultural access road realignments	Condition of design-build contract	Impact AG #6: Creation of Remnant Parcels of Important Farmland Impact SO#21: Permanent Agricultural Access Impact and Road Closures from Operation
Parks, Recreation and Open Space										
PK-IAMF#1	Parks, Recreation, and Open Space	<p>Prior to construction, the Contractor shall prepare and submit to the Authority a technical memorandum that identifies project design features to be implemented to minimize impacts on parks, recreation, and open space. Typical design measures to avoid or minimize impacts on parks and recreation may include:</p> <ul style="list-style-type: none"> • Provide safe and attractive access for present travel modes (e.g., motorists, bicyclists, pedestrians—as applicable) to existing park and recreation facilities. • Design guideway, system, and station features in such a way as to enhance the surrounding local communities. Provide easy crossings of the guideway which allows for community use under the guideway or at station areas. 	Pre-construction	Reporting	At incorporation or completion of design/monthly reporting during construction	Contractor	Contractor	Prepare technical memorandum that documents project design features that minimize impacts to park, recreation, and open space	Condition of design-build contract	Impact PK #1: Temporary Impact Areas, Temporary Facility Closures, or Temporary Detours
Aesthetics and Visual Quality										
AVQ-IAMF#1	Aesthetic Options	Prior to construction, the Contractor shall document, through issue of a technical memorandum, how the Authority's aesthetic guidelines have been employed to minimize visual impacts. The Authority seeks to balance providing a consistent, project-wide aesthetic with the local context for the numerous HSR non-station structures across the state. Examples of aesthetic options would be provided to local jurisdictions that can be applied to nonstandard structures in the HSR system. Refer to <i>Aesthetic Options for Non-Station Structures</i> , 2011.	Pre-construction	Reporting	At incorporation or completion of design/monthly reporting during construction	Contractor	Contractor	Prepare aesthetics technical memorandum	Condition of design-build contract	Impact AVQ #3: Permanent Impacts Related to Construction of a Large High-Speed Rail Structure Impact SO#17: Permanent Disruption to Community Cohesion or Division of Existing Communities from Project Operation Impact LU #5: Potential for Operations to Permanently Conflict with Existing Land Uses

IAMF	Title	IAMF Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Title
AVQ-IAMF#2	Aesthetics Review Process	Prior to construction, the Contractor shall document that the Authority's aesthetic review process has been followed to guide the development of non-station area structures. Documentation shall be through issuance of a technical memorandum to the Authority. The Authority would identify key non-station structures recommended for aesthetic treatment, consult with local jurisdictions on how best to involve the community in the process, solicit input from local jurisdictions on their aesthetic preferences, and evaluate aesthetic preferences for potential cost, schedule, and operational impacts. The Authority would also evaluate compatibility with project-wide aesthetic goals, include recommended aesthetic approaches in the construction procurement documents, and work with the Contractor and local jurisdictions to review designs and local aesthetic preferences and incorporate them into final design and construction. Refer to <i>Aesthetic Review Process for Non-Station Structures, 2014</i> .	Pre-construction	Reporting	At incorporation or completion of design/monthly reporting during construction	Contractor	Contractor	Prepare aesthetics review process technical memorandum	Condition of design-build contract	Impact AVQ #3: Permanent Impacts Related to Construction of a Large High-Speed Rail Structure Impact SO#17: Permanent Disruption to Community Cohesion or Division of Existing Communities from Project Operation
Cultural Resources										
CUL-IAMF#1	Geospatial Data Layer and Archaeological Sensitivity Map	Prior to Construction (any ground disturbing activities) and staging of materials and equipment, the Contractor's archaeologist or geoarchaeologist shall prepare a geospatial data layer identifying the locations of all known archaeological resources and built historic resources that require avoidance or protection, and areas of archaeological sensitivity that require monitoring within the area of potential effect (APE). The Contractor's archaeologist, who meets the Secretary of the Interior's Professional Qualifications Standards provided in 36 Code of Federal Regulations (CFR) Part 61, is to use, as appropriate, a combination of the following: known locations of archaeological sites and built historic properties, tribal consultation, landforms, depositional processes, distance to water, mapping provided in the Archaeological Treatment Plan, or historic mapping. This mapping is to be updated as the design progresses if it results in an expansion of the area of ground disturbance/APE, including temporary construction easements and new laydown and access areas. This mapping would be used to develop an archaeological monitoring plan to be prepared by the Contractor's archaeologist, and upon approval by the Authority, implemented by the Contractor's archaeologist. When design is sufficiently advanced, a geospatial data layer would be produced by the Contractor overlaying the locations of all known archaeological resources and built historic resources within the APE, for which avoidance measures are necessary, and all archaeologically sensitive areas, for which monitoring is required.	Design/Pre-construction	Prepare plan	At incorporation or completion of design	Contractor's archaeologist or geoarchaeologist	Authority	Prepare geospatial data layer	Condition of design-build contract	Impact CUL-1: Permanent Construction-Period Potential Adverse Impacts on Archaeological Resources Due to Construction Activities Impact CUL-2: Permanent Construction-Period Potential Adverse Impacts on Built Resources due to Construction Activities

IAMF	Title	IAMF Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Title
CUL-IAMF#2	Worker Environmental Awareness Program (WEAP) Training Session	<p>Prior to Construction (any ground disturbing activity) construction contractor personnel who work on site would attend a WEAP training session provided by the Contractor. The WEAP would include cultural resources awareness training performed by the Contractor's archaeologist who meets the Secretary of the Interior's Professional Qualification Standards provided in 36 CFR Part 61. The Contractor would develop instructional materials and a fact sheet for distribution to the construction crews, and submit the materials, as well as qualifications of the personnel providing the training, to the Authority for approval at least 15 days prior to being permitted onsite access. The training would address measures required to avoid or protect built historic resources, educate crews on artifacts and archaeological features they may encounter and the mandatory procedures to follow should potential cultural resources be exposed during construction. Translation services shall be provided by the Contractor for non-English speaking participants. The training sessions shall be given prior to the initiation of any ground disturbance activities and repeated on an annual basis. Additionally, new construction crewmembers shall attend an initial WEAP training session prior to working on site.</p> <p>On completion of the WEAP training, construction crews would sign a form stating that they attended the training, understood the information presented, and would comply with the WEAP requirements. The Contractor's archaeologist would submit the signed WEAP training forms to the Mitigation Manager on a monthly basis. On an annual basis, the Contractor would provide the Authority with a letter indicating that regular WEAP training has been implemented and would provide at least one PowerPoint annually of the WEAP training. On a monthly basis, the Contractor's archaeologist would provide updates and synopsis of the training to workers during the daily safety ("tailgate") meeting. Construction crews would be informed during the WEAP training that, to the extent possible, travel within the marked project site would be restricted to established roadbeds.</p>	Pre-construction	Training program/ Reporting	Annual (training)/ Monthly (reporting)	Contractor	Contractor	WEAP training	Condition of design-build contract	Impact CUL-1: Permanent Construction-Period Potential Adverse Impacts on Archaeological Resources Due to Construction Activities

IAMF	Title	IAMF Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Title
CUL-IAMF#3	Preconstruction Cultural Resource Surveys	Prior to Construction (any ground disturbing activities in areas not yet surveyed) and the staging of materials and equipment, the Contractor shall conduct pre-construction cultural resource surveys. Resulting from lack of legal access, much of the construction footprint may not have been surveyed. Once parcels are accessible the Contractor would have archaeologists or architectural historians, as appropriate, who meet the Secretary of the Interior professional qualification standards survey and complete reporting in appropriate document for archaeology and / or built resources, in accordance with documentation requirements stipulated in the Programmatic Agreement. Identified resources shall be evaluated for the National Register of Historic Places (NRHP) and the California Register of Historical Resources (CRHR). The qualified archaeologist or architectural historian, as appropriate, would assess the potential to affect to historic properties (NRHP) by applying the effects criteria in 36 CFR Part 800.5(a)(1), and the potential of significant impacts to historical resources (CRHR) by applying the criteria in California Environmental Quality Act (CEQA) Guidelines 15064.5(b). Should the Authority determine, in consultation with the State Historic Preservation Office (SHPO), that any newly identified historic properties or historical resources would be adversely affected, the Built Environment Treatment Plan or Archeological Treatment Plan, as appropriate, would be amended, to document mitigation measures agreed upon by the MOA signatories. The schedule of these surveys would be dependent on the timing of obtaining legal access to the properties and may be driven by the need to complete construction-related activities, e.g., geotechnical borings, laydown yards, etc. Prior to beginning surveys, updated records searches may be required by the Authority, depending on the length of the passage of time, to validate that accurate information was obtained regarding previous inventory and evaluation efforts. The Contractor's archaeologist, in consultation with the Authority, would determine if an updated records search is required. If an updated records search is necessary, the search shall be performed by the Contractor's archaeologist.	Pre-construction	Conduct pre-construction surveys; Identify historic and/or cultural resources	Surveys conducted prior to ground disturbance	Contractor	Contractor	Cultural resource surveys conducted prior to ground disturbance	Condition of design-build contract	Impact CUL-1: Permanent Construction-Period Potential Adverse Impacts on Archaeological Resources Due to Construction Activities
CUL-IAMF#4	Relocation of Project Features when Possible	Changing the rail alignment to avoid newly discovered sites is likely infeasible; however, access areas and laydown sites may be relocated should their proposed location be found to be on archaeological sites or have the potential to affect historic built resources in the vicinity. The contractor would delineate all avoidance and protection measures for identified archaeological and built resources on construction drawings.	Construction	Relocation of access areas and laydown sites	As needed	Contractor	Contractor	Relocation access areas and laydown sites as needed to avoid archeological or historic built resources	Condition of design-build contract	Impact CUL-1: Permanent Construction-Period Potential Adverse Impacts on Archaeological Resources Due to Construction Activities

IAMF	Title	IAMF Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Title
CUL-IAMF#5	Archaeological Monitoring Plan and Implementation	Prior to construction the Contractor's professionally qualified archaeologist, as defined in the Programmatic Agreement, would prepare a monitoring plan based on the results of geospatial data layer and archaeological sensitivity map. The plan is to be reviewed and approved by the Authority prior to any ground-disturbing activities. During Construction (any ground disturbing activities) or staging of materials or equipment, the Contractor would be responsible for implementing the monitoring plan and providing archaeological and tribal monitoring of ground-disturbing construction activities with a potential to affect archaeological remains in areas identified as archaeologically sensitive in the Archaeological Treatment Plan. The Contractor shall obtain Authority approval of all persons providing archaeological or tribal monitoring.	Pre-construction/ Construction	Prepare and implement monitoring plan	Prior to construction (prepare plan)/ During construction (implement plan)	Contractor	Contractor	Prepare archaeological monitoring plan	Condition of design-build contract	Impact CUL-1: Permanent Construction-Period Potential Adverse Impacts on Archaeological Resources Due to Construction Activities
CUL-IAMF#6	Preconstruction Conditions Assessment, Plan for Protection of Historic Built Resources, and Repair of Inadvertent Damage	Prior to Construction (any ground disturbing activities that are within 1,000 feet of a historic built property) the Contractor may be required to assess the condition of construction-adjacent historic properties, and prepare a Plan for the Protection of Historic Built Resources and Repair of Inadvertent Damage. The MOA and Built Environment Treatment Plan (BETP) would stipulate for which properties the plan is to be prepared. MOA signatories and consulting parties may comment on the adequacy of the assessments. Protection measures would be developed in consultation with the landowner or land-owning agencies as well as the SHPO and the MOA signatories and consulting parties, as required by the Programmatic Agreement. As the design progresses, additional properties may be identified by the Authority as requiring this plan. The plan shall record existing conditions in order to (1) establish a baseline against which to compare the property's post-project condition, (2) to identify structural deficiencies that make the property vulnerable to project construction related damage, such as vibration, and (3) to identify stabilization or other measures required to avoid or minimize inadvertent adverse effects. The plan would be further described in the BETP and be prepared by an interdisciplinary team, including (but not limited to) as appropriate, an architectural historian, architect, photographer, structural engineer, and acoustical engineer. Ambient conditions would be used to identify buildings that are sensitive receptors to construction-related vibration and require vibration monitoring during construction activities. Additional protective measures may be required if the property is vacant during construction. The plan content shall be outlined in the BETP and is to be completed and approved by the Authority, with protective measures implemented before construction begins within 1,000 feet of the subject building. The plan shall describe the protocols for documenting inadvertent damage (should it occur), as well as notification, coordination, and reporting to the SHPO, MOA signatories, and the owner of the historic property. The plan shall direct that inadvertent damage to historic properties shall be repaired in accordance with the Secretary of the Interior's (SOI) Standards for the Treatment of Historic Properties (U.S. Department of the Interior, 1995). The plan shall be developed in coordination with the Authority, and shall be submitted to the SHPO for review and approval. Protective plans would be required for buildings that would be moved as part of the project mitigation, including stabilization before, during, and after relocation; protection during temporary storage; and relocation to a new site, followed by rehabilitation.	Pre-construction	Conduct assessment and protection plan	Required if within 1,000 feet of historic built property	Contractor/ Authority	Contractor/ Authority	Assess the condition of construction-adjacent historic properties and prepare a Plan for the Protection of Historic Built Resources and Repair of Inadvertent Damage	MOA/PA/BETP	Impact CUL-2: Permanent Construction-Period Potential Adverse Impacts on Built Resources due to Construction Activities

IAMF	Title	IAMF Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Title
CUL-IAMF#7	Built Environment Monitoring Plan	Prior to Construction (any ground disturbing activities within 1,000 feet of a historic property or resource) the Contractor shall prepare a Built Environment Monitoring Plan (BEMP). Draft and final BEMP's would be prepared describing the properties that would require monitoring, the type of activities or resources that would require full-time monitoring or spot checks, the required number of monitors for each construction activity, and the parameters that would influence the level of effort for monitoring. Maximum vibration level thresholds may be established in the Plan for Protection of Historic Resources and Repair of Inadvertent Damage the monitoring of which would be included in this monitoring plan. The BETP would outline the process for corrective action should the protection measures prove ineffective. Consultation procedures would also be defined in the BETP. The Contractor shall develop both the draft and final plans in coordination with the Authority, and shall be submitted to the SHPO for review and approval. The plan would be implemented prior to any ground-disturbing activities within 1,000 feet of properties identified as requiring monitoring, as specified in the BETP.	Pre-construction	Prepare monitoring plan	Required if within 1,000 feet of historic built property	Contractor/ Authority	Contractor/ Authority	Prepare a Built Environment Monitoring Plan (BEMP).	BETP	Impact CUL-2: Permanent Construction-Period Potential Adverse Impacts on Built Resources due to Construction Activities
CUL-IAMF#8	Implement Protection and/or Stabilization Measures	Implement the plan described in the Plan for Protection of Historic Resources and Repair of Inadvertent Damage and in the Built Environment Treatment Plan. Such protection measures would include, but would not be limited to, vibration monitoring of construction in the vicinity of historic properties; cordoning off of resources from construction activities (e.g., traffic, equipment storage, personnel); shielding of resources from dust or debris; and stabilization of buildings adjacent to construction. Temporary stabilization and protection measures would be removed after construction is complete, and the historic properties would be restored to their preconstruction condition. For buildings that would be moved, treatment would include stabilization before, during, and after relocation; protection during temporary storage; and relocation to a new site, followed by rehabilitation.	Pre-construction	Implement protection and/or stabilization measures	Per BETP	Contractor	Contractor	Implement historic built resource protection measures per BETP	BETP	Impact CUL-2: Permanent Construction-Period Potential Adverse Impacts on Built Resources due to Construction Activities
Transportation										
TR-IAMF#1	Protection of Public Roadways during Construction	Prior to Construction, the Contractor shall provide a photographic survey documenting the condition of the public roadways along truck routes providing access to the proposed project site and implement post-project remedial pavement preservation work that is needed to restore the affected roadways to their pre-project Pavement Management index conditions. The photographic survey shall be submitted for approval to the agency responsible for road maintenance and the Authority. The Contractor shall be responsible for the repair of any structural damage to public roadways caused by HSR construction or construction access, returning any damaged sections to the equivalent of their original pre HSR construction structural condition or better. The Contractor shall survey the condition of the public roadways along truck routes providing access to the proposed project site after construction is complete. The Contractor shall complete a before- and after-survey report and submit it to the Authority for review, indicating the location and extent of any damage.	Pre-construction/ Post-construction	Survey/ Reporting	Immediately prior to and immediately following construction, and during construction as needed.	Contractor	Contractor	Provide a photographic survey	Condition of design-build contract	Impact TR #2: Circulation and Emergency Access during Construction Impact TR #4: Circulation and Emergency Access during Operation

IAMF	Title	IAMF Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Title
TR-IAMF#2	Construction Transportation Plan	<p>The design-build contractor shall prepare a detailed Construction Transportation Plan (CTP) for the purpose of minimizing the impact of construction and construction traffic on adjoining and nearby roadways in close consultation with the local jurisdiction having authority over the site. The Authority must review and approve the CTP before the Contractor commences any construction activities. This plan would address, in detail, the activities to be carried out in each construction phase, with the requirement of maintaining traffic flow during peak travel periods. Such activities include, but are not limited to, the routing and scheduling of materials deliveries, materials staging and storage areas, construction employee arrival and departure schedules, employee parking locations, and temporary road closures, if any. The CTP would provide traffic controls pursuant to the <i>California Manual on Uniform Traffic Control Devices</i> sections on temporary traffic controls [Caltrans 2014] and would include a traffic control plan that includes, at a minimum, the following elements:</p> <ul style="list-style-type: none"> • Temporary signage to alert drivers and pedestrians to the construction zone. • Flag persons or other methods of traffic control. • Traffic speed limitations in the construction zone. • Temporary road closures and provisions for alternative access during the closure. • Detour provisions for temporary road closures—alternating one-way traffic would be considered as an alternative to temporary closures where practicable and where it would result in better traffic flow than would a detour. • Identified routes for construction traffic. • Provisions for safe pedestrian and bicycle passage or convenient detour. • Provisions to minimize access disruption to residents, businesses, customers, delivery vehicles, and buses to the extent practicable—where road closures are required during construction, limit to the hours that are least disruptive to access for the adjacent land uses. • Provisions for farm equipment access. • Provisions for 24-hour access by emergency vehicles. • Safe vehicular and pedestrian access to local businesses and residences during construction. The plan would provide for scheduled transit access where construction would otherwise impede such access. Where an existing bus stop is within the work zone, the design-builder would provide a temporary bus stop at a safe and convenient location away from where construction is occurring in close coordination with the transit operator. Adequate measures would be taken to separate students and parents walking to and from the temporary bus stop from the construction zone. • Advance notification to the local school district of construction activities and rigorously maintained traffic control at all school bus loading zones, to provide for the safety of schoolchildren. Review existing or planned Safe Routes to Schools with school districts and emergency responders to incorporate roadway modifications 	Design/ Construction	Prepare plan/ Reporting	At incorporation or completion of design/ implementation during construction	Contractor	Contractor	Prepare and implement CTP	Condition of design-build contract	<p>Impact TR #1: Temporary Road Closures during Construction</p> <p>Impact TR #2: Circulation and Emergency Access during Construction</p> <p>Impact TR #4: Circulation and Emergency Access during Operation</p> <p>Impact SO#1: Temporary Disruption to Community Cohesion or Division of Existing Communities from Project Construction</p>

IAMF	Title	IAMF Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Title
		<p>that maintain existing traffic patterns and fulfill response route and access needs during project construction and HSR operations.</p> <ul style="list-style-type: none"> • Identification and assessment of the potential safety risks of project construction to children, especially in areas where the project is located near homes, schools, daycare centers, and parks. • Promotion of child safety within and near the project area. For example, crossing guards could be provided in areas where construction activities are located near schools, daycare centers, and parks. <p>CTPs would consider and account for the potential for overlapping construction projects.</p>								
TR-IAMF#3	Off-Street Parking for Construction-Related Vehicles	The Contractor shall identify adequate off-street parking for all construction-related vehicles throughout the construction period to minimize impacts on public on-street parking areas. If adequate parking cannot be provided on the construction sites, the Contractor shall designate a remote parking area and arrange for the use a shuttle bus to transfer construction workers to/from the job site. This measure shall be addressed in the CTP.	Design/ Construction	Prepare plan	Prior to construction	Contractor	Contractor	Prepare CTP/Identify adequate off-street parking for all construction-related vehicles	Condition of design-build contract	Impact TR #2: Circulation and Emergency Access during Construction
TR-IAMF#4	Maintenance of Pedestrian Access	The Contractor shall prepare specific construction management plans to address maintenance of pedestrian access during the construction period. Actions that limit pedestrian access would include, but not be limited to, sidewalk closures, bridge closures, crosswalk closures or pedestrian rerouting at intersections, placement of construction-related material within pedestrian pathways or sidewalks, and other actions that may affect the mobility or safety of pedestrians during the construction period. If sidewalks are maintained along the construction site frontage, provide covered walkways and fencing. The plan objective shall be to maintain pedestrian access where feasible (i.e., meeting design, safety, and Americans with Disabilities Act [ADA] requirements). This measure shall be addressed in the CTP.	Design/ Construction	Prepare plan	Prior to construction	Contractor	Contractor	Prepare construction management plans that address maintenance of pedestrian access	Condition of design-build contract	Impact TR #1: Temporary Road Closures during Construction Impact TR #2: Circulation and Emergency Access during Construction
TR-IAMF#5	Maintenance of Bicycle Access	The Contractor shall prepare specific construction management plans to address maintenance of bicycle access during the construction period. Actions that limit bicycle access would include, but not be limited to, bike lane closures or narrowing, closure or narrowing of streets that are designated bike routes, bridge closures, placement of construction-related materials within designated bike lanes or along bike routes, and other actions that may affect the mobility or safety of bicyclists during the construction period. Maintain bicycle access where feasible (i.e., meeting design, safety, and ADA requirements). This measure shall be addressed in the CTP.	Design/ Construction	Prepare plan	Prior to construction	Contractor	Contractor	Prepare construction management plans that address maintenance of bicycle access	Condition of design-build contract	Impact TR #1: Temporary Road Closures during Construction Impact TR #2: Circulation and Emergency Access during Construction

IAMF	Title	IAMF Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Title
TR-IAMF#6	Restriction on Construction Hours	The Contractor shall limit construction material deliveries between 7 a.m. and 9 a.m. and between 4 p.m. and 6 p.m. on weekdays to minimize impacts on traffic on roadways. The Contractor shall limit the number of construction employees arriving or departing the site between the hours of 7 a.m. and 8:30 a.m. and 4:30 p.m. and 6 p.m. Areas where these restrictions would be implemented would be determined as part of the CTP. Based on Authority review of the CTP, the restricted hours may be altered due to local travel patterns.	Construction	CTP to be prepared prior to construction followed by reporting	Prior to construction/ Weekly	Contractor	Contractor	Prepare CTP/ Limit construction materials deliveries and employee arrival and departures	Condition of design-build contract	Impact TR #2: Circulation and Emergency Access during Construction
TR-IAMF#7	Construction Truck Routes	The Contractor shall deliver all construction-related equipment and materials on the appropriate truck routes and shall prohibit heavy-construction vehicles from using alternative routes to get to the site. Truck routes would be established away from schools, daycare centers, and residences, or along routes with the least impact if the Authority determines those areas are unavoidable. This measure shall be addressed in the CTP.	Construction	CTP to be prepared prior to construction followed by reporting.	Prior to construction/ Weekly	Contractor	Contractor	Prepare CTP/ Establish truck routes	Condition of design-build contract	Impact TR #2: Circulation and Emergency Access during Construction
TR-IAMF#8	Construction during Special Events	The Contractor shall provide a mechanism to prevent roadway construction activities from reducing roadway capacity during major athletic events or other special events that substantially (10 percent or more) increase traffic on roadways affected by project construction. Mechanisms include the presence of police officers directing traffic, special-event parking, use of within-the-curb parking, or shoulder lanes for through-traffic and traffic cones. This measure shall be addressed in the CTP.	Construction	CTP to be prepared prior to construction followed by reporting	Prior to construction/ Weekly	Contractor	Contractor	Prepare CTP/ Event coordination	Condition of design-build contract	Impact TR #2: Circulation and Emergency Access during Construction
TR-IAMF#9	Protection of Freight and Passenger Rail during Construction	The Contractor shall repair any structural damage to freight or public railways that may occur during the construction period and return any damaged sections to their original structural condition. If necessary, during construction, a "shoofly" track would be constructed to allow existing train lines to bypass any areas closed for construction activities. Upon completion, tracks would be opened and repaired; or new mainline track would be constructed, and the "shoofly" would be removed. Contractor repair responsibility would be included in the design-build contract.	Construction	Design-build and CTP to be prepared prior to construction followed by reporting	Weekly	Contractor	Contractor	Repair structural damage to freight or public railways	Condition of design-build contract	Impact TR #2: Circulation and Emergency Access during Construction Impact TR #2: Circulation and Emergency Access during Construction Impact TR #4: Circulation and Emergency Access during Operation
TR-IAMF#11	Maintenance of Transit Access	The Contractor shall prepare specific Construction Management Plans to address maintenance of transit access during the construction period. Actions that limit transit access include, but are not limited to, roadway lane closures or narrowing, closure or narrowing of streets that are designated transit routes, bus stop closures, bridge closures, placement of construction-related materials within designated transit lanes, bus stop or layover zones or along transit routes, and other actions that may affect the mobility or safety of bus transit during the construction period. A plan objective shall be to maintain transit access where feasible (i.e., meeting design, safety, and ADA requirements). This measure shall be addressed in the CTP.	Construction	Design-build and CTP to be prepared prior to construction followed by reporting	Prior to construction/ Weekly	Contractor	Contractor	Prepare Construction Management Plans to address maintenance of transit access	Condition of design-build contract	Impact TR #1: Temporary Road Closures during Construction Impact TR #2: Circulation and Emergency Access during Construction

IAMF	Title	IAMF Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Title
TR-IAMF#12	Pedestrian and Bicycle Safety	Prior to construction, the Contractor shall provide a technical memorandum describing how pedestrian and bicycle accessibility would be provided and supported across the HSR corridor, to and from stations and on station property. Priority of safety for pedestrians and bicycles and vulnerable populations over motor vehicle access would be done in a way so as to encourage maximum potential access from non-motorized modes. Local access programs, such as Safe Routes to Schools, shall be maintained or enhanced. Access to community facilities for vulnerable populations shall be maintained or enhanced.	Pre-construction	Prepare technical memorandum	Prior to construction	Contractor	Contractor	Preparation of a pedestrian and bicycle accessibility technical memorandum	Condition of design-build contract	Impact TR #1: Temporary Road Closures during Construction Impact TR #2: Circulation and Emergency Access during Construction

AASHTO = American Association of State Highway and Transportation Officials
 ADA = Americans with Disabilities Act
 ASCE = American Society of Civil Engineers
 ASTM = American Society for Testing and Materials
 APE = area of potential effect
 Authority = California High-Speed Rail Authority
 BETP = built environment treatment plan
 BMP = best management practice
 BRMP = biological resources management plan
 Cal OSHA = California Occupational Safety and Health Administration
 Caltrans = California Department of Transportation
 CDFW = California Department of Fish and Wildlife
 CEQA = California Environmental Quality Act
 CESA = California Endangered Species Act
 C.F.R. = Code of Federal Regulations
 CMP = construction management plan
 CP = construction package
 CTP = construction transportation plan
 DOGGR = California Department of Conservation, Division of Oil, and Gas and Geothermal Resources
 DWR = California Department of Water Resources
 EIR = environmental impact report
 EIS = environmental impact statement
 EMF = electromagnetic field
 EMI = electromagnetic interference
 EMMA = Environmental Mitigation Management and Assessment
 ESA = Environmental Site Assessment
 FESA = Endangered Species Act
 FAST Act = Fixing America's Surface Transportation Act

FRA = Federal Railroad Administration
 FEMA = Federal Emergency Management Agency
 GIS = geographic information system
 HSR = high-speed rail
 IBC = International Building Code
 ISEP = Implementation Stage Electromagnetic Compatibility Program Plan
 IAMF = impact avoidance and minimization feature
 MOA = Memorandum of Understanding
 NHPA = National Historic Preservation Act
 NMFS = National Marine Fisheries Service
 NOx = nitrogen oxide
 O&M = operations and maintenance
 OSHA = Occupational Safety & Health Administration
 PM10 = particulate matter smaller than or equal to 10 microns in diameter
 PRM = Paleontological Resource Monitors
 PRMMP = Paleontological Resources Monitoring and Mitigation Plan
 SHPO = State Historic Preservation Office
 SJVAPCD = San Joaquin Valley Unified Air Pollution Control District
 SR = State Route
 SVP = Society of Vertebrate Paleontology
 SWPPP = Stormwater Pollution Prevention Plan
 SWRCB = State Water Resources Control Board
 Uniform Act = Uniform Relocation Assistance and Real Property Acquisition Policies Act, as amended
 USACE = U.S. Army Corps of Engineers
 USFWS = U.S. Fish and Wildlife Service
 VOCs = volatile organic compounds
 WEF = wildlife exclusion fence zones
 WEAP = Worker Environmental Awareness Program

Table 4 Fresno to Bakersfield Locally Generated Alternative Project Section: Impact Avoidance and Minimization Measures that Apply Only to the Bakersfield to Palmdale Project Section From Immediately South of the F Street Station to Oswell Street in the City of Bakersfield

IAMF	Title	IAMF Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism
Air Quality									
F-B AQ-IAMM#1	Truck Equipment	<ul style="list-style-type: none"> Trucks will be covered to reduce significant fugitive dust emissions while hauling soil and other similar material. All trucks and equipment will be washed before exiting the construction site. 	Construction	Covering materials on truck beds, truck and equipment washing	Weekly	Contractor	Contractor	Covering materials on truck beds, truck and equipment washing	Condition of design-build contract
F-B AQ-IAMM#3	Trackouts	<ul style="list-style-type: none"> Within urban areas, trackout will be immediately removed when it extends 50, or more, feet from the site. 	Construction	Removal of accumulation from public streets	Weekly	Contractor	Contractor	Removal of accumulation from public streets	Condition of design-build contract
Biological Resources									
F-B BIO-IAMM#1	Environmental Design	<p>At multiple locations, the route of the alternative alignments was altered to avoid impacts and effects to biological resources.</p> <p>During project design and construction, the Authority and FRA would implement measures to reduce impacts on air quality and hydrology based on applicable design standards. Implementation of these measures would also reduce impacts to biological resources. The design standards applicable to the project are listed in Appendix 2-D and the measures to be applied are summarized in Section 3.3, Air Quality and Global Climate Change and Section 3.8, Hydrology and Water Resources.</p>	Pre-construction	Implement measures to reduce impacts	Prior to construction	Contractor	Contractor	Implement measures to reduce impacts	Condition of design-build contract
Cultural Resources									
F-B CUL-IAMM#1	Protective Measures	Cultural resources mitigation measures and commitments could occur prior to, during, and following construction. Protective measures, such as conducting archaeological training, building stabilization or archaeological site capping, and recordation of resources would take place prior to construction; other protective measures such as vibration monitoring for built resources or monitoring for archaeological resources during ground-disturbing activities would occur during construction. Measures that could take place after construction may include interpretive programs, including displays, interpretive signage, etc.	Pre-construction	Prepare assessment and protection plan	Monthly	Contractor/ Authority	Contractor/ Authority	Assess the condition of construction-adjacent historic properties and prepare a Plan for the Protection of Historic Built Resources and Repair of Inadvertent Damage	MOA/PA/BETP
F-B CUL-IAMM#2	PA	The PA established the framework for the development and implementation of measures to avoid, minimize, and/or mitigate adverse effects on historic properties caused by the HST System, in compliance with Section 106 and NEPA. The PA also established that a MOA will be prepared for each section of the HST project to detail the HST project commitments to implement these treatments.	Pre-construction	Implement MOA	Monthly	Contractor/ Authority	Contractor/ Authority	Implement MOA	Condition of design-build contract
Geologic Resources									
F-B GEO-IAMM#2	Groundwater Withdrawal	Control the amount of groundwater withdrawal from the project, re-inject groundwater at specific locations if necessary, or use alternate foundation designs to offset the potential for settlement. This control is important for locations with retained cuts in areas where high groundwater exists, and where existing buildings are located near the depressed track section.	Pre-construction	Prepare CMP	Monthly	Contractor	Authority/ Contractor	Prepare CMP	Reporting contract requirements/ specifications

IAMF	Title	IAMF Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism
F-B GEO-IAMM#4	Geotechnical Inspections	Prior to and throughout construction, conduct geotechnical inspections to verify that no new, unanticipated conditions are encountered, and to determine the locations of unstable soils in need of improvement.	Pre-construction/ Construction	Conduct inspections	Monthly	Contractor	Authority/ Contractor	Conduct geotechnical inspections	Condition of design-build contract
F-B GEO-IAMM#5	Improve Unstable Soils	Employ various methods to mitigate for the risk of ground failure from unstable soils. If the soft or loose soils are shallow, they can be excavated and replaced with competent soils. To limit the excavation depth, replacement materials can also be strengthened using geosynthetics. Where unsuitable soils are deeper, ground improvement methods, such as stone columns, cement deep-soil-mixing (CDSM), or jet-grouting, can be used. Alternatively, if sufficient construction time is available, preloading—in combination with prefabricated vertical drains (wicks) and staged construction—can be used to gradually improve the strength of the soil without causing bearing-capacity failures. Both over-excavation and ground improvement methods have been successfully used to improve similar soft or loose soils. Lime treatment of heavy rail subgrades over soft soils has also been used successfully in the San Joaquin Valley. The application of these methods is most likely at stream and river crossings, where soft soils could occur; however, localized deposits could occur at other locations along the alignment. The ground improvement or over-excavation methods may also be necessary at the start of approach fills for elevated track sections or retained-earth segments of the alignment if the earth loads exceed the bearing capacity of the soil. Alternatively, at these locations, earth fills might be replaced by lightweight fill, such as lightweight concrete, extruded polystyrene (geofam), or short columns, and cast-in-drilled hole (CIDH) piles might be used to support the transition from the elevated track to the at-grade alignment.	Design/ Construction	Prepare CMP	Monthly	Contractor	Contractor	Prepare CMP	Condition of design-build contract
F-B GEO-IAMM#6	Improve Settlement-Prone Soils	Settlement-prone soils are improved prior to facility construction. Ground improvement is used to transfer new earth loads to deeper, more competent soils. Another alternative is to use preloads and surcharges with wick drains to accelerate settlement in areas that are predicted to undergo excessive settlement. By using the preload and surcharge with wick drains, settlement would be forced to occur. The application of these methods is most likely at stream and river crossings, where soft soils are more likely to occur. Where groundwater is potentially within 50 feet of the ground surface, any below-ground excavations use well points in combination with sheet pile walls to limit the amount of settlement of adjacent properties from temporary water drawdown. Alternately, water can be re-injected to make up for localized water withdrawal.	Design/ Construction	Prepare CMP	Monthly	Contractor	Contractor	Prepare CMP	Condition of design-build contract
F-B GEO-IAMM#7	Prevent Water and Wind Erosion	Many mitigation methods exist for controlling water and wind erosion of soils. These include the use of straw bales and mulches, revegetation, and covering areas with geotextiles. Where the rate of water runoff could be high, riprap and riprap check dams could be used to slow the rate of water runoffs. Other BMPs for water are discussed in Section 3.8, Hydrology and Water Resources. Implementation of these methods is important where large sections of earth are exposed during construction, such as for retained-cut design segments.	Design/ Construction	Prepare CMP	Monthly	Contractor	Contractor	Prepare CMP	Condition of design-build contract
F-B GEO-IAMM#8	Modify or Remove and Replace Soils with Shrink-Swell Potential and Corrosion Characteristics	One option is to excavate and replace soils that represent the highest risk. In locations where shrink-swell potential is marginally unacceptable, soil additives will be mixed with existing soil to reduce the shrink-swell potential. The decision whether to remove or treat the soil is made on the basis of specific shrink-swell potential or corrosivity characteristics of the soil, the additional costs for treatment versus excavation and replacement, as well as the long-term performance characteristics of the treated soil.	Design/ Construction	Prepare CMP	Monthly	Contractor	Contractor	Prepare CMP	Condition of design-build contract
F-B GEO-IAMM#10	Secondary Seismic Hazards	As discussed above, various ground improvement methods can be implemented to mitigate the potential for liquefaction, liquefaction-induced lateral spreading or flow of slopes, or post-earthquake settlement. Ground improvement around CIDH piles improves the lateral capacity of the CIDH during seismic loading. CDSM, stone columns, EQ drains or jet-grouting develop resistance to lateral flow or spreading of liquefied soils.	Design/ Construction	Design to mitigate the potential for secondary seismic hazards	Monthly	Contractor	Contractor	Implement ground improvement methods	Condition of design-build contract

IAMF	Title	IAMF Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism
Hazardous Materials and Waste									
F-B HMW-IAMM#8	Storage of Hazardous Materials	Storage of hazardous materials during construction and operation will meet requirements for transport, labeling, containment, cover, and other BMPs to comply with the State Water Resources Control Board Construction General Permit conditions.	Post-construction	Prepare plans	Prior to operations	Authority	Authority	Prepare hazardous materials monitoring plan and SWPPP	Condition of design-build contract
F-B HMW-IAMM#9	Material Selection	To the extent feasible, the Authority is committed to identifying, avoiding, and minimizing hazardous substances in the material selection process for construction, operation, and maintenance of the HST system. Moreover, using an Environmental Management System, the Authority will evaluate the full inventory of hazardous materials employed on an annual basis and will replace hazardous substances with nonhazardous materials to the extent possible. These standards and material specifications would aid in promoting safety for passengers and employees.	Post-construction	Annual review	Annually	Authority	Authority	Prepare annual review	Condition of design-build contract
Station Planning, Land Use, and Development									
F-B LU-IAMM#1	Zone of Responsibility	Although not strictly part of the project design, the Authority has established a certain "zone of responsibility" around the proposed stations. To that end, the Authority prepared and distributed Urban Design Guidelines (Authority [2010] 2011b) available on the Authority's website to provide assistance in urban planning for the stations to help achieve great placemaking. The guidelines are based on international examples where cities and transit agencies have incorporated sound urban design principles as integrated elements of large-scale transportation systems. The application of sound urban design principles to the HST System will help to maximize the performance of the transportation investment, enhance the livability of the communities it serves, create long-term value, and sensitively integrate the project into the communities along the HST System corridor. The Authority and FRA have also provided planning grants for cities that could have an HST station to assist them in land use planning in the areas surrounding the stations.	Design/ Pre-construction	Implement sound design principals	Monthly	Contractor/ Authority	Contractor/ Authority	Implement sound design principals	Condition of design-build contract
F-B LU-IAMM #2	Construction Management Plan	Project design features would reduce some of the temporary land use impacts from project construction. These features are described in Section 3.12.6, Socioeconomics, Communities, and Environmental Justice, and in Section 3.3.8, Air Quality and Global Climate Change. They include implementation of a construction management plan to minimize temporary impacts on adjacent land uses and implementation of dust control measures during project construction.	Pre-construction	Prepare CMP	Monthly	Contractor	Contractor	Prepare CMP	Condition of design-build contract
Safety and Security									
F-B SS-IAMM#1	Emergency Vehicle Access	Final design includes development of a detailed construction transportation plan that would include coordination with local jurisdictions on emergency vehicle access. The plan would establish procedures for temporary road closures including: access to residences and businesses during construction, lane closure, signage and flag persons, temporary detour provisions, alternative bus and delivery routes, emergency vehicle access, and alternative access locations.	Pre-construction/ Construction	Prepare plan	Monthly	Contractor	Contractor	Prepare Construction Safety Transportation Management Plan	Condition of design-build contract
F-B SS-IAMM#10	Environmental Design	HST urban design guidelines (Authority 2011b) require implementing the principles of Crime Prevention through Environmental Design. This is a design method that focuses on reducing opportunities for crime through the design and management of the physical environment. Four basic principles of Crime Prevention through Environmental Design should be considered during station and site planning: territoriality (designing physical elements that express ownership of the station or site); natural surveillance (arranging physical features to maximize visibility); improve sightlines (provide clear views of surrounding areas); and access control (physical guidance of people coming and going from a space).	Pre-construction	Implement measures to reduce impacts	Prior to construction	Contractor	Contractor	Implement measures to reduce impacts	Condition of design-build contract

IAMF	Title	IAMF Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism
Transportation									
F-B TR-IAMM #11	Additional Features in the Cities of Fresno and Bakersfield	<p>In addition to the measures listed above, the Authority will also perform the following in the cities of Fresno and Bakersfield:</p> <ul style="list-style-type: none"> Maintain detection at signalized intersections where alignment changes or widening is necessary, in order that the traffic signal does not need to be placed on recall (fixed timing). Changeable message signs (CMS) will be employed to advise motorists of lane closures or detours ahead. The CMSs will be deployed seven days before the start of construction at that location. Where project construction would cause delays on major roadways during the construction period, the project will provide for a network of CMS locations to provide adequate driver notification. For example, construction-related delays at the railroad grade separations that lead to SR 99 interchanges will require CMS placement to the east to allow drivers to make alternate route decisions. In the case of work on Shaw Avenue, recommended placement would be a CMS at Shaw Avenue just east of SR 41 and a CMS at Shaw Avenue just east of Palm Avenue. Similar CMS usage will be required along Ashlan Avenue, Clinton Avenue, McKinley Avenue, Olive Avenue, and Belmont Avenue. The Authority, in conjunction with the City of Fresno Public Works Department and City of Bakersfield Public Works Department, will develop a traffic management plan for the surface transportation network to minimize potential impacts on public safety services. During project construction, alignment of roadways to be grade-separated and freeway overpasses to be reconstructed will be offset from the existing alignment to facilitate staged construction, wherever possible. <p>The Authority will also include the following measures specific to the city of Fresno:</p> <ul style="list-style-type: none"> Clinton Avenue over SR 99 and Ashlan Avenue over the Union Pacific Railroad (UPRR) will be offset from their existing alignments to allow the existing roadway to remain open while the new structure is being built. It is recognized by the city that this type of staging may necessitate temporary ramps to and from SR 99 during various phases of construction. Four travel lanes will be maintained from 7 a.m. to 9 a.m. and from 4 p.m. to 6 p.m. on Shaw Avenue from Cornelia to Blythe Avenue (at UPRR), on Ashlan Avenue from Parkway to Valentine Avenue (at UPRR), and on Clinton Avenue from Marks Avenue to Weber Avenue (at SR 99). The Veterans Boulevard overpass and construction of new alignments of Golden State Boulevard and Bullard Avenue will be completed and open to traffic prior to the closure of the Carnegie Avenue at-grade railroad crossing. One lane of traffic in each direction must be maintained at all times for Olive Avenue and McKinley Avenue for construction of the proposed grade separations. No full closures of these crossings will occur, with the exception of short duration closures of less than 72 hours not more than once per month. During any Belmont Avenue closures that are determined to be necessary, the adjacent crossings of Olive Avenue and Divisadero Street will remain open with no lane closures at the two crossings. Two of the three crossings will remain open at any given time at the existing railroad crossings at Divisadero, Tuolumne, and Stanislaus 	Design/ pre-construction/ construction	Implement measures in Bakersfield	Monthly	Contractor	Contractor	Implement measures to reduce impacts	Condition of design-build contract

Authority = California High-Speed Rail Authority
 CDSM = cement deep soil mixing
 CHA = collision hazard analysis
 CIDH = cast-in-drilled hole
 CMP = Construction Management Plan
 CMS = changeable message sign
 EQ = earthquake
 FRA = Federal Railroad Administration
 HSR = high-speed rail

MOA = Memorandum of Agreement
 PHA = preliminary hazard analysis
 RWQCB = Regional Water Quality Control Board
 SHPO = State Historic Preservation Officer
 SR = State Route
 SWPPP = Stormwater Pollution Prevention Plan
 TVA = threat and vulnerability assessment
 UPRR = Union Pacific Railroad
 U.S. = United States

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APPENDIX D: COMMENTS RECEIVED BETWEEN THE PUBLICATION OF THE FINAL EIS AND THE AUGUST 19, 2021 BOARD MEETING

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#	First Name	Last Name	Business/ Organization	Summary of Stakeholder Comments/Issues	Response/Status Update
001	Clarke	Robey		The commenter expresses opposition to the project.	The Authority acknowledges the commenter's opposition to the project.
002	David	Hoagland	HOAGLAND TRUST	The commenter notes the property owner received an offer to purchase specified parcels.	The Authority coordinated with commenter and provided a project update including information on the release of the Final EIR/EIS, the August Board meeting and how to access information through the Authority website. The Authority has not initiated the process of land acquisition/relocation, which will be determined once funds become available. The Authority has provided the commenter right of way contact information and an update on the status of potential impacts to the APNs provided.
003	Mike	Radlovic	Coldwell Banker Commercial	The commenter is concerned because escrows are falling through for some of his clients when buyers learn that the properties are in the path of HSR.	The Authority coordinated with commenter and provided a project update including information on the release of the Final EIR/EIS, the August Board meeting and how to access information through the Authority website. The Authority has not initiated the process of land acquisition/relocation, which will be determined once funds become available.
004	anonymous	anonymous		The commenter left message to express his abhorrence towards the project.	The Authority acknowledges the commenter's opposition to the project.
005	Greg	fmsdme.com	Fundamental Medical Supply, Inc.	The commenter raises right of way questions.	The Authority coordinated with commenter and provided a project update including information on the release of the Final EIR/EIS, the August Board meeting and how to access information through the Authority website. The Authority has not initiated the process of land acquisition/relocation, which will be determined once funds become available. The Authority has provided the commenter right of way contact information and an update on the status of potential impacts to the APNs provided.
006	Theresa	Scott		Request for FEIREIS electronic copy	The Authority contacted the commenter to inform them the Final EIR/EIS will be available online and can be accessed through the Authority's website on Friday, June 25. The commenter requested a printed copy but stated that an electronic copy would be fine and they would access it online.
007	Greg	fmsdme.com	Fundamental Medical Supply, Inc.	The commenter raises right of way questions.	The Authority coordinated with commenter and provided a project update including information on the release of the Final EIR/EIS, the August Board meeting and how to access information through the Authority website. The Authority has not initiated the process of land acquisition/relocation, which will be determined once funds become available. The Authority has provided the commenter right of way contact information and an update on the status of potential impacts to the APNs provided.
008	Svannah	Welch	KBAK/KBFX	The commenter was requesting information related to a media request.	The RC Outreach team referred the commenter to the Authority Communications team.
009	Svannah	Welch	KBAK/KBFX	The commenter was requesting information related to a media request.	The RC Outreach team referred the commenter to the Authority Communications team.
010	Unknown	avarchaeology		Please send me a copy. Sent via the Samsung Galaxy S8+, an AT&T 4G LTE smartphone	The Authority attempted to contact the commenter but did not receive a response. The Authority emailed the commenter a link to where the Final EIR/EIS is available on the Authority's website.
011	Frank	Jordan	Land Use Services Department	The commenter requested copies of project-related documents.	The commenter requested copies of the geotechnical and geological reports in addition to the Final EIR/EIS, the previously published Revised Draft EIR/Supplemental Draft EIS and Draft EIR/EIS. The Authority informed the commenter the Final EIR/EIS, Revised Draft EIR/EIS, and the Draft EIR/EIS are available on the Authority's website. The Authority sent the commenter the requested technical reports on flash drive. Sent 7/20/21 USPS tracking# 9405509202121559530829
012	Sharon	King		The commenter requested copies of project-related documents.	The Authority contacted the commenter to confirm the request, and the commenter indicated she did not need an electronic copy of the Final EIR/EIS rather just wants an update on the proposed design of the project through Arabian Drive.
013	Lee	Lanfried		Sent from my iPad	No comment was provided.
014	Katherine	Schmidt - NOAA Federal	NOAA Fisheries West Coast Region	The commenter requested digital copies and that notices be sent to her attention.	The Authority has updated the distribution list to include the commenter as the point of contact. The Authority contacted the commenter to confirm if she would like an electronic copy or if the printed media she received would suffice.
015	Greg	fmsdme.com	Fundamental Medical Supply, Inc	The commenter raises right of way questions.	The Authority coordinated with commenter and provided a project update including information on the release of the Final EIR/EIS, the August Board meeting and how to access information through the Authority website. The Authority has not initiated the process of land acquisition/relocation, which will be determined once funds become available. The Authority has provided the commenter right of way contact information and an update on the status of potential impacts to the APNs provided.

#	First Name	Last Name	Business/ Organization	Summary of Stakeholder Comments/Issues	Response/Status Update
016	Heather Thomas	Brown		The commenter requested information regarding the August Board Meeting dates and where to find Meeting information.	The Authority contacted the commenter about the August Board Meeting dates and where to locate the Board Meeting information online.
017	Robert A	Castro		The commenter requested copies of project-related documents.	The Authority offered to send the commenter electronic copies of the Final EIR/EIS on a flash drive. The Authority also informed the commenter that the document can be accessed online at the Authority's website or at one of the public locations listed on the NOA he received by mail.
018	Lonzoe	Hart		The commenter inquired about getting certified as a minority company for general contracting and requested copies of Board Meeting files.	The Authority confirmed the location for Board Meeting materials and offered to mail a flash drive with Board Meeting material contents to the commenter.
019	Philip	Lappe	DSCP23 Package	The commenter requested copies of project-related documents.	The Authority provided the commenter with the requested documents on flash drive. Sent 7/22/21 USPS tracking# 9405509202121048533898
020	John	Stocksdale		The commenter requested copies of project-related documents.	The Authority offered to send the requested document on flash drive and informed the commenter that the document can be accessed online at the Authority's website or at one of the public locations listed on the NOA he received by mail.
021	Mark	Fox		The commenter requested copies of project-related documents.	The Authority provided the commenter with the requested documents on flash drive. Sent 7/22/21 USPS tracking# 9405509202121048533904
022	Steven D.	Hofbauer	City of Palmdale	The commenter expressed support for the project.	The Authority appreciates the commenter's support of the project.
023	Peter	Svidler	PartnersCRE Compass Commercial	The commenter raises right of way questions.	The Authority is researching specific property information as requested and will follow up with the commenter.
024	Hemendra	Acharya		The commenter requested copies of project-related documents.	The Authority provided the commenter with the requested documents on CD. Sent 7/22/21 USPS tracking# 9405509202121048533874
025	Rochelle E.	Campomanes	Los Angeles Sheriff's Department Facilities Planning Bureau	The commenter inquired about submitting a comment letter.	The Authority contacted the commenter, who confirmed LASD will mail a comment letter to "Serge Stanich in Sacramento" and e-mail a copy via the Authority website. The commenter also confirmed understanding this is not an official comment period but appreciates opportunity to provide a comment. The commenter did not indicate the nature of the comment. No additional inquiries or comments have been received from LASD.
026	Luis	Monterroso		The commenter noted concern about his property.	The Authority is researching specific property information as requested and will follow up with the commenter.
027	J.P.	Rose	CENTER for BIOLOGICAL DIVERSITY	The commenter requested an extension to provide comments on the Final EIR/EIS.	After several attempts to reach the commenter via phone to acknowledge receipt of the email, the Authority was unable to leave a message because the commenter's mailbox is full. On August 16, 2021, Authority staff meet with Center for Biological Diversity staff to discuss the comment letter. The Authority has considered the commenter's request for an extension; however, given the Draft EIR/EIS circulated for 60 days, the Revised Draft EIR/Supplemental Draft EIS circulated for 45 days, and the Final EIR/EIS was available for 54 days prior to the Authority Board Meeting, the Authority provided sufficient durations for the public, agencies, and organizations to provide comments on the EIR/EIS.
028	Derek	Abbott	Tejon Ranch	The commenter submitted comments related to Tejon Ranch property and operations.	The Authority previously responded to similar comments contained in Submission 706 in Chapter 25 of the Final EIR/EIS and Submission 987 in Chapter 34 in the Final EIR/EIS.
029	Peter	Svidler	PartnersCRE Compass Commercial	The commenter raises right of way questions.	The Authority is researching specific property information as requested and will follow up with the commenter.
030	Jason	Landes	PALMDALE PAWNSHOP	The commenter raises right of way questions.	The Authority contacted the commenter to confirm his e-mail inquiry was received. The Authority was unable to reach stakeholder via phone and will follow up with an email.
031	Jean	Prijatel	United States Environmental Protection Agency, Region IX	The commenter expressed appreciation for the continued collaboration with the U.S. EPA.	The commenter notes that the U.S. Environmental Protection Agency had previously submitted comments on the Draft EIR/EIS and the Revised Draft EIR/Supplemental Draft EIS, and at that time, their concerns had been addressed through previous coordination efforts. The commenter states that they have no comments on the Final EIR/EIS, and looks forward to collaborating as the project progresses.
032	John	Stocksdale		The commenter raises right of way questions.	The Authority is researching specific property information as requested and will follow up with the commenter.
033	Graham	Johnson		The commenter expresses opposition to the project.	The Authority acknowledges the commenter's opposition to the project.
034	Dennis	Tope		The commenter expresses opposition to the project.	The Authority acknowledges the commenter's opposition to the project.

#	First Name	Last Name	Business/ Organization	Summary of Stakeholder Comments/Issues	Response/Status Update
035	Amanda	Alvine		The commenter inquired about roadway design in Palmdale.	As described in Section 3.12.6.4 Impact SO#17, all three of the affected road crossings in the Palmdale Station area (Avenue P/Rancho Vista Boulevard, Sierra Highway, and Palmdale Boulevard) are currently at-grade with the existing UPRR tracks. Each of these at-grade crossings would be replaced with new grade-separated crossings. These new grade separations would enhance mobility in Palmdale by eliminating traffic delays for motorists who are currently forced to wait for passing trains.
036	Todd	Ferrara	Tejon Ranch	The commenter expressed support for continued coordination with HSR post-ROD as design progresses.	The Authority will continue to coordinate with the public and private sectors during subsequent phases of the project (right-of-way acquisition, regulatory permitting, final design, etc.) in order to address concerns and resolve issues.
037	Katie	Rodriguez	CA Dept. of Transportation	Commenter expressed interest in working with HSR regarding wildlife crossing along the HSR and SR58 corridor.	The Authority intends to meet all Caltrans requirements and is committed to continued coordination with Caltrans as design progresses. .
038	Cara Kristeen J.P. Paul	Lacey Penrod Rose Beier	The Nature Conservancy SC Wildlands Center for Biological Diversity Center for Large Landscape Conservation	The commenter expressed concern regarding the Authority's public involvement in the environmental process, as well as potential impacts to species, habitat, and connectivity.	<p>The commenter noted that the Authority had stopped meeting with the conservation organizations in 2015; however, the Authority met with The Nature Conservancy in July 2016, April 2020, and April 2021 and with the Center for Biological Diversity in August 2021. As acknowledged in the Authority's resolution approving the project, the Authority will continue to collaborate with the commenters and other stakeholders on wildlife crossing designs and compensatory mitigation.</p> <p>The commenter states that the EIR/EIS does not clearly describe how mitigation measures will sufficiently reduce environmental impacts and questions how mitigation will adequately address the significant impacts. As addressed in Responses to Comments 781-576 (Chapter 20 of the Final EIR/EIS) and 968-1185 (Chapter 34 of the Final EIR/EIS), the EIR/EIS includes an explanation of how the mitigation measures will be made enforceable in Section 3.7.7.</p> <p>The commenter questions the adequacy and size of the proposed wildlife crossings along the Bakersfield to Palmdale alignment and the Tehachapi Linkage. The approach used for the Tehachapi Linkage was to intersperse tunnels and viaducts with short at-grade segments to provide frequent movement opportunities that would make installation of wildlife crossings unnecessary in most areas. There are 6 underground tunnel sections within the Tehachapi Linkage that each provide more than 1,400 feet of natural habitat: the lengths are approximately 1,500 feet, 3,900 feet, 1,700 feet, 3,900 feet, 12,400 feet, and 1,476 feet. There are also 5 elevated viaduct sections within the Tehachapi Linkage with lengths of approximately 2,100 feet, 600 feet, 1,100 feet, 390 feet, and 1,516 feet. All of the viaducts are greater than 15 feet in height, which allows large mammals such as mountain lion and mule deer to freely pass under.</p> <p>The commenter also questions the effectiveness of dual-use crossings. As discussed in Response to Comment 777-315, contained in Chapter 25 of the Final EIR/EIS, wildlife crossings will be designed with consideration given to traffic, noise, and lighting. Section 4.2.1 of the WCA provides a list of sources consulted in developing the wildlife crossing designs, while Sections 7.7.3 through 7.7.5 provide additional detail on the project's effects on wildlife crossings.</p> <p>As discussed in the responses to comment letter 789 in Chapter 25 of the Final EIR/EIS, the base modeling data used for the LPA model were from the South Coast Wildlands Missing Linkages project (South Coast Wildlands no date). The LPA model was developed based on modeling wildlife movement across openings associated with the underground tunnel and elevated viaducts where wildlife could move across the project unimpeded. Additionally, available roadkill data along SR 58 and in-the-field evaluations of potential culvert crossings underneath SR 58 were also used and incorporated into the analysis. This method is sufficient to determine the effects on wildlife movement cost associated with the project. This analysis is discussed in Section 3.7.4.4 of the Final EIR/EIS, and additional detail in support of the EIR/EIS analysis is provided in Sections 7.7.3 through 7.7.5 of the BARTR and Section 5.2.1 of the WCA.</p> <p>a. It is recognized that in the Fresno to Bakersfield Project Section, there were design changes that resulted in less viaduct and more embankment. Those design changes received additional environmental review and permitting and were accompanied by additional wildlife crossing structures to offset the impacts of the additional embankment. The Authority has since changed its procurement process such that changes to tunnel and viaduct locations are not expected for the Bakersfield to Palmdale Project section. As discussed in Response to Comment 988-1271, contained in Chapter 32 of the Final EIR/EIS, the Authority is committed to maintaining those area shown as elevated viaducts, underground tunnels, and dedicated wildlife crossings shown in the current project design. However, if any design changes are proposed by the Authority or its design contractors, these changes will be evaluated in an environmental reexamination under NEPA pursuant to Section 13.e of FRA's 1999 <i>Environmental Procedures for Considering Environmental Impacts</i> and under CEQA pursuant to Sections 15162-15164 of the CEQA Guidelines. Although unexpected, if design changes occurred that resulted in more embankment, it would first require further environmental analysis and, if necessary, corresponding mitigation.</p>

#	First Name	Last Name	Business/ Organization	Summary of Stakeholder Comments/Issues	Response/Status Update
039	Paul	Beier	Center for Large Landscape Conservation	Commenter states that the Tehachapi Mountains connect two major mountain range complexes by virtue of being the only broad and continuous swath of non-desert land between the two major regions and, as such, the Tehachapi Mountains Corridor is a crucial wildlife corridor not only locally, but also at continental scale. Commenter raised the concern that viaducts that have less than 15 feet of clearance will not be used by mule deer and that the Authority should consider all viaducts with less than 15 feet of clearance as impermeable for mule deer. Commenter identifies five connectivity enhancement projects for Interstate 5, State Route 58 and State Route 14 that could serve to mitigate impacts to wildlife movement from the Project.	<p>The Final EIR/EIS recognizes that the Tehachapi Mountains provide a critical habitat connection for wildlife gene flow within California and beyond. Having recognized this, the Final EIR/EIS identified important wildlife movement areas and incorporated tunnels and viaducts to avoid or minimize impacts to movement compared to the baseline condition.</p> <p>All viaducts in the Bakersfield to Palmdale Project section have clearances that exceed 15 feet and as such all viaducts in the Project section are permeable to mule deer as well as mountain lion.</p> <p>During design of the wildlife crossings for large and small animals, the Authority will consider protection of land along the wildlife crossings and specific crossing treatments. In addition, one of the criteria to be emphasized when acquiring compensatory habitat is the protection of critical habitat linkages. Additional mitigation, such as the funding of crossings for freeways, is not warranted given the extensive measures and ultimate minor effect to wildlife movement cost associated with the Project, as demonstrated by the results of the local permeability analysis.</p>
040	Bradley	Johnson	Harrison, Temblador, Hungerford & Johnson (CalPortland Cement)	The commenter expresses concern about the CalPortland Cement property and future operations.	<p>The commenter reiterated its prior concerns from its Draft EIR/EIS comment letter related to proximity of the alignment to blast zones and fly rock. In response to CalPortland's Draft EIR/EIS comments, the Authority refined the design to add a cover extending 1,700 feet from the northern terminus of Tunnel #9 to protect the HSR infrastructure from fly rock. Refer to Response to Comment 804-724, contained in Chapter 25 of the Final EIR/EIS. The Authority is committed to continued coordination with CalPortland to address concerns through advanced design.</p> <p>The commenter questions the 220-foot buffer identified in the EIR/EIS. The EIR/EIS states that the "exclusion zone" – the distance between CalPortland's blasting and the tunnels — would need to be a minimum of 220 feet. CalPortland has indicated that the exclusion zone would need to be at least 600 feet. The 220-foot distance included in the alignment design in the EIR/EIS was established based on two technical reports prepared by experts:</p> <ul style="list-style-type: none"> • <i>Quarry Blast Impact Numerical Study</i> (Authority 2018a) • <i>Vibration Study on CHSRA Tunnels based on Earthquake Data and Numerical Analysis</i> (Authority 2018b) <p>The buffer distance may be refined post-ROD in the final design stage, as is common for a major infrastructure project and will be subject to approval by the FRA with respect to safety. Although the Authority had requested geotechnical data of CalPortland and met with them multiple times during the years leading up to and inclusive of 2021, the Authority had not received detailed geotechnical data, so the Authority's technical reports in support of the EIR/EIS were prepared using the best information available and are based on reasonable assumptions. While the commenter supplied a new technical memorandum with its August 17th letter, which again questions the 220-foot buffer, the memorandum did not provide any new, detailed geotechnical data. The Authority considered the information in the comment letter and technical memorandum and has stated that it will continue to work with CalPortland. Extending the distance from blasting could impact cost, which will be considered as part of a future property negotiation with CalPortland.</p> <p>The commenter states the EIR/EIS does not consider the impact to limestone reserves at the Mojave Facility. The EIR/EIS analyzes impacts to mineral resources including impacts specific to CalPortland's mining operations, and concludes that impacts would be less than significant under CEQA. As discussed in Response to Comment 804-725, contained in Chapter 25 of the Final EIR/EIS, CalPortland has stated that there is 200 years of limestone reserves that can be extracted from its property, and that the project would reduce that amount by 6.2 years. Based on these numbers, CalPortland will still be able to continue mining more than 190-years' worth of limestone reserves at the site.</p> <p>The commenter indicated that it has identified quality limestone reserves across nearly 4,000 acres of its Mojave facility, which spans nearly 6,000 acres in total. CalPortland's letter also stated that a 220-foot exclusion zone on either side of the tunnels would comprise approximately 2.6 acres. The actual impact will be less because CalPortland's figure assumes no mining would be allowed in the exclusion zone, when in fact mining can safely continue in the exclusion zone with the use of non-blasting techniques, which may become more economical as technology evolves. Refer to Response to Comment 804-725, contained in Chapter 25 of the Final EIR/EIS.</p> <p>The commenter notes that the Mojave Facility contains state-recognized significant deposits of limestone and cement additive minerals classified as MRZ-2a. As discussed in Section 3.9.6.3 in the Final EIR/EIS, the project would result in the loss of only 0.13 percent of MRZ-2 inventory in Kern and Los Angeles Counties.</p> <p>The commenter suggests that the project's right-of-way costs are inaccurate because the commenter opines the Authority will be forced to purchase a larger buffer zone based on CalPortland data. As discussed in Response to Comment 804-728, contained in Chapter 25 of the Final EIR/EIS, the Authority understands its responsibilities to compensate CalPortland for its property and resources affected by the Bakersfield to Palmdale Project Section.</p>

#	First Name	Last Name	Business/ Organization	Summary of Stakeholder Comments/Issues	Response/Status Update
					<p>The HSR team has met with CalPortland representatives numerous times, including in June 2020 and February 2021, to discuss their concerns in detail. As discussed in Response to Comment 804-724, contained in Chapter 25 of the Final EIR/EIS, during previous meetings CalPortland representatives indicated that the Alternative 3 alignment would cause greater impact to future limestone reserve, and according to CalPortland representatives, of the alternatives being carried forward into the Draft EIR/EIS, Alternatives 1, 2, and 5 would be the least objectionable alignments of those currently proposed.</p> <p>The commenter claims the EIR/EIS does not include localized impacts. The impacts analysis in Chapter 3 applies these thresholds and explains, based on a discussion of both regional and localized effects, whether an impact exceeds the threshold and is therefore significant. Refer to Response to Comment 741-64, contained in Chapter 22 of the Final EIR/EIS.</p> <p>The commenter claims that the combination of CalPortland’s mining activities and the HSR construction will result in HSR being left in a columnar spine running through the Mojave Facility. The blasting exclusion zone that will be refined during the final design stage will have a three-dimensional analysis that will take this risk into account. HSR operations cannot begin without safety approval by FRA. FRA oversight, involvement, and expertise throughout the design and construction process will ensure that the ultimate configuration through this area will allow for HSR to operate in a safe environment.</p> <p>The commenter notes that the City of Tehachapi had commented on the contents of Table 3.4-6 in the Draft EIR/EIS and suggested that the analysis only considered at-grade rail. As discussed in Response to Comment 741-73, contained in Chapter 22 of the Final EIR/EIS, two cross-sections, aerial and underground, were previously omitted. They are correctly identified in the Final EIR/EIS. The proper track types were utilized in the impact analysis; therefore, this is a text edit. All three track types will be present in the Tehachapi vicinity.</p> <p>The commenter stated that impacts related to oak woodlands may be understated in the EIR/EIS. Refer to Response to Comment 044 in this appendix.</p> <p>The commenter states that the Arvin-Edison Water Storage District would be significantly impacted by the project. Refer to Response to Comment 762-746, contained in Chapter 22 of the Final EIR/EIS.</p> <p>The commenter states that the cumulative projects list is outdated and that the XpressWest Project is not included. Refer to Responses to Comments 759-287 and 781-625, contained in Chapters 22 and 20 of the Final EIR/EIS, respectively.</p>
041	Zack	Scivner	County of Kern (CalPortland)	The commenter expresses concern about the CalPortland Cement property and future operations.	The Authority has worked extensively with CalPortland to Minimize potential project impacts. The Authority will continue working with CalPortland to address concerns as design for this segment advances.
042	Shannon	Grove	California State Senate (CalPortland)	The commenter expresses concern about the CalPortland Cement property and future operations.	The Authority has worked extensively with CalPortland to minimize potential project impacts. The Authority will continue working with CalPortland to address concerns as design for this segment advances.

#	First Name	Last Name	Business/ Organization	Summary of Stakeholder Comments/Issues	Response/Status Update
043	J.P	Rose	Center for Biological Diversity	<p>Commenter requests delay of approval of the Final EIR/EIS until adequate mitigation measures are in place. Commenter states that clarifying revisions to BIO-MM#84 to specify that the survey methods for mountain lion dens prior to construction would be based on consultations with mountain lion experts and CDFW protocol are deferred mitigation. Commenter states that the mitigation for wildlife movement is inadequate for the over 55 miles of at-grade rail. Commenter states that design and implementation of tunnel and viaduct sections is not certain because there were changes in the Fresno to Bakersfield Project Section as design progressed that resulted in more embankment and less viaduct. Commenter states that BIO-MM#53 improperly defers mitigation because it states that the Compensatory Mitigation Plan to be prepared will include the ratios to be applied. Commenter states that compensatory mitigation should be protected in perpetuity and include long-term funding for monitoring. Commenter states that the movement needs and behaviors of target species should be taken into consideration when designing crossings, and that the recently published "Measures to Reduce Road Impacts on Amphibians and Reptiles in California (Langton & Clevenger, 2021) should be consulted. Commenter notes that Tejon Ranch Company has requested that the Authority work with it and other landowners to identify potentially suitable mitigation lands. Commenter stated that Joshua Tree recently became a candidate species under CESA and that the EIR/EIS should present an analysis of project impacts to Joshua Tree now that it is a candidate species and provide compensatory mitigation to offset project impacts. Commenter also asserted that the Final EIR/EIS does not contain a mitigation measure that would require surveys for Joshua Tree prior to construction. Commenter states that relocation of Joshua Trees that cannot be avoided would require a Section 2081 permit under the California Endangered Species Act. Commenter states that they were unable to access reports underlying the DEIR/EIS during the public comment period.</p>	<p>The commenter requested that the Board delay action on the project. Refer to Response to Comment 027 in this response table.</p> <p>The mitigation measures set forth in the Final EIR/EIS for biological resources are effective and will reduce impacts to less than significant. The Final EIR/EIS meets the requirements of CEQA and NEPA. There will be opportunities after Project approval to collaborate with the commenter and other stakeholders on wildlife crossing designs and compensatory mitigation.</p> <p>The commenter states that developing protocols for surveys later with CDFW is deferred mitigation. The Authority disagrees. As discussed in Response to Comment 970-1206, contained in Chapter 34 of the Final EIR/EIS, the Authority has committed to designing the wildlife crossings consistent with Section 7.3.4 of the WCA, Appendix I of the BARTR. Applicable mitigation measures to wildlife movement include BIO-MM#37, BIO-MM#64, BIO-MM#77, BIO-MM#78, BIO-MM#84, BIO-MM#85, BIO-MM#86, and BIO-MM#87 and provide mitigation for minimizing effects to wildlife movement during construction and establishing wildlife fencing, jump outs, and preconstruction mountain lion den surveys, core and patch replacement, and minimizing lighting. The mitigation measures clearly specify that surveys are required. As noted by the commenter, locating mountain lion dens is challenging; however, BIO-MM#84 commits to the use of the best available science and CDFW protocols in place at the time of start of construction.</p> <p>The commenter questions the adequacy and size of the proposed wildlife crossings along the Bakersfield to Palmdale alignment. Refer to Response to Comment 027 in this response table.</p> <p>The commenter states that mitigation ratios are not identified and potential compensatory mitigation locations are not provided. The Final EIR/EIS provides mitigation ratios. The statement in BIO-MM#53 is referring to a compilation of the mitigation ratios that were set out in the species and habitat specific compensatory mitigation measures (see BIO-MM#85: Provide Compensatory Mitigation for Impacts on Mountain Lion Core and Patch Habitat; BIO-MM#83: Provide Compensatory Mitigation for Impacts on Monarch Butterfly Breeding and Foraging Habitat; BIO-MM#70: Provide Compensatory Mitigation for Impacts on Tricolored Blackbird Habitat; BIO-MM#81: Provide Compensatory Mitigation for Impacts on Crotch Bumble Bee Habitat; BIO-MM#35: Implement Transplantation and Compensatory Mitigation Measures for Protected Trees; BIO-MM#46: Provide Compensatory Mitigation for Permanent Impacts on Riparian Habitat).</p> <p>BIO-MM#53 provides that habitat will be protected in perpetuity and that funding will be provided for long-term management and monitoring.</p> <p>The commenter states mitigation lands should be identified in concert with local agencies and organizations. The Authority intends to work with Tejon Ranch Company and other landowners. Refer to Response to Comment 706-280, contained in Chapter 25 of the Final EIR/EIS.</p> <p>The Final EIR/EIS fully evaluates impacts to Joshua Tree in the evaluation of impacts to the special-status "Joshua Woodlands" vegetation community. The Final EIR/EIS discloses that there would be 320 acres of permanent impacts to Joshua Tree woodlands. The Final EIR/EIS also provides for compensatory mitigation for Joshua Tree as a candidate species (1:1) and as a protected tree (3:1).</p> <p>The mitigation measure requiring plant surveys, BIO-MM#1 is applicable to Joshua Tree and requires presence/absence botanical field surveys for special-status plant species and special-status plant sensitive natural communities in all potentially suitable habitats within a Work Area. The measure further requires that the surveys be consistent with Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities (CDFW 2018) and Guidelines for Conducting and Report Botanical Inventories for Federally Listed, Proposed and Candidate Plants (USFWS 2001).</p> <p>The change in legal status for Joshua Tree does not require additional analysis or mitigation beyond what is contained in the Final EIR/EIS.</p> <p>The Authority agrees that relocation of Joshua Trees that cannot be avoided would require a Section 2081 permit.</p> <p>The commenter stated that supporting documentation was not available for review. This issue was addressed in Response to Comment 716-231, contained in Chapter 25 of the Final EIR/EIS. The public notice provided information on how to request the underlying technical documents.</p>
044	Janet	Cobb	California Wildlife Foundation/California Oaks	<p>The commenter expresses concern regarding potential impacts to oak woodlands. The commenter refers to comments made on the Draft EIR/EIS. Refer to Submission 783 in Chapter 25 of the Final EIR/EIS.</p>	<p>The Authority stands by its analysis as presented in the Final EIR/EIS. The analysis takes a more conservative approach than is suggested by the commenter and is more conservative than local ordinances and regulations. Refer to Responses to Comments 777-310 and 783-736, contained in Chapter 25 of the Final EIR/EIS, for more detailed information regarding the Authority's analysis.</p>
045	Diana	Frieling		<p>The commenter requested copies of project-related documents.</p>	<p>On the date of the request (August 19, 2021), the Authority offered to send the commenter electronic copies of the Final EIR/EIS on a flash drive. The Authority also informed the commenter that the document can be accessed online at the Authority's website.</p>

#	First Name	Last Name	Business/ Organization	Summary of Stakeholder Comments/Issues	Response/Status Update
046	Tracey	Jue	Los Angeles Sheriff's Department	The commenter expresses concern regarding potential impacts to police and emergency medical services in the Lancaster and Palmdale areas.	The commenter states that in Section 3.11.4.2 of the Final EIR/EIS, the document incorrectly states that Palmdale receives emergency medical services from the Kern County Fire Department. Palmdale is in Los Angeles County and would be serviced by the Los Angeles County Fire Department. This error has been corrected in the errata in Appendix E of this ROD. The commenter expresses concern regarding public safety and additional emergency service needs at rail crossings, and states that the information included in the Final EIR/EIS regarding the Lancaster and Palmdale stations for the Los Angeles County Sheriff's Department is not current. Refer to Impact Avoidance and Minimization Feature (IAMF) SS-IAMF#3, contained in Section 3.11.3.2 Impact Avoidance and Minimization Features in the Final EIR/EIS, for information regarding design features to reduce safety impacts at crossings. Refer to mitigation measure S&S-MM#1 contained in Section 3.11.6 Mitigation Measures in the Final EIR/EIS for information regarding mitigation for impacts to emergency services. The Authority looks forward to working with the Los Angeles County Sheriff's Department as project design advances.
047	Kristeen	Penrod	SC Wildlands	The commenter expresses concern regarding habitat and wildlife connectivity.	The commenter questions the adequacy and size of the proposed wildlife crossings along the Bakersfield to Palmdale alignment. Refer to Response to Comment 027 in this response table. The commenter states that during the design/build construction phase crossing locations could change. Refer to Response to Comment 027 in this response table. The commenter questions the WCA analysis. The Authority has responded to previous comment related to the scale of the analysis. Refer to Response to Comment 789-347 contained in Chapter 25 of the Final EIR/EIS. Also refer to Response to Comment 027 in this response table.
048	Lance	Hastings	California Manufacturers & Technology Association	The commenter expresses concern about the CalPortland Cement property and impacts to future operations.	The Authority has worked extensively with CalPortland to minimize potential project impacts. The Authority will continue to work with CalPortland to address concerns as design for this segment advances.
049	Bart	York	CalPortland Mojave Cement Plant	The commenter expresses concern about the CalPortland Cement property and future operations, as well as the safety of the rail line through the CalPortland property.	The Authority has worked extensively with CalPortland to minimize potential project impacts. The Authority will continue to work with CalPortland to address concerns as design for this segment advances.
050	Arthur	Sohikian	High Desert Corridor Joint Powers Authority	The commenter expresses support for the project.	Comment noted.
051	Tom	Lackey	California State Assembly	The commenter expresses concern about the CalPortland Cement property and future operations.	The Authority has worked extensively with CalPortland to minimize potential project impacts. The Authority will continue to work with CalPortland to address concerns as design for this segment advances.
052	T. Winston	Vickers	UC Davis Wildlife Health Center Mountain Lion Project	Commenter stated that the mitigation measures in the EIR/EIS are inadequate and vague and that the process of making materials available to the public for review has been inadequate. Commenter stated that the linkage through the Tehachapis is critical and that the EIR/EIS does not adequately address the negative impact on mountain lion.	The mitigation measures contain specific and enforceable actions to avoid, minimize and offset Project impacts. The commenter does not provide specific information regarding the mitigation measures that would warrant review or revision to any mitigation measure. Clear instructions were provided with the notice indicating that background technical reports supporting the DEIR/EIS and RDEIR/SDEIS were available to the public upon request. The local permeability analysis demonstrates that the interspersal of tunnels and viaducts (all of which have a height in excess of 15 feet) between portions of the alignment that are on embankment provide numerous crossing opportunities for mountain lion and mule deer. Significantly, the portion of the alignment that is most conducive to mountain lion movement is underground for 2.37 miles. Because of the highly permeable areas where tunnels and viaduct are located, it was determined that installation of five dual use crossings would reduce Project effects to approximate the baseline level. As such, more wildlife crossings sized for large mammals were not included. Additional measures to reduce effects of noise and light during operations were included in the Final EIR/EIS. BIO-MM#64: <i>Establish Wildlife Crossings</i> was expanded to add additional details on addressing lighting and sound impacts (including requirements for sound barriers where applicable) in wildlife crossings as well as the addition of the development of a monitoring and adaptive management plan to monitor the effectiveness and use of crossing designs. BIO-MM#87: <i>Implement Lighting Minimization Measures for Operations</i> was added to specify numerous measures to reduce facility and train lighting effects. The inclusion of additional measures to reduce effects of noise and light will substantially reduce potential effects on wildlife movement and habitat use. The cumulative effects of past, present, and reasonably foreseeable projects were fully considered in combination with the effects of the Project in chapter 3.19 of the Draft and Final EIR/EIS. The analysis recognized that the effects on biological resources from the combination of projects was cumulatively significant. However, based on the Project design features and mitigation measures, the analysis concluded that the Project did not cause a considerable contribution to that effect: "while disturbance to wildlife corridors from operations could combine with other regional projects' impacts to disrupt normal movement within wildlife corridors, the proposed improvements within the Bakersfield to Palmdale Project Section's contributions to these cumulative impacts would not be cumulatively considerable." See Section 3.19.5.7 of the Final EIR/EIS.

#	First Name	Last Name	Business/ Organization	Summary of Stakeholder Comments/Issues	Response/Status Update
053	Paul	Park	National Chavez Center	The commenter expresses concern regarding potential impacts to the La Paz National Historic Landmark District/National Monument.	<p>The commenter expresses concern regarding potential impacts to the La Paz National Historic Landmark District/National Monument. The Authority had responded to similar comments in Chapter 25 of the Final EIR/EIS (Submission 791). The significance of La Paz has been studied and evaluated in detail, as presented in the La Paz National Register of Historic Places nomination, the subsequent National Historic Landmark nomination and park foundation documents, and a Cultural Landscape Inventory prepared by the NPS. The character-defining features, boundary, significant themes, and periods of significance as defined in these studies were used in the FOE and the EIR/EIS (refer to the References section of the FOE). The studies identify and define the boundary of La Paz as a historic property and conclude that the current defined boundary includes all features that contribute to the historic property. The landscape inventory also concludes that the adjacent lands outside the boundary do not contribute to the significance of the historic property (NPS 2014: 13). The landscape inventory identifies many contributing elements and character-defining features, and the FOE identified which contributors and character-defining features could potentially be adversely affected by the project. The conclusion was that no physical alteration would occur to the boundary or contributing elements of the La Paz historic property within the boundary. With conditions imposed to address noise and visual elements, the FOE also concluded that the project would have no adverse effect on the setting or the character-defining features of La Paz. The analysis presented is therefore complete.</p> <p>The FOE presented the analysis of the potential noise and visual effects, and also provided visual simulations, showing the avoidance and minimization features in place. As the design progresses beyond 30 percent, the milestone reviews will include updating the visual simulations with the updated design data to ensure that the avoidance and minimization conditions are met. The berm itself will be consistent with existing hilly topography, scale, and native vegetation. The visual simulations depict what will be visible to observers from the various vantage points on the La Paz property, and this will continue to be updated in subsequent milestone reviews. The FOE concluded that the conditions imposed, including the soundwalls and vegetated berm, along with the other elements of the design refinements included in the Refined CCNM Design Option, would result in no adverse effect. SHPO concurred in the FOE findings. Refer to Response to Comment 791-396, contained in the Final EIR/EIS, as well.</p> <p>In the June 2021 MOA, the Authority has stipulated the continued engagement of consulting parties and milestone review of plans by the SHPO and consulting parties as the project design is advanced beyond its current level of 30 percent. The BETP will describe all minimization treatments and will include construction dust control and all other treatments identified for implementation at the La Paz historic property, as well as planning for response to unanticipated effects. It should be noted that Section 3.3 of this Final EIR/EIS discusses dust control measures that will be required of the project (AQ-IAMF#1) as well as regulatory requirements to control dust emissions (Section 3.3.2.3 of this Final EIR/EIS). Section 3.4.6.3 of this Final EIR/EIS discusses vibration impacts associated with the project are discussed under Impacts N&V #2 and N&V #5 and identifies that construction related and operations impacts would be less than significant with the implementation of Mitigation Measures N&V-MM #2 and N&V-MM #5, respectively. All potential impacts resulting from the Bakersfield to Palmdale Project Section known to the Authority have been disclosed.</p>
054	Arthur	Sohikian	North Los Angeles County Transportation Coalition	The commenter expresses support for the project.	Comment noted.
055	Scott	Wilk	California State Senate	The commenter expresses concern about the CalPortland Cement property and future operations.	The Authority has worked extensively with CalPortland to minimize potential project impacts. The Authority will continue working with CalPortland to address concerns as design for this segment advances.
056	J.J.	Murphy	City of Palmdale	The commenter expresses support for the project.	Comment noted.
057	Brittney	Poppell		Commenter requested information on the Right-of-Way Acquisition process.	The Authority is researching specific property information as requested and will follow up with the commenter.
058	OJ	Bautista		Commenter requests information related to an owned parcel.	The Authority is researching specific property information as requested and will follow up with the commenter.

APPENDIX E: ERRATA

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California High-Speed Rail Authority

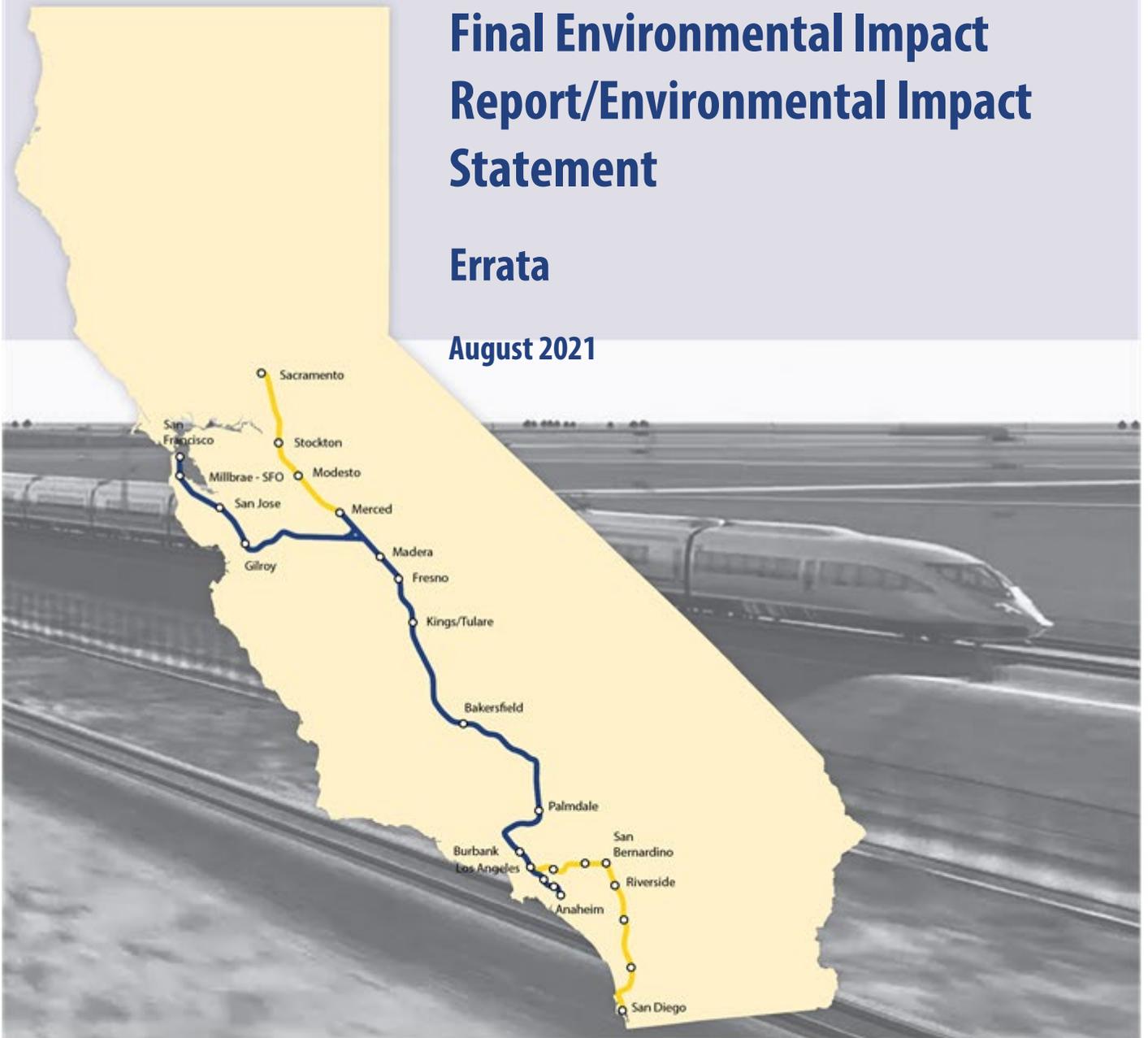
Bakersfield to Palmdale

Project Section

Final Environmental Impact Report/Environmental Impact Statement

Errata

August 2021



The environmental review, consultation, and other actions required by applicable Federal environmental laws for this project are being or have been carried out by the State of California pursuant to 23 U.S.C. 327 and a Memorandum of Understanding dated July 23, 2019, and executed by the Federal Railroad Administration and the State of California.

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ERRATA SHEET

The following items are herewith clarified and corrected (note corrected text in underline and strikethrough). Clarifications and corrections requiring underline and strikethrough text are indicated with a vertical line in the margin.

Table 1 Errata in the Final EIR/EIS

Number	Reference	Published Final EIR/EIS Text	Clarification of or Correction to Final EIR/EIS	Reason for Clarification or Correction
1	Title Page	Date of May 2021	Correction: Date of June 2021	Text correction. The Final EIR/EIS was published on June 25, 2021.
2	Preface, Page i	This document was not contained in Volume 1 of the Draft Environmental Impact Report/ Environmental Impact Statement (EIR/EIS), but it appeared on the California High-Speed Rail Authority (Authority) website as the “Guide to Reviewing.”	Correction: This document was not contained in Volume 1 of the Draft Environmental Impact Report/ Environmental Impact Statement (EIR/EIS), but it appeared on the California High-Speed Rail Authority (Authority) website as the “Guide to Reviewing <u>the Draft EIR/EIS</u> .”	Corrected incomplete title of referenced document.
3	Summary, Page S-4	Figure S-2 lists the F Street Station as “proposed”.	Correction: Figure S-2, in addition to Figures 1-3, 2-1, 2-50, 2-54, 2-65, and 8-1 should reflect that the F Street Station has been “approved.”	The F Street Station was approved by the Authority Board on October 16, 2018.
4	Summary, Page S-62	In Table S-5, AG-IAMF#2 through #5 are incorrectly numbered.	Correction: In Table S-5, the AG-IAMFs have been corrected as follows: AG-IAMF# 23 : Farmland Consolidation Program AG-IAMF# 34 : Notification to Agricultural Property Owners AG-IAMF# 45 : Temporary Livestock and Equipment Crossings AG-IAMF# 56 : Equipment Crossings	Text correction.
5	Summary, page S-108	Text designating mitigation measures as “F-B LGA” measures is missing from the table.	Clarification: Table S-8 identifies that SO-MM#3 applies to Impact SO#7: Displacement of the Bakersfield Homeless Shelter; Impact SO#7: Displacement of religious facilities; and Impact SO#7: Displacement of the Mercado Latino Tianguis. The table has been modified to clarify that this mitigation measure is <u>F-B LGA</u> SO-MM#3.	Text clarification.

Number	Reference	Published Final EIR/EIS Text	Clarification of or Correction to Final EIR/EIS	Reason for Clarification or Correction
6	Chapter 1, Page 1-2	Figure 1-1 says “Subject to Change”.	Clarification: Figure 1-1 is not subject to change.	Text clarification.
7	Chapter 2, page 2-73	AG-IAMF #2, Permit Assistance is erroneously listed in Section 2.4.2.1.	Correction: AG-IAMF#1: Restoration of Important Farmland Used for Temporary Staging Areas AG-IAMF#2: Permit Assistance AG-IAMF#3: Farmland Consolidation Program AG-IAMF#4: Notification to Agricultural Property Owners AG-IAMF#5: Temporary Livestock and Equipment Crossings AG-IAMF#6: Equipment Crossings	Text correction. AG-IAMF #2 was erroneously included in Chapter 2’s list of IAMFs. This IAMF does not apply.
8	Chapter 2, Page 2-74	On page 2-74, Biological Resources, for BIO-IAMF #3, the word “Water” was inadvertently used instead of “Worker”	Correction: BIO-IAMF#3: Prepare <u>Worker</u> Evaluation and Planning (WEAP) Training Materials and Conduct Construction Period WEAP Training	Text correction. “Water” replaced with “Worker” to correctly identify WEAP acronym.
9	Chapter 2, Page 2-75	HMW-IAMF #2: Landfill inadvertently included in list of IAMFs	Correction: HMW-IAMF#1: Property Acquisition Phase I and Phase II Environmental Site Assessments HMW-IAMF#2: Landfill HMW-IAMF#23: Work Barriers HMW-IAMF#34: Undocumented Contamination HMW-IAMF#45: Demolition Plans HMW-IAMF#56: Spill Prevention HMW-IAMF#67: Transport of Materials HMW-IAMF#78: Permit Conditions HMW-IAMF#89: Environmental Management System HMW-IAMF#940: Hazardous Materials Plans	Text correction. HMW-IAMF#2: Landfill inadvertently included in Chapter 2 list of IAMFs. This IAMF does not apply.
10	Section 3.2, page 3.2-26	Figure 3.2-2 Major Roadways and Rail Lines incorrectly listed the number of figure sheets.	Correction: The index map in Figure 3.2-2 identifies 13 figure sheets, whereas the figure only has 9 sheets.	Text correction that there are only 9 sheets.
11	Section 3.11, page 3.11-31	In Palmdale, emergency medical services are provided by the Kern County Fire Department, emergency medical service agencies, and independent ambulance services.	Correction: In Palmdale, emergency medical services are provided by the Kern Los Angeles County Fire Department, emergency medical service agencies, and independent ambulance services.	Text correction to state that the City of Palmdale is serviced by Los Angeles County Fire Department.

Number	Reference	Published Final EIR/EIS Text	Clarification of or Correction to Final EIR/EIS	Reason for Clarification or Correction
12	Section 3.15, pages 3.15-21, 3.15-41, 3.15-42	Section 3.15 discusses the Kern County Museum and the Metropolitan Recreation in the impact discussion for the Bakersfield F Street Station.	Clarification: The Kern County Museum and the Metropolitan Recreation Area are outside the geographic limits of, and would not be affected by, the Preferred Alternative. These properties were properly and fully evaluated in the Fresno to Bakersfield Section Final Supplemental EIR.	Clarification to address potential confusion.
13	Chapter 5, page 5-39	Inclusion of AG-IAMF#2	Correction: Chapter 5 incorrectly references AG-IAMF#2. The first paragraph under the “Economic and Other Effects” heading was revised to correctly reference AG-IAMF#5: However, these effects would not be adverse because the project’s potential impacts related to agricultural access and road closures would be minimized with the implementation of temporary livestock and equipment crossings (AG-IAMF#25), which would address potential effects of the closures of these unpaved dirt roads on local agricultural operations.	Text correction.
14	Chapter 6, page 6-7	Missing footnote to Table 6-3	Correction: “The ridership forecasts used in this environmental analysis correspond to forecasts in the 2016 Business Plan. For the year 2040, the “medium” ridership forecast assumed 42.8 million riders and the “high” ridership forecast assumes 56.8 million riders for Phase 1. For additional information, see Chapter 3.1, Introduction, of this EIR/EIS.”	Text correction. The footnote was inadvertently omitted from Chapter 6.
15	Volume 4, Chapter 25, page 25-181	Response 706-781 incorrectly states that the stakeholder declined to meet with the Authority.	Correction/Clarification: HSR’s Outreach team has contacted stakeholder to request meetings (most recently May 2019 and June 2020). Stakeholder has declined to meet.	Text correction. Multiple meetings between Tejon Ranch and Authority staff were held during the environmental process, including in March 2013, March 2015, February 2016, September 2016, May 2019, and June 2020.

Number	Reference	Published Final EIR/EIS Text	Clarification of or Correction to Final EIR/EIS	Reason for Clarification or Correction
16	Volume 4, Chapter 26, page 26-65	Response 796-538 is inadvertently omitted, with response 756-173 inadvertently copied in its place.	<p>Correction: Response to Submission 796 (blayneepps@gmail.com, April 23, 2020)</p> <p><u>796-538</u> Refer to Standard Response BP-Response-GENERAL-01: Alternatives.</p> <p>The commenter indicates that an alternative route is needed. The commenter is accurate in the statement that 65th Street in Rosamond would be replaced by cul-de-sacs at Fisher Avenue and that the HSR alignment would be at-grade in this location.</p>	Text correction.
17	Volume 4, Chapter 26, page 26-68	Response 799-676 is inadvertently omitted, with response 756-173 inadvertently copied in its place.	<p>Correction: Response to Submission 799 (Kirk Sunderman, March 5, 2020)</p> <p><u>799-676</u> Refer to Standard Response BP-Response-GENERAL-01: Alternatives.</p> <p>The commenter’s suggestion for a tunnel through Bakersfield from the Golden State NE location to a downtown station is acknowledged. Please refer to Chapter 2, Alternatives, Section 2.3.12, Range of Potential Alternatives Considered and Findings of the Draft EIR/EIS, for a detailed discussion of alternatives considered, alternatives withdrawn from further consideration, the reasons for their withdrawal, and alternatives ultimately carried forward in the EIR/EIS analysis. Additionally, Table 2-4 of this Bakersfield to Palmdale Project Section Final EIR/EIS summarizes the previous and current alternatives and lists reasons for the withdrawal of alternatives. Additionally, on October 16, 2018, the Authority Board certified the Fresno to Bakersfield Section Final Supplemental EIR (Authority 2018a) and approved the portion of the Fresno to</p>	Text correction

Number	Reference	Published Final EIR/EIS Text	Clarification of or Correction to Final EIR/EIS	Reason for Clarification or Correction
			Bakersfield Locally Generated Alternative from just north of Poplar Avenue in Kern County up to and including the F Street Station (specifically, to the intersection of 34th Street and L Street in Bakersfield). Additionally, as Fresno to Bakersfield Locally Generated Alternative, the Authority issued the combined Supplemental Record of Decision and Final Supplemental EIS dated October 31, 2019. The Authority, as NEPA federal lead agency, finalized the NEPA process for the Fresno to Bakersfield Locally Generated Alternative.	

Source: California High Speed Rail Authority, 2021

CEQA = California Environmental Quality Act

EIR/EIS = Environmental Impact Report/Environmental Impact Statement

F-B LGA = Fresno to Bakersfield Locally Generated Alternative

HSR = high-speed rail

IAMF = impact avoidance and minimization feature

LMF/MOIS/MOWF = light maintenance facility/maintenance of infrastructure facility/maintenance-of-way facility

Table 2 Errata in the Technical Report Supplements

Number	Reference	Published Technical Report Supplement Text	Clarification of or Correction to Technical Report Supplement	Reason for Clarification or Correction
1	Relocation Impact Report Technical Report Supplement, page 2-20 and 2-21	Placeholder text for Table 18 of the Relocation Impact Report Technical Report Supplement.	Correction: The Relocation Impact Report Technical Report Supplement included placeholder text at Table 18 that was to be updated prior to publication. The correct table is in the Final EIR/EIS (Table 3.12-18, page 3.12-86).	Text correction.
2	Community Impact Assessment Technical Report Supplement, page 2-32	Placeholder text for Table 26 of the Relocation Impact Report Technical Report Supplement.	Correction: The Community Impact Assessment Technical Report Supplement included placeholder text at Table 26 that was to be updated prior to publication. The correct table is in the Final EIR/EIS (Table 3.12-18, page 3.12-86).	Text correction.

Source: California High Speed Rail Authority, 2021

APPENDIX F: STATE HISTORIC PRESERVATION OFFICE SECTION 106 CONCURRENCE LETTER AND MEMORANDUM OF AGREEMENT, JUNE 22, 2021

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**DEPARTMENT OF PARKS AND RECREATION
OFFICE OF HISTORIC PRESERVATION**

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Lisa Ann L. Mangat, Director

March 8, 2020

Reference Number: FRA_2016_0906_001

Submitted Via Electronic Mail

Brett Rushing
Cultural Resources Program Manager
California High-Speed Rail Authority
770 L Street, Suite 620
Sacramento, CA 95814

Re: High-Speed Rail Program, Bakersfield to Palmdale Section – Request for Review and Comment on Section 106 Addendum Finding of Effect Report

Dear Mr. Rushing:

The California State Historic Preservation Officer (SHPO) is in receipt of your February 25, 2021 submittal continuing consultation regarding the Bakersfield to Palmdale project section of the California High-Speed Rail Program. This consultation is undertaken in accordance with the 2011 *Programmatic Agreement Among the Federal Railroad Administration, the Advisory Council on Historic Preservation, the California State Historic Preservation Officer, and the California High-Speed Rail Authority (Authority) regarding Compliance with Section 106 of the National Historic Preservation Act, as it pertains to the California High-Speed Train Project (PA)*. In support of this consultation, the Authority has prepared the following documents:

- *Bakersfield to Palmdale Project Section Addendum Finding of Effect Report* (January 2021: JRP Historical Consulting and LSA Associates)

The Section 106 Addendum Finding of Effect Report (Addendum FOE) is an addendum to the *Bakersfield to Palmdale Section: Section 106 Finding of Effect Report* (Authority 2020) The specific purpose of the Addendum FOE is to assess and report adverse effects on historic properties caused by various engineering refinements (“VERs APE Memorandum”) of the Bakersfield to Palmdale Project Section Preferred Alternative. Because these engineering refinements were not analyzed in the original FOE or the Bakersfield to Palmdale Project Section Draft Environmental Impact Report/Environmental Impact Statement (EIR/EIS), which was publicly circulated from February 28, 2020 to April 27, 2020, the Authority prepared the Addendum FOE.

This Addendum FOE presents the effect conclusions for three new built environment historic properties (i.e. 332 W. Lancaster Blvd., 44847 Trevor Ave., and the Cedar Ave Historic District) and two new archaeological sites (i.e. P-15-001042 and P-15-016253) identified in the VERs APE Memorandum and presents the effect conclusions for historic properties previously analyzed in the April 2020 FOE where the VERs APE Memorandum has revised the APE.

As of September 24, 2020, the built environment survey has been 100 percent completed for the properties identified by the VERs APE Memorandum. In sum, there are seven built-environment historic properties analyzed in this Addendum FOE. Three of the properties are newly identified and the remaining 4 were previously evaluated for project effects.

The enclosed addendum FOE assesses seven historic properties within the APE that have the potential to be affected by the proposed Bakersfield to Palmdale Project Section VERs. This addendum FOE follows the guidelines for documentation as required in the PA and 36 C.F.R. § 800.11 and analyzes anticipated effects on seven built-environment historic properties:

- Big Creek Hydroelectric System Historic District
- First Los Angeles Aqueduct
- Lancaster Post Office
- Western Hotel, Lancaster, Kern County
- Residence at 332 W. Lancaster Boulevard, Lancaster, Kern County
- Residence at 44847 Trevor Avenue, Lancaster, Kern County
- Cedar Avenue Historic District, Lancaster, Kern County

The addendum FOE concluded that the Big Creek Hydroelectric System Historic District will be adversely affected. The First Los Angeles Aqueduct, Lancaster Post Office, Western Hotel, 332 W. Lancaster Boulevard, 44847 Trevor Avenue, and the Cedar Avenue Historic District will not be adversely affected. These findings represent no change to the April 2020 FOE as the Authority had previously determined that the project would adversely effect the Big Creek Hydroelectric System and resolution of those effects would be included in the Memorandum of Agreement.

The Addendum FOE also presents the effect conclusions for 2 new archaeological sites, identified in the VERs APE Memorandum as P-15-001042/CA-Ker-1042 (prehistoric site), and P-15-016253/CA-KER-8486H (historic site). These two sites were previously identified by others, records for which are on file at the Southern San Joaquin Valley Information Center. These archaeological resources are currently unevaluated and presumed NRHP-eligible for planning purposes. As stipulated in the Section 106 PA (Stipulations VI.E and VIII.A.1), phased identification will be necessary as property access is granted, and additional archaeological resources may be identified during future phased identification and evaluation efforts.

In sum, there are now 42 archaeological historic properties in the Bakersfield to Palmdale Project Section APE. The effect conclusions for 40 of the archaeological historic properties would not change from what was previously described in the April 2020 FOE. 4(f) of the United States Department of Transportation Act of 1966 requires consultation with the SHPO, the official with jurisdiction over historic properties, as stipulated in 23 CFR § 774.17. The Authority is consequently notifying the SHPO of its intent to make a de minimis impact determination for Residence at 332 W. Lancaster Boulevard in accordance with 23 CFR § 774.5.

For historic properties, a de minimis impact determination under Section 4(f) is based on findings made in the Section 106 consultation process and can be made if the project will have no adverse effect on the historic property. The Authority has determined that 332 W. Lancaster Blvd will not be adversely affected and, therefore, will incur a de minimis use under Section 4(f). By concurring with the Authority's finding of no adverse effect under Section 106, the SHPO also concurs with this 4(f) determination.

Having reviewed your submittal, SHPO concurs with the Authority's Finding of Effect. Furthermore, SHPO also concurs with the Authority's 4(f) determination.

If you have any questions, please contact State Historian Tristan Tozer at (916) 445-7027 or Tristan.Tozer@parks.ca.gov.

Sincerely,



Julianne Polanco
State Historic Preservation Officer

**MEMORANDUM OF AGREEMENT
AMONG THE CALIFORNIA HIGH-SPEED RAIL AUTHORITY, THE SURFACE TRANSPORTATION BOARD,
THE CALIFORNIA STATE HISTORIC PRESERVATION OFFICER, AND
THE ADVISORY COUNCIL ON HISTORIC PRESERVATION
REGARDING THE BAKERSFIELD TO PALMDALE PROJECT SECTION OF THE
CALIFORNIA HIGH-SPEED RAIL PROGRAM
KERN AND LOS ANGELES COUNTIES, CALIFORNIA**

WHEREAS, the California High-Speed Rail Authority (Authority) proposes to construct the Bakersfield to Palmdale Project Section (the Undertaking), an approximately 80-mile portion of the California High-Speed Rail Program in Kern and Los Angeles Counties, which would consist of constructing a new rail alignment, stations, maintenance facilities, electrical substations, and other appurtenant facilities; and

WHEREAS, the Bakersfield to Palmdale Project Section was identified as an undertaking subject to review under Section 106 of the National Historic Preservation Act (54 United States Code [U.S.C.] § 306108) and its implementing regulations (36 Code of Federal Regulations [CFR] Part 800) in the *Programmatic Agreement among the Federal Railroad Administration, the Advisory Council on Historic Preservation, the California State Historic Preservation Officer, and the California High-Speed Authority regarding compliance with Section 106 of the National Historic Preservation Act as it pertains to the California High-Speed Train Project (PA)*, executed on July 22, 2011 (**Attachment 1**); and

WHEREAS, the Authority has coordinated compliance with Section 106 and 36 CFR Part 800 with steps taken to meet the requirements of the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA) and has planned public participation, analysis, and review in such a way to satisfy the requirements of each statute; and

WHEREAS, on July 23, 2019, the State of California and the Federal Railroad Administration (FRA) executed a memorandum of understanding under the Surface Transportation Project Delivery Program (known as NEPA Assignment), pursuant to the legal authority under 23 U.S.C. §327; and under NEPA Assignment, the State, acting through the California State Transportation Agency and the Authority, assumed FRA's responsibilities under NEPA and other federal environmental laws, including Section 106; and

WHEREAS, government-to-government consultation with federally recognized Native American tribes remains the FRA's responsibility under NEPA Assignment; and

WHEREAS, on April 18, 2013, the Surface Transportation Board (STB) issued a decision concluding that it has jurisdiction over the construction of the California High-Speed Rail Program, requiring the Authority to obtain STB approval for the construction of each project section, and STB subsequently designated FRA lead agency to act on its behalf for the purposes of compliance with Section 106 for High-Speed Rail Program undertakings; and the Authority invited STB to be an Invited Signatory to this memorandum of agreement (MOA); and

WHEREAS, implementation of the Undertaking would require construction on federal lands under the jurisdiction of the Bureau of Land Management (BLM), a consulting party to the Undertaking that has been invited to sign this MOA as a concurring party; and

WHEREAS, the Undertaking would be designed and constructed using a design-build procurement process, in which the current level of design is generally 15 percent complete (approximately 30 percent

complete in the vicinity of César E. Chávez National Monument/Nuestra Señora Reina de La Paz National Historic Landmark [La Paz]), and which the Authority's design-build contractor (the Contractor) will advance to 100 percent, potentially resulting in changes to the project footprint; and

WHEREAS, the Authority has delineated the Area of Potential Effects (APE) for the Undertaking based on the current level of design in accordance with Stipulation VI.A of the PA to encompass the geographic areas within which the Undertaking may directly or indirectly cause alterations in the character or use of historic properties, as depicted in **Attachment 2**; and

WHEREAS, the Authority surveyed the APE for built-environment resources and, in consultation with the California State Historic Preservation Officer (SHPO) and other consulting parties, determined that the APE contains 21 built-environment historic properties listed in or considered eligible for listing in the National Register of Historic Places (NRHP) (listed in **Attachment 3**), including one property that is also designated a National Historic Landmark and National Monument (La Paz); and

WHEREAS, the Authority has surveyed approximately 16 percent of the project footprint for archaeological resources and, in consultation with the SHPO and other consulting parties, determined that the APE contains 42 archaeological historic properties (listed in **Attachment 3**) that are currently unevaluated and presumed NRHP-eligible for planning purposes; and

WHEREAS, the Authority proposes to phase the identification and evaluation of archaeological historic properties as provided for in Stipulation VI.E of the PA and 36 CFR 800.4(b)(2); and

WHEREAS, on August 24, 2016, the FRA notified the Secretary of the Interior (represented by the National Park Service [NPS]) of the potential for the Undertaking to adversely affect La Paz and invited the Secretary to participate in the consultation, pursuant to PA Stipulation VII.B and 36 CFR 800.10(c); and the NPS elected to participate in the consultation on March 16, 2017, and as a consulting party has been invited to sign this MOA as a concurring party; and

WHEREAS, the Advisory Council on Historic Preservation (ACHP) notified the FRA that the ACHP would participate in consultation regarding the Undertaking on February 4, 2019; and

WHEREAS, the Authority, in consultation with the SHPO, Invited Signatories and other consulting parties, determined that the Undertaking may have an adverse effect on three (3) built-environment historic properties (Republic Supply Company, Kern County Land Company Warehouse, and Big Creek Hydroelectric System Historic District), no adverse effect on 17 built-resource historic properties, a conditional no adverse effect on one (1) built-environment historic property, and no effect on three (3) of the 42 recorded archaeological historic properties, as documented in the Finding of Effect (FOE) reports for the Bakersfield to Palmdale Project Section and the Fresno to Bakersfield Project Section Locally Generated Alternative, and as listed in **Attachment 3** of this MOA; and the Authority will phase the evaluation and effects assessment for the remaining 39 archaeological properties that have been identified in the APE; and

WHEREAS, the Authority prepared a draft FOE report concluding that the Undertaking would result in unavoidable adverse effects on La Paz; however, some consulting parties disagreed with the Authority's conclusions; and in response to those concerns, the Authority conducted extensive additional consultation and changed the design of the Undertaking to avoid adversely affecting La Paz; and

WHEREAS, the Authority determined that the Undertaking would result in no adverse effect to La Paz conditioned on subsequent review of project design by the SHPO, ACHP, Invited Signatories, and other

consulting parties and through the design and construction of the Undertaking in a manner that would ensure the continued protection of La Paz (as outlined in Stipulation IV.C of this MOA), to which the NPS agreed on January 29, 2020; to which the National Chávez Center, César Chávez Foundation, and National Trust for Historic Preservation (as consulting parties to the Undertaking) disagreed on January 30, 2020; and to which the SHPO concurred on June 23, 2020; and

WHEREAS, the Authority will ensure the avoidance, minimization, or resolution of adverse effects of the Undertaking on historic properties through the execution and implementation of this MOA and the implementation of the Archaeological Treatment Plan (ATP; **Attachment 4**) and the Built Environment Treatment Plan (BETP; **Attachment 5**); and

WHEREAS, because the Contractor has not yet been selected, the Authority shall ensure that the terms of this MOA, ATP, and BETP are incorporated in their entirety in all contracts, licenses, or other approvals for this undertaking, with the intent to bind the Contractors to compliance with this MOA, ATP, and BETP; and

WHEREAS, in accordance with Stipulation V.A and V.B of the PA, the Authority has consulted with agencies with jurisdiction over portions of the APE and other parties with a demonstrated interest in the undertaking, a legal or economic relation to an affected historic property, or concern with the Undertaking's effects on historic properties, as noted in **Attachment 6**, about the Undertaking and its effects on historic properties and has taken into account all comments received from them; and

WHEREAS, in accordance with Stipulation IV.A.5 and IV.C.2 of the PA, the FRA, with the support of and in coordination with the Authority, has formally consulted with or has made a good faith effort to formally consult with the federally recognized Native American tribes that may attach religious and cultural significance to historic properties within the APE of the Undertaking; the federally recognized tribes that have chosen to participate in the consultation are identified in **Attachment 7**; and

WHEREAS, in accordance with Stipulation IV.B.5, IV.C.1, and IV.C.2 of the PA, the Authority has consulted with or made a good faith effort to consult with California Native American tribes that are on the Native American Heritage Commission's consultation list that are traditionally and culturally affiliated with the APE of the Undertaking; the California Native American tribes that have chosen to participate in the consultation are identified in **Attachment 7**; and

WHEREAS, the parties listed in Attachments 6 and 7 have accepted the Authority's invitation to be consulting parties to the Undertaking (collectively referred to as the Consulting Parties); and

WHEREAS, the Authority sought and considered the views of the public on this Undertaking through its public involvement program as part of the environmental review process and requirements of NEPA and CEQA, as described in the Environmental Impact Report/Environmental Impact Statement (EIR/EIS) for the Undertaking, which included distributing informational materials to the public, making presentations and soliciting comments at public meetings, and circulating the draft and final EIR/EIS and supporting technical reports for public review and comment; and

WHEREAS, the Authority, SHPO, and ACHP are collectively referred to as the Signatories; STB is referred to as an Invited Signatory; and

WHEREAS, the Consulting Parties have been invited to sign this MOA as concurring parties; and

NOW, THEREFORE, the Authority, SHPO, and ACHP agree the Undertaking will be implemented in accordance with the following stipulations in order to take into account the effects of the Undertaking on historic properties, and further agree that these stipulations shall govern the Undertaking and all its parts until this MOA expires or is terminated.

STIPULATIONS

The Authority, with the assistance of its contractors, shall ensure that the following stipulations of this MOA are carried out:

I. OVERSIGHT AND COORDINATION

The Authority, as the lead federal agency, will be responsible for ensuring compliance with all stipulations of this MOA, with the exception of government-to-government consultation with federally recognized Native American tribes, which remains the FRA's responsibility under NEPA Assignment.

The Authority shall ensure that the terms of this MOA, including the ATP and BETP, are incorporated in their entirety in all contracts, licenses, or other approvals for this Undertaking and shall ensure the completion of all measures specified in this MOA, including in the ATP and BETP.

The Authority shall ensure that it carries out its responsibilities under the PA (as may be amended from time to time) and any subsequent programmatic agreements regarding compliance with Section 106, to the extent such responsibilities are applicable to the Undertaking and in effect.

II. MODIFICATIONS TO THE AREA OF POTENTIAL EFFECTS

In accordance with the PA, the APE was developed and agreed upon by the Authority and the SHPO, and accounts for potential impacts on both archaeological and built-environment resources that may result from the construction and operation of the Undertaking.

If modifications to the Undertaking, subsequent to the execution of this MOA, necessitate the revision of the APE, the Authority is responsible for informing the Signatories, Invited Signatories, consulting federally-recognized Native American tribes, and other Consulting Parties within 15 days of identification of the needed changes in accordance with PA Stipulation VI. The Authority shall document the revised APE in an appropriate supplemental identification report (e.g., APE Modification Memo, addendum Archaeological Survey Report, and/or addendum Historic Architecture Survey Report). The SHPO will have 30 days to review the modified APE. If the SHPO objects to the modified APE, the Authority will revise the APE based upon SHPO comments and resubmit for review. The SHPO will have 30 days to review and comment on this revised APE.

III. COMPLETION OF HISTORIC PROPERTIES IDENTIFICATION EFFORT PRIOR TO CONSTRUCTION

The Authority will ensure that any additional historic property identification efforts are completed as outlined below and that documentation of the identification efforts is prepared in accordance with this MOA, including the ATP and BETP and PA Stipulation VI. The Authority will submit documentation of these efforts to the SHPO, Invited Signatories and other interested Consulting Parties for a 30-day review period. Prior to finalizing any inventory and evaluation documentation, the Authority shall consider the comments regarding identification efforts that are received through this consultation process.

Completion of the historic properties identification effort will be consistent with Stipulation VI (Identification of Historic Properties) and IX (Changes in Ancillary Area/Construction ROW) of the PA, including archaeological survey of areas not previously accessible/surveyed prior to construction. The Authority shall provide the Signatories, Invited Signatories and other Consulting Parties with the information necessary to document that efforts to identify and evaluate historic properties in the Undertaking's APE are sufficient to comply with 36 CFR § 800.4(b) and (c).

The Authority will ensure that addendum FOEs (aFOE) are prepared, in accordance with PA Stipulation VII, once supplemental historic property identification efforts are completed. The Authority will submit aFOEs to the Signatories, Invited Signatories and other Consulting Parties with an interest in the historic property for a concurrent 30-day review period. The Authority shall take into consideration all comments regarding effects received within the review period prior to finalizing aFOEs for submission to the SHPO for review and concurrence. The SHPO shall have an additional 30 days to review final aFOE reports. If the SHPO makes no objection within the final 30-day review period, the findings for resources documented in the aFOE will become final.

IV. TREATMENT OF HISTORIC PROPERTIES IDENTIFIED IN THE APE

This MOA outlines the Authority's commitments regarding the treatment of all historic properties, both currently known and yet-to-be-identified, that may be affected by the Undertaking. As allowed under Stipulation VI.C of the PA, this MOA includes provisions for treatment plans that include use of a combined archaeological testing and data recovery program. Two detailed historic property treatment plans have been prepared for the Undertaking: the ATP and the BETP.

The ATP (**Attachment 4**) describes treatments for effects on archaeological properties and Native American traditional cultural properties. The BETP (**Attachment 5**) describes the treatments for effects on the built environment resources. The work described in the treatment plans will be conducted prior to construction, during construction, and/or after construction of the Undertaking. The treatments to historic properties known at the time of execution of this MOA are summarized in an impact/treatment table, organized by historic property, in **Attachment 3**. The treatment measures listed will be applied to historic properties affected in order to avoid, minimize, and/or mitigate effects of the Undertaking. The Authority shall implement and complete the treatment measures within two (2) years of completion of construction of the Undertaking, or earlier if so specified. The Authority shall ensure that sufficient time and funding are provided to complete all necessary preconstruction commitments before disturbances related to the Undertaking occur.

A. Archaeological Treatment Plan

The ATP describes in detail the methods that will be employed to complete the historic properties identification effort within the Undertaking's APE as part of the phased identification of archaeological resources. More specifically, the ATP builds upon the identification efforts completed to date and specifies where and under what circumstances further efforts to identify significant archaeological deposits will take place within the Undertaking's areas of physical impact.

The ATP also describes in detail the avoidance, minimization, and/or mitigation treatment measures for all currently known and yet-to-be-identified significant archaeological resources and Native American cultural resources affected by the Undertaking. Additional measures to avoid, minimize, or mitigate adverse effects on archaeological historic properties may be

developed in consultation with Consulting Parties as identification and evaluation efforts are performed in future planning and construction phases of the Undertaking. The Authority commits to implementing the terms of the ATP.

The SHPO, Invited Signatories and other Consulting Parties with an interest in archaeological resources shall have the opportunity to review and comment on cultural resources documentation specified in the ATP in accordance with Stipulation VI of this MOA.

B. Built Environment Treatment Plan

The BETP provides detailed descriptions of treatment measures for built environment historic properties located within the APE that may be affected by the Undertaking. The treatments will be carried out by qualified professionals pursuant to Stipulation III of the PA. The treatment measures are included in the BETP and are intended to avoid, minimize, and/or mitigate adverse effects caused by the Undertaking. The Authority commits to implementing the terms of the BETP.

The Authority shall provide documentation produced under the BETP to the SHPO, Invited Signatories and other Consulting Parties with an interest in historic properties included in the BETP for review and comment in accordance with Stipulation VI of this MOA.

C. Conditions for the Treatment of La Paz

To ensure the Undertaking will result in no adverse effect to La Paz, the Authority shall convene and consult with a La Paz treatment oversight panel (La Paz TOP) as the design, planning, and construction of the Undertaking advances to ensure the continued protection of La Paz, as stipulated in the BETP and in IV.C.1-3, below.

1. Continued Consultation

- a. Members of the La Paz TOP will include the Authority, ACHP, SHPO, National Chávez Center, César Chávez Foundation, NPS, National Trust for Historic Preservation, and National Parks Conservation Association.
- b. The Authority will establish an outreach schedule in consultation with the La Paz TOP members that will be integrated in the future design and construction schedules. As project design advances, the Authority will seek the input of the La Paz TOP members before project design reaches 60 percent and 90 percent. The Authority shall afford the La Paz TOP members the opportunity to review and comment on project design documentation at approximately 60 percent and 90 percent development levels, in accordance with Stipulation IV.C.2 below. The Authority will also provide the La Paz TOP the opportunity to review construction planning materials for activities that have the potential to affect La Paz (e.g. Fugitive Dust Control Plan, Noise and Vibration Technical Memorandum, and Construction Traffic Plan). The scope of the La Paz TOP members' review and comment will be the assessment of potential adverse effects to La Paz as project design advances and construction planning materials are developed.
- c. The Authority shall consider comments received in developing final plans for the Undertaking, in accordance with Stipulation IV.C.2, below.

- d. If, through the design process or during construction or operation of the Undertaking, the Authority determines the Undertaking would result in adverse effects on La Paz, the Authority shall consult with the La Paz TOP members to avoid, minimize, or mitigate adverse effects.
- e. Disputes arising from consultation related to La Paz shall be resolved in accordance with Stipulation VII.A of this MOA.
- f. By January 31 of each year, the Authority will prepare a report of project activities related to La Paz, including any unanticipated damage caused by the Undertaking, that took place during the previous calendar year, and subsequently distribute this report to the La Paz TOP.

2. Review Process

The Authority will submit design and planning documentation for portions of the Undertaking that have the potential to affect La Paz, including 60 and 90 percent design development documentation, to the La Paz TOP for review and comment as the documentation becomes available.

- a. The Authority will notify the La Paz TOP of the upcoming availability of design and planning documentation at least one week before the documentation is made available for review.
- b. The Authority will develop and provide La Paz TOP members additional visualization materials and documentation to inform the review of engineering design documentation.
- c. For each review period, the La Paz TOP members will have 30 calendar days from receipt of a printed or electronic copy of the materials to provide written comments to the Authority. If requested by a La Paz TOP member, the Authority will coordinate a virtual or in-person meeting during the review period to present and review the documentation.
- d. If the La Paz TOP members do not comment within 30 days, the documentation will be considered final. If any La Paz TOP member provides comments within the 30-day review period, the Authority will take the comments into consideration and may make revisions before finalizing the documentation. The Authority will consider an extension to the 30-day review period if requested by a La Paz TOP member.
- e. If the Authority determines that the developing project designs have the potential to cause adverse effects to La Paz, the Authority will prepare an aFOE and continue consultation with the La Paz TOP members, in accordance with the BETP, before design is advanced further. The Authority will transmit the aFOE to the La Paz TOP members for a 30-day review and comment period. The Authority shall ensure that comments are considered prior to finalizing the aFOE report for submission to the SHPO for review and concurrence. The SHPO shall have an additional 30 days to review the final aFOE report. If the SHPO makes no objection within the final 30-day review period, the findings for those resources would become final. If SHPO objects,

the Authority will follow the dispute resolution procedures identified in Stipulation VII.a. of this MOA.

3. Avoidance and Minimization Features

The Authority has identified property-specific and programmatic Impact Avoidance and Minimization Features (IAMF) to ensure the Undertaking would result in no adverse effect to La Paz, as outlined in the BETP.

- a. The Authority will ensure that the IAMFs are incorporated into project design and construction contracts for the Undertaking.
- b. In consultation with the Signatories, Invited Signatories and other Consulting Parties, the Authority will ensure that the IAMFs are implemented during the appropriate design, construction, and operational phases of the Undertaking.
- c. The Authority may revise the IAMFs or develop additional IAMFs to ensure the Undertaking would result in no adverse effect on La Paz, in accordance with Stipulation VII.B below.

V. POST-REVIEW DISCOVERIES

If properties are discovered that may be historically significant or unanticipated effects on historic properties are found, the Authority shall follow the processes detailed in the ATP and BETP.

VI. PREPARATION AND REVIEW OF DOCUMENTS

A. Professional Qualifications

The Authority shall ensure that all cultural resources studies carried out pursuant to this MOA are performed by or under the direct supervision of personnel meeting *The Secretary of the Interior's Professional Qualifications Standards* (48 Federal Register 44738-39) in the disciplines of history, architectural history, historic architecture, and/or archaeology, as appropriate.

B. Confidentiality

The Signatories and Invited Signatories acknowledge that the handling of documentation regarding historic properties covered by this MOA are subject to the provisions of Section 304 of the National Historic Preservation Act of 1966 (54 U.S.C. 307103) and Section 6254.10 of the California Government Code (Public Records Act).

C. Review

Unless otherwise specified, parties to this MOA will have 30 calendar days from receipt to provide the Authority comments on all technical materials, findings, and other documentation arising from this MOA. If no comments are received from a party within the 30-calendar-day review period, the Authority may assume that the non-responsive party has no comment. The Authority shall take into consideration all comments received in writing within the 30-

calendar-day review period and may make revisions before finalizing the documentation.

For documentation that is amended or revised, the Authority will prepare a comment and response summary or matrix and provide it to Signatories, Invited Signatories and other Consulting Parties.

If a party to this MOA objects to documentation provided for review within 30 calendar days of the receipt of any submissions, the Authority shall resolve the objection in accordance with Stipulation VII.A, below.

D. Electronic Submittals

Unless otherwise requested, documentation produced under this MOA will be distributed electronically. Additionally, electronic mail may serve as an official method of communication regarding this MOA.

VII. ADMINISTRATIVE STIPULATIONS

A. Dispute Resolution

Should any Signatory, Invited Signatory or other Consulting Party object at any time to any actions proposed or the manner in which the terms of this MOA are implemented, the Authority shall consult with such party to resolve the objection. If the Authority determines that such objection cannot be resolved, the Authority will:

1. Forward all documentation relevant to the dispute, including the Authority's proposed resolution, to the ACHP. The Authority will also provide a copy to all Signatories, Invited Signatories and other Consulting Parties with a demonstrated interest in the affected property or subject of the dispute. The ACHP shall provide the Authority with its advice on the resolution of the objection within 30 days of receiving adequate documentation. Prior to reaching a final decision on the dispute, the Authority shall prepare a written response that takes into account any advice or comments regarding the dispute from the ACHP, Signatories, Invited Signatories and interested Consulting Parties, and provide them with a copy of this written response. The Authority will then proceed according to its final decision.
2. If the ACHP does not provide its advice regarding the dispute within the 30-day time period, the Authority may make a final decision on the dispute and proceed accordingly. Prior to reaching such a final decision, the Authority shall prepare a written response that takes into account any comments regarding the dispute from the Signatories, Invited Signatories and other Consulting Parties with a demonstrated interest in the affected property or subject of the dispute and provide them and the ACHP with a copy of such written response.
3. The Authority's responsibility to carry out all other actions subject to the terms of this MOA that are not the subject of the dispute remains unchanged.

B. Amendment to the MOA and Revisions to Attachments

This MOA may be amended by written request from any Signatory or Invited Signatory. Consulting parties shall be afforded 30 days to review and comment on any proposed amendments to this MOA. The Signatories and Invited Signatories shall take into consideration all comments received prior to executing an amendment. The amendment will be effective when all Signatories and Invited Signatories that signed the original agreement, sign a copy of the amendment.

Notwithstanding the prior paragraph, to address changes in the Undertaking or the treatment of historic properties affected by the Undertaking, the Authority may revise the ATP, the BETP, or other attachments to this MOA in consultation with the Signatories, Invited Signatories and other Consulting Parties, without executing a formal amendment to this MOA. The Authority shall provide proposed ATP or BETP revisions to the Signatories, Invited Signatories and other Consulting Parties with an interest in historic properties that may be affected by the proposed revisions for a 30-day review. The Signatories shall take into consideration all timely comments received prior to agreeing to the revisions. Upon the written concurrence of all the Signatories, such revisions to the ATP, the BETP, or other attachments shall take effect and be considered a part of this MOA.

C. Termination

If any Signatory or Invited Signatory determines that its terms will not or cannot be carried out, that party shall immediately consult with the other Signatories and Invited Signatories to attempt to resolve the issue under Stipulation VII.A, above, or to develop an amendment under Stipulation VII.B, above. If within 30 days (or another time period agreed to by all Signatories and Invited Signatories) an amendment cannot be reached, any Signatory or Invited Signatory may terminate this MOA upon written notification to the other Signatories and Invited Signatories. Termination hereunder shall render this MOA without further force or effect.

If this MOA is terminated, and the Authority determines that the Undertaking will proceed, the Authority must either execute a new MOA pursuant to 36 CFR § 800.6 prior to proceeding further with the Undertaking or follow the procedures for termination of consultation pursuant to 36 CFR § 800.7. The Authority shall notify the Signatories, Invited Signatories and other Consulting Parties as to the course of action it will pursue.

D. Duration

If the Authority determines that construction of the Undertaking has not been completed within 10 years following execution of this MOA, the Signatories and Invited Signatories shall consult to reconsider its terms. Reconsideration may include continuation of the MOA as originally executed, amendment, or termination.

This MOA will be in effect through the Authority's implementation of the Undertaking and will terminate and have no further force or effect when the Authority, in consultation with the other Signatories and Invited Signatories, determines that the terms of this MOA have been fulfilled in a satisfactory manner. The Authority shall provide the other Signatories and Invited Signatories with written notice of its determination and of termination of this MOA.

E. Reporting

The Authority shall prepare an annual report documenting the implementation of the actions taken under this MOA. The annual report shall include specific lists of studies, reports, actions, evaluations, and consultation and outreach efforts related to implementation of this MOA. The Authority will provide this annual report to the Signatories, Invited Signatories and other Consulting Parties. If requested by the Signatories, Invited Signatories or other Consulting Parties, the Authority will coordinate a meeting or call to discuss this annual report.

VIII. EFFECTIVE DATE AND EXECUTION

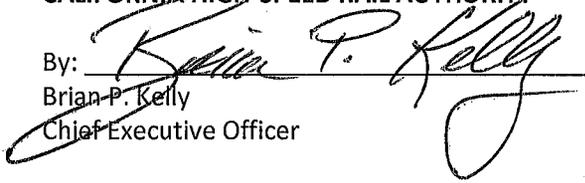
This MOA may be executed in counterparts, with a separate page for each Signatory, and will take effect on the latest date of execution by the Authority, SHPO, and ACHP. STB signature is not required to execute this MOA or for its effectiveness. Separate concurrence pages may also be provided for each Concurring Party. The Authority shall ensure that each Signatory, Invited Signatory, and Concurring Party is provided with a copy of the fully executed MOA. The refusal of any Concurring Party to sign this MOA shall not invalidate this MOA or prevent this MOA from taking effect.

Execution of this MOA by the Authority, SHPO, and ACHP and implementation of its terms evidence that the Authority has taken into account the effects of this undertaking on historic properties and afforded the ACHP an opportunity to comment.

**MEMORANDUM OF AGREEMENT
AMONG THE CALIFORNIA HIGH-SPEED RAIL AUTHORITY, THE SURFACE TRANSPORTATION BOARD,
THE CALIFORNIA STATE HISTORIC PRESERVATION OFFICER, AND
THE ADVISORY COUNCIL ON HISTORIC PRESERVATION
REGARDING THE BAKERSFIELD TO PALMDALE PROJECT SECTION OF THE
CALIFORNIA HIGH-SPEED RAIL PROGRAM
KERN AND LOS ANGELES COUNTIES, CALIFORNIA**

SIGNATORIES:

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

By:  Date: June 17, 2021
Brian P. Kelly
Chief Executive Officer

CALIFORNIA STATE HISTORIC PRESERVATION OFFICER

By:  Date: June 18, 2021
Julianne Polanco
State Historic Preservation Officer

ADVISORY COUNCIL ON HISTORIC PRESERVATION

By:  Date: June 22, 2021
Reid J. Nelson
Acting Executive Director

INVITED SIGNATORY:

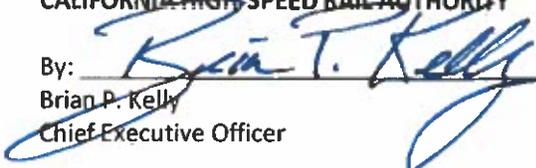
SURFACE TRANSPORTATION BOARD

By: _____ Date: _____
Danielle Gosselin
Acting Director, Office of Environmental Analysis

**MEMORANDUM OF AGREEMENT
AMONG THE CALIFORNIA HIGH-SPEED RAIL AUTHORITY, THE SURFACE TRANSPORTATION BOARD,
THE CALIFORNIA STATE HISTORIC PRESERVATION OFFICER, AND
THE ADVISORY COUNCIL ON HISTORIC PRESERVATION
REGARDING THE BAKERSFIELD TO PALMDALE PROJECT SECTION OF THE
CALIFORNIA HIGH-SPEED RAIL PROGRAM
KERN AND LOS ANGELES COUNTIES, CALIFORNIA**

SIGNATORIES:

CALIFORNIA HIGH SPEED RAIL AUTHORITY

By: 
Brian P. Kelly
Chief Executive Officer

Date: April 8, 2021

CALIFORNIA STATE HISTORIC PRESERVATION OFFICER

By: _____ Date: _____
Julianne Polanco
State Historic Preservation Officer

ADVISORY COUNCIL ON HISTORIC PRESERVATION

By: _____ Date: _____
Reid J. Nelson
Acting Executive Director

INVITED SIGNATORY:

SURFACE TRANSPORTATION BOARD

By: 
Danielle Gosselin
Acting Director, Office of Environmental Analysis

**MEMORANDUM OF AGREEMENT
AMONG THE CALIFORNIA HIGH-SPEED RAIL AUTHORITY, THE SURFACE TRANSPORTATION BOARD,
THE CALIFORNIA STATE HISTORIC PRESERVATION OFFICER, AND
THE ADVISORY COUNCIL ON HISTORIC PRESERVATION
REGARDING THE BAKERSFIELD TO PALMDALE PROJECT SECTION OF THE
CALIFORNIA HIGH-SPEED RAIL PROGRAM
KERN AND LOS ANGELES COUNTIES, CALIFORNIA**

CONCURRING PARTIES:

BUREAU OF LAND MANAGEMENT

By: _____ Date: _____
Name
Title

NATIONAL PARK SERVICE

CINDY ORLANDO Digitally signed by CINDY ORLANDO
By: _____ Date: 2021.04.22 16:38:17 -07'00' Date: _____
Name Cindy Orlando,
Title Acting Regional Director, NPS, Interior Regions 8, 9, 10, and 12

LOS ANGELES COUNTY DEPARTMENT OF REGIONAL PLANNING

By: _____ Date: _____
Name
Title

CÉSAR CHÁVEZ FOUNDATION

By: _____ Date: _____
Name
Title

NATIONAL CHÁVEZ CENTER

By: _____ Date: _____
Name
Title

**MEMORANDUM OF AGREEMENT
AMONG THE CALIFORNIA HIGH-SPEED RAIL AUTHORITY, THE SURFACE TRANSPORTATION BOARD,
THE CALIFORNIA STATE HISTORIC PRESERVATION OFFICER, AND
THE ADVISORY COUNCIL ON HISTORIC PRESERVATION
REGARDING THE BAKERSFIELD TO PALMDALE PROJECT SECTION OF THE
CALIFORNIA HIGH-SPEED RAIL PROGRAM
KERN AND LOS ANGELES COUNTIES, CALIFORNIA**

NATIONAL PARKS CONSERVATION ASSOCIATION

By: _____ Date: _____
Name
Title

NATIONAL TRUST FOR HISTORIC PRESERVATION

By: _____ Date: _____
Name
Title

SOUTHERN CALIFORNIA EDISON

By: _____ Date: _____
Name
Title

PICAYUNE RANCHERIA OF CHUKCHANSI INDIANS

By: _____ Date: _____
Name
Title

SAN MANUEL BAND OF MISSION INDIANS

By: _____ Date: _____
Name
Title

SANTA ROSA RANCHERIA TACHI-YOKUT TRIBE

By: _____ Date: _____
Name
Title

**MEMORANDUM OF AGREEMENT
AMONG THE CALIFORNIA HIGH-SPEED RAIL AUTHORITY, THE SURFACE TRANSPORTATION BOARD,
THE CALIFORNIA STATE HISTORIC PRESERVATION OFFICER, AND
THE ADVISORY COUNCIL ON HISTORIC PRESERVATION
REGARDING THE BAKERSFIELD TO PALMDALE PROJECT SECTION OF THE
CALIFORNIA HIGH-SPEED RAIL PROGRAM
KERN AND LOS ANGELES COUNTIES, CALIFORNIA**

TABLE MOUNTAIN RANCHERIA

By: _____ Date: _____
Name
Title

TEJON INDIAN TRIBE

By: _____ Date: _____
Name
Title

TULE RIVER TRIBE

By: _____ Date: _____
Name
Title

BARBAREÑO/VENTUREÑO BAND OF MISSION INDIANS

By: _____ Date: _____
Name
Title

FERNANDEÑO TATAVIAM BAND OF MISSION INDIANS

By: _____ Date: _____
Name
Title

KERN VALLEY INDIAN COMMUNITY

By: _____ Date: _____
Name
Title

ATTACHMENT 1: PROGRAMMATIC AGREEMENT FOR CALIFORNIA HIGH-SPEED RAIL

Attachment is available upon request.

ATTACHMENT 2: AREA OF POTENTIAL EFFECTS

Attachment is available upon request.

ATTACHMENT 3: HISTORIC PROPERTIES WITHIN THE AREA OF POTENTIAL EFFECTS

Built Environment Historic Properties within the Bakersfield to Palmdale Project Section Area of Potential Effects

Property Name and Address	City, County	Effects Finding	Treatment Measures
Statue of Father Garces	Bakersfield, Kern	No Adverse Effect	See F-B LGA MOA and Treatment Plan
Republic Supply Company (Golden Empire Gleaners) 1326 30th Street	Bakersfield, Kern	Adverse Effect— Visual	See F-B LGA MOA and Treatment Plan
Division of Forestry Services Office 2731–2738 “O” Street; 1120 Golden State Avenue	Bakersfield, Kern	No Adverse Effect	See F-B LGA MOA and Treatment Plan
Kern County Land Company Warehouse 210 Sumner Street	Bakersfield, Kern	Adverse Effect— Visual	See F-B LGA MOA and Treatment Plan
Noriega’s 525 Sumner Street	Bakersfield, Kern	No Adverse Effect	See F-B LGA MOA and Treatment Plan
Amestoy Hotel (formerly Cesmat Hotel and Narducci’s) 622 E 21st Street	Bakersfield, Kern	No Adverse Effect	See F-B LGA MOA and Treatment Plan
Southern Pacific Depot 730 Sumner Street	Bakersfield, Kern	No Adverse Effect	See F-B LGA MOA and Treatment Plan
Fire Station Number Two 716 E 21st Street	Bakersfield, Kern	No Adverse Effect	See F-B LGA MOA and Treatment Plan
Folk Victorian 2509 E California Avenue	Bakersfield, Kern	No Adverse Effect	See F-B LGA MOA and Treatment Plan
State Route 204/Golden State Avenue	Bakersfield, Kern	No Adverse Effect	See F-B LGA MOA and Treatment Plan
Big Creek Hydroelectric System Historic District North of Edison Highway, east of Fairfax Road	Bakersfield (vicinity) / Kern	Adverse Effect	CUL-IAMF #1—Geospatial Data Layer and Mapping CUL-IAMF #2—Worker Environmental Awareness Program (WEAP) Training Session CUL-IAMF #6—Plan for Protection and Stabilization and the Response Plan for Unanticipated Effects and Inadvertent Damage CUL-IAMF #7—Built Environment Monitoring Plan CUL-MM #6—Preparation of Additional Recordation and Documentation CUL-MM #8—Implementation Procedures for Unanticipated Effects and Inadvertent Damage

Property Name and Address	City, County	Effects Finding	Treatment Measures
La Paz 29700 Woodford-Tehachapi Road, Keene	Keene / Kern	No Adverse Effect, with conditions	CUL-IAMF #4 – Relocation of Project Features when Possible AQ-IAMF#1: Fugitive Dust Emissions NV-IAMF#1: Noise and Vibration TR-IAMF#6: Restriction on Construction Hours TR-IAMF#7: Construction Truck Routes Design Review Visual Screening Planting Plan La Paz Treatment Oversight Panel
Keene Fire Station 30356 Woodford-Tehachapi Road, Keene	Keene / Kern	No Adverse Effect	CUL-IAMF #1—Geospatial Data Layer and Mapping CUL-IAMF #2—Worker Environmental Awareness Program (WEAP) Training Session CUL-IAMF #6—Pre-Construction Conditions Assessment, Plan for Protection and Stabilization and the Response Plan (PPSRP) for Unanticipated Effects and Inadvertent Damage CUL-IAMF #7—Built Environment Monitoring Plan CUL-IAMF #8—Implement Protection and/or Stabilization Measures CUL-MM #8 – Implementation Procedures for Unanticipated Effects or Inadvertent Damage*
First Los Angeles Aqueduct About 1 mile SW of Tehachapi- Willow Springs Road and about 6 miles NW of Willow Springs (multiple APNs)	Willow Springs (vicinity) / Kern	No Adverse Effect	CUL-IAMF #1—Geospatial Data Layer and Mapping CUL-IAMF #2—Worker Environmental Awareness Program (WEAP) Training Session CUL-IAMF #6—Pre-Construction Conditions Assessment, Plan for Protection and Stabilization and the Response Plan (PPSRP) for Unanticipated Effects and Inadvertent Damage CUL-IAMF #7—Built Environment Monitoring Plan CUL-IAMF #8—Implement Protection and/or Stabilization Measures CUL-MM #8 – Implementation Procedures for Unanticipated Effects or Inadvertent Damage*
Willow Springs Raceway About 5 miles west of Rosamond	Rosamond (vicinity) / Kern	No Adverse Effect	CUL-IAMF #1—Geospatial Data Layer and Mapping CUL-IAMF #6—Pre-Construction Conditions Assessment, Plan for Protection and Stabilization and the Response Plan (PPSRP) for Unanticipated Effects and Inadvertent Damage CUL-MM #8 – Implementation Procedures for Unanticipated Effects or Inadvertent Damage*
Lancaster Post Office 567 W Lancaster Boulevard, Lancaster	Lancaster / Kern	No Adverse Effect	CUL-IAMF #1—Geospatial Data Layer and Mapping CUL-IAMF #6—Pre-Construction Conditions Assessment, Plan for Protection and Stabilization and the Response Plan (PPSRP) for Unanticipated Effects and Inadvertent Damage CUL-MM #8 – Implementation Procedures for Unanticipated Effects or Inadvertent Damage*

Property Name and Address	City, County	Effects Finding	Treatment Measures
Western Hotel 557 W Lancaster Boulevard, Lancaster	Lancaster / Kern	No Adverse Effect	CUL-IAMF #1—Geospatial Data Layer and Mapping CUL-IAMF #6—Pre-Construction Conditions Assessment, Plan for Protection and Stabilization and the Response Plan (PPSRP) for Unanticipated Effects and Inadvertent Damage CUL-MM #8 – Implementation Procedures for Unanticipated Effects or Inadvertent Damage*
Denny's Restaurant #30 (aka Village Grille Diner) 44303 Sierra Highway, Lancaster	Lancaster / Kern	No Adverse Effect	CUL-IAMF #1—Geospatial Data Layer and Mapping CUL-IAMF #6—Pre-Construction Conditions Assessment, Plan for Protection and Stabilization and the Response Plan (PPSRP) for Unanticipated Effects and Inadvertent Damage CUL-MM #8 – Implementation Procedures for Unanticipated Effects or Inadvertent Damage*
Residence at 332 W. Lancaster Boulevard	Lancaster / Kern	No Adverse Effect	CUL-IAMF #1—Geospatial Data Layer and Mapping CUL-IAMF #6—Pre-Construction Conditions Assessment, Plan for Protection and Stabilization and the Response Plan (PPSRP) for Unanticipated Effects and Inadvertent Damage CUL-MM #8 – Implementation Procedures for Unanticipated Effects or Inadvertent Damage* SOCIO-IAMF #1—Construction Management Plan This IAMF is required for development of a plan to maintain vehicular access to the residence during construction. SOCIO-IAMF #2—Compliance with Uniform Relocation Assistance and Real Property Acquisition Policies Act This IAMF is required to compensate the property owner for relocation of the driveway to maintain vehicular access to the property.
Residence at 44847 Trevor Avenue	Lancaster / Kern	No Adverse Effect	CUL-IAMF #1—Geospatial Data Layer and Mapping CUL-IAMF #6—Pre-Construction Conditions Assessment, Plan for Protection and Stabilization and the Response Plan (PPSRP) for Unanticipated Effects and Inadvertent Damage CUL-MM #8 – Implementation Procedures for Unanticipated Effects or Inadvertent Damage*
Cedar Avenue Historic District	Lancaster / Kern	No Adverse Effect	CUL-IAMF #1—Geospatial Data Layer and Mapping CUL-IAMF #6—Pre-Construction Conditions Assessment, Plan for Protection and Stabilization and the Response Plan (PPSRP) for Unanticipated Effects and Inadvertent Damage CUL-MM #8 – Implementation Procedures for Unanticipated Effects or Inadvertent Damage*

Historic Properties are listed from north to south, in order of their location between Bakersfield and Palmdale.

F-B LGA = Fresno to Bakersfield Locally Generated Alternative

* Adverse effects are not anticipated. Mitigation measures will only be required in the event of unanticipated effects or inadvertent damage.

Archaeological Historic Properties within the Bakersfield to Palmdale Project Section Area of Potential Effects

Property Number*	Type	Attributes	Effects Finding	Treatment Measures
P-15-019272 / CA-KER-10546 (BP-JS-1)	Prehistoric site	Lithic scatter; quarry	Phased	<u>Applies to all archaeological historic properties:</u> Inventory (Addenda ASRs) Evaluation (AEPs/AERs) Data Recovery (Archaeological Data Recovery Reports) Archaeological Monitoring Plan Avoidance/Protection Measures/ Best Management Practices Cultural Resources Awareness Training Archaeological/Native American Monitoring Observation of Protocols for Unanticipated Discoveries Additional measures to avoid, minimize, or mitigate effects on archaeological historic properties may be developed in consultation with Signatories, Invited Signatories and other Consulting Parties as identification and evaluation efforts are performed in future planning and construction phases of the Undertaking.
P-15-019263 / CA-KER-10537 (BP-IS-1)	Prehistoric site	Lithic scatter; quarry	Phased	
P-15-018645 / CA-KER-10171	Prehistoric site	Lithic scatter; quarry	Phased	
P-15-019264 / CA-KER-10538 (BP-IS-2)	Prehistoric site	Lithic scatter	Phased	
P-15-019281 / CA-KER-10555 (BP-LH-7)	Prehistoric site	Lithic scatter	Phased	
P-15-019265 / CA-KER-10539 (BP-IS-3)	Prehistoric site	Bedrock milling feature	No Effect	
P-15-002959 / CA-KER-2959	Prehistoric site	Bedrock milling feature; lithic scatter	Phased	
P-15-010031 / CA-KER-5918	Prehistoric site	Lithic scatter	Phased	
P-15-001043 / CA-KER-1043	Prehistoric site	Bedrock milling feature	Phased	
P-15-010030 / CA-KER-5917	Prehistoric site	Bedrock milling features; lithic scatter	Phased	
P-15-002750 / CA-KER-2750	Prehistoric site	Bedrock milling feature	No Effect	
P-15-002189 / CA-KER-2189	Prehistoric site	Lithic scatter; cairns/rock features; quarry	Phased	
P-15-002954 / CA-KER-2954	Prehistoric site (with locus of sparse amethyst glass)	Lithic scatter; bedrock milling feature; architectural feature; cairns/rock features; trash scatter	No Effect	
P-15-019266 / CA-KER-10540 (BP-IS-4)	Prehistoric site	Lithic scatter	Phased	
P-15-007681 / CA-KER-7681	Prehistoric site	Bedrock milling feature	Phased	
P-15-012810 / CA-KER-7231	Prehistoric site	Lithic scatter	Phased	
P-15-015559 / CA-KER-8592	Prehistoric site	Lithic scatter	Phased	
P-15-012811 / CA-KER-7232	Prehistoric site	Lithic scatter; bedrock milling feature; cairn/rock feature	Phased	
P-15-001615 / CA-KER-1615	Historic site	Grave	Phased	
P-15-013689 / CA-KER-7690H	Historic site	Trash scatter	Phased	
P-15-013931 / CA-KER-7815H	Historic site	Road; trash scatter	Phased	
P-15-013841 / CA-KER-7749	Prehistoric site	Lithic scatter	Phased	
P-15-016251 / CA-KER-8784H	Historic site	Trash scatter; road	Phased	

Property Number*	Type	Attributes	Effects Finding	Treatment Measures
P-15-012714 / CA-KER-7172H	Historic site	Foundations/structure pads; trash scatters	Phased	
P-15-013690 / CA-KER-7691H	Historic site	Trash scatter	Phased	
P-15-016534 / CA-KER-9114	Prehistoric site	Lithic scatter	Phased	
P-15-016248 / CA-KER-8981H	Historic site	Trash scatter; homestead or mining claim marker	Phased	
P-15-002539 / CA-KER-2539	Prehistoric site	Lithic scatter; habitation debris	Phased	
P-15-019275 / CA-KER-10549 (<i>BP-JS-6</i>)	Prehistoric site	Lithic scatter	Phased	
P-15-019283 / CA-KER-10557 (<i>BP-TJ-2</i>)	Prehistoric site	Lithic scatter	Phased	
P-15-019268 / CA-KER-10542 (<i>BP-IS-7</i>)	Prehistoric site	Lithic scatter	Phased	
P-15-019277 / CA-KER-10551 (<i>BP-JS-8</i>)	Prehistoric site	Lithic scatter; hearths; FAR	Phased	
P-15-019269 / CA-KER-10543 (<i>BP-IS-8</i>)	Prehistoric site	Lithic scatter	Phased	
P-15-019278 / CA-KER-10552 (<i>BP-JS-9</i>)	Prehistoric site	Lithic scatter; ground stone	Phased	
P-15-019270 / CA-KER-10544 (<i>BP-IS-9</i>)	Prehistoric site	Lithic scatter	Phased	
P-15-000522 / CA-KER-522	Prehistoric site	Lithic scatter	Phased	
P-15-012466 / CA-KER-7031H	Historic site	Trash scatter	Phased	
P-19-002183 / CA-LAN-2183H	Historic site	Foundations; landscaping; trash scatters; wall	Phased	
P-19-002215 / CA-LAN-2215H	Historic site	Foundations; trash scatters	Phased	
P-19-002039 / CA-LAN-2039H	Historic site	Foundations/structure pads; trash scatter; well; fence	Phased	
P-15-001042 / CA-KER-1042	Prehistoric site	Bedrock milling feature	Phased	
P-15-016253 / CA-KER-8486H	Historic site	Trash scatter; roads/trails	Phased	

Resources are listed from north to south, in order of their location between Bakersfield and Palmdale.

Temporary resource numbers previously used in the Bakersfield to Palmdale Project Section Archaeological Survey Report for newly identified archaeological historic properties are included in the table for reference and are indicated in italicized parentheses (e.g., "*BP-CJ-9*").

FAR = fire-affected rock

ASR = Archaeological Survey Report

AEP = Archaeological Evaluation Plan

AER = Archaeological Evaluation Report

ATTACHMENT 4: ARCHAEOLOGICAL TREATMENT PLAN

Attachment is available upon request.

ATTACHMENT 5: BUILT ENVIRONMENT TREATMENT PLAN

Attachment is available upon request.

ATTACHMENT 6: CONSULTING PARTIES AND OTHER INTERESTED PARTIES

State Historic Preservation Officer
Advisory Council on Historic Preservation
Surface Transportation Board
Bureau of Land Management
National Park Service
Los Angeles County Department of Regional Planning
César Chávez Foundation
National Chávez Center
National Parks Conservation Association
National Trust for Historic Preservation
Southern California Edison

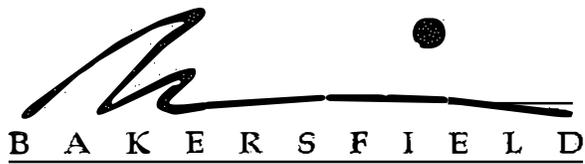
ATTACHMENT 7: CONSULTING NATIVE AMERICAN TRIBAL GOVERNMENTS

Picayune Rancheria of Chukchansi Indians
San Manuel Band of Mission Indians
Santa Rosa Rancheria Tachi-Yokut Tribe
Table Mountain Rancheria
Tejon Indian Tribe
Tule River Tribe
Barbareño/Ventureño Band of Mission Indians
Fernandeño Tataviam Band of Mission Indians
Kern Valley Indian Community

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APPENDIX G: SECTION 4(F) CONCURRENCE LETTERS

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(661) 852-2140
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Fax

To: Mark McLoughlin From: Dianne Hoover
email: mark.mcloughlin@hsr.ca.gov Pages: 5
Fax: mark.mcloughlin@hsr.ca.gov
Phone: 916-324-1541 Date: 9/17/18
Re: HSR - Bakersfield - Section 4(F) cc: 1

Urgent For Review Please Comment Please Reply Please Recycle

• Comments:



September 4, 2018

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Dr. Joaquín Arambula

Honorable Jim Beall

Dianne Hoover
Director of Recreation and Parks
City of Bakersfield
City Hall North, 1600 Truxtun Avenue, 3rd Floor
Bakersfield, California 93309

Subject: Request for a *De Minimis* Concurrence on a Section 4(f) Resource

To Whom It May Concern,

The California High-Speed Rail Authority (Authority) and the Federal Railroad Administration (FRA) are currently preparing a supplemental environmental impact statement/environmental impact report (EIS/EIR) for the Fresno to Bakersfield Locally Generated Alternative (F-B LGA) portion of the statewide High-Speed Rail program in accordance with the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA). This Supplemental EIS/EIR involves engineering, environmental analysis, public and agency involvement, and ensuring compliance with state and federal environmental laws and regulations. One federal law, Section 4(f), is the subject of this concurrence request.

Section 4(f) of the United States Department of Transportation (USDOT) Act of 1966, as amended, and codified in 49 United States Code (USC) §303, declares that "it is the policy of the United States Government that special effort should be made to preserve the natural beauty of the countryside and public park and recreation lands, wildlife and waterfowl refuges and historic sites."

In general, Section 4(f) specifies that the USDOT agencies may only approve a project that "uses" the resources mentioned above, if (1) there is no prudent and feasible alternative that completely avoids Section 4(f) resources and (2) the project includes all possible planning to minimize harm to those resources. In lieu of making these findings, the USDOT also can approve the use of a Section 4(f) resource if the USDOT determines that the project will have a "de minimis" impact on that resource and the official with jurisdiction over the resource concurs in that determination. For historic properties, the official with jurisdiction generally is the State Historic Preservation Officer (SHPO). For parks, recreation areas, and refuges, the official with jurisdiction is the agency (or agencies) that owns or administers the property.

The FRA has determined that the Kern River Parkway and Weill Park are Section 4(f) resources, are within the resource study area of the F-B LGA, and that your agency is the official with jurisdiction with respect to these resources. The purpose of this letter is request your agency's concurrence in a finding of de minimis impact that FRA has made with respect to the Kern River Parkway and Weill Park. The basis for this finding is set forth below.

Edmund G. BROWN JR.
GOVERNOR



Kern River Parkway

The F-B LGA section of the HSR project would cross above the Kern River Parkway on a viaduct (guideway) at a height of approximately 40 feet (from surface elevation to the bottom of the guideway) in an area of the Kern River Parkway that contains a pathway available for use by bicyclists and pedestrians and features that serve floodway purposes.

The HSR would be on an elevated structure spanning a portion of the parkway that is undeveloped except for the bicycle and pedestrian pathway. Footings for the columns that would support the guideway would be constructed within the Kern River Parkway, permanently impacting 0.66 acre, and the completed guideway would span the bicycle and pedestrian pathway. Except for the footings, no portion of the Kern River Parkway would be purchased by the California High Speed Rail Authority (Authority) because the guideway would completely span the property and the park underneath the elevated guideway would remain available for park use.

Temporary closure of the parkway would be required during construction. The bicycle/pedestrian pathway would not be closed during the entire construction period, and no physical impacts on the bicycle pathway itself would occur. No physical changes would occur to the resource; following construction of this segment of the viaduct, the pathway would be reopened for use. The Authority and the FRA would coordinate with the City of Bakersfield prior to project construction to develop an alternate route for bicycle pathway users during the temporary closure. Areas in proximity to construction would be closed temporarily. The bicycle pathway would be restored to the pre-project construction condition, and following construction of this segment of the viaduct, these facilities would be reopened for use. Permanent impacts to the Kern River Parkway would therefore be de minimis.

Noise impacts due to operation of the HSR system over the Kern River Parkway would result in a moderate increase in noise levels (from 56 A-weighted decibels [dBA] equivalent continuous sound level [Leq] to 63 dBA Leq). While evident, this is not a considerable enough increase to substantially impair the attributes that qualify the facility for protection under Section 4(f).

While these visual and noise impacts would be noticeable to parkway users, the preliminary determination is that the impacts would not substantially impair the attributes and features that qualify the parkway for protection under Section 4(f) and, therefore, would not constitute a Section 4(f) constructive use.

Weill Park

The F-B LGA would cross above Weill Park on an elevated structure at a height of approximately 58 feet (from surface elevation to the bottom of the guideway) in an area that contains a grass field. Footings for the columns that would support the guideway would be constructed within Weill Park and would permanently impact 0.099 acre. Except for the footings, no portion of Weill Park would be purchased by the Authority because the guideway would nearly span the property and the park underneath the elevated guideway would remain available for park use.

Construction would require temporary closure of park facilities for safety purposes when construction occurs over the park. Other than the placement of the footings described above, no physical changes would occur to the resource; following construction of this segment of the viaduct, the park under the viaduct would be reopened for use. The Authority and the FRA would coordinate with the city of Bakersfield prior to project construction to develop an alternate route for pathway users during the temporary closure. Areas in proximity to construction would be closed temporarily. The park underneath the viaduct would be restored to pre-construction condition.

Although introduction of the HSR viaduct above Weill Park would introduce a new visual transportation element that did not previously exist, the park is currently in an urban setting with various existing transportation features directly adjacent. The park is adjacent to industrial uses, and the existing BNSF Railway railroad right-of-way is in the vicinity of the park. Additionally, measures to minimize harm (similar to those described above for the Kern River Parkway) would be employed to reduce these impacts. These measures would ensure coordination regarding guideway and column design, alternative routes for bicycles and pedestrians, and opportunities to reduce impacts such as minimizing the vertical clearance of the guideway. Additionally, construction noise would be monitored to ensure that impacts to park users are minimized. A full list of measures is located in Table 4-4 of the Draft Supplemental EIR/EIS. After construction is complete, Weill Park would be revegetated as necessary and restored to preproject construction condition.

Noise impacts due to operation of the HSR system would result in a moderate increase in noise levels (from 62 dBA Leq to 65 dBA Leq). The projected vibration level from the HSR is 74.7 VdB and this vibration level would not exceed the threshold of 75 VdB for Category 3 land uses (Institutional land uses with primary daytime use including parks). While evident, these are not considerable enough increases to substantially impair the attributes that qualify the facility for protection under Section 4(f).

While these visual and noise impacts would be noticeable to parkway users, the determination is that the impacts would not substantially impair the attributes and features that qualify the parkway for protection under Section 4(f) and, therefore, would not constitute a Section 4(f) constructive use.

The FRA's intent to make a de minimis impact determination for the Kern River Parkway and Weill Park was discussed at several coordination meetings between the Authority, FRA, and city of Bakersfield beginning in November 2015. These meetings were established for coordination purposes on the project and have led to the incorporation of specific avoidance, minimization, and mitigation measures (as described above) to reduce the impact to the parks owned or administered by the city of Bakersfield within the proposed project corridor. In addition, the public has been given an opportunity to comment on this determination during the 60-day comment period of the Draft Supplemental EIS/EIR.

Based on information set forth above, the FRA has determined that the project would not adversely affect or otherwise restrict the public's use of the parks nor will it adversely affect the features, attributes, or activities that make the parks eligible for Section 4(f) protection as parks. The FRA seeks your concurrence in this determination. A concurrence clause is provided at the end of this letter for this purpose. If you do not concur in this Section 4(f) de minimis impact determination, the FRA will need to conduct a full Section 4(f) evaluation for one or both of these properties.

We respectfully request your reply to this matter within two weeks of receipt of this letter. We look forward to continuing our successful working relationship with you and should you have any questions or need additional information, please feel free to contact us.

Please return a scanned copy of this letter by email to mark.mcloughlin@hsr.ca.gov.

If you have any questions, please contact Andrew Bayne, Project Section Environmental Manager, at andrew.bayne@hsr.ca.gov or 916-384-0580.



CALIFORNIA High-Speed Rail Authority

Sincerely,

Mark A. McLoughlin
Director of Environmental Services, California High-Speed Rail Authority

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**Honorable
Dr. Joaquin Arambula**

Honorable Jim Beall

CONCURRENCE:

Based on the information set forth in this letter and on the documents and coordination referenced herein, the city of Bakersfield concurs with FRA's determination that the Fresno to Bakersfield Locally Generated Alternative will not adversely affect the activities, features, or attributes that make the Kern River Parkway and Weill Park eligible for Section 4(f) protection. Therefore, the city of Bakersfield concurs in the FRA's determination that the Fresno to Bakersfield Locally Generated Alternative will have a de minimis impact on the Kern River Parkway and Weill Park in accordance Section 4(f) of the USDOT Act.

Dianne Hoover
Director of Recreation and Parks
City of Bakersfield

9/12/18
Date

EDMUND G. BROWN JR.
GOVERNOR





File Code: 2350
Date: February 16, 2021

Mr. Brett Rushing
Supervising Environmental Planner
California High-Speed Rail Authority
770 L Street, Suite 620
Sacramento, CA 95814

Dear Mr. Rushing:

Please find enclosed the signed letter of concurrence on the *de minimis* finding that the High Speed Rail Authority has made with respect to the Pacific Crest Trail for the Bakersfield to Palmdale Project Section.

If you have any questions please contact Togan Capozza, Acting Pacific Crest Trail Administrator at togan.capozza@usda.gov or (707) 656-6119.

Sincerely,

JAMES BACON
Director of Public Services

Enclosure: CHSRA BP 4f Concurrence PCT

cc: Brett.Rushing@hsr.ca.gov, togan.capozza@usda.gov, csymons@blm.gov



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Ms. Beth Boyst
United States Forest Service (USFS)
1323 Club Drive
Vallejo, CA 94592

Mr. Carl Symons
United States Department of the Interior, Bureau of Land Management (BLM)
Ridgecrest Field Office
300 S. Richmond Road
Ridgecrest, CA 93555

Subject: Request for Concurrence with Section 4(f) Determination

Dear Ms. Boyst and Mr. Symons,

In February 2020, the California High-Speed Rail Authority (Authority) released a Draft Environmental Impact Report/Environmental Impact Statement (EIR/EIS) for the Bakersfield to Palmdale Project Section of the California High-Speed Rail Program in accordance with the requirements set forth by the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA). The Draft EIR/EIS included engineering and environmental analysis and a summary of public, stakeholder, and agency involvement. The Draft EIR/EIS also detailed preliminary determinations for Section 4(f) resources, including the Pacific Crest Trail (PCT). The Authority has since prepared an Administrative Final EIR/EIS, which includes responses to comments received on the Draft EIR/EIS and updated Section 4(f) evaluations. The Administrative Final EIR/EIS was shared with BLM and USFS on November 10, 2020.

Section 4(f) of the United States Department of Transportation (USDOT) Act of 1966, as amended, and codified in 49 United States Code (USC) §303, declares that “it is the policy of the United States Government that special effort should be made to preserve the natural beauty of the countryside and public park and recreation lands, wildlife and waterfowl refuges and historic sites.” The Authority is responsible for Section 4(f) compliance for the California High-Speed Rail Program as the lead federal agency pursuant to 23 U.S.C. 327 and the terms of the National Environmental Policy Act (NEPA) Assignment Memorandum of Agreement (Federal Railroad Administration [FRA] and State of California 2019) assigning to the Authority responsibility for compliance with NEPA and other federal environmental laws, including Section 4(f) (49 U.S.C. 303) and related U.S. Department of Transportation orders and guidance. In general, Section 4(f) specifies that the USDOT agencies may only approve a project that “uses”

the resources mentioned above, if (1) there is no prudent and feasible alternative that completely avoids Section 4(f) resources and (2) the project includes all possible planning to minimize harm to those resources. In lieu of making these findings, the USDOT also can approve the use of a Section 4(f) resource if the USDOT determines that the project would have a “*de minimis*” impact on that resource and the official with jurisdiction over the resource concurs in that determination. For parks, recreation areas, and refuges, the official with jurisdiction is the agency (or agencies) that owns or administers the property.

The purpose of this letter is to request concurrence on the *de minimis* finding that the Authority has made with respect to PCT. This basis for this finding was originally detailed in the Draft EIR/EIS and has been subsequently revised in the Administrative Final EIR/EIS based on written and oral comments received on the Draft EIR/EIS. A summary of the Authority’s *de minimis* determination is set forth below.

The Authority has determined that the PCT is a Section 4(f) resource, is within the resource study area of the Bakersfield to Palmdale Project Section, and that your agencies are the officials with jurisdiction with respect to this resource. Under the Preferred Alternative (Alternative 2 with the Refined CCNM Design Option), the HSR project would be immediately adjacent to and in an aerial alignment (1,500-foot-long viaduct) above the PCT, crossing the existing trail at three locations (see Figure 1). The proposed viaduct would require the installation of columns to support the viaduct structure, which would be outside the existing PCT trail alignment.

To minimize impacts to the trail, the Authority has worked with USFS, BLM, and the Pacific Crest Trail Association (PCTA) to develop a mitigation measure that would realign 2,110 linear feet of trail east of the proposed viaduct (see Figure 1). The trail realignment would reduce the number of trail crossings under the viaduct from three crossings (existing trail) to one crossing (realigned trail). The reduction in number of trail crossings and the trail relocation east of the HSR alignment would result in an improved trail for PCT users. Key viewpoints and visual simulations are shown in Figures 2 and 3. This proposed mitigation measure for the PCT realignment would represent a permanent change to the trail and would constitute a permanent use of land under Section 4(f). The Authority, in consultation with the USFS and BLM, would be required to obtain a new easement from the private property owner for the realigned segment of the PCT.

During the public review period for the Draft EIR/EIS, USFS, BLM, and PCTA submitted comments expressing concerns regarding the Authority’s *de minimis* determination under Section 4(f). To address these comments, the Authority has conducted a more detailed evaluation of the project’s impacts to the PCT relative to the provisions of the Section 4(f) statute and confirmed that the project’s impact to the PCT would be a *de minimis* impact as defined under 49 USC 303(d). Additionally, in response to concerns about trail users having to cross under the existing Tehachapi Willow Springs Road in a 80-foot long 15-foot by 15-foot box culvert, the Authority has made several engineering refinements in the vicinity of the PCT. The Authority realigned Tehachapi Willow Springs Road to the west of the Preferred Alternative (including the section of existing Tehachapi Willow Springs Road that crosses Oak Creek), added a new

connection from Tehachapi Willow Springs Road to the existing Oak Creek Road near the creek, and further refined the realignment of the PCT realign. .

The design refinements near the PCT eliminate project impacts to the parking area along Oak Creek Road (including removal of an oak tree). The refinements also increase safety for PCT users because they would no longer have to cross Tehachapi Willow Springs Road, which has a posted speed limit of 55 miles per hour. In addition, with the new design, the PCT will no longer need to go through a box culvert under the HSR viaduct. PCT users would now cross under the HSR viaduct (and the new Tehachapi Willow Springs Road bridge) in an open crossing adjacent to the creek with over 57 feet of vertical clearance which would improve the experience for the trail users as they cross under the HSR and Tehachapi Willow Springs Road viaducts.

In the Administrative Final EIR/EIS, the Authority has reaffirmed its *de minimis* determination that the features and attributes that qualify the PCT for protection under Section 4(f) would not be substantially impaired by the HSR project. During construction and operation of HSR project, the trail would still function as a public trail under the Preferred Alternative. There would be a direct permanent use of the PCT as a result of the trail realignment, the HSR project crossing the PCT once, and the maintenance easement. With the realignment, the trail would still be publicly accessible and impacts resulting from the trail realignment would be addressed by the compensatory mitigation identified in the EIR/EIS for potential impacts to the PCT.

Based on information set forth above, the Authority has determined that the project would not adversely affect or otherwise restrict the public's use of the PCT nor would it adversely affect the activities, features, or attributes that make the PCT eligible for Section 4(f) protection as a recreational resource. Therefore, the Authority has determined that the Preferred Alternative (Alternative 2 with the Refined CCNM Design Option) would result in a *de minimis* impact, as defined by 49 U.S.C. 303(d). The Authority seeks your concurrence in this determination. A concurrence clause is provided at the end of this letter for this purpose.

We respectfully request your reply to this matter by **January 29, 2021**. We look forward to continuing our successful working relationship with you as we work to deliver the nation's first high-speed rail project, while still protecting important national resources such as the PCT.

Sincerely,



Brett Rushing
Supervising Environmental Planner
California High-Speed Rail Authority
Brett.Rushing@hsr.ca.gov

CONCURRENCE:

Based on the information set forth in this letter, and the planned offsite compensatory mitigation, the United States Forest Service and Bureau of Land Management concur with the California High-Speed Rail Authority's determination that the Bakersfield to Palmdale Project Section of the California High-Speed Rail Program would not adversely affect the activities, features, or attributes that make the Pacific Crest Trail eligible for Section 4(f) protection. Therefore, the United States Forest Service and Bureau of Land Management concur with the Authority's determination that the Bakersfield to Palmdale Project Section would have a *de minimis* impact on the Pacific Crest Trail in accordance with Section 4(f) of the United States Department of Transportation Act of 1966.



2/8/2021

Jim Bacon, Director, Public Services
United States Forest Service

Date

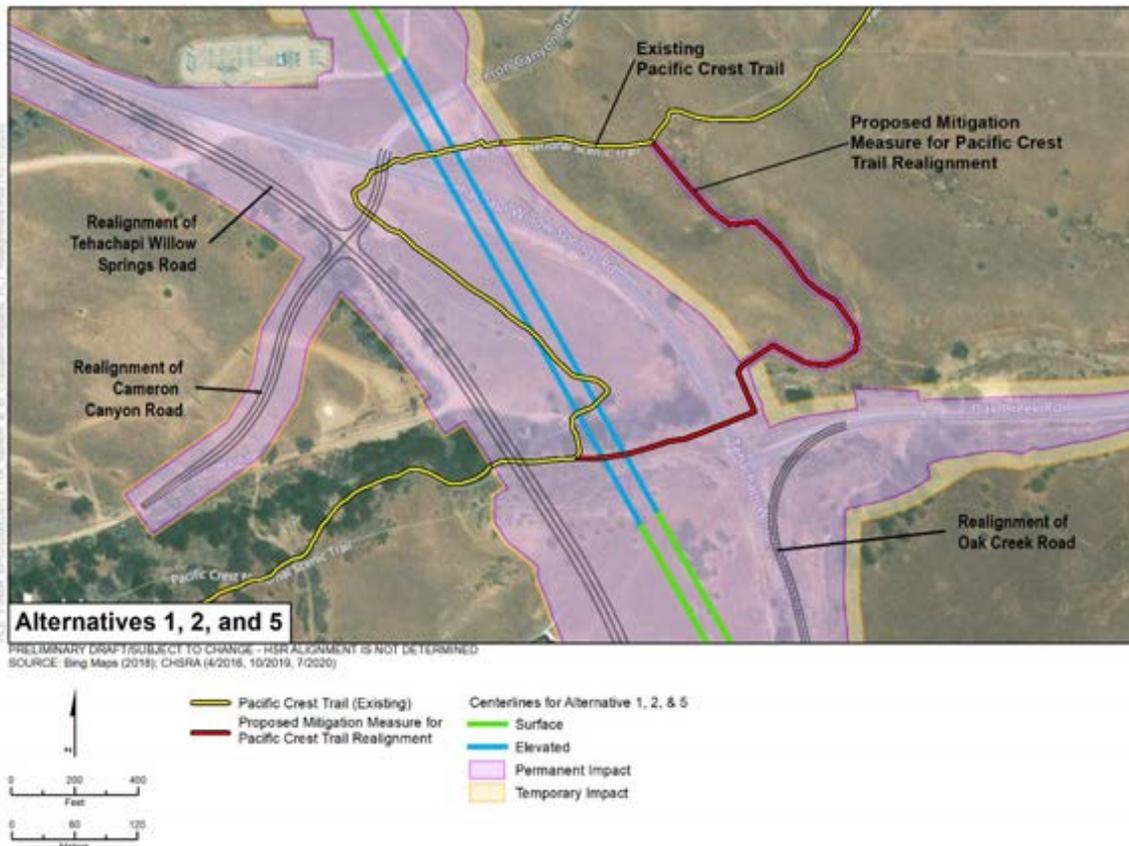


Figure 1 Overview of the HSR PCT Crossing



Figure 2 Key Viewpoint 18a: Existing and Simulated Views of Alternatives 1, 2, and 5 from the Pacific Crest Trail Looking West



Figure 3 Key Viewpoint 18b: Existing and Simulated Views of Alternatives 1, 2, and 5 from the Pacific Crest Trail Looking Southwest