APPENDIX A: LEAST ENVIRONMENTALLY DAMAGING PRACTICABLE ALTERNATIVE CONCURRENCE LETTERS

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DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, SACRAMENTO DISTRICT
1325 J STREET
SACRAMENTO CA 95814-2922

May 5, 2017

Regulatory Division (SPK-2009-01482)

Mark McLoughlin
California High Speed Rail Authority
770 L Street, Suite 800
Sacramento, California 95814

Dear Mr. McLoughlin:

I am writing in response to your April 2017, Supplemental Checkpoint C Summary Report and the May 2, 2017, request for concurrence on the Preliminary Least Environmentally Damaging Practicable Alternative (LEDPA) determination for the proposed Fresno to Bakersfield segment of the California High-Speed Train (CHST) Project. In accordance with our *National Environmental Policy Act/Clean Water Act Section 404/Rivers and Harbors Act Section 14 Integration Process for the California High-Speed Train Program Memorandum of Understanding* dated November 2010 (NEPA/404/408 MOU). This letter is our formal response.

As a cooperating agency for preparation of the Fresno to Bakersfield Supplemental Environmental Impact Report/Environmental Impact Statement (EIR/EIS) and in fulfillment of our responsibilities under the NEPA/404/408 MOU, we offered feedback to the Federal Railroad Administration as well as the California High-Speed Rail Authority (Authority) on the Preliminary LEDPA determination and draft Compensatory Mitigation Plan. We provided comments on April 4, 2017, regarding the draft Checkpoint C Supplemental Summary Report and Information Packet submitted on March 10, 2017. We have also discussed these comments and the proposed alternatives in multiple meetings with your staff and consultants.

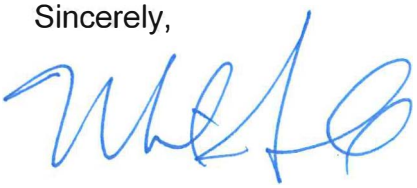
After reviewing the data provided, we concur that the Fresno to Bakersfield Locally Generated Alternative from Poplar Avenue in Shafter to Oswell Street in Bakersfield, appears to be the Preliminary LEDPA. This alignment is a continuation of the December 19, 2013, Checkpoint C LEDPA determination from the Fresno station to Seventh Standard Road. Please be aware that this determination is being made prior to the circulation of the public Draft Environmental Impact Statement and will be revisited if additional information is available after public comments are received.

In addition, we concur that the draft Compensatory Mitigation Plan may provide sufficient mitigation to meet the needs of the project under Section 404 of the Clean Water Act. However, the Corps cannot make a permit decision until we receive a final

mitigation plan in accordance with 33 CFR Part 332, *Compensatory Mitigation for Losses of Aquatic Resources*. We will continue to work with the Authority to finalize the mitigation plan in order to fully satisfy the requirements for a final mitigation plan.

We appreciate your willingness to work with this office to reach this concurrence. If you have any questions, please contact Mr. Zachary Simmons at our Enforcement/Special Projects Branch, 1325 J Street, Room 1350, Sacramento, California 95814-2922, by email at *Zachary.M.Simmons@usace.army.mil*, or by telephone at 916-557-6746.

Sincerely,



Michael S. Jewell
Chief, Regulatory Division

cc:
Mr. David Valenstein, Federal Railroad Administration, *David.Valenstein@dot.gov*
Mr. Jason Brush, U.S. Environmental Protection Agency, Region IX, Wetlands Regulatory Office (WTR-8), *Brush.Jason@epa.gov*
Ms. Connell Dunning, U.S. Environmental Protection Agency, Region IX, Environmental Review Office/Transportation, *Dunning.Connell@epa.gov*
Mr. Serge Stanich, Parsons Brinkerhoff, *Serge.Stanich@hsr.ca.gov*

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

May 22, 2017

Stephanie Perez-Arrieta
Federal Railroad Administration
1120 Vermont Avenue, NW, MS 20
Washington, D.C. 20590

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

Subject: Final Supplemental Checkpoint C Summary Report Package for the Fresno to Bakersfield Project Section- Request for Agreement on Preliminary Least Environmentally Damaging Practicable Alternative and Draft Compensatory Mitigation Plan

Dear Ms. Perez-Arrieta and Mr. McLoughlin:

Thank you for the opportunity to provide comments in advance of publication of the Supplemental Draft Environmental Impact Statement (SDEIS) for the Fresno to Bakersfield section of California High Speed Rail (HSR). This letter responds to your May 2, 2017 request for agreement on the Preliminary Least Environmentally Damaging Practicable Alternative (LEDPA) determination for the proposed Fresno to Bakersfield Locally Generated Alternative (F-B LGA), which spans 23.13 miles between Poplar Avenue in Shafter and Oswell Street in Bakersfield and includes a proposed station at the intersection of State Route 204 and F Street in Bakersfield. We appreciate the additional edits made to the Checkpoint C Package in response to previous comments made by our agency via email on March 31, 2017 and at the pre-submittal workshop on April 4, 2017.

EPA feedback is aimed at integrating permitting requirements of Clean Water Act (CWA) Section 404 with NEPA requirements. The purpose of this letter is to provide EPA's "agreement" with "Checkpoint C", a step in the integration process described in the *NEPA/ CWA Section 404/Rivers and Harbors Act Section 14 (33 U.S.C. 408) Integration Process for the California High-Speed Train Program Memorandum of Understanding* (NEPA/404 MOU) dated December 2010. To facilitate effective integration of CWA Section 404 and NEPA for this project, EPA continues to coordinate closely with your agencies and the U.S. Army Corps of Engineers (Corps).

Least Environmentally Damaging Practicable Alternative (LEDPA)
After reviewing the information provided in the Checkpoint C package, and per the NEPA/404 MOU, EPA provides agreement with FRA and CHSRA's determination that the "F-B LGA" alternative is the preliminary LEDPA for the connection between Poplar Avenue in Shafter and Oswell Street in Bakersfield. This alignment is a continuation of the December 19, 2013, Checkpoint C LEDPA determination from the Fresno station to Seventh Standard Road. As this determination has been made prior to public circulation of the SDEIS, it will be revisited if necessary should additional information become available after public comments are received.

Draft Compensatory Mitigation Plan
The Draft Compensatory Mitigation Plan is a conceptual strategy specifying resources available for the establishment and/or rehabilitation of aquatic resources. The submitted Checkpoint C Package provides a general overview of mitigation needs, opportunities, and plausible implementation scenarios. According to the submittal, the F-B LGA will result in direct impacts to 17.14 acres of waters of the United States (WOUS). The submittal also briefly describes 3 potential mitigation sites to offset unavoidable impacts to WOUS.

Per the NEPA/404 MOU, EPA provides agreement that the Draft Compensatory Mitigation Plan may provide sufficient mitigation to meet the needs of the project under Section 404 of the Clean Water Act. EPA expects that more site-specific information will be made available prior to Clean Water Act Section 404 permitting. Specifically, the Final Mitigation Plan should include information on all key elements of the mitigation rule (Subpart J of the 404(b)(1) Guidelines at 40 CFR Part 230) in order to ensure compliance. Some factors include, but are not limited to: information on the environmental suitability of candidate compensatory mitigation sites; landscape scale connectivity between proposed mitigation sites and other aquatic resources; evidence of historical wetlands occurrence; suitability to sustain hydrology; and presence of adequate buffer areas. EPA looks forward to collaborating with your agencies and Corps staff in the use of the program technical procedures to implement a watershed approach to mitigation.

Thank you for requesting EPA's agreement on the LEDPA and Draft Compensatory Mitigation Plan. We look forward to further participation in the development of environmental documents for this project. EPA will ultimately review EISs for each section of the California HSR system pursuant to NEPA, Council on Environmental Quality (CEQ) regulations (40 CFR Parts 1500-1508), and Section 309 of the Clean Air Act. EPA will also review CWA Section 404 permit applications for each HSR section for compliance with EPA's 404(b)(1) Guidelines (40 CFR 230.10). We appreciate this opportunity to address potential environmental issues as early as possible.

If you have any questions or comments please contact the NEPA lead for this project, Clifton Meek, at (415) 972-3370 (meek.clifton@epa.gov) or the aquatic resources lead for this project, Sarvy Mahdavi, at (213) 244- 1830 (mahdavi.sarvy@epa.gov).

Sincerely,

Connell Dunning

Connell Dunning, Transportation Team Supervisor
Environmental Review Section
Enforcement Division

CC Via Email:
Kitty Barkley, California High Speed Rail Authority
Serge Stanich, California High Speed Rail Authority
Zachary Simmons, U.S. Army Corps of Engineers
Susan Meyer, U.S. Army Corps of Engineers

APPENDIX B: CORRESPONDENCE FROM FEDERAL RAILROAD ADMINISTRATION REGARDING GENERAL CONFORMITY

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From:	Perez-Arrieta, Stephanie (FRA)
To:	Beightel, Eric(PB)@HSR; Osterhues, Marlys (FRA)
Cc:	McLoughlin, Mark@HSR; McKell, Dan@HSR; Porter, Bryan(PB)@HSR; Stanich, Serge(PB)@HSR; Bayne, Andrew(PB)@HSR; Patel, Manisha D.
Subject:	RE: LGA Air Quality Conformity Verification
Date:	Friday, October 18, 2019 1:59:39 PM

Eric,

Thank you for your explanations below. FRA agrees with the underlying conclusion of the memo that no new conformity determination or re-evaluation is required for the LGA. However, we would like to discuss the details of your memo so that we have a common understanding of the evaluations for the CV Wye and any future supplemental EISs. We should also take that opportunity to discuss project sections that will require new general conformity determinations by FRA.

Please let me know when you would be available for further discussion on this topic in light of what we understand is the status of the CV Wye EIS.

Stephanie

Stephanie B. Perez, PG
Office of Program Delivery
Federal Railroad Administration
West Building – Mail Stop 20
1200 New Jersey Avenue, SE
Washington, DC 20590
202.493.0388
202.510.1378 (mobile)
stephanie.perez@dot.gov

From: Beightel, Eric(PB)@HSR [mailto:Eric.Beightel@hsr.ca.gov]
Sent: Tuesday, October 15, 2019 2:18 PM
To: Perez-Arrieta, Stephanie (FRA) <stephanie.perez@dot.gov>; Osterhues, Marlys (FRA) <Marlys.Osterhues@dot.gov>
Cc: McLoughlin, Mark@HSR <Mark.McLoughlin@hsr.ca.gov>; McKell, Dan@HSR <Dan.McKell@hsr.ca.gov>; Porter, Bryan(PB)@HSR <bryan.porter@hsr.ca.gov>; Stanich, Serge(PB)@HSR <Serge.Stanich@hsr.ca.gov>; Bayne, Andrew(PB)@HSR <Andrew.Bayne@hsr.ca.gov>; Patel, Manisha D. <Manisha.Patel@wsp.com>
Subject: RE: LGA Air Quality Conformity Verification

Stephanie –

Sorry I missed the call this morning but I understand that you discussed the responses to your query below. I've pasted the answers in bold for your use.

- Was the 2014 model run for the final EIS to determine "de minimis" on the selected alternative? - **The run was done for the BNSF alternative which, as detailed in the EIR/EIS, was the worst case alternative. The results of the analysis were used for comparison to the de minimis thresholds.**

- Is table 1 in the memo for the entire FB project or just the section from Wasco to Bakersfield downtown station? **Table 1 is the Construction emissions from the Final General Conformity Determination, which was finalized in 2014, and represent the entire 2014 FB alignment. Table 2 is the full FB alignment including the LGA modifications. The emissions are lower in Table 2 because, under the LGA, the station would be located at F Street, making the route shorter, with fewer structures, and it would take less time to build.**

Please let me(us) know if you have any additional questions or concerns.

EBB

From: Perez-Arrieta, Stephanie (FRA) <stephanie.perez@dot.gov>
Sent: Friday, October 11, 2019 3:23 PM
To: Beightel, Eric(PB)@HSR <Eric.Beightel@hsr.ca.gov>; Osterhues, Marlys (FRA) <Marlys.Osterhues@dot.gov>
Cc: McLoughlin, Mark@HSR <Mark.McLoughlin@hsr.ca.gov>; McKell, Dan@HSR <Dan.McKell@hsr.ca.gov>; Porter, Bryan(PB)@HSR <bryan.porter@hsr.ca.gov>; Stanich, Serge(PB)@HSR <Serge.Stanich@hsr.ca.gov>; Bayne, Andrew(PB)@HSR <Andrew.Bayne@hsr.ca.gov>; Patel, Manisha D. <Manisha.Patel@wsp.com>
Subject: RE: LGA Air Quality Conformity Verification

Eric,

Two quick questions on the AQ memo just for clarification.

- Was the 2014 model run for the final EIS to determine "de minimis" on the selected alternative?

- Is table 1 in the memo for the entire FB project or just the section from Wasco to Bakersfield downtown station?

Thanks,

Stephanie

From: Beightel, Eric(PB)@HSR [mailto:Eric.Beightel@hsr.ca.gov]
Sent: Tuesday, October 01, 2019 7:25 PM
To: Osterhues, Marlys (FRA) <Marlys.Osterhues@dot.gov>; Perez-Arrieta, Stephanie (FRA) <stephanie.perez@dot.gov>

Cc: McLoughlin, Mark@HSR <Mark.McLoughlin@hsr.ca.gov>; McKell, Dan@HSR <Dan.McKell@hsr.ca.gov>; Porter, Bryan(PB)@HSR <bryan.porter@hsr.ca.gov>; Stanich, Serge(PB)@HSR <Serge.Stanich@hsr.ca.gov>; Bayne, Andrew(PB)@HSR <Andrew.Bayne@hsr.ca.gov>; Patel, Manisha D. <Manisha.Patel@wsp.com>
Subject: LGA Air Quality Conformity Verification
Importance: High

Marlys/Stephanie –

On behalf of Mark McLoughlin (who is driving to Chowchilla at the moment) please find attached to this email a memorandum summarizing the information related to the air quality conformity determination for the Fresno to Bakersfield – Locally Generated Alternative (LGA) Supplemental Environmental Impact Statement. Pursuant to the requirements of 23 U.S.C. 327 and the NEPA Assignment MOU, FRA retains the responsibility for making air quality conformity determinations under the Clean Air Act. This memo provides relevant project history on the previous conformity determination for the Fresno to Bakersfield EIS and justification for relying on that determination for the LGA. We'd appreciate your review and confirmation that the previous conformity determination is still valid as soon as you are able – in our previous conversations you indicated that we could expect your response within 10 days or by October 10.

Please let us know if you have any questions or would like to discuss and we will arrange for a call.

Thank you,

Eric

Eric B. Beightel
Environmental Policy Advisor
O: 202-661-5318
C: 785-218-6901
Eric.beightel@hsr.ca.gov

CALIFORNIA High-Speed Rail Authority

(Headquarters/Environmental)_ Memorandum	DATE ISSUED: 10/01/19	EXPIRES: Not Applicable
TO: Ms. Stephanie Perez	REFERENCES: Fresno to Bakersfield Project Section	
FROM: Mark A. McLoughlin		
SUBJECT: General Conformity Verification: Fresno to Bakersfield Locally Generated Alternative		

The California High-Speed Rail Authority (Authority) requests that the Federal Railroad Administration (FRA) confirm that the Final General Conformity Determination for the Fresno to Bakersfield (F-B) Project Section, between the Fresno Station and Oswell Street in Bakersfield, California, remains valid for the Locally Generated Alternative (LGA) and that a new conformity determination is not needed.

Fresno to Bakersfield Environmental Impact Report/Environmental Impact Statement

The Final General Conformity Determination for the F-B Project Section was signed by FRA Administrator Joseph Szabo on June 27, 2014, and published with the Record of Decision. It was based on the condition that the Authority enter into a Voluntary Emissions Reduction Agreement (VERA) with the San Joaquin Valley Air Pollution Control District (SJVAPCD or Valley Air District) to offset construction emissions of criteria pollutants to net zero. The Authority and FRA made this commitment as part of Air Quality Mitigation Measure #4 (AQ-MM#4), "Offset Project Construction Emissions through an SJVAPCD VERA" in the F-B Revised Draft Environmental Impact Report/Environmental Impact Statement (EIR/EIS), which was shared with the public and cooperating agencies in June 2012.

In April 2014, the Authority and FRA prepared and released the F-B Final EIR/EIS, which included both Air Quality Mitigation Measure AQ-MM#4 and a Draft General Conformity Determination stating that, by entering into a VERA with the Valley Air District, the F-B Project Section would meet General Conformity requirements during construction. In May 2014 the Authority certified the F-B Final EIR/EIS, and in June 2014 FRA approved a Record of Decision, which included the Final General Conformity Determination. Construction emissions from the Final General Conformity Determination are shown in Table 1.

Central Valley Construction

After approval of the Merced to Fresno Section Final EIR/EIS (2012) and the F-B Section Final EIR/EIS (2014), the Authority procured three design-build contracts (Construction Packages [CP] 1, 2/3, and 4). The Authority developed emissions estimates based on the designs in the construction packages; provided the emissions estimates for each construction packages to the Valley Air District; and negotiated and signed individual VERAs. The VERA for CP 1 became effective July 23, 2014, while the agreement for CP 2/3 and the agreement for CP 4 were approved on January 13, 2016, and September 16, 2016, respectively. The Authority has funded the offsets. The design-build contractors report their actual emissions monthly so the Authority can confirm the emissions do not exceed the reductions specified in the VERA. The Valley Air District reports to the Authority annually to demonstrate that the construction emissions have been offset to net zero.

In addition, on November 9, 2017, the Authority issued guidance requiring the use of Tier 4 engines on all off-road construction equipment, where feasible. The guidance also mandates use of renewable diesel fuel, which is required to meet the most recent ASTM D975 specification for ultra-low-sulfur diesel and must have a carbon intensity no greater than 50 percent diesel. Renewable diesel fuel has the lowest carbon intensity among petroleum fuels sold in California.

Locally Generated Alternative Draft Supplemental EIR/EIS

Concurrent with procurement of the design-build contracts, the Authority negotiated settlement agreements with parties that litigated the California Environmental Quality Act document. Negotiations with the City of Bakersfield

resulted in an alternative station location (at F Street), and the Authority agreed to evaluate this LGA in a supplemental environmental document. When initiating the Supplemental EIR/EIS, the Authority and FRA met to develop the scope of the document. The agencies jointly agreed on which technical studies needed to be prepared in support of the Supplemental EIR/EIS and which did not need to be updated from the F-B Section Final EIR/EIS. The agencies agreed that the air quality technical report should be revised because it had been for each of the previous draft and final documents.

The Authority completed the Air Quality and Global Climate Change Technical Report for the Supplemental EIR/EIS in June 2017. Consistent with previous air quality technical reports, chapter 9 is the General Conformity analysis. The updated 2017 analysis showed that construction emissions for the F-B project section are lower when considering the LGA than they would be for the overall Preferred Alternative (which included Fresno Station to Oswell Street), as presented in the 2014 General Conformity Determination. Table 2 shows construction emissions estimates under the LGA. The emissions would be lower because, under the LGA, the station would be located at F Street, making the route shorter, with fewer structures, and it would take less time to build. The Air Quality and Global Climate Change Technical Report, on page 9-2, shows the final General Conformity Determination is still valid, and no reevaluation of the Determination is required for the F-B LGA.

The Draft Supplemental EIR/EIS, signed by the FRA Associate Administrator, was released for public comment in November 2017. The General Conformity analysis described in Section 3.3.6.1 Draft Supplemental EIR/EIS was consistent with the finding documented in the Air Quality and Global Climate Change Technical Report. That is, the final General Conformity Determination was still valid, and no reevaluation of the Determination was required for the F-B LGA (Authority and FRA, November 2017, Fresno to Bakersfield Draft Supplemental EIR/EIS, pages 3.3-44 – 3.3-46).

Comments Received on the Draft Supplemental EIR/EIS

The Authority and FRA proceeded with the development of the F-B Final Supplemental EIR/EIS, in which Volume 4 presented the comments received and their responses. One comment was received from the general public related to General Conformity. FRA had no comment on the response prepared by the Authority.

The Valley Air District had two comments on the F-B Draft Supplemental EIR/EIS:

1) The Valley Air District acknowledged that the Authority is committed to expanding the VERA to cover the LGA, and that the VERA resolves the original Valley Air District concerns about the project going forward in the Central Valley.
2) The Valley Air District pointed out that the emissions modeling used a 2011 model, though the 2014 model was available. The Authority's response is that the original evaluation was based on the 2011 model and, by using the 2011 model for the LGA, the analysis remains consistent with the 2014 EIR/EIS. The purpose for using the 2011 model is to ensure a fair comparison of the F-B project overall between the 2014 selected alternative and the LGA.

During Cooperating Agency review, the U.S. Environmental Protection Agency had no comments on air quality and stated that the Authority had responded adequately to its comments on the F-B Draft Supplemental EIR/EIS.

Final General Conformity Determination

The Authority will enter into a VERA with the Valley Air District for the LGA. The Authority has entered into VERAs prior to construction on the previous construction packages and has demonstrated their efficacy to offset construction emissions to net zero. With the LGA, the F-B Project Section is shorter, has fewer structures, and can be constructed more efficiently. The Authority has implemented more emissions reduction measures than were required in the F-B Supplemental EIR/EIS.

Based on this information, the Authority requests that the FRA confirm that the Final General Conformity Determination remains valid for the F-B Project Section, between the Fresno Station and Oswell Street in Bakersfield, for the LGA, and that a new conformity determination is not needed.

Table 1
Final General Conformity Determination Fresno to Bakersfield Project Section Annual Construction-Phase Emissions

Pollutant		Emissions (tons/year)										Conformity Applicability Thresholds (tons/year)
		2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	
NO_x		**622.40**	**818.30**	**548.64**	**161.43**	**70.89**	4.17	1.95	**79.74**	0.53	0.19	10
VOCs		**24.01**	**42.78**	**33.82**	8.51	3.89	0.42	0.25	3.87	0.09	0.03	10
$PM_{2.5}$*		20.20	36.47	28.66	12.03	9.67	6.94	0.14	2.49	0.05	0.02	100
PM_{10}		51.44	75.12	62.43	15.79	14.90	8.63	2.95	4.33	0.13	0.08	100
CO**	Fresno	30.51	74.79	66.14	12.17	3.92	1.31	0.43	8.85	0.00	0.00	100
	Bakersfield	29.79	64.59	57.88	15.31	3.74	1.70	1.21	9.26	0.00	0.00	100

Note: **Bold** values exceed applicability thresholds.
* Includes sulfur dioxide emission rates as a partial precursor to $PM_{2.5}$ (i.e., it was conservatively assumed that 100 percent of SO_2 emissions become $PM_{2.5}$).
** Fresno and Bakersfield urbanized maintenance areas only.
CO = carbon monoxide; NO_x = nitrous oxides; PM_{10} = 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 2
Fresno to Bakersfield LGA Annual Construction-Phase Emissions

Pollutant		Emissions (tons/year)										Conformity Applicability Thresholds (tons/year)
		2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	
NO_x		**234.24**	**471.71**	**364.12**	**66.36**	**57.36**	4.17	1.95	**17.68**	0.53	0.19	10
VOCs		**10.26**	**30.04**	**25.92**	4.28	3.36	0.42	0.25	1.06	0.09	0.03	10
$PM_{2.5}$*		8.84	25.77	22.68	9.33	9.01	6.93	0.14	0.76	0.05	0.02	100
PM_{10}		36.31	62.57	55.82	13.10	14.24	8.63	2.95	2.67	0.13	0.08	100
CO**	Fresno	12.76	56.88	51.37	3.26	3.35	1.31	0.43	2.73	0.00	0.00	100
	Bakersfield	12.14	47.72	44.05	6.38	3.17	1.70	1.21	3.14	0.00	0.00	100

Note: **Bold** values exceed applicability thresholds.
* Includes sulfur dioxide emission rates as a partial precursor to $PM_{2.5}$ (i.e., it was conservatively assumed that 100 percent of SO_2 emissions become $PM_{2.5}$).
** Fresno and Bakersfield urbanized maintenance areas only.
CO = carbon monoxide; NO_x = nitrous oxides; PM_{10} = 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

APPENDIX C: MITIGATION MONITORING AND ENFORCEMENT PLAN (AND AMENDMENTS)

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CALIFORNIA HIGH-SPEED TRAIN

Project Environmental Impact Report/Environmental Impact Statement

Fresno to Bakersfield

Mitigation Monitoring and Enforcement Plan

June 2014

CALIFORNIA
High-Speed Rail Authority

U.S. Department of Transportation
Federal Railroad Administration

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Tables

Attachments

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Introduction

In April 2014, the Federal Railroad Administration (FRA) and California High-Speed Rail Authority (Authority) prepared a joint Final Project Environmental Impact Report/ Environmental Impact Statement (EIR/EIS) for the Fresno to Bakersfield Section of the California High-Speed Train (HST) System (Project). The Final Project EIR/EIS satisfies the requirements of National Environmental Policy Act (NEPA) and is the basis for the FRA's Record of Decision (ROD). As part of the ROD, FRA has selected the BNSF Alternative in combination with the Corcoran Bypass, Allensworth Bypass, and the Bakersfield Hybrid alternatives and the Kings/Tulare Regional Station-East Alternative and the Bakersfield Station-Hybrid Alternative.

This Mitigation Monitoring and Enforcement Plan (MMEP) has been prepared for the Fresno to Bakersfield Section of the HST Project and adheres to the Council on Environmental Quality's (CEQ) regulations (40 Code of Federal Regulations [CFR] Section 1505) and FRA Procedures for Considering Environmental Impacts (64 Federal Register 28545, May 26, 1999). On January 14, 2011, the CEQ finalized guidance entitled *Appropriate Use of Mitigation and Monitoring and Clarifying the Appropriate Use of Mitigated Findings of No Significant Impact* (CEQ Guidance). The CEQ Guidance is intended to assist federal agencies to develop mitigation programs that provide effective documentation, implementation, and monitoring of mitigation commitments. FRA considered the CEQ Guidance in the preparation of this MMEP.

Table 1 and Attachment A of the MMEP describe mitigation measures that would mitigate the potential adverse environmental impacts to construct and operate and Table 2 describes measures that would avoid or minimize potential impacts to construct and operate the Project. These measures were developed by the FRA and the Authority in consultation with appropriate agencies, as well as with input from the public, to meet the requirements of NEPA and the California Environmental Quality Act (CEQA).

The Authority is required to comply with all mitigation measures adopted when the project was approved by the California High Speed Rail Authority Board, including any that were identified specifically to comply with CEQA as well as those addressing federal laws and requirements. The Project incorporates project design features and best management practices (BMPs) identified in the Final Project EIR/EIS and described in detail in a series of technical reports that accompanied preparation of the environmental document. As a result of applying these project design features and BMPs, the HST Project will avoid potential adverse environmental impacts in several resource areas, including electromagnetic interference/electromagnetic fields (EMI/EMF), hydrology and water resources, geology and soils, and hazardous materials and wastes. In addition, the Project's compliance with 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. Representative agencies include the U.S. Fish and Wildlife Service (USFWS), U.S. Army Corps of Engineers (USACE), and Environmental Protection Agency[1] with jurisdiction under the Endangered Species Act and the Clean Water Act, respectively. Like the mitigation measures listed in Table 1 and Attachment A, the project design features (see Table 2) 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 Project.

The laws and orders the project is subject to and the design features that are part of the Project are described for the following resource areas in more detail in the corresponding chapters of the Final Project EIR/EIS:

- Transportation – Chapter 3.2, section 3.2.2, section 3.2.6
- Air Quality and Global Climate Change – Chapter 3.3, section 3.3.2, section 3.3.8
- Noise and Vibration – Chapter 3.4, section 3.4.2, section 3.4.6
- EMI/EMF – Chapter 3.5, section 3.5.2, section 3.5.6
- Public Utilities and Energy – Chapter 3.6, section 3.6.2, section 3.6.6
- Biological Resources and Wetlands – Chapter 3.7, section 3.7.2, section 3.7.6
- Hydrology and Water Resources – Chapter 3.8, section 3.8.2, section 3.8.6
- Geology and Soils – Chapter 3.9, section 3.9.2, section 3.9.6
- Hazardous Materials and Wastes – Chapter 3.10, section 3.10.2, section 3.10.6
- Safety and Security – Chapter 3.11, section 3.11.2, section 3.11.6
- Socioeconomics, Communities, and Environmental Justice – Chapter 3.12, section 3.12.2, section 3.12.6
- Station Planning, Land Use, and Development –Chapter 3.13, section 3.13.2, section 3.13.16
- Agricultural Lands – Chapter 3.14, section 3.14.2, section 3.14.6
- Parks, Recreation, and Open Space, Chapter 3.15, section 3.15.2
- Aesthetics and Visual Resources – Chapter 3.16, section 3.16.2, section 3.16.6
- Cultural and Paleontological Resources – Chapter 3.17, section 3.17.2, section 3.17.6
- Regional Growth –Chapter 3.18, section 3.18.1
- Cumulative Impacts – Chapter 3.19, section 3.19.1, section 3.19.4

[1] EPA delegated authority under Section 401 of the Clean Water Act to the State of California.

Mitigation Monitoring and Enforcement Plan

The environmental effects of the Preferred Alternative and station locations for the Fresno to Bakersfield Section of the HST Project would result in effects that would be considered significant under NEPA. Mitigation measures that would reduce or eliminate potential adverse environmental effects are described in Chapter 3 of Volume 1 of the Final Project EIR/EIS. The specific provisions contained in the MMEP are presented as a table and include the mitigation measures identified in the Final Project EIR/EIS, organized by environmental issue and topical areas addressed in the EIR/EIS. In collaboration with FRA and the appropriate agencies, the Authority may refine the means by which it will implement a mitigation measure, as long as the alternative means ensure compliance with the intent of the original measure during project implementation. The MMEP describes implementation and monitoring procedural guidance, responsibilities, and timing for each mitigation measure identified in the Final Project EIR/EIS, including:

Significant Impact: Provides a brief description of the impact expected to occur from the proposed project as identified in the Final EIR/EIS.

Mitigation Measure: Provides the mitigation measure and monitoring requirements as identified the Final EIR/EIS.

Implementing Party/Monitoring /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 following roles are utilized in the text of mitigation measures in the MMEP:

As the proponent of the 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 accountable for the overall administration of the mitigation monitoring program and for assisting relevant individuals and parties in their oversight and reporting responsibilities. The responsibilities of mitigation implementation, monitoring, and reporting extend to several entities as discussed above; however, the Authority will bear the primary responsibility for verifying that the mitigation measures are implemented.

The FRA and Authority define 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 their 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.

Roles and Responsibilities

- **Authority:** Implementation and reporting on mitigation, avoidance and minimization measures as specified in the this MMEP as the responsibility of the Authority may be carried out by an Authority representative or a contractor hired independent of the Design Build Contractor or the Environmental Team. Authority responsible implementation and reporting may 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:** Design Build Contractor or the Environmental Team provided by the Design Build Contractor responsible for implementing or monitoring and reporting mitigation, avoidance and minimization measures as specified in this MMEP.
- **Mitigation Manager:** Design Build Contractor's representative responsible for overseeing their Environmental Team's implementation and reporting of environmental commitments. Reports the status of each mitigation measure to Authority in accordance with this MMEP.
- **Project Biologist:** The Design Build Contractor provided Biologist, upon approval by regulatory oversight agencies, is responsible for implementing mitigation measures in compliance with the terms and conditions outlined in the MMEP and U.S. Fish and Wildlife (USFWS), U.S. Army Corps of Engineers (USACE), State Water Resource Control Board (SWRCB), and California Department of Fish and Wildlife (CDFW) permits. The Project Biologist will direct compliance activities carried out by the Project Biological Monitors.
- **Biological Monitor(s):** The Design Build Contractor provided Biological Monitor(s) will be approved by and report directly to the Contractor's Biologist. The Project 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.
- **Project Biologist, Regulatory Specialist (Waters), Project Botanist:** The Project Biologist(s), Regulatory Specialist(s), and Project Botanist(s) provided by the Design-Build Contractor will represent the construction management team, will report directly to the Authority, will implement the mitigation reflected in the construction drawings and specifications, and will be responsible for reporting and overseeing the biological resources mitigation measures from the Final Fresno to Bakersfield Section EIR/EIS. The Project Biologist(s), Regulatory Specialist(s), and Project Botanist(s) will also be responsible for implementing mitigation measures in compliance with the MMEP and with the terms and conditions outlined in the USFWS, USACE, SWRCB, and CDFW permits. The Project Biologist(s), Regulatory Specialist(s), Project Botanist(s) will report to the overall construction management team Mitigation Manager (Mitigation Compliance Manager), interact with the designated Resident Engineer for the Fresno to Bakersfield Section and work to provide quality assurance of the implementation of the biological resources mitigation program as performed by the Contractor and the designated Project Biological Monitor(s). It is anticipated that the Project Biologist(s), Regulatory Specialist(s), and Project Botanist(s) will have specialized support from other biological monitors and work with the Mitigation Manager during deployment of the monitors and in performance of their respective responsibilities.
- **Cultural Resources Compliance Manager/Principal Investigator:** The Design Build Contractor provided Archaeologist, who meets the Secretary of the Interior (SOI) Standards of Archaeologist, 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, PA and MOA. Per

the Archaeological Treatment Plan (ATP) and MOA, the Cultural Resources Compliance Manager shall determine whether a Native American monitor is required to be present during ground-disturbing activities in various Archaeologically Sensitive Areas of the Project.

- **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. The Archaeological 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.
- **Contractor's Biologist/Mitigation Timing (Implementation Schedule/Reporting Schedule):** Not all mitigation actions will occur at the same time. Depending upon the measure, it may be undertaken prior to construction, during construction, or during project operations. Measures may also be undertaken in conjunction with different construction packages or at such time as project operations reach a certain level. This column of the table identifies the stage of the project during which the mitigation action will be taken and when reporting is to occur, if reporting is required.
- **Implementation Mechanism or Tool:** Identifies the actions required to implement the measures, including any required agreements and/or conditions.

Environmental Management System (EMS)

The Authority will implement an Environmental Management System (EMS) 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 EMS will also include a component that tracks the implementation of mitigation measures (as well as environmental commitments, BMPs, and design features) and can produce reports on compliance. FRA 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.

Table 1
Fresno to Bakersfield Mitigation Monitoring and Enforcement Plan

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Fresno to Bakersfield Mitigation Monitoring and Enforcement Plan

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact #	Impact Text
Air Quality											
AQ-MM#1	Reduce Criteria Exhaust Emissions from Construction Equipment	This mitigation measure will apply to heavy-duty construction equipment used during the construction phase. All off-road construction diesel equipment will use the cleanest reasonably available equipment (including newer equipment and/or tailpipe retrofits), but in no case less clean than the average fleet mix for the current calendar year, as set forth in CARB's OFFROAD 2011 database, and no less than a 40% reduction compared to a Tier 2 engine standard for NOx emissions. The Contractor will document efforts undertaken to locate newer equipment (such as, in order of priority, Tier 4, Tier 3, or Tier 2 equipment) and/or tailpipe retrofit equivalents. The Contractor will provide documentation of such efforts, including correspondence with at least two construction equipment rental companies. A copy of each unit's certified tier specification and any required CARB or SJVAPCD operating permit will be made available at the time of mobilization of each piece of equipment. The Contractor will keep a written record (supported by equipment-hour meters where available) of equipment usage during project construction for each piece of equipment.	Construction	Reporting	Weekly	Contractor	Contractor	Daily Record Keeping and Weekly Reporting	A copy of each unit's certified tier specification and any required California Air Resources Board (CARB) or San Joaquin Valley Air Pollution Control District (SJVAPCD) operating permit will be made available at the time of mobilization of each piece of equipment.	AQ#1	Construction of the HST alternatives would exceed the CEQA emissions thresholds for VOCs, NO_x, PM_{10}, and $PM_{2.5}$. Therefore, it could potentially cause violations of NO_2, O_3, PM_{10}, and $PM_{2.5}$ air quality standards or contribute substantially to NO_2 O_3, PM_{10}, and $PM_{2.5}$ existing or projected air quality violations.
										AQ #2	Construction of the HST alternatives would exceed the CEQA emissions thresholds for VOC, NO_x, PM_{10}, and $PM_{2.5}$. Therefore, it would conflict with the 1-hour Ozone Attainment Plan, the 8-hour Ozone Attainment Plan, and the PM_{10} and $PM_{2.5}$ Attainment Plans.
										LU Impact #1	Temporary and intermittent construction equipment emissions would inconvenience nearby residents on some lands along 31 miles of the Preferred Alternative.
AQ-MM#2	Reduce Criteria Exhaust Emissions from On-Road Construction Equipment	This mitigation measure applies to all on-road trucks used to haul construction materials, including fill, ballast, rail ties, and steel. Material-hauling trucks 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 CARB's EMFAC 2011 database. The Contractor will provide documentation of efforts to secure such a fleet mix. The Contractor will keep a written record of equipment usage during project construction for each piece of equipment.	Construction	Reporting	Weekly	Contractor	Contractor	Weekly reporting	Contract Requirement/ Specification	AQ #1	Construction of the HST alternatives would exceed the CEQA emissions thresholds for VOCs, NOx, PM_{10}, and $PM_{2.5}$. Therefore, it could potentially cause violations of NO_2, O_3, PM10, and PM2.5 air quality standards or contribute substantially to NO2 O3, PM10, and PM2.5 existing or projected air quality violations
										AQ#2	Compliance with Air Quality Plans: Construction of the HST alternatives would exceed the CEQA emissions thresholds for VOC, NOx, PM10, and PM2.5. Therefore, it would conflict with the 1-hour Ozone Attainment Plan, the 8-hour Ozone Attainment Plan, and the PM10 and PM2.5 Attainment Plans.
										AQ#3	Material hauling outside the SJVAB would exceed CEQA emission thresholds for NOx in the BAAQMD, Mojave Desert AQMD, Eastern Kern County APCD, and the South Coast AQMD, and would exceed the VOC threshold in South Coast AQMD for certain hauling scenarios. Therefore, it could potentially cause violations of NO_2, and O_3 air quality standards or contribute substantially to NO_2 and O_3 existing or projected air quality violations in those air basins.
										LU Impact #1:	Temporary and intermittent construction equipment emissions would inconvenience nearby residents on some lands along 31 miles of the Preferred Alternative.

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Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact #	Impact Text
AQ-MM#3	Reduce the Potential Impact of Concrete Batch Plants	Concrete batch plants would be sited at least 1,000 feet from sensitive receptors, including daycare centers, hospitals, senior care facilities, residences, parks, and other areas where people may congregate The concrete batch plant will utilize typical control measures to reduce the 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 U.S. EPA AP-42 controlled emission factors for concrete batch plants.	Pre-construction	Design/Reporting	Weekly	Contractor	Contractor	Weekly Reporting	Contract Requirements/ Specifications	AQ #8	Construction of the alignment may expose sensitive receptors to temporary substantial pollutant concentrations from concrete batch plants.
										LU Impact #1	Temporary and intermittent construction equipment emissions would inconvenience nearby residents on some lands along 31 miles of the Preferred Alternative.
AQ-MM#4	Offset Project Construction Emissions Through an SJVAPCD VERA	This mitigation measure would address AQ Impact #1 (Common Regional Air Quality Impacts During Construction) that would exceed the GC applicability and CEQA emissions thresholds for VOC and NOx, and the CEQA emission thresholds for PM10 and PM2.5. The Authority and SJVAPCD will enter into a contractual agreement to mitigate (by offsetting) to net zero the project's actual emissions from construction equipment and vehicle exhaust emissions of VOC, NOx, PM10, and PM2.5. The agreement will provide funds for the district's Emission Reduction Incentive Program[1] (SJVAPCD 2011) to fund grants for projects that achieve emission reductions, with preference given to highly impacted 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 C.F.R. Part 93 Section 93.163.	Pre-construction	Reporting/Funding	Weekly	Authority	Contractor	Weekly Reporting	The Authority and SJVAPCD will enter into a contractual agreement to mitigate the project's emissions by providing funds for the district's Emission Reduction Incentive Program to fund grants for projects that achieve emission reductions, thus offsetting project-related impacts on air quality.	AQ #1	Construction of the HST alternatives would exceed the CEQA emissions thresholds for VOCs, NOx, PM_{10}, and $PM_{2.5}$. Therefore, it could potentially cause violations of NO_2, O_3, PM_{10}, and $PM_{2.5}$ air quality standards or contribute substantially to NO_2 O_3, PM_{10}, and $PM_{2.5}$ existing or projected air quality violations.
										AQ #2	Construction of the HST alternatives would exceed the CEQA emissions thresholds for VOC, NO_x, PM_{10}, and $PM_{2.5}$. Therefore, it would conflict with the 1-hour Ozone Attainment Plan, the 8-hour Ozone Attainment Plan, and the PM_{10} and $PM_{2.5}$ Attainment Plans.
										LU Impact #1	Temporary and intermittent construction equipment emissions would inconvenience nearby residents on some lands along 31 miles of the Preferred Alternative.
AQ-MM#5	Purchase Offsets and Offsite Emission Mitigation for Emissions Associated with Hauling Ballast Material in Certain Air Districts	This mitigation measure will apply if ballast material is hauled from quarries outside the SJVAB and the hauling activities result in the exceedance of the annual applicable General Conformity threshold(s) or local air basin CEQA threshold(s) for NOx. To determine whether an exceedance will occur based on actual hauling activities, the Authority shall at the beginning of each calendar year or as soon as practicable thereafter to obtain the most up-to-date information, based on actual or projected contractor-specific information about hauling in the Mojave AQMD, South Coast AQMD and Bay Area AQMD, calculate for the next calendar year using the same methodology used in this EIR/EIS the expected NOx emissions from hauling activities in those districts. If, based on that calculation, exceedance of the applicable NOx threshold(s) is anticipated to occur in that next calendar year, the Authority will secure	Pre-construction/ Construction	Reporting/Funding	Weekly reporting	Contractor and Authority	Contractor and Authority	Weekly Reporting	Authority to coordinate the purchase of offsets with pertinent AQMDs per contractor reports.	AQ #3	Material hauling outside the SJVAB would exceed CEQA emission thresholds for NOx in the BAAQMD, Mojave Desert AQMD and the South Coast AQMD.

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Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact #	Impact Text
		from the appropriate air district(s) or other appropriate source the production or generation of a sufficient quantity of NOx offsets for that calendar year necessary to achieve conformity (in the case of exceedance of GC thresholds) and/or to result in net NOx generation below the applicable CEQA threshold(s). At a minimum, sufficient mitigation/offsets will be secured so they are generated in the year of impact or as otherwise permitted by 40 C.F.R. Part 93 Section 93.163.The Mojave Desert AQMD's emission bank has 2,061 tons of NOx credits (Mojave Desert AQMD 2012); therefore, there should be enough NOx credits to offset approximately 6 tons per year from this project in the Mojave Desert AQMD. The exact number of NOx credits in the SCAQMD RECLAIM program is unknown, but 1,199 tons of NOx credits were traded in 2011 and 235 tons of NOx credits were traded in 2012 (SCAQMD 2012). Therefore, there should be enough available NOx credits in the program to offset approximately 75 tons of NOx per year from this project in the SCAQMD.In the Bay Area AQMD, any material emissions above the district's significance threshold will be mitigated through an offsite emission mitigation program to achieve emission reduction due to material hauling in the Bay Area AQMD. Potential offsite mitigation programs include the Bay Area AQMD's Carl Moyer Memorial Air Quality Standards Attainment Program (CMP) or other air district emission reduction incentive programs. Depending on the final location selected to obtain ballast material, this would amount to a maximum of 3 tons of NOx credits.									
Noise and Vibration											
N&V-MM #1	Construction Noise Mitigation Measures	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). 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. A noise-monitoring program will be developed to meet required noise limits, the following noise control mitigation measures will be implemented as necessary, for nighttime and daytime:	Construction	Reporting	Weekly	Contractor	Contractor	Weekly	Contract Requirements/ Specifications	N&V#1	Construction Noise
										LU Impact #1	The generation of noise would temporarily inconvenience nearby residents on some lands along 31 miles of the Preferred Alternative.
										PK#1	Construction activities would increase noise exposure at McMurtrey Aquatic Center.
										PK#1	Construction activities would increase noise exposure at Mill Creek Linear Park.

Table 1
Fresno to Bakersfield Mitigation Monitoring and Enforcement Plan

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact #	Impact Text
		• 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 • CHSRA will establish and maintain in operation until completion of construction a toll-free "hotline" regarding the Section construction activities. CHSRA shall arrange for all incoming messages to be logged (with summaries of the contents of each message) and for a designated representative of CHSRA to respond to hotline messages within 24 hours (excluding weekends and holidays). CHSRA 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. CHSRA shall make a log of the in-coming messages and CHSRA's responsive actions publicly available on its website. • Mitigation for construction noise should include a requirement to adhere to the city's noise requirements and restrictions on construction activities in and around school									

Table 1
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Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact #	Impact Text
		areas to weekends and near all other sensitive receptors to weekdays and daytime hours only (Vol. V, City of Bakersfield comment). The Authority will consider the suggested mitigation measure for construction in conjunction with future decisions regarding an alignment through Bakersfield.									
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 25 to 50 feet from buildings, or if alternative methods such as push piling or auger piling 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, pre-construction 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 contractor will arrange for the repair of damaged buildings or will pay compensation to the property owner.	Pre-construction/ Construction / Post-construction	Reporting	Weekly	Contractor	Contractor	Ongoing monitoring during construction/ post-construction monitoring as needed to assess damage to buildings.	Contract Requirements/Specifications	N&V#2	Construction Vibration
										LU Impact #1:	The generation of noise would temporarily inconvenience nearby residents on some lands along 31 miles of the Preferred Alternative.
										PK#1	Construction activities would increase noise exposure at McMurtrey Aquatic Center.
										PK#1	Construction activities would increase noise exposure at Mill Creek Linear Park.
N&V- MM #3	Implement Proposed California High-Speed Train Project Noise Mitigation Guidelines	To determine the appropriate mitigation measure for properties experiencing severe noise impacts, noise mitigation guidelines would be applied as follows: Prior to operation of the HST the Authority will install sound barriers where they can achieve between 5 and 15 dB 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. Depending on the situation, sound barriers can become visually intrusive. Typically, the sound barriers 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	Pre-construction/ Construction / Post-construction	Reporting	Weekly	Authority	Authority	Ongoing monitoring during construction/ post-construction monitoring as needed to assess damage to buildings	Contract Requirements/ Specifications Noise and Vibration Mitigation Guidelines	N&V#3	Moderate and Severe Noise Impacts from Project Operation to Sensitive Receivers. Project Noise Impacts Preferred Alternative: 6,601 moderate and 3,378 severe impacts.
										N&V#6	The Hanford East Station Alternative would result in increases in traffic volume that would result in an increase in the future peak-hour noise level.
										PK#4	McMurtrey Aquatic Center. HST operation of the Preferred Alternative would increase noise exposure.
										PK#4	Kern River Parkway. Project impacts from operation of the HST would increase noise exposure.
										BIO#6	Project impacts from the HST would permanently impact suitable habitat that has the potential to support special-status invertebrate species through the creation of noise that would reduce the desirability of the habitat.
										BIO#6	Project impacts from the HST would permanently impact suitable habitat that has the potential to support special-status reptiles and amphibian species through the creation of noise that would reduce the desirability of the habitat.
										BIO#6	Project impacts from the HST would permanently impact suitable habitat that has the potential to support special-status bird species through the creation of noise that would reduce the desirability of the habitat.
										BIO#6	Project impacts from the HST would permanently impact suitable habitat that has the potential to support special-status mammal species through the creation of noise that would reduce the desirability of the habitat.

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Fresno to Bakersfield Mitigation Monitoring and Enforcement Plan

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact #	Impact Text
		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. 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 dB) 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 dB) 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 walls or sound installation 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 HST operations in which the homeowners would									

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Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact #	Impact Text
		accept the future noise conditions. This approach is usually taken only in isolated cases where other mitigation options are infeasible, impractical, or too costly.									
N&V-MM#4	Vehicle noise specification	In the procurement of an HST 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-dB-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.	Pre-construction/ Construction / Post-construction	Reporting	Weekly	Authority	Authority	Ongoing monitoring during construction/ post-construction monitoring as needed	Contract Requirements/Specifications Noise and Vibration Mitigation Guidelines	N&V#3	Moderate and Severe Noise Impacts from Project Operation to Sensitive Receivers. Project Noise Impacts Preferred Alternative: 2,564 moderate and 1,553 severe impacts,
N&V-MM#5	Special trackwork at crossovers and turnouts	Because the impacts of HST wheels over rail gaps at turnouts increases HST 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 project can use special types of trackwork that eliminate the gap.	Pre-construction/ Construction / Post-construction	Reporting	Weekly	Authority	Authority	Ongoing monitoring during construction/ post-construction monitoring as needed	Contract Requirements/ Specifications Noise and Vibration Mitigation Guidelines	N&V#3	Moderate and Severe Noise Impacts from Project Operation to Sensitive Receivers. Project Noise Impacts Preferred Alternative: 2,564 moderate and 1,553 severe impacts.
N&V-MM #6	Additional Noise Analysis Following Final Design	If final design or final vehicle specifications result in changes to the assumptions underlying the noise analysis, reassess noise impacts and recommendations for mitigation and provide supplemental environmental documentation, as required by CEQA.	Pre-construction/ Design/ Operation	Reporting	Final design/Final vehicle specification	Contractor/Authority (vehicle)	Contractor/ Authority (vehicle)	Final design/Final vehicle specification	Submit assessment and supplemental environmental documentation	N&V#3	Moderate and Severe Noise Impacts from Project Operation to Sensitive Receivers. Project Noise Impacts Preferred Alternative: 6,601 moderate and 3,378 severe impacts.
										N&V#6	The Hanford East Station Alternative would result in increases in traffic volume that would result in an increase in the future peak-hour noise level.
EMI/EMF											
EMF/EMI-MM #1	Protect Sensitive Equipment In Accordance with the EMCPP	The contractor will coordinate with Mercy Hospital regarding the potential impacts of HST–related EMF or RF interference on imaging equipment prior to completion of final design. Where necessary to avoid interference, the final design will include suitable design provisions to prevent interference. These design provisions may include establishing magnetic field shielding walls around sensitive equipment, or installing RF filters into sensitive equipment. HST-related EMI may affect highly susceptible, unshielded sensitive RF equipment such as older magnetic resonance imaging (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. In general, a shielding range between 60 and 90 dB may be considered a high level of protection, while 90 to 120 dB is exceptional.	Pre-construction/ Design	Reporting	Monthly	Contractor	Contractor	During construction report monthly	Reporting Contractor (unless Authority has 3rd party agreement with Mercy) to meet with Mercy West Hospital Representatives regarding potential impacts and provide shielding	EMF/EMI Impact #5:	Impacts to Sensitive Equipment from EMI. Under the Preferred Alternative, the worst-case EMFs are 1.8 mG at the edge of Mercy Hospital closest to the centerline of the HST right-of-way. Therefore, EMI may occur to sensitive medical devices or imaging equipment in the study area if the equipment is unshielded.

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Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact #	Impact Text
Public Utilities and Energy											
PU&E-MM #1	Reconfigure or relocate substations and/or substation components	Reconfigure existing substation ancillary components located at the southwest corner of Grangeville Boulevard and 7½ Avenue, east of the city of Hanford.	Pre-construction/ Design	Design/Reporting	Monthly	Contractor	Contractor	During construction report monthly	Condition of Design Build Contract	PU&E#8	Potential Conflicts with Fixed Electrical Facilities
Biological Resources											
BIO-MM#1	Designate Project Biologist(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	Mitigation Manager will identify Project Biologist, Regulatory Specialist (Waters), Project Botanist. Contractor will identify Project Biological Monitors and provide resumes to regulatory agencies as required.	Final Design	Contractor	Contractor	Final Design	Condition of Design Build Contract	BIO-MM#1 Applies to all BIO Impacts	
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	Pre-construction/ Construction /Post-construction	Access Granted to Regulatory Agencies	1 day following agency site visit	Contractor, Project Biologist	Contractor	1 day following agency site visit	Condition of Design Build Contract	Bio MM#2 applies to all BIO Impacts	

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Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact #	Impact Text
		to the Mitigation Manager. Any non-compliance issues will be reported to the Contractor and Authority.									
BIO-MM#3	Prepare and Implement a Worker Environmental Awareness Program (WEAP)	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 fact sheet 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	Training of all crew/construction personnel prior to start of construction. Provide daily weekly/monthly report as required by permit conditions or as additional crew/construction personnel receive training.	Daily Tracking	Contractor	Contractor	Monthly training forms submitted monthly.	Condition of Design/Build Contract	BIO-MM#3 applies to all BIO Impacts	
BIO-MM#4	Prepare and Implement a Weed Control Plan and Annual Vegetation Control 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	Pre-construction/ Construction / Post-construction/ Operation	Plan to be prepared prior to construction followed by Monthly memorandum to document the progress	Monthly	Contractor, Authority	Contractor, Authority	Monthly	Condition of the Design/Build Contract	BIO-MM#4 applies to all BIO Impacts	

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Fresno to Bakersfield Mitigation Monitoring and Enforcement Plan

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact #	Impact Text
		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 (CalIPC), 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 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). • 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		and implementation of the Weed Control Plan.							

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Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact #	Impact Text
		C2 of the Caltrans Maintenance Manual to manage vegetation on Authority property (Caltrans 2010). 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. 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 HST 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.								
BIO-MM#5	Prepare and Implement a Biological Resources Management Plan	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	Plan required Pre-construction, Implementation will occur during Construction and Post-construction.	Plan to be prepared prior to construction followed by reporting schedule s established by agency permit conditions.	TBD in the Biological Resource Management Plan in accordance with reporting schedule established by	Contractor	Contractor	TBD in the Biological Resource Management Plan in accordance with reporting schedule	Condition of the Design/Build Contract	BIO-MM#5 applies to all BIO Impacts	

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Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact #	Impact Text
		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. The BRMP will be submitted to the Contractor and will contain, but not be limited to, the following information: a. 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. b. Specific measures for the protection of special-status species. c. 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. d. 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. e. Sources of plant materials and methods of propagation. f. Identification of specific parameters consistent with mitigation ratios and permit conditions for determining the amount of replacement habitat for temporary disturbance areas. g. 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.			agency permit conditions			established by agency permit conditions			

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Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact #	Impact Text
		h. Specification of performance standards for the re-established plant communities within the construction limits. i. Specification of the remedial measures to be taken if performance standards are not met (e.g., a form of adaptive management). j. 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. k. Measures to preserve topsoil and control erosion. l. Design of protective fencing around Environmentally Sensitive Areas (ESAs), environmentally restricted areas (ERAs), and the construction staging areas. m. Specification of the locations and quantities of gallinaceous guzzlers (catch basin/artificial watering structures) and the monitoring of water levels in them. n. Locations of trees to be protected as wildlife habitat (roosting sites) and locations for planting replacement trees. 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. Specific construction monitoring programs for habitats of concern and special-status species, as needed. 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. 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.								
BIO-MM#6	Prepare and Implement a Restoration and Revegetation Plan	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	Prepare the plan Pre-construction, Implement the plan during construction, Monitoring during Post-	Prepare and Implement RRP.	Finalize the RRP Pre-construction. Follow reporting requirements as established by agency permit	Contractor	Contractor	Finalize the RRP Pre-construction. Follow reporting requirements as established by agency	Condition of the Design/Build Contract Restoration and Revegetation Plan (RRP) Compliance report to document implementation	BIO-MM#6 applies to all BIO Impacts	

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Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact #	Impact Text
		decompaction or re-grading 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.	construction		conditions during Construction, and Post-Construction			permit conditions during Construction, and Post-Construction	and performances standards.		
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 MMEP 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	Identify and Establish ESAs and ERAs; Remove Fencing, Memo to Mitigation Manager	Prior to Construction. Following reporting schedule established by agency permit requirements	Contractor	Contractor	Prior to Construction. Following reporting schedule established by agency permit requirements	Condition of Design/Build Contract	BIO-MM#7 applies to all BIO Impacts	

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Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact #	Impact Text
BIO-MM#8	Wildlife Exclusion Fencing	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	Installation of wildlife-specific exclusion barriers; Memo to Mitigation Manager	Following reporting schedule established by agency permit requirements	Contractor	Contractor	Following reporting schedule established by agency permit requirements	Condition of Design/Build Contract	BIO#6	Project impact from the Preferred Alternative would permanently impact suitable habitat that has the potential to support special-status reptiles and amphibian species.
										BIO#6	Project impact from the Preferred Alternative would permanently impact suitable habitat that has the potential to support special-status mammal species.
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	Monitoring and Reporting	Following reporting schedule established by agency permit requirements	Contractor	Contractor	Following reporting schedule established by agency permit requirements	Condition of Design/Build Contract	BIO-MM#9 applies to all BIO Impacts	
BIO-MM#10	Mono-Filament Netting	Thirty days before and during the implementation of ground-disturbing activities, the Project Biologist will verify that 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	Monitoring and Reporting	Monthly or in accordance with reporting schedule established by agency permit requirements	Project Biologist	Project Biologist	Monthly or in accordance with reporting schedule established by agency permit requirements	Condition of Design/Build Contract	BIO#2	Construction of the Preferred Alternative would disturb the suitable habitat that has potential to support special-status reptile and amphibian species.
										BIO#2	Construction of the Preferred Alternative would disturb suitable habitat that has the potential to support special-status mammal species.
										BIO#6	Project impact from the Preferred Alternative would permanently impact suitable habitat that has the potential to support special-status reptiles and amphibian species.
										BIO#6	Project impact from the Preferred Alternative would permanently impact suitable habitat that has the potential to support special-status mammal species.

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Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact #	Impact Text
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	Establish vehicle routes, clearly flag and mark access routes, and prohibit off-road traffic, monitor and report	Weekly	Contractor	Contractor	Weekly	Condition of Design/Build Contract	BIO-MM#11 applies to all BIO Impacts	
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 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	Cover holes and trenches and protect pipes >3 inches in diameter	Weekly	Contractor	Contractor	Weekly	Condition of Design/Build Contract	BIO#2	Construction of the Preferred Alternative would disturb the suitable habitat that has potential to support special-status reptile and amphibian species.
										BIO#2	Construction of the Preferred Alternative would disturb suitable habitat that has the potential to support special-status mammal species.
										BIO#6	Project impact from the Preferred Alternative would permanently impact suitable habitat that has the potential to support special-status reptiles and amphibian species.
										BIO#6	Project impact from the Preferred Alternative would permanently impact suitable habitat that has the potential to support special-status mammal species.

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Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact #	Impact Text
BIO-MM#13	Work Stoppage	During ground-disturbing activities, the Project Biologist, Regulatory Specialist (Waters), and Project Botanist or Project 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; work may continue in other areas. Before construction, the Contractor will obtain written permission from CDFW to capture and relocate any non-listed wildlife species (does not included domesticated animals) from within the project footprint..	Construction	Stop Work, relocate species (if possible), and report	1 day following work stoppage	Contractor	Contractor	1 day following work stoppage	Condition of Design/Build Contract	BIO-MM#13 applies to all BIO Impacts	
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	Notification of Mitigation Manager, USFWS and/or CDFW and recommendation of additional measures	Immediate notification of Mitigation Manager; Notify USFWS and/or CDFW within 24 hours	Contractor	Contractor	Immediate notification of Mitigation Manager; Notify USFWS and/or CDFW within 24 hours	Condition of Design/Build Contract	BIO#2	Construction of the Preferred Alternative would disturb suitable habitat that has potential to support special-status invertebrate species.
										BIO#2	Construction of the Preferred Alternative would disturb suitable habitat that has potential to support special status reptiles and amphibians
										BIO#2	Construction of the Preferred Alternative would disturb suitable habitat that has potential to support special status bird species
										BIO#2	Construction of the Preferred Alternative would disturb suitable habitat that has potential to support special status mammal species
										BIO#6	Project impacts from the Preferred Alternative would permanently impact suitable habitat that has the potential to support special-status invertebrate species.
										BIO#6	Project impacts from the Preferred Alternative would permanently impact suitable habitat that has the potential to support special-status reptile and amphibian species.
										BIO#6	Project impacts from the Preferred Alternative would permanently impact suitable habitat that has the potential to support special-status bird species (including raptors).
										BIO#6	Project impacts from the Preferred Alternative would permanently impact suitable habitat that has the potential to support special-status mammal species.
BIO-MM#15	Post-Construction Compliance Reports	After each construction package, construction phase, permitting phase, or other portion of the HST 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., USFWS, 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	Compliance Reporting	In accordance with reporting schedule established by agency permit requirements	Contractor	Contractor	In accordance with reporting schedule established by agency permit requirements	Condition of Design/Build Contract	BIO-MM#15 applies to all BIO Impacts	

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Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact #	Impact Text
BIO-MM#16	Conduct Protocol-Level Pre-construction Surveys for Special-Status Plant Species and Special-Status Plant Communities	Prior to construction, 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 prior to construction. 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 a relocation/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, Construction, and Post-construction	Conduct protocol level surveys for special-status plant species; Report findings; Restore temporary disturbed areas	Report findings at least 30 days prior to ground disturbance	Contractor	Contractor	Report findings at least 30 days prior to ground disturbance	Condition of Design/Build Contract Following requirements established by regulatory compliance permits	BIO#1	Construction of the Preferred Alternative would directly or indirectly impact suitable habitat that has potential to support special-status plant species.
										BIO#3	Construction of the Preferred Alternative would disturb special-status plant communities, and riparian areas.
										BIO#5	Project impacts from the Preferred Alternative would permanently impact special-status plant species or suitable habitat that has potential to support these species.
										BIO#7	Project impacts from the Preferred Alternative would permanently impact special-status plant communities, and riparian areas.
										BIO#7	Project impacts from the Preferred Alternative would disturb portions of recovery plans.
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,	Pre-construction (Plan), Implementation during construction, Monitoring post-construction	Prepare/Implement Plan and Report Compliance	Follow reporting requirements as established by regulatory compliance permits.	Contractor	Contractor	Follow reporting requirements as established by regulatory compliance permits.	Condition of Design Build Contract Salvage, Relocation, and Propagation of Special Status Plant Species Following requirements established by regulatory compliance permits	BIO#1	Construction of the Preferred Alternative would directly or indirectly impact suitable habitat that has potential to support special-status plant species.
										BIO#5	Project impacts from the Preferred Alternative would permanently impact special-status plant species or suitable habitat that has potential to support these species.
										BIO#7	Project impacts from the Preferred Alternative would disturb portions of recovery plans.

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		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.									
BIO-MM#18	Conduct Pre-construction Sampling and Assessment for Vernal Pool Fauna	Before the start of ground-disturbing activities, the Project Biologist will conduct pre-construction aquatic assessment and sampling in seasonal wetlands and vernal pools in the construction footprint. The approved biologists will visit the sites after initial storm events to determine when seasonal wetlands and vernal pools have been inundated. A seasonal wetland/vernal pool is considered to be inundated when it holds greater than 3 cm of standing water 24 hours after a rain event. Approximately 2 weeks after the pools are inundated, the biologists will conduct general aquatic surveys in appropriate seasonal wetland and vernal pool habitats. The sampling is an assessment that will be useful in understanding the species present and will help guide the implementation of the performance standards to be consistent with BIO-MM#20: Implement and Monitor Vernal Pool Protection. The Project Biologist will submit a report to the Mitigation Manager and Authority or its designee within 30 days of completing the field work. The report will provide the documentation and the results of the sampling, including the results of the data collection and a comparison with the performance standards.	Pre-construction	Aquatic assessment and sampling; reporting	Report findings at least 30 days prior to ground disturbance	Contractor	Contractor	Report findings at least 30 days prior to ground disturbance	Condition of Design Build Contract Following requirements established by regulatory compliance permits	BIO#2	Construction of the Preferred Alternative would disturb suitable habitat that has potential to support special-status invertebrate species.
										BIO#6	Project impacts from the Preferred Alternative would permanently impact suitable habitat that has the potential to support special-status invertebrate species.
										BIO#7	Project impacts from the Preferred Alternative would disturb portions of recovery plans.
BIO-MM#19	Seasonal Vernal Pool Work Restriction	For seasonal avoidance of special-status vernal pool branchiopods and vernal-pool-dependent species (e.g., vernal pool branchiopods, western spadefoot toads, California tiger salamanders), the Contractor will not work within 250 feet of suitable aquatic habitats (e.g., vernal pools, seasonal wetlands) from October 15 to June 1 (corresponding to the rainy season) or as determined through informal or formal consultation with the USFWS or USACE. Ground-disturbing activities may begin once the habitat is no longer inundated for the season and it is after April 15. If any work remains to be completed after October 15, the Contractor (under the direction of the Project Biologist) will install exclusion fencing and erosion control measures in those areas where construction activities need to be completed. The Project Biologist will document compliance through memoranda to the Mitigation Manager during the establishment of the fencing activities.	Construction	Exclusion fencing, Reporting	Follow reporting requirements as established by regulatory compliance permits	Contractor	Contractor	Follow reporting requirements as established by regulatory compliance permits	Condition of Design Build Contract Following requirements established by regulatory compliance permits	BIO#2	Construction of the Preferred Alternative would disturb suitable habitat that has potential to support special-status invertebrate species.
										BIO#6	Project impacts from the Preferred Alternative would permanently impact suitable habitat that has the potential to support special-status invertebrate species.
										BIO#7	Project impacts from the Preferred Alternative would disturb portions of recovery plans.

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BIO-MM#20	Implement and Monitor Vernal Pool Protection	Although all temporary impacts on vernal pools are considered to be permanent and will be mitigated through offsite compensatory mitigation (see BIO-MM#63), vernal pools within the temporary construction footprint will be protected by erecting exclusion fencing, if they can be avoided. The Contractor will erect and maintain the exclusion fencing. For impacts on vernal pools within the temporary construction footprint that cannot be avoided, the Contractor, under the guidance of the Regulatory Specialist (Waters), will place rinsed gravel within the affected vernal pools and will cover the affected vernal pools with geotextile fabric before the start of ground-disturbing activities to minimize damage to the soils and protect the contours. The Contractor, under the direction of the Regulatory Specialist (Waters), will collect a representative sampling of soils from the vernal pools before initiating ground-disturbing activities within the vernal pools. The representative soil samples will contain viable plant seeds and vernal pool branchiopod cysts to be preserved from the vernal pools. These samples may be incorporated into other vernal pools, as applicable, with USFWS and/or CDFW consultation. The Contractor will implement these measures within temporary impact areas adjacent to or within the construction footprint. Resource agency consultations with the USFWS and USACE will occur as needed and based on permit conditions. 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. Because impacts to vernal pools within the temporary construction footprint are considered to be permanent impacts, these impacts will be mitigated through offsite mitigation, as described in BIO-MM#63. The Contractor will obtain approval from USACE, before the implementation of the above-described mitigation measures, for any unanticipated temporary impacts on vernal pools. If unanticipated temporary impacts last more than one full wet-dry season cycle, offsite mitigation will be implemented.	Construction	Exclusion fencing, collection of soil material, off-site compensatory mitigation; reporting	Weekly or reporting requirements as established by regulatory compliance permits	Contractor	Contractor	Weekly or reporting requirements as established by regulatory compliance permits	Condition of Design Build Contract Following requirements established by regulatory compliance permits	BIO#2	Construction of the Preferred Alternative would disturb suitable habitat that has potential to support special-status invertebrate species.
										BIO#6	Project impacts from the Preferred Alternative would permanently impact suitable habitat that has the potential to support special-status invertebrate species.
										BIO#7	Project impacts from the Preferred Alternative would disturb portions of recovery plans.
BIO-MM#21	Implement Avoidance and Minimization Measures for the Valley Elderberry Longhorn Beetle	Before and during the implementation of ground-disturbing activities, the Project Biologist will direct the Contractor to implement the avoidance and minimization measures detailed in the Conservation Guidelines for the Valley Elderberry Longhorn Beetle (USFWS 1999a). These measures include conducting protocol-level presence/absence surveys for this species, establishing and maintaining appropriate buffer areas around elderberry	Pre-construction, Construction, Post-construction	Protocol-level surveys, implementation of avoidance and minimization measures, restore temporary disturbances	Weekly or reporting requirements as established by regulatory compliance permits	Contractor	Contractor	Weekly or reporting requirements as established by regulatory compliance permits	Condition of Design Build Contract Following requirements established by regulatory compliance permits	BIO#2	Construction of the Preferred Alternative would disturb suitable habitat that has potential to support special-status invertebrate species.
										BIO#6	Project impacts from the Preferred Alternative would permanently impact suitable habitat that has the potential to support special-status invertebrate species.
										BIO#7	Project impacts from the Preferred Alternative would disturb portions of recovery plans.

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		plants, restricting the use of chemicals that might harm beetles, and mowing restrictions. After ground-disturbing activities are completed, any damage to temporarily disturbed buffer areas surrounding elderberry shrubs will be restored as detailed in the Conservation Guidelines for the Valley Elderberry Longhorn Beetle (USFWS 1999a). 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.		following construction							
BIO-MM#22	Conduct Pre-construction 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	Pre-construction surveys for special status species, and establishment of ESAs and ERAs	Weekly or at other appropriate interval	Contractor	Contractor	Surveys conducted 30 days prior to ground disturbance, During construction submit weekly reports or reporting requirements as established by regulatory compliance permits	Condition of Design Build Contract Following requirements established by regulatory compliance permits	BIO#2	Construction of the Preferred Alternative would disturb the suitable habitat that has potential to support special-status reptiles and amphibian species.
										BIO#6	Project impacts from the Preferred Alternative would permanently impact suitable habitat that has the potential to support special-status reptiles and amphibian species
										BIO#7	Project impacts from the Preferred Alternative would disturb portions of recovery plans.
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 species. 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	Monitoring during construction, reporting	Contractor	Contractor	Contractor	Daily monitoring, weekly or reporting requirements as established by regulatory compliance permits	Condition of Design Build Contract Following requirements established by regulatory compliance permits	BIO#2	Construction of the Preferred Alternative would disturb the suitable habitat that has potential to support special-status reptiles and amphibian species.
										BIO#6	Project impacts from the Preferred Alternative would permanently impact suitable habitat that has the potential to support special-status reptiles and amphibian species
										BIO#7	Project impacts from the Preferred Alternative would disturb portions of recovery plans.

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BIO-MM#24	Conduct Protocol and Pre-construction Surveys for California Tiger Salamander	In the annual grassland and pasture habitats in the Cross Creek grassland region, protocol-level surveys will be conducted in accordance with the Interim Guidance on Site Assessment and Field Surveys for Determining Presence or a Negative Finding of the California Tiger Salamander (USFWS and CDFG 2003). The purpose of these surveys will be to determine presence or absence of the California tiger salamander within the study area. Before the start of ground-disturbing activities, a qualified, agency-approved biologist (designated by the Project Biologist) will conduct visual pre-construction surveys in suitable habitats in the Cross Creek grassland region. Surveys will be conducted no more than 30 days before the start of ground-disturbing activities and will be phased with project build-out. In the unlikely event that California tiger salamander individuals are found within the project footprint during protocol-level pre-construction surveys, the Project Biologist will contact the USFWS and CDFW to identify appropriate avoidance and minimization measures to be implemented for 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	Protocol and Pre-construction level surveys	Protocol level surveys, Pre-construction 30 day prior to construction; Weekly reporting or reporting requirements as established by regulatory compliance permits	Contractor	Contractor	Protocol level surveys (at least 1 year prior to ground disturbance), pre-construction 30 day prior to construction; Weekly reporting or reporting requirements as established by regulatory compliance permits	Condition of Design Build Contract Following requirements established by regulatory compliance permits	BIO#2	Construction of the Preferred Alternative would disturb the suitable habitat that has potential to support special-status reptiles and amphibian species.
										BIO#6	Project impacts from the Preferred Alternative would permanently impact suitable habitat that has the potential to support special-status reptiles and amphibian species
										BIO#7	Project impacts from the Preferred Alternative would disturb portions of recovery plans.
BIO-MM#25	Implement Avoidance and Minimization Measures for California Tiger Salamander	The measures listed below will be implemented in the Cross Creek grassland region to avoid and minimize potential adverse effects to this species: • The Contractor, under the direction of the Project Biologist will install, and maintain exclusion fencing along the perimeter of the construction footprint. The Project Biological Monitor will monitor the exclusion fencing to ensure that no take of California tiger salamander or destruction of their potential habitat outside of the project footprint occurs. Exclusion fencing will be composed of a combination of high-visibility construction fence and wildlife exclusion fence. Exclusion fencing must be trenched into the soil at least 4 inches in depth, with the soil compacted against both sides of the fence for its entire length to prevent central California tiger salamanders from passing under the fence. Barriers must be inspected by an USFWS-approved Project Biological Monitor at least twice weekly on non-consecutive days outside of the breeding season. Barriers will be inspected daily following any rain event and during months when juvenile central California tiger salamanders are most likely emigrating from their breeding ponds in search of burrows in surrounding upland habitat. Barriers will be installed by the Contractor with turn-arounds	Construction	Establish exclusion fencing	Daily or Twice per week inspections (non-consecutive days), weekly reporting	Contractor	Contractor	Daily or twice per week inspections (non-consecutive days), weekly reporting	Condition of Design Build Contract	BIO#2	Construction of the Preferred Alternative would disturb the suitable habitat that has potential to support special-status reptiles and amphibian species.
										BIO#6	Project impacts from the Preferred Alternative would permanently impact suitable habitat that has the potential to support special-status reptiles and amphibian species
										BIO#7	Project impacts from the Preferred Alternative would disturb portions of recovery plans.

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		at any access openings needed in the fencing, to redirect central California tiger salamanders away from openings. • The Contractor will not conduct construction activities within 250 feet of potential California tiger salamander breeding habitat during the wet season (October 15 through June 1); however, construction activities may begin once the habitat is no longer inundated for the season and it is after April 15. 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.									
BIO-MM#26	Conduct Protocol-Level Surveys for Blunt-Nosed Leopard Lizard	The Project Biologist will conduct protocol-level surveys in suitable habitats for the blunt-nosed leopard lizard within 1 year of each construction phase. These surveys will be conducted in areas of potential blunt-nosed leopard lizard habitat in accordance with the Approved Survey Methodology for the Blunt-Nosed Leopard Lizard (CDFG 2004). 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	Conduct Protocol level surveys; Reporting	Surveys within 1 year prior to construction; Reporting weekly or in Survey Methodology	Contractor	Contractor	Within 1 year prior to construction or as required in Survey Methodology	Condition of Design Build Contract	BIO#2	Construction of the Preferred Alternative would disturb the suitable habitat that has potential to support special-status reptiles and amphibian species.
										BIO#6	Project impacts from the Preferred Alternative would permanently impact suitable habitat that has the potential to support special-status reptiles and amphibian species
										BIO#7	Project impacts from the Preferred Alternative would disturb portions of recovery plans.
BIO-MM#27	Phased Pre-construction Surveys for Blunt-Nosed Leopard Lizard	The Project Biologist will conduct visual pre-construction surveys in areas of potential blunt-nosed leopard lizard habitat no more than 30 days before ground-disturbing activities. The Project Biological Monitor will conduct daily clearance surveys before construction activities. 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	Pre-construction Surveys; Daily clearance surveys; reporting	Surveys within 30 days prior to ground disturbance; daily clearance surveys; weekly reporting or reporting requirements as established by regulatory compliance permits	Contractor	Contractor	Surveys within 30 days prior to ground disturbance; daily clearance surveys; weekly reporting or reporting requirements as established by regulatory compliance permits	Condition of Design Build Permit	BIO#2	Construction of the Preferred Alternative would disturb the suitable habitat that has potential to support special-status reptiles and amphibian species.
										BIO#6	Project impacts from the Preferred Alternative would permanently impact suitable habitat that has the potential to support special-status reptiles and amphibian species
										BIO#7	Project impacts from the Preferred Alternative would disturb portions of recovery plans.
BIO-MM#28	Blunt-Nosed Leopard Lizard Avoidance	During the active season (April 15 through October 15), in areas where blunt-nosed leopard lizards or blunt-nosed leopard lizard signs are present, the following measures will be implemented: • Following the phased pre-construction survey for blunt-nosed leopard lizard within the construction footprint (see BIO-MM#27), if active burrows or egg clutch sites are identified within the construction footprint, the Contractor and Project Biologist will establish, maintain, and monitor 50-foot buffers around	Construction	Establish buffers, vegetation removal, pre-construction survey, and passive relocation; erect barriers; monitoring and reporting	Weekly reporting	Contractor	Contractor	Weekly reporting	Condition of Design Build Contract	BIO#2	Construction of the Preferred Alternative would disturb the suitable habitat that has potential to support special-status reptiles and amphibian species.
										BIO#6	Project impacts from the Preferred Alternative would permanently impact suitable habitat that has the potential to support special-status reptiles and amphibian species
										BIO#7	Project impacts from the Preferred Alternative would disturb portions of recovery plans.

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		active burrows and egg clutch sites. The 50-foot buffers will be established around the active burrow and clutch sites in a manner that allows for blunt-nosed leopard lizard to leave the construction footprint after the young have hatched. Project activities within the 50-foot buffers, including vegetation clearing and grubbing (as described below), will be prohibited until the eggs have hatched and blunt-nosed leopard lizard have been allowed to leave the construction footprint, as determined by the Project Biologist. • Following the phased pre-construction survey for blunt-nosed leopard lizard within the construction footprint (see BIO-MM#27), if no active burrows or egg clutch sites are identified within the construction footprint, the Contractor, under the direction of the Project Biologist will conduct vegetation clearing and grubbing activities with hand tools. Cleared vegetation will be cut to 4 inches above the ground level, and all trimmings will be removed from the construction footprint. The vegetation-free work area will be allowed to sit undisturbed for a minimum of 72 hours to allow blunt-nosed leopard lizards to passively relocate from the site. A follow-up pre-construction survey will be conducted in the vegetation-free work area to look for blunt-nosed leopard lizards or their sign. Any blunt-nosed leopard lizards observed during the follow-up survey will be allowed to leave the work site on their own accord. Immediately after the follow-up pre-construction survey of the vegetation-free work area, the construction footprint will be delineated with high-visibility construction fence and a wildlife exclusion fence with "a non-gaping, non-climbable barrier using a rigid and non-climbable material." The vegetation-free work area within the wildlife exclusion fence will be maintained by the Contractor and monitored daily by the Project Biologist. • The Contractor will conduct ground-disturbing activities when air temperatures are between 75 and 95 degrees Fahrenheit. The temperature range corresponds to the period when this species is moving around and can avoid danger. During the non-active season (October 16 through April 14), suitable blunt-nosed leopard lizard burrows identified during protocol-level and pre-construction surveys will be avoided by the Contractor. A 50-foot no-work buffer will be established around burrows to prevent impacts until the active season, when blunt-									

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		nosed leopard lizards will be able to leave the vegetation-free work area on their own accord. The no-work buffer will be established by routing the high-visibility construction fence and wildlife exclusion fence around the suitable burrow sites in a manner that allows for a connection between the burrow site and the suitable natural habitat adjacent to the footprint so that blunt-nosed leopard lizard individuals are able to leave the construction footprint during the active season. If construction activities are required during this period, the appropriate measures will be established through consultation with USFWS and CDFW. Non-disturbance exclusion zones will be maintained by the Contractor and monitored by USFWS-approved biological monitor(s) to avoid the possibility for take of lizards, their burrows/nests, or the species' habitat outside of the project footprint. If blunt-nosed leopard lizards are observed at any time during protocol-level surveys, phased pre-construction surveys, or during construction, USFWS and CDFW will be contacted. Appropriate measures to avoid take of the species will be established through consultation with the USFWS and 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.									
BIO-MM#29	Conduct Pre-construction 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	Pre-construction	Pre-construction surveys, and establish nest buffers	Surveys conducted prior to disturbance; Report weekly or as established by regulatory compliance permits	Contractor	Contractor	Surveys conducted prior to disturbance; Report weekly or as established by regulatory compliance permits	Condition of Design Build Permit	BIO#2	Construction of the Preferred Alternative would disturb suitable habitat that was potential to support nesting special-status bird species (including raptors).
										BIO#6	Project impacts from the Preferred Alternative would permanently impact suitable habitat that has the potential to support special-status bird species (including raptors).
										BIO#7	Project impacts from the Preferred Alternative would disturb portions of recovery plans.

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		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.									
BIO-MM#30	Conduct Pre-construction 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	Pre-construction surveys, and establishment of nest buffers	Surveys conducted no more than 14 days prior to construction; Report weekly or as established by regulatory compliance permits	Contractor	Contractor	Surveys conducted no more than 14 days prior to construction; Report weekly or as established by regulatory compliance permits	Condition of Design Build Permit	BIO#2	Construction of the Preferred Alternative would disturb suitable habitat that was potential to support nesting special-status bird species (including raptors).
										BIO#6	Project impacts from the Preferred Alternative would permanently impact suitable habitat that has the potential to support special-status bird species (including raptors).
										BIO#7	Project impacts from the Preferred Alternative would disturb portions of recovery plans.
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.	Construction	Verify structures are raptor safe in accordance with APLIC guidance; Compliance Reporting	Prior to final design	Contractor	Contractor	Prior to final design	Condition of Design Build Contract Condition of regulatory permits	BIO#2	Construction of the Preferred Alternative would disturb suitable habitat that was potential to support nesting special-status bird species (including raptors).
										BIO#6	Project impacts from the Preferred Alternative would permanently impact suitable habitat that has the potential to support special-status bird species (including raptors).
										BIO#7	Project impacts from the Preferred Alternative would disturb portions of recovery plans.
BIO-MM#32	Conduct Protocol and Pre-construction	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	Pre-construction	Conduct Protocol and Pre-construction	Weekly or as established by regulatory compliance	Contractor	Contractor	Weekly or as established by regulatory compliance	Condition of Design Build Contract Condition of regulatory	BIO#2	Construction of the Preferred Alternative would disturb suitable habitat that was potential to support nesting special-status bird species (including raptors).
										BIO#6	Project impacts from the Preferred Alternative would permanently impact

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	Surveys for Swainson's Hawks	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.		Surveys; Compliance Reporting	permits			permits	permits		suitable habitat that has the potential to support special-status bird species (including raptors).
										BIO#7	Project impacts from the Preferred Alternative would disturb portions of recovery plans.
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 (Buteo swainsoni) 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	Establish active nest buffers; Compliance Reporting	Weekly or as established by regulatory compliance permits	Contractor	Contractor	Weekly or as established by regulatory compliance permits	Condition of Design Build Contract Condition of regulatory permits	BIO#2	Construction of the Preferred Alternative would disturb suitable habitat that was potential to support nesting special-status bird species (including raptors).
										BIO#6	Project impacts from the Preferred Alternative would permanently impact suitable habitat that has the potential to support special-status bird species (including raptors).
										BIO#7	Project impacts from the Preferred Alternative would disturb portions of recovery plans.
BIO-MM#34	Monitor Removal of Nest Trees for Swainson's Hawks	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	Construction	Monitor Swainson's hawk nest trees; Compliance Reporting	Weekly or as established by regulatory compliance permits	Contractor	Contractor	Weekly or as established by regulatory compliance permits	Condition of Design Build Contract Condition of regulatory permits	BIO#2	Construction of the Preferred Alternative would disturb suitable habitat that was potential to support nesting special-status bird species (including raptors).
										BIO#6	Project impacts from the Preferred Alternative would permanently impact suitable habitat that has the potential to support special-status bird species (including raptors).
										BIO#7	Project impacts from the Preferred Alternative would disturb portions of recovery plans.
										BIO#7	Project impacts from the Preferred Alternative would disturb portions of recovery plans.

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Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact #	Impact Text
		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.									
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 (CDFG 2012c). 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	Protocol level surveys; Compliance Reporting	Weekly or at other appropriate interval	Contractor	Contractor	Weekly or at other appropriate interval	Condition of Design Build Contract	BIO#2	Construction of the Preferred Alternative would disturb suitable habitat that was potential to support nesting special-status bird species (including raptors).
										BIO#6	Project impacts from the Preferred Alternative would permanently impact suitable habitat that has the potential to support special-status bird species (including raptors).
										BIO#7	Project impacts from the Preferred Alternative would disturb portions of recovery plans.
BIO-MM#36	Burrowing Owl Avoidance and Minimization	The Project Biologist will implement burrowing owl avoidance and minimization measures following CDFW's Staff Report on Burrowing Owl Mitigation (CDFG 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. 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 (CDFG 2012) guidelines. The Project Biologist will submit a memorandum, on a weekly basis or at other	Construction	Establish exclusion zones or buffers; Compliance Reporting	Weekly or at other appropriate interval	Contractor	Contractor	Weekly or at other appropriate interval	Condition of Design Build Contract	BIO#2	Construction of the Preferred Alternative would disturb suitable habitat that was potential to support nesting special-status bird species (including raptors).
										BIO#6	Project impacts from the Preferred Alternative would permanently impact suitable habitat that has the potential to support special-status bird species (including raptors).
										BIO#7	Project impacts from the Preferred Alternative would disturb portions of recovery plans.

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Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact #	Impact Text
		appropriate intervals, to the Mitigation Manager to document compliance with this measure. Table 3.7-19 California Department of Fish and Wildlife recommended restricted activity dates and setback distances by level of disturbance for burrowing owls Location Time of Year Level of Disturbance Low Medium High Nesting Sites April 1–Aug 15 200 m 500 m 500 m Nesting Sites Aug 16-Oct 15 200 m 200 m 500 m Nesting Sites Oct 16-March 31 50 m 100 m 500 m									
BIO-MM#37	Conduct Pre-construction Surveys for Nelson's Antelope Squirrel, Tipton Kangaroo Rat, Dulzura Pocket Mouse, and Tulare Grasshopper Mouse	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.	Pre-construction	Habitat Assessment	Weekly or as established by regulatory compliance permits	Contractor	Contractor	Weekly or as established by regulatory compliance permits	Condition of Design Build Contract Condition of regulatory permits	BIO#2	Construction of the Preferred Alternative would disturb suitable habitat that has the potential to support special-status mammal species.
										BIO#6	Project impacts from the Preferred Alternative would permanently impact suitable habitat that has the potential to support special-status mammal species.
										BIO#7	Project impacts from the Preferred Alternative would disturb portions of recovery plans.
BIO-MM#38	Implement Avoidance and Minimization Measures for Nelson's Antelope Squirrel, Tipton Kangaroo Rat, Dulzura Pocket Mouse, and Tulare Grasshopper Mouse	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. • 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	Establish Exclusion Zones, Vegetation Removal and Small Mammal Trapping; Compliance Reporting	Weekly or as established by regulatory compliance permits	Contractor	Contractor	Weekly or as established by regulatory compliance permits	Condition of Design Build Contract Condition of regulatory permits	BIO#2	Construction of the Preferred Alternative would disturb suitable habitat that has the potential to support special-status mammal species.
										BIO#6	Project impacts from the Preferred Alternative would permanently impact suitable habitat that has the potential to support special-status mammal species.
										BIO#7	Project impacts from the Preferred Alternative would disturb portions of recovery plans.

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Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact #	Impact Text
		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 (Dipodomys ingens) (H.T. Harvey & Associates 2011) or as determined in consultation with CDFW and USFWS. The small-mammal trapping surveys will occur within the construction footprint in potentially suitable habitat for special-status small-mammal species. The trapping will be conducted before the start of construction and phased with project build-out; trapping will be limited to the dry, summer months on evenings when the nightly low temperature is forecast to exceed 50°F.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.									
BIO-MM#39	Implement Avoidance and Minimization Measures for Fresno Kangaroo Rat	Before the start of ground-disturbing activities, a qualified agency-approved biologist, designated by the Project Biologist, will conduct a habitat assessment on any parcels within the project footprint that may support the Fresno kangaroo rat to determine presence of kangaroo rat burrows or their signs. If no burrows or signs of kangaroo rats are detected and kangaroo rats are confirmed to be absent from the construction footprint, the following actions will be implemented: • The Project Biologist will install, maintain, and monitor exclusion fencing along the perimeter of the construction footprint to ensure that no take of Fresno kangaroo rat or destruction of their potential habitat outside of the project footprint occurs. • The Contractor, under the supervision of the Project Biologist, will trim and clear vegetation to the ground by hand or using hand-operated equipment to discourage small-mammal presence in the construction footprint. The area from which the vegetation was cleared will remain undisturbed by project construction equipment for 14 days to allow other small-mammal species to passively relocate through the one-way exit/escape points along the wildlife exclusion fencing. In the unlikely event that kangaroo rat individuals, their burrows, or signs of them are found within the project footprint during the	Pre-construction	Habitat assessment; Agency Coordination; Compliance Reporting	Weekly Reporting or at other appropriate interval	Contractor	Contractor	Weekly Reporting or at other appropriate interval	Condition of Design Build Contract Condition of regulatory permits	BIO#2	Construction of the Preferred Alternative would disturb suitable habitat that has the potential to support special-status mammal species.
										BIO#6	Project impacts from the Preferred Alternative would permanently impact suitable habitat that has the potential to support special-status mammal species.
										BIO#7	Project impacts from the Preferred Alternative would disturb portions of recovery plans.

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Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact #	Impact Text
		habitat assessment, the USFWS and CDFW will be notified immediately and the FRA will reinitiate consultation to identify appropriate avoidance and minimization measures to be implemented for this species, such as: • With agency permission, small-mammal trapping may be conducted by a qualified biologist(s) with the necessary permits. The trapping surveys will be conducted in general accordance with California Valley Solar Ranch Project: Plan for Relocation of Giant Kangaroo Rats (Dipodomys ingens) (H.T. Harvey & Associates 2011) or as determined in consultation with either USFWS or CDFW and will be limited to the dry, summer months on evenings when the nightly low temperature is forecast to exceed 50°F. 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.									
BIO-MM#40	Conduct Pre-construction Surveys for Special-Status Bat Species	Thirty days 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	Pre-construction Surveys, Compliance Reporting	Weekly or at other appropriate interval	Contractor	Contractor	Weekly or at other appropriate interval	Condition of Design Build Contract	BIO#2	Construction of the Preferred Alternative would disturb suitable habitat that has the potential to support special-status mammal species.
										BIO#6	Project impacts from the Preferred Alternative would permanently impact suitable habitat that has the potential to support special-status mammal species.
										BIO#7	Project impacts from the Preferred Alternative would disturb portions of recovery plans.
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	Construction	Bat Roost Relocation Plan; Compliance Reporting	Weekly or at other appropriate interval	Contractor	Contractor	Weekly or at other appropriate interval	Condition of Design Build Contract	BIO#2	Construction of the Preferred Alternative would disturb suitable habitat that has the potential to support special-status mammal species.
										BIO#6	Project impacts from the Preferred Alternative would permanently impact suitable habitat that has the potential to support special-status mammal species.
										BIO#7	Project impacts from the Preferred Alternative would disturb portions of recovery plans.

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		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.									
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.	Construction	Bat exclusion and deterrence; Compliance Reporting	Weekly or at other appropriate interval	Contractor	Contractor	Weekly or at other appropriate interval	Condition of Design Build Contract	BIO#2	Construction of the Preferred Alternative would disturb suitable habitat that has the potential to support special-status mammal species.
										BIO#6	Project impacts from the Preferred Alternative would permanently impact suitable habitat that has the potential to support special-status mammal species.
										BIO#7	Project impacts from the Preferred Alternative would disturb portions of recovery plans.
BIO-MM#43	Conduct Pre-construction 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	Conduct Pre-construction survey; Compliance Report	Weekly Reporting or other appropriate interval	Contractor	Contractor	Weekly Reporting or other appropriate interval	Condition of Design Build Contract	BIO#2	Construction of the Preferred Alternative would disturb suitable habitat that has the potential to support special-status mammal species.
										BIO#6	Project impacts from the Preferred Alternative would permanently impact suitable habitat that has the potential to support special-status mammal species.
										BIO#7	Project impacts from the Preferred Alternative would disturb portions of recovery plans.
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.	Construction	Establish buffer around active dens; Compliance Reporting	Weekly Reporting or other appropriate interval	Contractor	Contractor	Weekly Reporting or other appropriate interval	Condition of Design Build Contract	BIO#2	Construction of the Preferred Alternative would disturb suitable habitat that has the potential to support special-status mammal species.
										BIO#6	Project impacts from the Preferred Alternative would permanently impact suitable habitat that has the potential to support special-status mammal species.
										BIO#7	Project impacts from the Preferred Alternative would disturb portions of recovery plans.
BIO-MM#45	Conduct Protocol-Level Pre-	Before the start of ground-disturbing activities, the Project Biologist will conduct pre-construction surveys in accordance with	Pre-construction	Conduct Pre-construction Survey for San	Weekly Reporting or as established by	Contractor	Contractor	Weekly Reporting or as	Condition of Design Build Contract Condition	BIO#2	Construction of the Preferred Alternative would disturb suitable habitat that has the potential to support special-status mammal species.
										BIO#6	Project impacts from the Preferred Alternative would permanently impact

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Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact #	Impact Text
	construction Surveys for San Joaquin Kit Fox	USFWS' San Joaquin Kit Fox Survey Protocol for the Northern Range (USFWS 1999b). Pre-construction surveys for the kit fox 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.		Joaquin kit fox; Compliance Reporting	regulatory compliance permits			established by regulatory compliance permits	of regulatory permits		suitable habitat that has the potential to support special-status mammal species.
										BIO#7	Project impacts from the Preferred Alternative would disturb portions of recovery plans.
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 [1999] 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.	Construction	Implement Standardized Recommendations for Protection of the San Joaquin Kit Fox Prior to or During Ground Disturbance; Compliance Reporting	Weekly Reporting or as established by regulatory compliance permits	Contractor	Contractor	Weekly Reporting or as established by regulatory compliance permits	Condition of Design Build Contract Condition of regulatory permits	BIO#2	Construction of the Preferred Alternative would disturb suitable habitat that has the potential to support special-status mammal species.
										BIO#6	Project impacts from the Preferred Alternative would permanently impact suitable habitat that has the potential to support special-status mammal species.
										BIO#7	Project impacts from the Preferred Alternative would disturb portions of recovery plans.
BIO-MM#47	Restore Temporary Riparian Impacts	During post-construction, the Contractor, under the direction of the Project Botanist, will revegetate all disturbed valley foothill riparian areas using appropriate plants and seed mixes. The Project Botanist will monitor restoration activities consistent with provisions in the RRP, as described in BIO-MM#6. The Project Botanist will submit a memorandum, on a weekly basis or at other appropriate intervals, to the Mitigation Manager documenting compliance and other reporting requirements required by the regulatory agency permits (e.g., 1600 Streambed Alteration Agreement).	Post-construction	Restoration of temporary disturbance areas; Compliance Reporting	Weekly Reporting or as established by regulatory compliance permits (BIO-MM#62)	Contractor	Contractor	Weekly Reporting or as established by regulatory compliance permits	Condition of Design Build Contract Condition of regulatory permits	BIO#3	Construction of the Preferred Alternative would disturb special-status plant communities, and riparian areas.
										BIO#3	Construction of the Preferred Alternative would have direct and indirect impacts on jurisdictional waters.
										BIO#7	Project impacts from the Preferred Alternative would permanently impact special-status plant communities, and riparian areas.
										BIO#7	Project impacts from the Preferred Alternative would permanently affect jurisdictional waters.
										BIO#7	Project impacts from the Preferred Alternative would disturb portions of recovery plans.
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	Construction or Post-construction	Restoration of temporary disturbance areas; Compliance Reporting	Weekly Reporting or as established by regulatory compliance permits	Contractor, Authority	Contractor	Weekly Reporting or as established by regulatory compliance permits	Condition of Design Build Contract Condition of regulatory permits	BIO#3	Construction of the Preferred Alternative would disturb special-status plant communities, and riparian areas.
										BIO#3	Construction of the Preferred Alternative would have direct and indirect impacts on jurisdictional waters.
										BIO#7	Project impacts from the Preferred Alternative would disturb portions of recovery plans.

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Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact #	Impact Text
		memorandum, on a weekly basis or at other appropriate intervals, to the Mitigation Manager to document compliance with this measure.									
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	Compliance Monitoring, Compliance Reporting	Weekly Reporting or as established by regulatory compliance permits	Contractor	Contractor	Weekly Reporting or as established by regulatory compliance permits	Condition of Design Build Contract Condition of regulatory permits	BIO#2	Construction of the Preferred Alternative would disturb suitable habitat that has potential to support special-status invertebrate species.
										BIO#2	Construction of the Preferred Alternative would disturb the suitable habitat that has potential to support special-status reptiles and amphibian species.
										BIO#3	Construction of the Preferred Alternative would disturb special-status plant communities, and riparian areas.
										BIO#3	Construction of the Preferred Alternative would have direct and indirect impacts on jurisdictional waters.
										BIO#6	Project impacts from the Preferred Alternative would permanently impact suitable habitat that has the potential to support special-status invertebrate species.
										BIO#6	Project impacts from the Preferred Alternative would permanently impact suitable habitat that has the potential to support special-status reptiles and amphibian species.
										BIO#7	Project impacts from the Preferred Alternative would permanently impact special-status plant communities, and riparian areas.
										BIO#7	Project impacts from the Preferred Alternative would permanently affect jurisdictional waters.
										BIO#7	Project impacts from the Preferred Alternative would disturb portions of recovery plans.
BIO-MM#50	Mitigation and Monitoring of Protected Trees	Before, during, and after construction, the following methods to preserve and/or mitigate for impacts on protected trees will be implemented: • A qualified biologist, designated by the Project Botanist, will conduct surveys before removal or disturbance to evaluate the condition of all protected trees found within areas directly and indirectly affected by the Fresno to Bakersfield Section. • The Authority will compensate for impacts and effects to protected tree resources, including removal or trimming of naturally occurring native protected trees and landscape or ornamental trees (see BIO-MM#64, Compensate for Impacts on Protected Trees). • The Contractor, under the direction of the Project Botanist, will fence protected trees that may be indirectly affected by construction activities 5 feet from their drip lines to form ERAs. • The Authority will prepare and implement a monitoring and maintenance program that monitors transplanted trees for re-establishment of root systems. The Project Botanist will submit a memorandum to the Mitigation Manager to document compliance with this measure.	Pre-construction, Construction, Post-construction	Conduct Surveys prior to removal; Provide tree protection; Authority Compensate for Impacts	Monthly	Contractor	Contractor	Monthly	Condition of Design Build Contract	BIO#7	Project impacts from the Preferred Alternative would disturb portions of recovery plans.
										BIO#7	Project impacts from the Preferred Alternative would permanently affect protected trees.

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Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact #	Impact Text
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 with flashing or slats will be maintained during operation of the HST 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.	Construction	Install fencing enhanced with flashing or slats; Reporting	Yearly	Contractor	Contractor	Yearly	Condition of Design Build Contract Requirement of Regulatory Agency Permits	BIO#7	Project impacts from the Preferred Alternative would disturb portions of recovery plans.
										BIO#8	Project impacts from the Preferred Alternative would permanently reduce the functionality of wildlife movement corridors and habitat linkages.
BIO-MM#52	Construction in Wildlife Movement Corridors	Before the start of ground-disturbing activities, the Project Biologist will submit a construction avoidance and minimization plan for wildlife movement linkages (e.g., SR 43–Garces Highway and Deer Creek–Sand Ridge linkages, Kern River linkage) to the Authority via the Mitigation Manager for concurrence. The plan will limit the use of construction and avoid permanent fencing in wildlife movement linkages where the viaducts (e.g., elevated platforms) or bridges are included in the final design. The Contractor will minimize ground-disturbing activities within the wildlife linkages (e.g., SR 43–Garces Highway and Deer Creek–Sand Ridge linkages) during nighttime hours to the extent practicable. The Contractor will also keep nighttime illumination (e.g., for security) from spilling into the linkages or shield nighttime lighting to avoid illumination spilling into the linkages. Inspections by the Project Biologist will verify compliance with this measure. 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	Prepare Avoidance and Minimization Plan for Construction in Wildlife Movement linkages	Weekly or as established by regulatory compliance permits	Contractor	Contractor	Weekly or as established by regulatory compliance permits	Condition of Design Build Contract Construction in Wildlife Movement Linkages Plan	BIO#7	Project impacts from the Preferred Alternative would disturb portions of recovery plans.
										BIO#8	Project impacts from the Preferred Alternative would permanently reduce the functionality of wildlife movement corridors and habitat linkages.
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:	Pre-construction, Construction , Post-Construction	Compliance Report	Before final design	Authority	Authority	Before final design	Authority to compensatory based on extent of special-status plant species impacted	BIO#1	Construction of the Preferred Alternative would directly or indirectly impact suitable habitat that has potential to support special-status plant species.
										BIO#5	Project impacts from Preferred Alternative would permanently impact special-status plant species or suitable habitat that has potential to support these species.

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Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact #	Impact Text
		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: a. Identification of suitable sites to receive the listed plants. i. 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. ii. Authority-proposed permittee-responsible mitigation sites. iii. Other locations approved by USFWS. b. 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.							by the Contractor Regulatory agency permit requirements	BIO#7	Project impacts from the Preferred Alternative would permanently impact special-status plant communities, and riparian areas.
										BIO#7	Project impacts from the Preferred Alternative would disturb portions of recovery plans.
BIO-MM#54	Compensate for Impacts on Vernal Pool Fairy Shrimp and Vernal Pool Tadpole Shrimp	The Authority will mitigate direct and indirect impacts, including temporary and permanent, on vernal pool branchiopod habitat through compensation determined in consultation with the USFWS and USACE. Compensation for vernal pool branchiopod habitat (e.g., vernal pools, seasonal wetlands) is addressed under compensation for impacts on jurisdictional waters (BIO-MM#63). The Authority or its designee will submit a memorandum to the USFWS to document compliance with this measure.	Pre-construction, Construction, Post-construction	Compliance Report	Prior to Operation	Authority	Authority	Prior to Operation	Authority to compensatory based on amount suitable habitat for vernal pool fairy shrimp and vernal pool tadpole shrimp impacted by the Contractor Regulatory agency permit requirements	BIO#2	Construction of the Preferred Alternative would disturb suitable habitat that has potential to support special-status invertebrate species.
										BIO#6	Project impacts from the Preferred Alternative would permanently impact suitable habitat that has the potential to support special-status invertebrate species.
										BIO#7	Project impacts from the Preferred Alternative would disturb portions of recovery plans.
										BIO#8	Project impacts from the Preferred Alternative would permanently reduce the functionality of wildlife movement corridors and habitat linkages.
BIO-MM#55	Compensate for Impacts on Valley Elderberry Longhorn Beetle	The Authority will provide compensatory mitigation for the valley elderberry longhorn beetle, including transplantation and replacement of elderberry shrubs and maintenance for replacement shrubs following the Conservation Guidelines for the Valley Elderberry Longhorn Beetle (USFWS 1999a). The performance criteria include a minimum survival rate of at least 60% of the elderberry plants, and 60% of the associated native plants must be maintained throughout the monitoring period. If survival drops below 60%, failed plantings shall be replaced. The Authority will submit a memorandum to the USFWS to document compliance with this measure.	Pre-construction, Construction, Post-construction	Compliance Report	Transplant Pre-construction; Compensatory prior to Operation	Authority	Authority	Transplant Pre-construction; Compensatory prior to Operation	Authority to compensatory based on number of host plants for the valley elderberry longhorn beetle impacted by the Contractor Regulatory agency permit requirements	BIO#2	Construction of the Preferred Alternative would disturb suitable habitat that has potential to support special-status invertebrate species.
										BIO#6	Project impacts from the Preferred Alternative would permanently impact suitable habitat that has the potential to support special-status invertebrate species.
										BIO#7	Project impacts from the Preferred Alternative would disturb portions of recovery plans.
										BIO#8	Project impacts from the Preferred Alternative would permanently reduce the functionality of wildlife movement corridors and habitat linkages.
BIO-MM#56	Compensate for Impacts on California Tiger Salamander	If compensatory mitigation is required to offset the loss of habitat for California tiger salamander, the Authority will determine the compensation through consultation with the USFWS. Compensatory mitigation could include one of the following: • Purchase of credits from an agency-approved mitigation bank.	Pre-construction, Construction, Post-construction	Compliance Report	Prior to Operation	Authority	Authority	Prior to Operation	Authority to compensatory based on amount suitable habitat for California tiger salamander impacted by the Contractor	BIO#2	Construction of the Preferred Alternative would disturb the suitable habitat that has potential to support special-status reptiles and amphibian species.
										BIO#6	Project impacts from the Preferred Alternative would permanently impact suitable habitat that has the potential to support special-status reptiles and amphibian species.
										BIO#7	Project impacts from the Preferred Alternative would disturb portions of recovery plans.

Table 1
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Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact #	Impact Text
		• Fee-title-acquisition of natural resource regulatory agency-approved property. • Purchase or establishment of a conservation easement with an endowment for long-term management of the property-specific conservation values. • In-lieu fee contribution determined through negotiation and consultation with USFWS. The Authority will submit a memorandum to the USFWS and CDFW to document compliance with this measure							Regulatory agency permit requirements	BIO#8	Project impacts from the Preferred Alternative would permanently reduce the functionality of wildlife movement corridors and habitat linkages.
BIO-MM#57	Compensate for Impacts on Blunt-Nosed Leopard Lizard, Tipton Kangaroo Rat, and Nelson's Antelope Squirrel	The Authority will determine compensatory mitigation to offset the permanent and temporary loss of suitable habitat for the blunt-nosed leopard lizard, Tipton kangaroo rat, and Nelson's antelope squirrel through consultation with the USFWS and/or CDFW. Compensatory mitigation could include one of the following: • Purchase of credits from an agency-approved mitigation bank. • Fee-title-acquisition of natural resource regulatory agency-approved property. • Purchase or establishment of a conservation easement with an endowment for long-term management of the property-specific conservation values. • In-lieu fee contribution determined through negotiation and consultation with USFWS. The Authority will submit a memorandum to the USFWS and or CDFW to document compliance with this measure.	Pre-construction, Construction, Post-construction	Compliance Reports	Prior to Operation	Authority	Authority	Prior to Operation	Authority to compensatory based on amount suitable habitat for Blunt-nosed leopard lizard, Tipton kangaroo rat and Nelson's Antelope Squirrel impacted by the Contractor Regulatory agency permit requirements	BIO#2	Construction of the Preferred Alternative would disturb the suitable habitat that has potential to support special-status reptiles and amphibian species.
										BIO#6	Project impacts from the Preferred Alternative would permanently impact suitable habitat that has the potential to support special-status reptiles and amphibian species.
										BIO#7	Project impacts from the Preferred Alternative would disturb portions of recovery plans.
										BIO#8	Project impacts from the Preferred Alternative would permanently reduce the functionality of wildlife movement corridors and habitat linkages.
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	Compliance Reports	Prior to Operation	Authority	Authority	Prior to Operation	Authority to compensatory based on amount of habitat for Swainson's hawks impacted by the Contractor Regulatory agency permit requirements	BIO#2	Construction of the Preferred Alternative would disturb suitable habitat that has potential to support nesting special-status bird species (including raptors).
										BIO#6	Project impacts from the Preferred Alternative would permanently impact suitable habitat that has the potential to support special-status bird species (including raptors).
										BIO#7	Project impacts from the Preferred Alternative would disturb portions of recovery plans.
										BIO#8	Project impacts from the Preferred Alternative would permanently reduce the functionality of wildlife movement corridors and habitat linkages.

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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	Compliance Reports	Prior to Operation	Authority	Authority	Prior to Operation	Authority to compensate based on number of burrowing owl burrows impacted by the Contractor Regulatory agency permit requirements	BIO#2	Construction of the Preferred Alternative would disturb suitable habitat that has potential to support nesting special-status bird species (including raptors).
										BIO#6	Project impacts from the Preferred Alternative would permanently impact suitable habitat that has the potential to support special-status bird species (including raptors).
										BIO#7	Project impacts from the Preferred Alternative would disturb portions of recovery plans.
										BIO#8	Project impacts from the Preferred Alternative would permanently reduce the functionality of wildlife movement corridors and habitat linkages.
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.	Post-construction	Compliance Memo	Prior to Operation	Authority	Authority	Prior to Operation	Authority to compensate based on area of habitat for San Joaquin kit fox impacted by the Contractor Regulatory agency permit requirements	BIO#2	Construction of the Preferred Alternative would disturb suitable habitat that has the potential to support special-status mammal species.
										BIO#3	Construction of the Preferred Alternative would disturb areas located in USFWS recovery plans.
										BIO#6	Project impacts from the Preferred Alternative would permanently impact suitable habitat that has the potential to support special-status mammal species.
										BIO#7	Project impacts from the Preferred Alternative would disturb portions of recovery plans.
										BIO#8	Project impacts from the Preferred Alternative would permanently reduce the functionality of wildlife movement corridors and habitat linkages.
BIO-MM#61	Compensate for Permanent Riparian Impacts	The Authority will compensate for permanent impacts on riparian habitats (i.e., valley foothill riparian), as determined in consultation with the appropriate agencies (e.g., CDFW), by restoring nearby areas to suitable habitat and/or by purchasing credits in a mitigation bank. The Comprehensive Mitigation and Monitoring Plan will provide the planning details. Compensation will be based on the following ratio (acres of mitigation to acres of impact), pending agency confirmation:• Valley Foothill Riparian: 2:1.The Authority will submit a memorandum to the SWRCB to document compliance with this measure.	Post-construction	Compliance Memo	Prior to Operation	Authority	Authority	Prior to Operation	Authority to compensate based on area of permanent riparian habitat impacted by the Contractor Regulatory agency permit requirements	BIO#3	Construction of the Preferred Alternative would disturb special-status plant communities, and riparian areas.
										BIO#3	Construction of the Preferred Alternative would have direct and indirect impacts on jurisdictional waters.
										BIO#7	Project impacts from the Preferred Alternative would permanently impact special-status plant communities, and riparian areas.
										BIO#7	Project impacts from the Preferred Alternative would permanently affect jurisdictional waters.
										BIO#7	Project impacts from the Preferred Alternative would disturb portions of recovery plans.
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	Pre-construction, Construction, Post-construction	Authority responsible for the preparation of and implementation of the CMMP, monitoring, and reporting. Implement CMMP, and prepare Monitoring Reports and Compliance Memos	Prepare CMMP Pre-construction; Implement CMMP During Construction and Post-Construction	Authority	Authority	Prepare CMMP Pre-construction; Implement CMMP During Construction and Post-Construction	Requirement to acquire regulatory agency permits Authority to compensate based on area of temporary and permanent jurisdictional waters impacted by the Contractor	BIO#3	Construction of the Preferred Alternative alternatives would disturb special-status plant communities, and riparian areas.
										BIO#3	Construction of the Preferred Alternative would have direct and indirect impacts on jurisdictional waters.
										BIO#7	Project impacts from the Preferred Alternative would permanently impact special-status plant communities and riparian areas.
										BIO#7	Project impacts from the Preferred Alternative would permanently affect jurisdictional waters.
										BIO#7	Project impact from the Proffered Alternative would disturb portions of recovery plans.

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		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: • 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: • 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. • 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. 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									

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		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). 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. 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: • 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.									

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		• 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). 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. 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. 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.									
BIO-MM#63	Compensate for Permanent and Temporary Impacts on Jurisdictional Waters	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). Regulatory compliance for jurisdictional waters includes relevant terms and conditions from the USACE 404 Permit, SWRCB 401 Permit, and CDFW 1600 Streambed Alteration Agreement. Compensation shall include aquatic resources restoration, establishment, enhancement, or preservation through one or more of the following methods: • Purchase of credits from an agency-approved mitigation bank. • Fee-title-acquisition of natural resource regulatory agency-approved property. • Permittee-responsible mitigation through the	Pre-construction, Construction, Post-construction	Compliance Report	Prior to Operation	Authority	Authority	Prior to Operation	Condition of Regulatory Agency Permits Authority to compensate based on area of permanent and temporary impacts on jurisdictional waters impacted by the Contractor	BIO#2	Construction of the Preferred Alternative would disturb suitable habitat that has potential to support special-status invertebrate species.
										BIO#3	Construction of the Preferred Alternative would disturb special-status plant communities, and riparian areas.
										BIO#3	Construction of the Preferred Alternative would have direct and indirect impacts on jurisdictional waters
										BIO#6	Project impacts from the Preferred Alternative would permanently impact suitable habitat that has the potential to support special-status invertebrate species.
										BIO#6	Project impacts from the Preferred Alternative would permanently impact suitable habitat that has the potential to support special-status reptiles and amphibian species.
										BIO#7	Project impacts from the Preferred Alternative would permanently impact special-status plant communities, and riparian areas.
										BIO#7	Project impacts from the Preferred Alternative would permanently affect jurisdictional waters
										BIO#7	Project impacts for the Preferred Alternative would permanently disturb portions of recovery plans.

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		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. • 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: • 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 HST 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.									
BIO-MM#64	Compensate for Impacts on Protected Trees	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	Pre-construction, Construction, Post-construction	Compliance Report	Prior to Operation	Authority	Authority	Transplanting/Replacement/Compensation per Local Regulations	Local Regulation Requirement	BIO#3	Construction of the Preferred Alternative would disturb protected trees
										BIO#7	Project impacts for the Preferred Alternative would permanently disturb portions of recovery plans.
										BIO#7	Project impacts from the Preferred Alternative would permanent affect protected trees.

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		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: • 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.									
BIO-MM#65	Offsite Habitat Restoration, Enhance-ment, and Preservation	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. In general, the long-term improvements to habitat functions and values will offset temporary effects during restoration, enhancement, and preservation activities. 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	Pre to Construction, Construction, Post-construction	Compliance Report	Prior to Operation or as established by regulatory compliance permits	Authority	Authority	Prior to Operation or as established by regulatory compliance permits	Authority to provide compensatory mitigation for impacts on biological resources impacted by the Contractor Offsite habitat restoration, enhancement, and preservation program will be designed, implementation and monitored consistent with the terms and conditions of regulatory permit requirements they apply to their jurisdiction and resources onsite	BIO#2	Construction of the Preferred Alternative would disturb suitable habitat that has potential to support special-status invertebrate species.
										BIO#2	Construction of the Preferred Alternative would disturb suitable habitat that has potential to support special status reptiles and amphibians
										BIO#2	Construction of the Preferred Alternative would disturb suitable habitat that has potential to support special status bird species
										BIO#2	Construction of the Preferred Alternative would disturb suitable habitat that has potential to support special status mammal species
										BIO#3	Construction of the Preferred Alternative would disturb special-status plant communities, and riparian areas
										BIO#3	Construction of the Preferred Alternative would have direct and indirect impacts on jurisdictional waters
										BIO#3	Construction of the Preferred Alternative would disturb protected trees
										BIO#6	Project impacts from the Preferred Alternative would permanently impact suitable habitat that has the potential to support special-status invertebrate species.
										BIO#6	Project impacts from the Preferred Alternative would permanently impact suitable habitat that has the potential to support special-status reptile and amphibian species.
										BIO#6	Project impacts from the Preferred Alternative would permanently impact suitable habitat that has the potential to support special-status bird species (including raptors).
										BIO#6	Project impacts from the Preferred Alternative would permanently impact suitable habitat that has the potential to support special-status mammal species.
										BIO#7	Project impacts from the Preferred Alternative would permanently impact special-status plants communities, and riparian areas.
										BIO#7	Project impacts from the Preferred Alternative would permanently affect jurisdictional waters.
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		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.								BIO#7	Project impacts from the Preferred Alternative would permanently affect protected trees.
Hydrology and Water Resources											
By complying with design standards regarding stormwater run-off and flood protection, there will be no significant impacts on Hydrology and Water Resources. Please refer to Table 2 for a description of measures that will be implemented to avoid or minimize adverse impacts to Hydrology and Water resources.											
Geology, Soils, and Seismicity											
With implementation of standard engineering design measures and BMPs, impacts for elevated structures, retained cuts, retained fills, and at-grade segments of each alternative would be less than significant.											
Hazardous Materials											
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, and would be effective in reducing the impact to a less-than-significant level.	Construction	Reporting and Monitoring	Weekly	Contractor Hazardous Materials Monitor	Contractor	Construction/ Weekly Reporting	Reporting Contract Requirements /Specifications	HMW#4	Temporary Hazardous Material and Waste Activities in the Proximity of Schools Twenty-nine schools are within 0.25 mile of the construction footprint of the Preferred Alternative.
Safety and Security											
S&S-MM #1:	Monitor Response of Local Fire, Rescue, and Emergency Service Providers to Incidents at Stations and Provide a Fair Share Cost of Service	Monitor response of local fire, rescue, and emergency service providers to incidents at stations and provide a fair share of cost of service. Upon approval of the Fresno to Bakersfield Section, the Authority will monitor service levels in the vicinity of the Fresno, Kings/Tulare, and Bakersfield stations to determine baseline service demands. "Service levels" consist of the monthly volume of calls for fire and police protection, as well as city- or fire protection district-funded EMT/ambulance calls that occur in the station site service areas. Prior to operation of the stations for HST 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 of services above the average baseline service demand level for the station and HMF 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	Construction /Post-construction/ Operation	Monitor/ Fair Share Agreement	Annually	Authority	Authority	Monitoring of service levels during construction in the vicinity of the Fresno, Kings/Tulare, and Bakersfield stations to determine baseline service demands. Prior to operation of the stations for HST service	Authority to fund through fair share of services agreement.	S&S #10:	Need for Expansion of Existing Fire, Rescue, and Emergency Services Facilities.

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		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 make sure that services are made available, impact fees will not constitute the sole funding mechanism, although impact fees may be used to fund capital improvements or fixtures (i.e., police substation, additional fire vehicle, on-site defibrillators, etc.) necessary to service delivery. 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. The fair share will take into account the volume of ridership, past record and trends in service demand at the stations and HMF site, new local revenues derived from station area development, and any services that the Authority may be providing at the station.									
Socioeconomics											
SO-MM#1:	Implement measures to reduce impacts associated with the division of residential neighborhoods	The Authority will minimize impacts associated with the Preferred Alternative in the rural residential areas around Ponderosa Road/Edna Way east of Hanford, the Newark Avenue vicinity northeast of Corcoran, and Crome as well as in urban residential areas in Fresno, Wasco, 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. 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, and moving of homes and replacement of services and utilities, as appropriate. 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 HST 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	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	SO #6	Division of existing community Ponderosa Road/Edna Way east of Hanford, the Newark Avenue vicinity northeast of Corcoran, and Crome. Impacts associated with the Preferred Alternative would relocate and displace residents of small, rural residential communities.
										SO #7	Effects to the regional agricultural community and displacement of homes in the unincorporated areas of the region of the four affected counties.

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		parcels that could benefit the community in the long term).									
SO-MM#2:	Implement measures to reduce impacts associated with the division of communities	The Authority will minimize impacts associated with the Preferred Alternative in the existing mixed-use communities in the Bakersfield Northwest, Central, and Northeast districts through a program of additional outreach to homeowners, residents, business owners, and community organizations in affected neighborhoods. As a part of this program, before land acquisition, the Authority will consult with officials and representatives of community facilities affected by significant noise impacts (e.g., churches, schools, and the veterinary hospital if the southern alignment is selected) to identify suitable noise abatement measures or to help affected businesses and organizations find more-suitable locations in the community. Similarly, the Authority will make every effort to locate suitable replacement housing for displaced residents. In cases where affected residents or community facilities wish to remain in their neighborhoods, the purchase and development of infill lots or other real estate, the relocation of existing buildings to vacant lots, and consultation with city staff regarding zoning and permit issues, may be required. The Authority will also conduct community workshops about the future use of the area beneath the rail guideway. These meetings will provide residents the opportunity to identify design and use options that could strengthen community cohesion and be compatible with the character of the impacted community. A minimum of three facilitated workshops will be held, one in each of the distinct neighborhoods, Bakersfield Northwest, Central, and Northeast districts. To maximize attendance and generate awareness of the workshops, the Authority will work with either community organizations, or community leaders within the neighborhoods. A location and time will be selected to increase attendance and be based on the needs of the community. Information will be presented at the workshops that give the community options for the future use of the area beneath the rail guideway, as well as an opportunity for individuals to provide feedback. For example, if safety considerations prohibit such uses as bike paths or community gardens, alternatives, such as sculpture gardens or managed landscaping, could be	Pre-construction/ Construction /Post-construction/ Operations	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	SO #6	Division of existing community Ponderosa Road/Edna Way east of Hanford, the Newark Avenue vicinity northeast of Corcoran, and Crome. Impacts associated with the Preferred Alternative would relocate and displace residents of small, rural residential communities.
										SO #7	Effects to the regional agricultural community and displacement of homes in the unincorporated areas of the region of the four affected counties.

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		considered. The comments and feedback will be considered in planning for the future use of the sites. Upon gathering feedback from the community, the Authority will report the findings, either through a fourth public workshop or in written report that would be made available to the public. The Authority will be responsible for implementing the results of the community workshops through project design and through the long-term management of the area beneath the elevated rail guideway. This will involve documenting the desired design concepts, incorporating them into the final design, and facilitating ongoing maintenance. The Authority will identify potential uses that may be developed in the project right-of-way. These uses will be compatible with the character of the adjacent community and sensitive to project needs (as outlined in Section 3.11, Safety and Security). The costs associated with the development of these associated uses and how these costs will be paid will be determined during consultations with the affected city, county, or parks district. Furthermore, the parties or entities (i.e., the Authority, local government, park or recreation district, or nonprofit organization) responsible for some ongoing maintenance of these community areas will be determined.									
SO-MM#3:	Implement measures to reduce impacts associated with the relocation of important facilities	Depending on the alternative selected, the Authority will minimize impacts resulting from the disruption to key community facilities: Bakersfield High School, Mercado Latino Tianguis, Fresno Rescue Mission, Mercy Hospital medical complex facilities, Bakersfield Homeless Shelter, Kern County Mental Health office (1400 L Street), Kern County Health and Human Services Department, community churches, an important livestock rendering facility (Baker Commodities) in the Hanford area, the City of Bakersfield's corporation yard and the fleet services downtown facility, the CityPlace affordable housing complex, and parking associated with Bakersfield's Convention Center and Owens Intermediate School. 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	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	SO #6	Displacement of the Mercado Latino Tianguis. Displacement of the Fresno Rescue Mission, Bakersfield Homeless Shelter and associated facilities and programs. Displacement of the Mercy Medical Plaza building associated with the Mercy Hospital medical complex. Displacement of religious facilities. Displacement of government facilities—Bakersfield public works corporation yard and a Kern Mental Health office—as well as parking associated with the Bakersfield Convention Center.

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		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.. Because the unique services provided by the rendering facility and the CDFA sampling station in Kings County are critical to agricultural operations in the region, relocation of these facilities will occur before the existing facilities are closed or steps will be taken to ensure that sufficient capacity is available at other facilities so there is no interruption to the services provided. To ensure the fair and equitable treatment of the affected residents of the CityPlace affordable apartment complex with special relocation needs (including handicapped), the Authority will consult with the City of Bakersfield to identify suitable housing replacement options and relocation alternatives for all affected households.									
SO-MM#4	Provide access modifications to affected farmlands.	In cases where partial-property acquisitions result in division of agricultural parcels, the Authority will evaluate with property owner input the effectiveness of providing overcrossings or undercrossings of the HST track to allow continued use of agricultural lands and facilities. This would include the design of overcrossings or undercrossings to allow farm equipment passage. (Refer to Section 3.14, Agricultural Lands, for additional information.) This mitigation measure will be effective because it will maintain access to farmlands for farmers whose property is bisected.	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	SO #7	Effects to the regional agricultural community and displacement of homes in the unincorporated areas of the region of the four affected counties.
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, Aesthetic Guidelines for Non-Station Structures (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	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	SO#6	Division of existing community Ponderosa Road/Edna Way east of Hanford, the Newark Avenue vicinity northeast of Corcoran, and Crome. Impacts associated with the Preferred Alternative would relocate and displace residents of small, rural residential communities.
										SO #7	Effects to the regional agricultural community and displacement of homes in the unincorporated areas of the region of the four affected counties.

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		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.							The Authority will hold workshops and create reports based on workshop and design findings		
SO-MM#6	Continue outreach to disproportionately and negatively impacted environmental justice populations.	The Authority will continue to conduct substantial EJ outreach activities in adversely affected neighborhoods to obtain resident feedback on potential impacts and suggestions for mitigation measures. Input from these communities will be used to refine the alternatives during ongoing design efforts. In addition, to offset any disproportionate effects, the Authority will develop special recruitment, training, and job set-aside programs so that minority and low-income populations are able to benefit from the jobs created by the project. This type of outreach is common for large infrastructure projects with long construction periods and has been found to be effective.	Pre-construction/ Construction / Operations		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	Applies to all environmental justice impacts.	
Station Planning, Land Use, and Development											
Mitigation measures for station planning, land use and development were incorporated in other sections. See Air Quality and Aesthetics, Noise and Vibration, and Agriculture.											
Agricultural Land											
AG-MM #1:	Preserve the Total Amount of Prime Farmland, Farmland of Statewide Importance, Farmland of Local Importance, and Unique Farmland	The Authority will enter into an agreement with the DOC California Farmland Conservancy Program to preserve farmland. 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, the Authority will provide an additional increment of Important Farmland mitigation acreage, above the 1:1 ratio minimum, at a level consistent with the terms of a settlement agreement the Authority reached with agricultural interests in County of Madera, et	Pre-construction	Reporting	Monthly	Authority & California Farmland Conservancy	Authority	Prior to construction/ Monthly reporting	The Authority will enter into an agreement with the DOC California Farmland Conservancy Program to implement the preservation of farmland. The Authority and California Farmland Conservancy Program will develop selection criteria under this agreement to guide the pursuit and purchase of conservation easements.	AG#4:	Permanent Conversion of Agricultural Land to Nonagricultural Use. The Preferred Alternative would affect 3,474 acres of Important Farmland.
										LU Impact #2:	The Preferred Alternative would cause a substantial change in intensity of land use incompatible with adjacent land uses.
										LU Impact #3:	The Kings/Tulare Regional Station–East is likely to result in some unplanned changes in the use of existing adjacent land, regardless of the amount of parking provided at the station.
										LU Impact #5	Indirect changes to adjacent lands at the Kings/Tulare Regional Station–East site would substantially change the pattern and intensity of land use in a way that would be incompatible with adjacent land uses.

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		al. v. California High-Speed Rail Authority. This approach will provide a consistent approach to calculating the total amount of acres of agricultural conservation easements across the Central Valley. The California Farmland Conservancy Program will work with local, regional, or statewide entities whose purpose includes the acquisition and stewardship of agricultural conservation easements. The Authority and California Farmland Conservancy Program will develop selection criteria under this agreement to guide the pursuit and purchase of conservation easements. These will include, but are not limited to, provisions to ensure that the easements will conform to the requirements of Public Resources Code Section 10252 and to prioritize the acquisition of willing seller easements on lands that are adjacent to other protected agricultural lands or that would support the establishment of greenbelts and urban separators.									
Parks and Recreation											
PP-MM#1	Temporary Restricted Access to Park Facilities During Construction	Prior to temporary restricted access to the multi-use trail and Hoey trail, the contractor will ensure that connections to the unaffected trail portions and nearby roadways are maintained. The contractor will provide alternative pedestrian and bicycle access via a temporary detour of the multi-use trail using existing roadways or other public rights of way. The contractor will provide detour signage and lighting and will ensure that the alternative routes meet all public safety requirements.	Pre-construction/ Construction	Reporting/Compensation	Weekly	Contractor	Authority/Contractor	Pre-construction/ Construction. Authority to coordinate with local jurisdictions	The Authority and Contractor will work with respective jurisdictions (City of Bakersfield) to develop a staging plan and detour plan for alternative access plan to impacted Trails.	PK#1	Kern River Parkway. Construction activities for the Preferred Alternative would create use restriction of the multi-use trail and Hoey trail within the construction footprint.
		Prior to temporary restricted access to the park facilities, the contractor will ensure that connections to the unaffected park portions or nearby roadways are maintained. If a proposed linear park closure restricts connectivity, the contractor will provide alternative pedestrian and bicycle access via a temporary detour of the pedestrian walkway using existing roadways or other public rights of way. The contractor will provide detour signage and lighting and will ensure that the alternative routes meet all public safety requirements.	Pre-construction/ Construction /Post-construction/ Operations	Reporting/Compensation	Monthly	Authority	Authority	Prior to construction/ monthly reporting	The Authority and Contractor will work with respective jurisdictions (City of Bakersfield) to develop a staging plan and detour plan for alternative access plan to impacted park facilities.	PK#1	Mill Creek Linear Park. Construction activities for the Preferred Alternative would create use restrictions of some areas of park facilities.
PP-MM#3	Collect Additional Maintenance Funds	The Authority will consult with the City of Bakersfield and Amtrak to identify its share of funding to provide additional maintenance, labor, and repairs for the existing Bakersfield Amtrak playground to remedy any potential degradation of existing facilities that may result from increased facility use. Prior to the opening of passenger service, the Authority will enter into an agreement with the city and Amtrak that establishes the funding share and describes the	Pre-construction/ Construction /Post-construction/ Operations	Compensation	Monthly	Authority	Authority	Prior to construction/ Construction/ Post construction/ Operations. Authority to coordinate with local jurisdictions	The Authority will coordinate with the City of Bakersfield to identify appropriate funding amounts	PK#4	Bakersfield Amtrak Station Playground. The Bakersfield Station would create an increase in use that would result in physical deterioration.

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		relative roles of the Authority, the City of Bakersfield, and Amtrak in providing continuous maintenance of the existing playground.									
Aesthetics and Visual Resources											
AVR-MM#1a	Minimize Visual Disruption from Construction Activities	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: • 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	AVR#2	Construction Impacts of Existing Visual Quality. Construction activities would cause visual impacts.
										LU Impact #1	Disruption of access to some properties would temporarily inconvenience nearby residents on some lands along 31 miles of the Preferred Alternative.
										PK#1	Construction activities would cause visual impacts to park, recreation, and open space resources.
										PK#1	Construction activities would cause visual impacts to school district facilities.
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	Reporting	Weekly	Contractor	Contractor	Construction/ Weekly reporting	Contract Requirements/ Specifications	AVR#3	Nighttime Lighting during construction. Intrusive nighttime lighting could result in adverse impacts in both rural and urban areas.
										LU Impact #1	Disruption of access to some properties would temporarily inconvenience nearby residents on some lands along 31 miles of the Preferred Alternative.
										PK#1	Construction activities would cause visual impacts to park, recreation, and open space resources.
										PK#1	Construction activities would cause visual impacts to school district facilities.

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AVR-MM#2a	Incorporate Design Criteria for Elevated and Station Elements That Can Adapt to Local Context	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: • 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 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. Actions taken to help achieve integration with the local design context during the context-sensitive solutions process will include the following: • Design HST 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 HST 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	Pre-construction/ Design	Reporting	Final design	Contractor and Authority	Contractor and Authority	Final design and Construction/ Monthly reporting	Established local consultation process with communities along the alignment	AVR#4	Lower visual quality in the Rural Valley/Agricultural Landscape Unit. Impacts on the existing visual character and quality of the site and its surroundings, as seen by nearby rural residents due to at-grade and elevated structures, HSTs, road overcrossings, or other prominent project features.
										AVR#4	Lower visual quality in Wasco, and Shafter Landscape Units. Impacts on the existing visual character and quality of the site and its surroundings due to at-grade and elevated structures, HSTs, road overcrossings, or other prominent project features.
										AVR#4	Lower visual quality in the Rosedale, Kern River, Central Bakersfield, and/or East Bakersfield Landscape Units. Impacts on the existing visual character and quality of the site and its surroundings in Bakersfield due to elevated guideways and sound barriers.
										AVR#4	Sound Barriers would lower visual quality or block views. The Preferred Alternative would require the use of sound barriers along portions of the guideway in urbanized areas, potentially lowering visual quality and/or blocking existing views, depending on the barrier location and materials.
										PK#4	Kern River Parkway. HST operation for the Preferred Alternative would substantially degrade the existing visual character of the site and its surroundings.
										PK#4	Mill Creek Linear Park. HST operation of the Preferred Alternative would substantially degrade the existing visual character of the site and its surroundings.
										PK#4	Bakersfield Amtrak Station Playground. HST operation of the Preferred Alternative would substantially degrade the existing visual character of the site and its surroundings.

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		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 HST project's obligations and constraints related to planning, mitigation, engineering, performance, funding, and operational requirements will be taken into consideration.									
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 AVR-MM#2a and the park mitigation measure PK-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	AVR#4	Lower visual quality in the Rural Valley/Agricultural Landscape Unit. Impacts on the existing visual character and quality of the project area, as seen by nearby rural residents due to at-grade and elevated structures, HSTs, road overcrossings, or other prominent project features.
										AVR#4	Lower visual quality in Wasco, and Shafter Landscape Units. Impacts on the existing visual character and quality of the site and its surroundings due to at-grade and elevated structures, HSTs, road overcrossings, or other prominent project features.
										AVR#4	Lower visual quality in the Rosedale, Kern River, Central Bakersfield, and/or East Bakersfield Landscape Units. Impacts on the existing visual character and quality of the site and its surroundings in Bakersfield due to elevated guideways and sound barriers.
										AVR#4	Sound Barriers would lower visual quality or block views. The Preferred Alternative would require the use of sound barriers along portions of the guideway in urbanized areas, potentially lowering visual quality and/or blocking existing views, depending on the barrier location and materials.
										PK#4	Kern River Parkway. HST operation for the Preferred Alternative would substantially degrade the existing visual character of the site and its surroundings.
										PK#4	Mill Creek Linear Park. HST operation of the Preferred Alternative would substantially degrade the existing visual character of the site and its surroundings.
										PK#4	Bakersfield Amtrak Station Playground. HST operation of the Preferred Alternative would substantially degrade the existing visual character of the site and its surroundings.

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AVR-MM#2c	Screen At-Grade and Elevated Guideways Adjacent to Residential Areas	Consistent with the design features developed under AVR-MM#2a, the contractor will plant trees along the edges of the rights-of-way in locations adjacent to residential areas. This will help reduce the visual contrast between the elevated guideway and the residential area. The species of trees to be installed will be selected on the basis of their mature size and shape, growth rate, hardiness, and drought tolerance. No species that is listed on the Invasive Species Council of California's list of invasive species will be planted. The crowns of trees used should ultimately be tall enough so that upon maturity they will partially, or fully, block or screen views of the elevated guideway from adjacent at-grade areas. Trees should allow ground-level views under the crowns (with pruning if necessary) while not interfering with the 15-foot clearance requirement for the guideway. The trees will be continuously maintained and appropriate irrigation systems will be installed within the tree planting areas.	Construction /Post-construction	Reporting	Monthly	Contractor and Authority	Contractor	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	AVR#4	Lower visual quality in the Rural Valley/Agricultural Landscape Unit. Impacts on the existing visual character and quality of the site and its surroundings, as seen by nearby rural residents due to at-grade and elevated structures, HSTs, road overcrossings, or other prominent project features.
										AVR#4:	Lower visual quality in Wasco, and Shafter Park Landscape Units. Impacts on the existing visual character and quality of the site and its surroundings due to at-grade and elevated structures, HSTs, road overcrossings, or other prominent project features.
										AVR#4	AVR#4: Lower visual quality in the Rosedale, Kern River, Central Bakersfield, and/or East Bakersfield Landscape Units. Impacts on the existing visual character and quality of the site and its surroundings in Bakersfield due to elevated guideways and sound barriers.
										AVR#4:	Sound Barriers would lower visual quality or block views. The Preferred Alternative would require the use of sound barriers along portions of the guideway in urbanized areas, potentially lowering visual quality and/or blocking existing views, depending on the barrier location and materials.
										PK#4	Kern River Parkway. HST operation for the Preferred Alternative would substantially degrade the existing visual character of the site and its surroundings.
										PK#4	Mill Creek Linear Park. HST operation of the Preferred Alternative would substantially degrade the existing visual character of the site and its surroundings.
										PK#4	Bakersfield Amtrak Station Playground. HST operation of the Preferred Alternative would substantially degrade the existing visual character of the site and its surroundings.
AVR-MM#2d	Replant Unused Portions of Lands Acquired for the HST	After construction is complete, the Authority will plant vegetation within lands acquired for the project (e.g., shifting roadways) that are not used for the HST or related supporting infrastructure. Plantings will allow adequate space between the vegetation and the HST alignment and catenary lines. All street trees and other visually important vegetation removed in these areas during construction will be replaced with similar vegetation that, upon maturity, will be similar in size and character to the removed vegetation. The Authority will ensure that vegetation will be continuously maintained and appropriate irrigation systems will be installed within the planting areas. No species that is listed on the Invasive Species Council of California's list of invasive species will be planted.	Post-construction/ Operations	Reporting	Monthly	Authority	Authority	Post - Construction/ monthly reporting	Authority to implement appropriate landscape and maintenance plan	AVR#4	Lower visual quality in the Rural Valley/Agricultural Landscape Unit. Impacts on the existing visual character and quality of the site and its surroundings, as seen by nearby rural residents due to at-grade and elevated structures, HSTs, road overcrossings, or other prominent project features.
										AVR#4	Lower visual quality in Corcoran, Wasco, and Shafter Landscape Units. Impacts on the existing visual character and quality of the site and its surroundings due to at-grade and elevated structures, HSTs, road overcrossings, or other prominent project features.
										AVR#4	Lower visual quality in the Rosedale, Kern River, Central Bakersfield, and/or East Bakersfield Landscape Units. Impacts on the existing visual character and quality of the site and its surroundings in Bakersfield due to elevated guideways and sound barriers.
										AVR#4:	Sound Barriers would lower visual quality or block views. The Preferred Alternative would require the use of sound barriers along portions of the guideway in urbanized areas, potentially lowering visual quality and/or blocking existing views, depending on the barrier location and materials.
										PK#4	Kern River Parkway. HST operation of the Preferred Alternative would substantially degrade the existing visual character of the site and its surroundings.
										PK#4	Mill Creek Linear Park. HST operation of the Preferred Alternative would substantially degrade the existing visual character of the site and its surroundings.
										PK#4	Bakersfield Amtrak Station Playground. HST operation of the Preferred Alternative would substantially degrade the existing visual character of the site and its surroundings.

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Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact #	Impact Text
AVR-MM#2e	Provide Offsite Landscape Screening Where Appropriate	Where onsite landscape screening measures as described under 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.	Post-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.	AVR#4	Lower visual quality in the Rural Valley/Agricultural Landscape Unit. Impacts on the existing visual character and quality of the site and its surroundings, as seen by nearby rural residents due to at-grade and elevated structures, HSTs, road overcrossings, or other prominent project features.
										AVR#4	Lower visual quality in Wasco, and Shafter Landscape Units. Impacts on the existing visual character and quality of the site and its surroundings due to at-grade and elevated structures, HSTs, road overcrossings, or other prominent project features.
										AVR#4	Lower visual quality in the Rosedale, Kern River, Central Bakersfield, and/or East Bakersfield Landscape Units. Impacts on the existing visual character and quality of the site and its surroundings in Bakersfield due to elevated guideways and sound barriers.
										AVR#4	Sound Barriers would lower visual quality or block views. The Preferred Alternative would require the use of sound barriers along portions of the guideway in urbanized areas, potentially lowering visual quality and/or blocking existing views, depending on the barrier location and materials.
										PK#4	Kern River Parkway. HST operation of the Preferred Alternative would substantially degrade the existing visual character of the site and its surroundings.
										PK#4	Mill Creek Linear Park. HST operation of the Preferred Alternative would substantially degrade the existing visual character of the site and its surroundings.
										PK#4	Bakersfield Amtrak Station Playground. HST operation of the Preferred Alternative would substantially degrade the existing visual character of the site and its surroundings.
AVR-MM#2f	Landscape Treatments along the HST Project Overcrossings and Retained Fill Elements of the HST	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.	Post-construction/ Operation	Reporting	Monthly	Authority	Authority	Monthly Reporting	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.	AVR#4	Lower visual quality in the Rural Valley/Agricultural Landscape Unit. Impacts on the existing visual character and quality of the site and its surroundings, as seen by nearby rural residents due to at-grade and elevated structures, HSTs, road overcrossings, or other prominent project features.
										AVR#4	Lower visual quality in Wasco, and Shafter Landscape Units. Impacts on the existing visual character and quality of the site and its surroundings due to at-grade and elevated structures, HSTs, road overcrossings, or other prominent project features.
										AVR#4	Lower visual quality in the Rosedale, Kern River, Central Bakersfield, and/or East Bakersfield Landscape Units. Impacts on the existing visual character and quality of the site and its surroundings in Bakersfield due to elevated guideways and sound barriers.
										AVR#4	Sound Barriers would lower visual quality or block views. The Preferred Alternative would require the use of sound barriers along portions of the guideway in urbanized areas, potentially lowering visual quality and/or blocking existing views, depending on the barrier location and materials.
										PK#4	Kern River Parkway. HST operation of the Preferred Alternative would substantially degrade the existing visual character of the site and its surroundings.
										PK#4	Mill Creek Linear Park. HST operation of the Preferred Alternative would substantially degrade the existing visual character of the site and its surroundings.
										PK#4	Bakersfield Amtrak Station Playground. HST operation of the Preferred Alternative would substantially degrade the existing visual character of the site and its surroundings.

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Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact #	Impact Text
AVR-MM#2g	Provide Sound Barrier Treatments	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). 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: • 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. Vegetation will be installed consistent with the provisions of AVR-MM#2f. 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	AVR#4	Lower visual quality in the Rural Valley/Agricultural Landscape Unit. Impacts on the existing visual character and quality of the site and its surroundings, as seen by nearby rural residents due to at-grade and elevated structures, HSTs, road overcrossings, or other prominent project features.
										AVR#4	Lower visual quality in Wasco, and Shafter Landscape Units. Impacts on the existing visual character and quality of the site and its surroundings due to at-grade and elevated structures, HSTs, road overcrossings, or other prominent project features.
										AVR#4	Sound Barriers Would Lower Visual Quality or Block Views
										AVR#4	Lower visual quality in the Rosedale, Kern River, Central Bakersfield, and/or East Bakersfield Landscape Units. Impacts on the existing visual character and quality of the site and its surroundings in Bakersfield due to elevated guideways and sound barriers.
AVR-MM#2h	Screen Traction Power Distribution Stations and Radio Communication Towers	Upon completion of station or HMF construction, the contractor will screen the traction power substations (located at approximately 30-mile intervals along any of the HST alternatives), including radio towers where required, and HMF from public view through the use of landscaping or solid walls/fences. This will consist of context-appropriate landscaping of a type and scale that does not draw attention to the station. Plant species will be selected on the basis of their mature size and shape, growth rate, hardiness, 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 within the landscaped areas. Walls will be constructed of cinder-block or similar material and will be painted a neutral color to blend in with the surrounding context. If a chain-link or cyclone fence is used, it will include slats in the fencing. Any graffiti or visual defacement or damage of fencing and walls will be painted over or repaired within a reasonable period as agreed between the Authority and local jurisdiction. Figure 3.16-66 shows a power substation in an urban	Post-construction/ Operation	Reporting	Annually	Contractor	Contractor	Post Construction/ Operations	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.	AVR#4	Lower visual quality in the Rural Valley/Agricultural Landscape Unit. Impacts on the existing visual character and quality of the site and its surroundings, as seen by nearby rural residents due to at-grade and elevated structures, HSTs, road overcrossings, or other prominent project features.
										AVR#4	Lower visual quality in Wasco, and Shafter Landscape Units. Impacts on the existing visual character and quality of the site and its surroundings due to at-grade and elevated structures, HSTs, road overcrossings, or other prominent project features.
										AVR#4	Traction Power Stations would alter visual character or block views. The Preferred Alternative would require the placement of Traction Power Distribution Stations of varying sizes at approximately 5-mile intervals along the alignment, which would potentially alter the visual character of adjacent lands and/or block views toward areas beyond the alignment.

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		environment that is partially screened by landscaping and fencing. None of the mitigation measure options are expected to result in secondary effects. The mitigation measures are typical of visual treatments applied on linear transportation facilities; they have been defined to be specific in range and implementable according to context, and designed in coordination with local jurisdictions.									
Cultural Resources											
CUL-MM #1	Complete Inventory for Archaeological Resources and Comply with the Stipulations Regarding the Treatment of Archaeological Resources in the PA and MOA	The contractor will complete the following management steps for currently inaccessible areas once permission to enter has been obtained: • The contractor will complete an inventory and evaluation report for archaeological resources. • This work will be led or supervised by cultural resources specialists who meet the SOI's professional qualification standards provided in 36 C.F.R. Part 61. • All newly identified resources will be mapped and described on DPR forms. Mapping will be completed by recording data with GPS hardware through which data can be imported and managed in Geographic Information Systems. Mapping of previously identified resources will be limited to updates of existing records where necessary to describe the current boundaries of the resource and any change in condition that has occurred after the first recordation. • The contractor will evaluate the eligibility of identified archaeological and built environment resources for listing on the CRHR. • Under delegated authority provided in the PA and MOA the contractor will also evaluate identified archaeological resources for the NRHP. • For archaeological resources that are NRHP eligible the contractor will assess the potential for adverse effects within the meaning of 36 C.F.R. Part 800.5(a)(1). For CRHR eligible resources the contractor shall assess the potential for significant impacts by applying the criteria in CEQA Guidelines 15064.5(b). • 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).	Pre-construction	Reporting	Weekly	Contractor	Contractor	Pre-construction/ weekly reporting or as dictated by the Archaeological Treatment Plan (ATP)	PA/ MOA	CUL #1	Potential Adverse Effects on Archaeological Resources due to Construction Activities Construction of the HST would result in possible substantial effects on unknown archaeological deposits or paleontological resources from ground-disturbing construction operations associated with the project, or in areas where PTE has not been granted.

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Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact #	Impact Text
		• For archaeological resources the Authority shall also determine if the resource is a unique archaeological site. If the resource is not an historical resource but is an archaeological site the resource shall be treated as required in California Public Resources Code 21083.2.									
CUL-MM #2	Conduct Archaeological Training	Before the start of ground-disturbing activities within the APE, a qualified professional archaeologist who meets the SOI Standards for Archaeology will develop a training program and printed material to be presented to construction personnel. The purpose of this training and accompanying materials will be to familiarize construction personnel with the relevant legal (Section 106/NEPA/CEQA) context for cultural resources of the project and with the types of cultural sites, features, and artifacts that could be uncovered during construction activities. These training sessions will be conducted before commencing construction within the APE or and will be repeated as needed as construction crews and supervisors change.	Pre-construction	Reporting	Monthly	Contractor	Contractor	Prior to ground-disturbing activities/monthly reporting	Worker Environmental Awareness Program training ATP MOA An Unanticipated Discoveries Plan is a part of the ATP and has been developed, in coordination with the consulting parties, to detail the specific procedures to be followed if archaeological materials are found during construction. Implement an ADRP if the circumstances warrant an ADRP. The Authority will provide the ADRP, as an element of the treatment plan prepared for the section, to the MOA signatories and MOA concurring parties for review and comment.	CUL #1	Potential Adverse Effects on Archaeological Resources due to Construction Activities Construction of the HST would result in possible substantial effects on unknown archaeological deposits or paleontological resources from ground-disturbing construction operations associated with the project, or in areas where PTE has not been granted.
CUL-MM #3	Conduct Archaeological Monitoring in Areas of Sensitivity, Halt Work in the Event of a Discovery	Prior to ground-disturbing construction the Authority will include a cultural resources discovery plan in the contract conditions of the Contractor, identifying the following steps to be taken in the event of the inadvertent discovery of cultural resources. • An archaeological monitor will be present to observe construction at geographic locations that are sensitive for unidentified cultural resources. Such locations may consist of construction areas near identified cultural resources (within a 200-foot radius around the	Construction	Reporting	Daily Logs (during active monitoring)	Contractor/Authority	Contractor	Daily logs (during active monitoring)	ATP/MOA	CUL #1	Potential Adverse Effects on Archaeological Resources due to Construction Activities Construction of the HST would result in possible substantial effects on unknown archaeological deposits or paleontological resources from ground-disturbing construction operations associated with the project, or in areas where PTE has not been granted.

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Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact #	Impact Text
		known boundaries of identified resources) and where ground-disturbing construction will occur within 1,500 feet of major water features, or in other areas of identified sensitivity based on inventory work to be completed when permission to enter is granted. • In the event of an archaeological resource discovery, work will cease 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. A qualified archaeologist will assess the significance of the find and make recommendations for further evaluation and treatment as necessary. These steps shall 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 the resource is eligible for the CRHR an archaeological resource 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 mitigation The Authority shall adopt a data recovery plan as required under CEQA Guidelines § 15126.4(b)(3)(C). The California State Lands Commission (CSLC) will be notified 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 will comply with all applicable rules and regulations promulgated by CSLC with respect to cultural resources in submerged lands. The project proponent will also comply with the PA. Performance tracking of this mitigation measure is based upon successful implementation and approval of the documentation by the SHPO and appropriate consulting parties.									
CUL-MM #4	Comply with State and Federal Law for Human Remains	Discoveries of human remains on private and state agency lands in California are governed by California Health and Safety Code Section 7050.5 and Public Resources Code Section 5097.98. Native American remains discovered on federal lands are governed by NAGPRA (25 US Code Section 3001. 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 an MLD. The MLD shall	Pre-construction/ Construction /Post-construction	Monitoring and reporting	No reporting necessary unless remains are identified	Qualified Professional Archaeologist	Qualified Professional Archaeologist, in coordination with the Authority, SHPO and appropriate consulting agencies	If remains are identified during construction, Weekly reporting	ATP/MOA	CUL #1	Potential Adverse Effects on Archaeological Resources due to Construction Activities Construction of the HST would result in possible substantial effects on unknown archaeological deposits or paleontological resources from ground-disturbing construction operations associated with the project, or in areas where PTE has not been granted.

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Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact #	Impact Text
		be empowered to reinter the remains with appropriate dignity. If the MLD fails to make a recommendation the remains shall be reinterred 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. If human remains are part of an archaeological site the Authority and contractor shall, in consultation with the MLD and other stakeholders, consider preservation in place as the first option, in the order of priority called for in CEQA Guidelines Section 15126.4(b)(3). In consultation with the relevant Native American stakeholders the Authority may conduct scientific analysis on the human remains if called for under a data recovery plan and amenable to all stakeholders. California and the Authority will work with the most likely descendant, to satisfy the requirements of California Public Resources Code Section 5097.98. Performance tracking of this mitigation measure will be based on successful implementation and approval of the documentation by the SHPO and appropriate consulting parties.									
CUL-MM#5	Conduct Additional Testing and Data Recovery	When access is obtained, conduct surveys, testing, and evaluation pursuant to the ATP. Follow treatments and data recovery, as required.	Pre-construction/ Construction	Reporting	Weekly	Contractor	Contractor	Pre-construction surveys and Construction/ weekly reporting or as dictated by the ATP and the MOA	PA	CuI#1	Potential Adverse Effects on Archaeological Resources due to Construction Activities Construction of the HST would result in possible substantial effects on unknown archaeological deposits or paleontological resources from ground-disturbing construction operations associated with the project, or in areas where PTE has not been granted.

Historic Architectural Resources											
CUL-MM#6	Complete Inventories for Historic Architectural Resources	Because design of the project is currently only at 15%, it may be necessary to conduct additional inventories for historic architectural resources as the design is finalized. The Authority, under delegated responsibility under the PA and MOA, shall complete inventory and evaluate historic architectural properties for the NRHP. The Authority will also evaluate historic architectural resources to determine if they are historical resources (CRHR-eligible). For identified NRHP historic properties the Authority will assess the potential for adverse effects by applying the effects criteria in 36 C.F.R. Part 800.5(a)(1). For CRHR historic resources the Authority shall assess the potential for significant impacts by applying the criteria in CEQA Guidelines 15064.5(b).	Pre-construction/ Construction	Reporting	Weekly	Contractor	Contractor	Pre-construction surveys and Construction/ weekly reporting or as dictated by the BETP and the MOA	PA / Historic Structure Report (HSR) and the relocation plan	Cul#2	Potential Adverse Effects on Historic Architectural Resources due to Construction Activities Construction activities that may cause impacts on historic architectural resources can include excavation, staging, heavy-equipment usage and movement, drilling,
CUL-MM #7	Avoid and/or Monitor Adverse Construction Vibration Effects	The BETP will describe the methodology for the avoidance of adverse vibration effects and how such avoidance will be monitored and implemented during construction of the project. Implementation of avoidance measures will be monitored to ensure that damaging vibration levels are avoided during construction adjacent to the historic properties identified as requiring this treatment.	Pre-construction/ Construction	Reporting	Weekly	Contractor	Contractor	Pre-construction surveys and Construction/ weekly reporting or as dictated by the BETP and the MOA	PA / Historic Structure Report (HSR) and the relocation plan	Cul#2	Potential Adverse Effects on Historic Architectural Resources due to Construction Activities Construction activities that may cause impacts on historic architectural resources can include excavation, staging, heavy-equipment usage and movement, drilling, demolition, or the need for relocation, as well as increases in vibration levels or introduction of new visual elements.
CUL-MM #8	Implement Protection and/or Stabilization Measures	The BETP will identify historic properties/historical resources that may require treatment, protection and/or stabilization before the start of construction of the project. Treatment will be developed in consultation with the landowner or land-owning agencies as well as the SHPO and the MOA signatories, as required by the PA. Such measures will include, but will 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. For buildings that would be moved, treatment will include stabilization before, during, and after relocation; protection during temporary storage; and relocation at a new site and during subsequent rehabilitation.	Pre-construction/ Construction	Reporting	Weekly	Contractor	Contractor	Pre-construction surveys and Construction/ weekly reporting or as dictated by the BETP and the MOA	BETP PA Historic Structure Report (HSR) and the relocation plan	Cul#2	Potential Adverse Effects on Historic Architectural Resources due to Construction Activities Construction activities that may cause impacts on historic architectural resources can include excavation, staging, heavy-equipment usage and movement, drilling, demolition, or the need for relocation, as well as increases in vibration levels or introduction of new visual elements.
CUL-MM #10	Minimize Adverse Effects through Relocation of Historic Structures	A BETP will identify historic properties/historical resources that could be relocated to help avoid their destruction and minimize the direct adverse effect of their physical damage or alteration. The development of the plan for relocation and the implementation of relocation will take place before construction. The relocation of the historic properties/historical resources will take into account the historic site and layout (i.e., the orientation of the buildings to the cardinal directions) and their potential re-use. The properties subject to relocation 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	Pre-construction/ Construction /Post-Construction	Reporting	Weekly (during physical relocation)	Contractor	Contractor	Pre-construction surveys and Construction/ weekly reporting or as dictated by the BETP and the MOA	BETP/Relocation Plan, PA HABS/HAER/HALS/ MOA	Cul#2	Potential Adverse Effects on Historic Architectural Resources due to Construction Activities Construction activities that may cause impacts on historic architectural resources can include excavation, staging, heavy-equipment usage and movement, drilling, demolition, or the need for relocation, as well as increases in vibration levels or introduction of new visual elements.

		the HABS, the Historic American Engineering Record (HAER), or the Historic American Landscape Survey (HALS) programs; or other recordation methods stipulated in the MOA and described in the BETP. The relocation plan will provide for stabilization of the structures before, during, and after the move, as well as inadvertent damage.									
CUL-MM #11	Minimize Adverse Operational Noise Effects	A BETP will identify the historic properties/historical resources that will be subject to treatment to minimize the indirect adverse effects caused by the operational noise of the HST project. Properties subject to this mitigation will be treated in consultation with the landowner or land-owning agencies and the CEQA lead agency (i.e., the Authority). Preliminary project design options, such as noise walls, have been developed to help reduce noise impacts and follow FRA methodologies for noise abatement.	Pre-construction/ Construction /Post-Construction	Reporting	Ongoing	Contractor	Contractor	Pre-construction and Construction	BETP PA Historic American Building Survey (HABS)/Historic American Engineering Record (HAER)/ Historic American Landscape Survey (HALS) programs, MOA	CuI#2	Potential Adverse Effects on Historic Architectural Resources due to Construction Activities Construction activities that may cause impacts on historic architectural resources can include excavation, staging, heavy-equipment usage and movement, drilling, demolition, or the need for relocation, as well as increases in vibration levels or introduction of new visual elements.
CUL-MM #12	Prepare and Submit Additional Recordation and Documentation	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 HABS, 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.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.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.	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	CuI#2	Potential Adverse Effects on Historic Architectural Resources due to Construction ActivitiesConstruction activities that may cause impacts on historic architectural resources can include excavation, staging, heavy-equipment usage and movement, drilling, demolition, or the need for relocation, as well as increases in vibration levels or introduction of new visual elements.

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 the SHPO and appropriate consulting parties	Post-construction/ annual reporting	BETP Photographic documentation Plan for repairs to historic properties	Cul#2	Potential Adverse Effects on Historic Architectural Resources due to Construction Activities Construction activities that may cause impacts on historic architectural resources can include excavation, staging, heavy-equipment usage and movement, drilling, demolition, or the need for relocation, as well as increases in vibration levels or introduction of new visual elements.
CUL-MM #14	Plan Repair of Inadvertent Damage	Based on the completed inventory, the BETP will provide a plan for the repair of inadvertent damage to historic properties or historical resources be developed before project construction. The plan will consist of a general protocol for inadvertent damage to historic architectural resources and a listing of specific properties that should be the subject of an individual plan because of their immediate proximity to the project. Inadvertent damage from the project to any of the historic properties or historical resources near construction activities will be repaired in accordance with the SOI's Standards for Rehabilitation. Inadvertent damage will consist of any damage that results in a significant impact to a historical within the meaning of CEQA Guidelines Section 15064.5(b)(2) or adverse effects to historic properties within the meaning of 36 C.F.R. Part 800.5(a)(1). The plan may utilize photographic documentation prepared for the other mitigation measures (such as the additional recordation) as the baseline condition for assessing damage. The plan will include the	Pre-construction/ Construction /Post-construction	Reporting	Monthly	Authority	Authority, in consultation with the SHPO and appropriate consulting parties	Monthly reporting	BETP, Historic American Building Survey (HABS)/Historic American Engineering Record (HAER)/ Conformance with SOI's Standards of Rehabilitation, Plans for repairs to historic properties	Cul #2	Potential Adverse Effects on Historic Architectural Resources due to Construction Activities Construction activities that may cause impacts on historic architectural resources can include excavation, staging, heavy-equipment usage and movement, drilling, demolition, or the need for relocation, as well as increases in vibration levels or introduction of new visual elements.

		protocols for notification, coordination, and reporting to the SHPO and the landowner or land-owning agencies. Before it can be implemented, the repair plan will be submitted for review and comment to the SHPO to verify conformance with the SOI's Standards for Rehabilitation. This mitigation measure is consistent with best practices within the professional historic preservation community and is commensurate with treatment of historic properties in similar-scale transportation projects. This type of mitigation measure has proven to be effective in achieving the stewardship goals of Section 106 and CEQA review. Performance tracking of this treatment is described in the BETP.									
CUL-MM #15	Visual Screening	Based on the finalization of design and the completed inventory, the BETP will identify historic properties and historical resources that will be subject to visual screening planting. Visual screening will consist of plant material that will minimize the view of the project from the property subject to mitigation. This treatment will minimize adverse effects on historic properties/historical resources to the extent possible.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. Visual screen planting may be undertaken in the form of boundary planting on the affected property, planting at affected viewpoints, and/or planting on project property as appropriate. This treatment will be developed in consultation with the landowner or land-owning agencies, as well as the SHPO and the MOA signatories, as required by the PA. The visual screen planting treatment will include preparation of a planting plan that utilizes evergreen tree or shrub species and will take into account both the growth rate and ultimate height and density for the selected species to ensure that the visual screen can be accomplished effectively.	Construction /Post-construction	Reporting	Annual	Authority	Authority	Post-construction/ annual reporting	BETPPhotographic documentationVisual Screening Plan	CuI#2	Potential Adverse Effects on Historic Architectural Resources due to Construction ActivitiesConstruction activities that may cause impacts on historic architectural resources can include excavation, staging, heavy-equipment usage and movement, drilling, demolition, or the need for relocation, as well as increases in vibration levels or introduction of new visual elements.

Paleontological Resources											
CUL-MM #16	Engage a Paleonto-logical 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 resources monitors (PRMs) 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)	Cul#3	Potential Adverse Effects on Paleontological Resources due to Construction Activities Like archaeological resources, construction activities that may impact paleontological resources include ground-disturbing activities. Surficial activities such as staging and clearing usually do not affect paleontological resources because the associated disturbance does not extend deep enough to affect paleontologically sensitive deposits.
CUL-MM #17	Prepare and Implement a Paleonto-logical Resource 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 1995) 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 training	Cul#3	Potential Adverse Effects on Paleontological Resources due to Construction Activities Like archaeological resources, construction activities that may impact paleontological resources include ground-disturbing activities. Surficial activities such as staging and clearing usually do not affect paleontological resources because the associated disturbance does not extend deep enough to affect paleontologically sensitive deposits.
CUL-MM #18	Halt Construction When Paleonto-logical 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 PRM or the PRS, a PRM or the PRS will immediately be notified.	Construction	Reporting	Daily logs during active monitoring	Contractor	Contractor	Construction/ Weekly reporting (if resource is identified during construction)	PRMMP, WEAP	Cul#3	Potential Adverse Effects on Paleontological Resources due to Construction Activities Like archaeological resources, construction activities that may impact paleontological resources include ground-disturbing activities. Surficial activities such as staging and clearing usually do not affect paleontological resources because the associated disturbance does not extend deep enough to affect paleontologically sensitive deposits.

Regional Growth											
No significant impacts on Regional Growth have been identified.											
Cumulative Impacts											
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 HST construction schedule and would allow for adjustment of construction schedules for adjacent projects or projects in close proximity to the HST 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	CUM-N&V	Cumulative noise and vibration impacts of the HST alternatives and other past, present, and reasonably foreseeable projects during construction
CUM-SO-MM#1	Consult with agencies regarding construction activities.	To minimize the potential cumulative effects of overlapping construction activities within the same area, the Authority would consult with the local city and county planning departments and other agencies as determined necessary, to notify the departments/agencies regarding the anticipated HST construction schedule and allow for adjustment of construction schedules for adjacent projects or projects in close proximity to the HST alignment, to the extent feasible, in order to limit the overlap of community disruption.	Pre-Construction / Construction	Notify and consult with departments/agencies	Monthly	Contractor/Authority	Contractor	Monthly, record keeping, and reporting	Meetings with departments/agencies	CUM-SO	Construction and operation of the HST project and other past, present, and reasonably foreseeable projects would result in division and/or disruption of communities in the cities of Fresno, Hanford, Corcoran, Wasco, Shafter, and Bakersfield, as well as unincorporated communities in Kings and Kern counties.
CUM-SO-MM#2	Public outreach.	For areas with potentially overlapping construction schedules for the HST and other projects, the Authority would continue to undertake environmental justice outreach prior to construction, as described in Mitigation Measure SO-6: Continue outreach to disproportionately and negatively impacted environmental justice communities of concern. The Authority would obtain feedback from the affected neighborhoods regarding these project construction schedules to address community concerns.	Pre-Construction /Construction	Public outreach activities	Monthly	Contractor/Authority	Contractor	Monthly, record keeping, and reporting	Meetings with departments/agencies	CUM-SO	Construction and operation of the HST project and other past, present, and reasonably foreseeable projects would result in division and/or disruption of communities in the cities of Fresno, Hanford, Corcoran, Wasco, Shafter, and Bakersfield, as well as unincorporated communities in Kings and Kern counties.
CUM-VQ-MM#1	Consult with agencies on HST project design.	Prior to construction, the Authority would consult with local city and county planning departments to provide information about the HST project design. This would allow for local plans and proposed development projects that could be adversely affected by the HST project to be modified and potential visual impacts to high-sensitivity viewers to be reduced, as determined feasible by project applicants/planning departments.	Pre-Construction / Construction	Notify and consult with departments/agencies	Monthly	Contractor/Authority	Contractor	Monthly, record keeping, and reporting	Meetings with departments/agencies	CUM-VQ	Cumulative visual effect of the HST in combination with other past, present, and reasonably foreseeable future projects

Table 2
Fresno to Bakersfield Avoidance and Minimization Measures

Table 2
Fresno to Bakersfield Avoidance and Minimization Measures

Avoidance and Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact #	Impact Text
Air Quality											
AQ-AM #1	Truck Equipment	• 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	Reporting	Daily	Contractor	Contractor	Daily Reporting	Condition of Design Build Contract	AQ #1 AQ #2 AQ #7	Common Regional Air Quality Impacts During Construction Compliance with Air Quality Plans Localized Air Quality Impacts to Schools during Construction
AQ-AM #2	Fugitive Dust Emissions	• Exposed surfaces and unpaved roads will be watered three times daily. • Vehicle travel speed on unpaved roads will be reduced to 15 miles per hour. • Any dust-generating activities will be suspended when wind speed exceeds 25 mph. • All disturbed areas, including storage piles that 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. In areas adjacent to organic farms, the Authority will use non-chemical means of dust suppression. • All onsite unpaved roads and offsite unpaved access roads will be effectively stabilized for dust emissions using water or a chemical stabilizer/suppressant. In areas adjacent to organic farms, the Authority will use non-chemical means of dust suppression. • All land clearing, grubbing, scraping, excavation, land leveling, grading, cut and fill, and demolition activities will be effectively controlled for fugitive dust emissions by an application of water or by presoaking. With the demolition of buildings up to six stories in height, all exterior surfaces of the buildings will be wetted during demolition. • All materials transported offsite will be covered or effectively wetted to limit visible dust emissions, and at least 6 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 for fugitive dust emissions using sufficient water or a chemical stabilizer/suppressant. In areas adjacent to organic farms, the Authority will use non-chemical means of dust suppression. For additional valley fever avoidance and mitigation measures and recommendations, see S&S – AM #4b and #4c	Construction	Reporting	Weekly	Contractor	Contractor	Weekly Reporting	Condition of Design Build Contract	AQ #1 AQ #2 AQ #7	Common Regional Air Quality Impacts During Construction Compliance with Air Quality Plans Localized Air Quality Impacts to Schools during Construction

AQ-AM #3	Trackouts	• 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 take actions specified in SJVAPCD's Rule 8041 to prevent carryout and trackout.	Construction	Contractor	Daily	Contractor	Contractor	Daily Reporting	Condition of Design Build Contract	AQ #1 AQ #2	Common Regional Air Quality Impacts During Construction Compliance with Air Quality Plans
AQ-AM #4	Material Selection	• Low- or super-compliant VOC (Clean Air) paints, coatings, and industrial coatings that meet the regulatory limits in the SCAQMD Rule 1113 will be used.	Design/Construction	Contractor	Monthly	Contractor	Contractor	At incorporation or completion of design/ During construction report monthly	Condition of Design Build Contract	AQ #7	Localized Air Quality Impacts to Schools during Construction
Noise and Vibration											
NV-AM #1	General Construction Guidelines-Noise and Vibration	FTA and FRA have guidelines for minimizing noise and vibration impacts at sensitive receptors that will be followed during construction.	Construction	Contractor	Monthly	Contractor	Contractor	At incorporation or completion of design/ During construction report monthly	Condition of Design Build Contract	N&V #1 N&V #2	Construction noise mitigation measures Construction vibration mitigation measures
EMI/EMF standards											
EMI/EMF -AM #1	EMCPP Design Features	The HST project would adhere to international guidelines and comply with applicable federal and state laws and regulations. Similarly, project design will follow the EMCPP to avoid EMI and to ensure HST operational safety. Some features of the EMCPP include: • During the planning stage through system design, the Authority will perform EMC/EMI safety analyses, which will 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. • HST standard corrosion protection measures would be implemented to eliminate risk of substantial corrosion of nearby metal objects. • The Authority will work with the engineering departments of BNSF Railway, UPRR, and SJVR where these railways parallel the HST 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 prior to the activation of potentially interfering systems of the HST. Applicable design standards for EMI/EMF that would be used for the project are provided in Appendix 2-D, such as IEEE Standard C95.6-2002 – IEEE Standard for Safety Levels with Respect to Human Exposure to Electromagnetic Fields, 0-3 kHz	Design/Construction	Reporting	Monthly	Contractor	Contractor/ Authority	At incorporation or completion of design/ During construction report monthly	Reporting Contractor	EMF/EMI Impact #5	Impacts to Sensitive Equipment from EMI
Public Utilities/ Energy Design Features											
PUB-AM #1	Minimization of Utility interruption	Project design and phasing of construction activities would be coordinated with service providers to minimize or avoid interruptions, including for upgrades of existing power lines to connect the HST System to existing PG&E substations. Where relocating an irrigation facility is necessary, the Authority shall ensure that where feasible the new facility is operational prior to disconnecting the original facility. Prior to construction in areas where utility	Design/Construction	Reporting	Monthly	Contractor	Contractor	At incorporation or completion of design/ During construction report monthly	Condition of Design Build Contract	PU&E#8	Potential Conflicts with Fixed Electrical Facilities

		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.									
Biological Resources											
BIO-AM #1	Environmental Design	In addition to the mitigation measures described below in Section 3.7.7, multiple project design features have been developed for the Fresno to Bakersfield Section to avoid and minimize potential impacts and effects on biological resources. At multiple locations, the route of the alternative alignments was altered to avoid impacts and effects to biological resources. 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.	Design/Construction	Contractor	Monthly	Contractor	Contractor	At incorporation or completion of design/ During construction report monthly	Condition of Design Build Contract	N/A	N/A
BIO-AM #2	Wildlife Crossings	Wildlife crossing opportunities will be available through a variety of engineered structures, including dedicated wildlife crossing structures, elevated structures, bridges over riparian corridors, road overcrossings and undercrossings, and drainage facilities (i.e., large-diameter [60- to 120-inch] culverts and paired 30-inch culverts). For a more detailed discussion of the crossing structures, including figures depicting the frequency and locations of these structures, refer to Figures 3-3a through 3-3d and Section 5.6 of the Fresno to Bakersfield Section: Biological Resources and Wetlands Technical Report (Authority and FRA 2012a).	Design/Construction	Contractor	Monthly	Contractor	Contractor	At incorporation or completion of design/ During construction report monthly	Condition of Design Build Contract	BIO#8	Project impacts from the HST alternatives would permanently reduce the functionality of wildlife movement corridors and habitat linkages.
Hydrology and Water Quality											
HYD- AM #1	Storm Water Management and Treatment	During the detailed design phase, each receiving stormwater system's capacity will be evaluated to accommodate project runoff for the design storm event. As necessary, onsite stormwater management measures, such as detention or selected upgrades to the receiving system, will be designed to provide adequate capacity and to comply with the design standards in Appendix 2-D and the latest version of *Technical Memorandum 2.6.5 Hydraulics and Hydrology Guidelines* (Authority 2011). Onsite stormwater management facilities will 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 (LID) techniques will be used to detain runoff onsite and to reduce offsite runoff. 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 will be used, where appropriate.	Design/ Construction	Contractor	Monthly	Contractor	Contractor	At incorporation or completion of design/ During construction report monthly	Condition of Design Build Contract	Impact HWR #6	Permanent Impact on Surface Water Quality

		Stormwater infiltration or detention facilities are to be built in compliance with the design standards indicated in Appendix 2-D. Vegetated set-backs from streams will be used.									
HYD- AM #2	Flood Protection	The project will be designed to both remain operational during flood events and to minimize increases in 100-year flood elevations. Design standards will include the following: • 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 flood flow. Avoid placement of facilities in the floodplain (e.g., at the Shafter East and Shafter West HMF sites) or raise the ground with fill above the base-flood elevation. The floodplain crossings will be designed 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 will not increase existing 100-year floodwater surface elevations in FEMA-designated floodways. The following design standards would minimize the effects of pier placement on floodplains and floodways: • 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. (The Central Valley Flood Protection Board [CVFPB] requires that the bottom members [soffit] of a proposed bridge be at least 3 feet above the design floodplain. The required clearance may be reduced to 2 feet on minor streams at sites where significant amounts of stream debris are unlikely.) • 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, complemented 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.	Design/ Construction	Authority/Contractor	Monthly	Contractor	Contractor	At incorporation or completion of design/ During construction report monthly	Condition of Design Build Contract	Impact HWR #8	Permanent Impact on Floodplains
HYD- AM #3	Construction Stormwater Pollution Prevention Plan.	The SWRCB Construction General Permit (Order No. 2009-0009 DWQ, NPDES No. CAS000002) establishes three project risk levels that are based on site erosion and receiving-water risk factors. Risk Levels 1, 2, and 3 correspond to low-, medium-, and high-risk levels for a project. A preliminary analysis indicates that most of the project would fall under Risk Level 1, the lowest risk level. However, sections of the project may be more appropriately categorized as Risk Level 2 due to the combination of local rainfall, soil erodibility, and the lengths of the constructed slopes. For example, the portion of the project draining to Kings River would fall under Risk Level 2. Risk Level 2 measures also would be carried out anywhere in the project vicinity where construction activities are conducted within or immediately	Design/Construction	Reporting	Monthly	Contractor	Contractor	At incorporation or completion of design/ During construction report monthly	Condition of Design Build Contract	Impact HWR #2	Temporary Water Quality Impact

		adjacent to sensitive environmental areas such as streams, wetlands, and vernal pools. The Construction General Permit requires preparation and implementation of a Stormwater Pollution Prevention Plan (SWPPP), which would provide 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 will include measures to provide permeable surfaces where feasible and to retain or detain and treat stormwater onsite. Other BMPs include strategies to manage the overall amount and quality of stormwater runoff. The Construction SWPPP will include measures to address, but are not limited to, the following: • Hydromodification management to ensure maintenance of pre-project hydrology by emphasizing onsite retention of stormwater runoff using measures such as flow dispersion, infiltration, and evaporation, supplemented by detention, where required. Additional flow control measures will 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, watering for dust control, perimeter silt fences, and sediment basins. • Implementing practices to maintain current water quality including silt fences, stabilized construction entrances, grass buffer strips, ponding areas, organic mulch layers, inlet protection, and Baker tanks and sediment traps to settle sediment. • Implementing practices to capture and provide proper offsite disposal of concrete washwater, including isolation of runoff from fresh concrete during curing to prevent it from reaching the local drainage system, and possible treatment with dry ice or other acceptable means to reduce the alkaline character of the runoff (high pH) that typically results from new concrete. • Developing and implementing a spill prevention and emergency response plan to handle potential fuel or other spills. • Using diversion ditches to intercept offsite surface runoff. • Where feasible, avoiding areas that may have substantial erosion risk, including areas with erosive soils and steep slopes. • Where feasible, limiting construction to dry periods when flows in water bodies are low or absent. Implementation of a SWPPP is the responsibility of the construction contractor's Qualified SWPPP Practitioner (QSP) or designee. As part of that responsibility, the effectiveness of construction BMPs must be monitored before and after storm events. Records of these inspections and monitoring results are submitted to the SWRCB/Regional Water Quality Control Board (RWQCB) as part of the annual report required by the Statewide Construction General Permit. The reports are available to the public online. The SWRCB and RWQCB have the opportunity to review these documents.									

HYD- AM #4	Regional Dewatering Permit	The Central Valley RWQCB, Order No. R5-2008-0081, Waste Discharge Requirements General Order for Dewatering and Other Low Threat Discharges to Surface Waters, is a permit that covers construction dewatering discharges and some other listed discharges that do not contain significant quantities of pollutants, and that either (1) are 4 months, or less, in duration, or (2) have an average dry-weather discharge that does not exceed 0.25 million gallons per day.	Design	Permit	As requested by Permit Conditions	Authority	Authority	Permit Application and Reporting	Reporting per Permit Requirements	Impact HWR #3	Temporary Impacts on Groundwater Quality and Volume
HYD- AM #5	Flood Protection	The CVFPB regulates specific river, creek, and slough crossings for flood protection. These crossings must meet the provisions of Title 23 of the CCR. Title 23 requires that new crossings maintain hydraulic capacity through such measures as in-line piers, adequate streambank height (freeboard), and measures to protect against streambank and channel erosion. Section 208.10 requires that improvements, including crossings, be constructed in a manner that does not reduce the channel's capacity or functionality, or that of any federal flood control project. The CVFPB reviews applications for encroachment permits for approval of a new channel crossing or other channel modification. For a proposed crossing or placement of a structure near a federal flood control project, the CVFPB coordinates review of the encroachment permit application with USACE pursuant to assurance agreements with USACE and the USACE Operation and Maintenance Manuals under Title 33 CFR, Section 208.10 and Title 33 U.S.C., Section 408. Under Section 408 of the Rivers and Harbors Act, the USACE must approve any proposed modification that involves a federal flood control project. A Section 408 permit would be required if construction modifies a federal levee. A Section 208.10 permit would be required where the project encroaches on a federal facility but does not modify it.	Design	Permit	As requested by Permit Conditions	Authority	Authority	Permit Application and Reporting	Reporting per Permit Requirements	Impact HWR #8	Permanent Impact on Floodplains
HYD- AM #6	Industrial Stormwater Pollution Prevention Plan	The stormwater general permit (Order No. 97-03-DWQ, NPDES No. CAS000001) requires preparation of a SWPPP 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.	Design	Permit	As requested by Permit Conditions	Authority	Authority	Permit Application and Reporting	Reporting per Permit Requirements	Impact HWR #6	Permanent Impact on Surface Water Quality
Geology and Soils											
GEO- AM #1	General Guidelines to be followed	• 2010 American Association of State Highway and Transportation Officials (AASHTO) Load and Resistance Factor Design Bridge Design Specifications and the 2009 AASHTO Guide Specifications for Load and Resistance Factor Design Seismic Bridge Design: 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 will 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	Design/Construction/ Operation	Design/ Reporting	Yearly	Contractor	Contractor	At incorporation or completion of design/ During construction report monthly	Implementation of guidelines during Design/ construction and operation phases	Impact GSS #1 through #11	

		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 AASHTO, they are more focused on best practices for rail systems. The manual includes principles, data, specifications, plans, and economics pertaining to the engineering, design, and construction of railways. • California Building Code: The code is based on 2009 International Building Code (IBC). This code contains general building design and construction requirements relating to fire and life safety, structural safety, and access compliance. • IBC 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 ground shaking, minimum standards for structural design, and inspection and testing requirements. • 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 Best Management Practices (BMPs) Manual and Construction Site Best Management Practice (BMP) Field Manual and Troubleshooting Guide that provide guidance and Best Management Practices for dewatering options and management, erosion control and soil stabilization, non-storm water 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. Most of the guidelines and standards cited above use ASTM or a corresponding series of standards from AASHTO to assure that quality is achieved in the constructed project.									
GEO-AM #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.	Construction/Operation	Contractor	Yearly	Contractor	Contractor	Monthly Record Keeping and Yearly Reporting	Condition of Design Build Contract	N/A	N/A
GEO-AM #3	Monitor Slopes	Incorporate slope monitoring into final design where a potential for long-term instability exists from gravity or seismic loading. This practice is important near 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.	Design/Construction	Contractor	Monthly	Contractor	Contractor	At incorporation or completion of design	Condition of Design Build Contract	Impact GSS #1 Impact GSS #6	Encountering Unstable Soils During Construction Effects of Unstable Soils on Operations

GEO-AM #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.	Design/Construction	Authority/Contractor	Monthly	Authority/Contractor	Authority/ Contractor	At incorporation or completion of design	Condition of Design Build Contract	N/A	N/A
GEO-AM #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 (geofoam), 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	Contractor	Monthly	Contractor	Contractor	At incorporation or completion of design	Condition of Design Build Contract	Impact GSS #1 Impact GSS #6	Encountering Unstable Soils During Construction Effects of Unstable Soils on Operations
GEO-AM #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	Contractor	Monthly	Contractor	Contractor	Monthly Record Keeping	Condition of Design Build Contract	Impact GSS #2 Impact GSS #7	Soil Settlement at Structures or along Trackway During Construction Effects of Soil Settlement on Operations
GEO-AM #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.	Construction	Contractor	Monthly	Contractor	Contractor	Monthly Record Keeping	Contract Requirements/ Specifications	Impact GSS #3	Soil Erosion During Construction
GEO-AM #8a	Modify or Remove and Replace Soils with Shrink-Swell Potential	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 characteristics of the soil,	Construction	Contractor	Monthly	Contractor	Contractor	Monthly Record Keeping	Condition of Design Build Contract	Impact GSS #8	Effects of Moderate to High Shrink-Swell Potential on Operations

		the additional costs for treatment versus excavation and replacement, as well as the long-term performance characteristics of the treated soil.									
GEO-AM #8b	Modify or Remove and Replace Soils Corrosion Characteristics	One option is to excavate and replace soils that represent the highest risk. In locations where corrosivity potential is marginally unacceptable, soil additives will be mixed with existing soil to reduce the corrosive potential. The decision whether to remove or treat the soil is made on the basis of specific 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.	Construction	Contractor	Monthly	Contractor	Contractor	Monthly Record Keeping	Condition of Design Build Contract	Impact GSS #9	Effects of Moderately to Highly Corrosive Soils on Operations
GEO-AM #9	Evaluate and Design for Large Seismic Ground Shaking	Prior to final design, additional seismic studies will be conducted to establish the most up-to-date estimation of levels of ground motion. Updated Caltrans seismic design criteria will be used in the design of any structures supported in or on the ground. These design procedures and features reduce the potential that moments, shear forces, and displacements that result from inertial response of the structure will lead to collapse of the structure. In critical locations, pendulum base isolators can reduce the levels of inertial forces. New composite materials can enhance seismic performance.	Design/Construction	Authority/Contractor	Monthly	Authority/Contractor	Authority/ Contractor	Monthly Record Keeping	Condition of Design Build Contract	Impact GSS #11	Effects of Seismicity on Operations
GEO-AM #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.	Construction	Contractor	Monthly	Contractor	Contractor	Monthly Record Keeping	Condition of Design Build Contract	Impact GSS #11	Effects of Seismicity on Operations
GEO-AM #11	Suspend Operations During or After an Earthquake	Install motion-sensing instruments to provide ground-motion data; install a control system to shut down HST operations temporarily during or after a potentially damaging earthquake to reduce risks. Monitors will be installed at select locations where high ground motions could damage the HST track system. Candidate locations would include, but are not limited to, elevated guideways and retained-earth, retained-cut, and at-grade segments.	Design/Construction/ Operation	Reporting	As Needed	Contractor/Authority	Contractor/ Authority	At incorporation or completion of design/ During construction report monthly	As needed based on an Earthquake Event	Impact GSS #11	Effects of Seismicity on Operations
Hazardous Materials and Waste											
HMW-AM #1	Transportation of Materials	Materials and wastes would be handled, transported, and disposed of in accordance with applicable state and federal regulations, such as 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 (see Section 3.3, Air Quality, for regulations applying to hazardous air pollutants).	Construction/Operation	Reporting	Monthly	Contractor	Contractor	Weekly Record Keeping and Monthly Reporting	Condition of Design Build Contract	Impact HMW #1	Temporary Transport, Use, Storage, and Disposal of Hazardous Materials and Wastes
										Impact HMW #6	Transport, Use, Storage, and Disposal of Hazardous Materials and Wastes
HMW-AM #2	Property Acquisition	During the property acquisition process, analysis of properties acquired for construction of the HST will be conducted, as needed, including title searches and determination of which properties require further assessment for hazardous material contamination. Prior to acquisition of properties, the Authority will conduct Phase 1 environmental site assessments in accordance with standard ASTM methodologies to characterize each site. The determination of what parcels require soil testing and where testing should occur would be informed by the Phase 1 environmental site assessment and made in conjunction with state and local agency officials. Testing and appropriate remediation would be conducted prior to	Design/Construction	Reporting	Monthly	Contractor	Contractor	Phase 1 Report	Condition of Design Build Contract	Impact HMW #2	Inadvertent Disturbance of Hazardous Materials or Waste
										Impact HMW #3	Construction on or in Proximity to PEC Sites

		acquisition Remediation activities may include removal of contamination, in-situ treatment, or soil capping									
HMW-AM #3	Landfill	All work within 1,000 feet of a landfill would require methane protection measures, including gas detection systems and personnel training, pursuant to Title 27, the hazardous materials contingency plan, and BMPs.	Construction	Reporting	Monthly	Contractor	Contractor	Monthly Record Keeping	Condition of Design Build Contract	N/A	N/A
HMW-AM #4	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	Design/Construction	Reporting	Monthly	Contractor	Contractor	Monthly Record Keeping	Condition of Design Build Contract	Impact HMW #2	Inadvertent Disturbance of Hazardous Materials or Waste
										Impact HMW #3	Construction on or in Proximity to PEC Sites
HMW-AM #5	Undocumented Contamination	The Authority is aware that undocumented contamination could be encountered during construction activities and is committed to work closely with local agencies to resolve any such encounters. A construction management plan will be developed that will include provisions for the disturbance of undocumented contamination.	Construction	Reporting	As Needed	Contractor	Contractor	Reporting as needed	Condition of Design Build Contract	Impact HMW #2	Inadvertent Disturbance of Hazardous Materials or Waste
										Impact HMW #4	Temporary Hazardous Material and Waste Activities in the Proximity of Schools
HMW-AM #6	Demolition Plans	Demolition plans will be prepared for the safe dismantling and removal of building components and debris. The demolition plans will include a plan for lead and asbestos abatement.	Construction	Reporting	As Needed	Contractor	Contractor	Reporting as needed	Condition of Design Build Contract	Impact HMW #2	Inadvertent Disturbance of Hazardous Materials or Waste
										Impact HMW #4	Temporary Hazardous Material and Waste Activities in the Proximity of Schools
HMW-AM #7	Spill Prevention	An SPCC plan or, for smaller quantities, a spill prevention and response plan, will be implemented that prescribes BMPs to follow to clean up any hazardous material release. During operation of the HST, hazardous materials monitoring plans, such as a hazardous materials business plan and an SPCC plan, will be implemented.	Construction	Reporting	As Needed	Contractor/Authority	Contractor/ Authority	Reporting as needed	Condition of Design Build Contract	Impact HMW #2	Inadvertent Disturbance of Hazardous Materials or Waste
										Impact HMW #4	Temporary Hazardous Material and Waste Activities in the Proximity of Schools
HMW-AM #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.	Construction/Operation	Reporting	Monthly	Contractor/Authority	Contractor	Weekly Record Keeping and Monthly Reporting	Condition of Design Build Contract	Impact HMW #1	Temporary Transport, Use, Storage, and Disposal of Hazardous Materials and Wastes
										Impact HMW #6	Transport, Use, Storage, and Disposal of Hazardous Materials and Wastes
HMW-AM #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.	Design/Construction/ Operation	Reporting	Yearly	Contractor/Authority	Contractor/ Authority	At incorporation or completion of design/ Yearly Reporting and Inventory	Condition of Design Build Contract	Impact HMW #1	Temporary Transport, Use, Storage, and Disposal of Hazardous Materials and Wastes
										Impact HMW #6	Transport, Use, Storage, and Disposal of Hazardous Materials and Wastes
Safety and Security											
S&S - AM #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.	Design/Construction	Design/Reporting	Monthly or as Needed During Construction	Contractor	Contractor	At incorporation or completion of design/As needed during construction	Condition of Design Build Contract	Impact S&S #1	Accidents at Construction Sites

S&S - AM #2	Operation and Transportation Hazards	Engineering design and construction phases include preliminary hazard analysis (PHA), collision hazard analysis (CHA), and threat and vulnerability assessment (TVA) methods. • PHAs follow the U.S. Department of Defense's System Safety Program Plan Requirements (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. • CHAs follow the Federal Railroad Administration's Collision Hazard Analysis Guide: Commuter and Intercity Passenger Service (FRA 2007) which provides a step-by-step procedure on how to perform a hazard analysis and how to develop effective mitigation strategies that will improve passenger rail safety.	Design/Construction	Design/Reporting	Monthly or as needed during construction	Contractor	Contractor	At incorporation or completion of design/As needed during construction	Condition of Design Build Contract	Impact S&S #4	Train Accidents
S&S - AM #3	Criminal and Terrorist Acts	TVAs 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 HST operations to avoid collisions.	Design/Construction	Design/Reporting	Monthly or as needed during construction	Contractor	Contractor	At incorporation or completion of design/As needed during construction	Condition of Design Build Contract	Impact S&S #16	Criminal Activity Aboard Trains and at Stations
S&S - AM #4a	Construction Safety Plan	Construction Safety and Health Plans (CSHPs) shall include the following: 1. Train workers and supervisors 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 use at the end of shifts. 3. Provide vehicles with enclosed, air-conditioned cabs and ensure workers keep windows closed. Equip heavy equipment cabs with high efficiency particulate air (EPA) filters. 4. Make National Institute for Occupational Safety and Health (NIOSH) -approved respiratory protection with particulate filters as recommended by the California Department of Public Health available to workers who request them.	Design/Construction	Design/Reporting	Monthly or as needed during construction	Contractor	Contractor	At incorporation or completion of design/As needed during construction	Condition of Design Build Contract	Impact S&S #1	Accidents at Construction Sites

S&S - AM #4b	Valley Fever	The following recommendations were provided by the Environmental Protection Agency and refined through discussion with the California Department of Public Health (CDPH). • Prior to construction , provide 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); • Continue outreach and coordination with the California Department of Public Health. In addition, reach out to 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, Provide a qualified person dedicated to overseeing implementation of Valley Fever prevention measures to encourage a culture of safety of the contractors and subcontractors. The individual should have the authority to adaptively manage the implementation of Valley Fever prevention and effect change in coordination with the county Public Health Officer. This medical information will be maintained following applicable and appropriate confidentiality protections.	Design/Construction/ Operation	Design/Reporting	Monthly or as needed during construction and operation	Authority/Contractor	Authority/ Contractor	At incorporation or completion of design/As needed during construction and operation	At incorporation or completion of design/As needed during construction and operation	Impact S&S #1	Accidents at Construction Sites
										Impact AQ #1	Common Regional Air Quality Impacts During Construction
										Impact AQ #6	Localized Air Quality Impacts During Guideway/Alignment Construction
										Impact AQ #7	Localized Air Quality Impacts to Schools during Construction
										Impact AQ #9	Localized Air Quality Impacts from HMF and MOWF Construction
S&S - AM #4c	Valley Fever	The following measures have been added to the requirements for the Construction Safety and Health Plans (CSHPs) regarding preventive measures to avoid Valley Fever exposure (Ch. 3.11, Design Features, 3.11.6). The following shall be included in the existing design feature for Ch. 3.11, "Safety and Security." The Construction Safety and Health Plan shall include 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. Equip heavy equipment cabs with high efficiency particulate air (HEPA) filters; and, 4. Make NIOSH approved respiratory protection with particulate filters as recommended by the CDPH available to workers who request them.	Design/Construction/ Operation	Design/Reporting	Monthly or as needed during construction and operation	Authority/Contractor	Authority/ Contractor	At incorporation or completion of design/As needed during construction and operation	At incorporation or completion of design/As needed during construction and operation	Impact S&S #1	Accidents at Construction Sites
										Impact AQ #1	Common Regional Air Quality Impacts During Construction
										Impact AQ #6	Localized Air Quality Impacts During Guideway/Alignment Construction
										Impact AQ #7	Localized Air Quality Impacts to Schools during Construction
										Impact AQ #9	Localized Air Quality Impacts from HMF and MOWF Construction

S&S - AM #5	Fire/Life Safety Programs	Fire/Life Safety Programs (FLSPs) implement the requirements set forth in the Federal Rail Safety Act. FLSPs address the safety of passengers and employees during emergency response. The FLSP also would address the needs of disabled persons. A FLSP 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.	Design/Construction/ Operation	Design/Reporting	Monthly or as needed during construction/operation	Authority/Contractor	Authority/ Contractor	At incorporation or completion of design/As needed during construction	Condition of Design Build Contract	Impact S&S #4	Train Accidents
S&S - AM #6	System Security Plans	System Security Plans address design features intended to maintain security at the stations within the track right-of-way, at stations, and onboard trains. The design standards and guidelines require emergency walkways on both sides of the tracks for both elevated and at-grade sections. Adequate space would be present along at-grade sections of the alignment to allow emergency response access. Ground access would be available from elevated tracks where access to ground equipment is required. This ground access could be used in the event of an emergency. Additional ground access would be considered, consistent with fire and rescue procedures and where practical operational standards include a system-specific police force.	Design/Construction/ Operation	Design/Reporting	Monthly or as needed during construction/ operation	Authority/Contractor	Authority/ Contractor	At incorporation or completion of design/As needed during construction	Condition of Design Build Contract	Impact S&S #4	Train Accidents
										Impact S&S #6	HST Accidents Associated with Seismic Events
										Impact S&S #7	Risk of Fire
										Impact S&S #9	Increased Response Times for Fire, Rescue, and Emergency Services Associated with Access to Elevated Track
S&S - AM #7	Operating Procedure	Standard operating procedures and emergency operating procedures include industry best practices, such as the FRA-mandated Roadway Worker Protection Program. They address the day-to-day operation and emergency situations to maintain the safety of employees, passengers, and the public.	Operation	Design/Reporting	Monthly or as needed during operation	Authority	Authority	As needed during operation	Reporting	Impact S&S #16	Criminal Activity Aboard Trains and at Stations
S&S - AM #8	FRA Requirements	• System Safety Program Plans (SSPPs) incorporate FRA requirements and are implemented upon FRA approval. These plans are based on the principles outlined in The Manual for Development of System Safety Program Plans for Commuter Railroads (American Public Transportation Association 2006) and address project design, construction, testing, and operation. • Rail systems must comply with FRA requirements for tracks, equipment, railroad operating rules, and practices, including the Passenger Equipment Safety Standards (49 CFR Part 238), Highway-Rail Grade Crossing Guideline for the High-Speed Passenger Rail (FRA 2009), and track safety standards (49 CFR Part 213). Requirements include warning systems and barrier systems to enhance track safety.	Design/Construction/ Operation	Design/Reporting	Monthly or as needed during construction/operation	Authority/Contractor	Authority/ Contractor	At incorporation or completion of design/As needed during construction and operation	Condition of Design Build Contract	Impact S&S #4	Train Accidents
										Impact S&S #6	HST Accidents Associated with Seismic Events
										Impact S&S #7	Risk of Fire
										Impact S&S #9	Increased Response Times for Fire, Rescue, and Emergency Services Associated with Access to Elevated Track
S&S - AM #9	Worker Safety	• Worker safety in the workplace is generally governed by the Occupational Health and Safety Act of 1970, which established the Occupational Safety and Health Administration (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 Cal OSHA. Under Cal OSHA regulations, as of July 1, 1991, every employer must establish, implement, and maintain an injury and illness prevention program.	Design/Construction/ Operation	Design/Reporting	Monthly or as needed during construction and operation	Authority/Contractor	Authority/ Contractor	At incorporation or completion of design/As needed during construction and operation	Condition of Design Build Contract	Impact S&S #4	Train Accidents
										Impact S&S #15	Hazards to HST Passengers and Employees from Flooding
										Impact S&S #16	Criminal Activity Aboard Trains and at Stations

S&S - AM #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).	Design/Construction/ Operation	Design/Reporting	Yearly	Authority/Contractor	Authority/ Contractor	At incorporation or completion of design/As needed during construction and operation	Design process and reporting	Impact S&S #16	Criminal Activity Aboard Trains and at Stations
Socioeconomics. Communities and Environmental Justice											
SO-AM #1	Construction Management Plan	The Authority will require that the design-build contractor will develop and implement a construction management plan to address communications, community impacts, visual protection, air quality, safety controls, noise controls, and traffic controls to minimize impacts on low-income households and minority populations. The plan will assure property access is maintained for local businesses, residences, and emergency services. This plan will 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 will include efforts to consult with local transit providers to minimize impacts on local and regional bus routes in affected communities. Construction Management Plans are standard for large infrastructure projects such as this one, and are considered effective in minimizing community impacts.	Design/Construction	Reporting	Monthly	Contractor	Contractor	At incorporation or completion of design/Monthly Reporting during Construction	Condition of Design Build Contract	N/A	N/A
SO-AM #2	Uniform Act and California Relocation Assistance Act Compliance	The Authority has considered avoidance and minimization measures that are consistent with the Statewide Program EIR/EIS (Authority and FRA 2005) and Bay Area to Central Valley Program EIR/EIS commitments (Authority and FRA [2008] 2010). The Authority must comply with the Uniform Relocation Assistance and Real Property Acquisition Policies Act, as amended (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 and ensure fair and equitable treatment of all affected persons. Additionally, the Fifth Amendment of the United States 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	Design/Construction/ Operations	Reporting and meeting with interested parties	Monthly	Authority	Authority	Monthly Reporting and Record Keeping	Compliance with Acts, Creation of Ombudsmen Office and Reporting	N/A	N/A

		tenants may be entitled are determined on an individual basis and explained in detail by an assigned right-of-way specialist. Similarly, the project must adhere to California Relocation Assistance Act requirements. Owners of private property have federal and state constitutional guarantees that their property will 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). The Authority has developed more detailed information about how it plans to comply with the Uniform Act and the California Relocation Assistance Act. The Authority has developed three detailed relocation assistance documents modeled after Caltrans versions. The documents are listed below and included in Appendix 3.12-A: • 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. Before any acquisitions occur, the Authority will develop a relocation mitigation plan, in consultation with affected cities and counties. In addition to establishing a program to minimize the economic disruption related to relocation, the relocation mitigation plan will be written in a style that also enables it to be used as a public-information document. The plan will be designed to meet the following objectives: • Provide affected property and business owners and tenants a high level of individualized assistance in situations when relocation is necessary. • Coordinate relocation activities with other agencies causing displacements in the study area to ensure that all displaced persons receive fair and consistent relocation benefits • Make a best effort to minimize the permanent closure of displaced businesses and non-profit agencies as a result of relocations. • Within the limits established by law and regulation, minimize the economic disruption caused to tenants and residents 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. • Provide those business owners who require complex permitting (such as dairies) with regulatory compliance assistance.									

		The relocation mitigation plan will include the following components: • A description of the appraisal, acquisition, and relocation process that describes the activities of the appraisal and relocation specialists, for the benefit of the reader. • 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 of demographically similar 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. Relocation Mitigation Plans are commonly used for large infrastructure projects that displace a large number of residences and businesses, such as this project, and are considered successful in minimizing the impact to individual property owners.									
Station Planning, Land Use and Development											
LU-AM#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/Construction/ Operation	Reporting	As needed during construction	Contractor/Authority	Contractor/ Authority	At incorporation or completion of design/Yearly Reporting during Construction	Meetings with local authority and contract specifications	LU Impact #3 LU Impact #5	The Kings/Tulare Regional Station alternatives are likely to result in some unplanned changes in the use of existing adjacent land, regardless of the amount of parking provided at the station. Indirect changes to adjacent lands at the Kings/Tulare Regional Station sites would substantially change the pattern and intensity of land use in a way that would be incompatible with adjacent land uses.
LU-AM#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.	Design/Construction	Reporting	Monthly	Contractor	Contractor	At incorporation or completion of design/Monthly Reporting during Construction	Condition of Design Build Contract	LU Impact #1:	Temporary and intermittent disruption of access to some properties, temporarily inconvenience nearby residents, and temporarily change the intensity of agricultural operations on some lands along 31 miles of the BNSF Alternative, along the Corcoran Bypass, and Allensworth Bypass
Agricultural Land											
AG-AM #1	Restoration of Land Used for Temporary Staging Areas	All staging areas on Important Farmlands will be returned to as close to their Design staging condition as possible with the goal of ensuring these parcels remain available for long-term agricultural use	Construction	Reporting	Monthly	Contractor	Contractor	Reporting	Condition of Design Build Contract	N/A	N/A
AG-AM #2	Farmland Consolidation Program	The Authority will establish and administer a farmland consolidation program to sell remnant parcels to neighboring landowners for consolidation with adjacent farmland properties. In addition, on request, the program	Design/Construction	Reporting	Monthly	Authority	Authority	At incorporation or completion of design/Monthly Reporting during Construction	Weekly record keeping and monthly reporting	AG#4	Permanent Conversion of Agricultural Land to Nonagricultural Use

		will assist the owners of remnant parcels in selling those remnants to adjacent landowners. The goal of the program is to provide The program will 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 will 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 general plan. The program will operate for no less than 5 years after construction of the Fresno to Bakersfield Section is completed. The Authority and FRA expect that productive farmland would be farmed in some manner, and not left idle in perpetuity. However, the Authority and FRA recognize that constructing the Fresno to Bakersfield HST project will have a disruptive effect on farm ownership that would temporarily idle some remainder parcels. The intent of the Farmland Consolidation Program is to take responsibility for the disruptive effects and proactively work to restore remainder parcels to productive agricultural use (and not rely on market forces to accomplish the same result). This process would be a series of real estate transactions, and the Authority would be using the same real property transaction processes used by Caltrans; this process features the use of Authority right-of-way agents who generally follow Caltrans procedures. The State of California has a long history of managing real estate transactions through Caltrans and other state entities (e.g., the Department of General Services), which helps promote the success of the Authority's farmland consolidation program.									
AG-AM #3	Permit Assistance	The Authority will assign a representative to act as a single point of contact to assist each confined animal facility owner during the process of obtaining new or amended permits or other regulatory compliance necessary to the continued operation or relocation of the facility. The Authority will consider and may provide compensation when acquisition of a confined animal site would either require relocation of the facility or amendment of its existing regulatory permits.	Design/Construction	Reporting	Monthly	Authority	Authority Representative	At incorporation or completion of design/Monthly Reporting during Construction	Weekly record keeping and monthly reporting/Authority Representative Assignment	N/A	N/A
AG-AM #4	Research	During the HST testing phase, the Authority will fund a program to undertake original research on the wind and noise effects of HST operations on agricultural activities. The Authority will engage qualified researchers within the University of California or California State University system to undertake this research. The researcher will be selected by the Authority through a request for proposal process. The research will include monitoring of noise and wind effects at representative points along the test track. The research period will include the testing phase and extend 2 years after commencement of revenue service. The Authority will publicly distribute a report of the findings of the research program. The research will include, but is not limited to, the following subjects: • Generated wind speed, duration, and area of influence from HST trainsets at typical operational speeds. • Effects of HST-generated wind on the effectiveness of honey bee pollination. • Dust production as a result of typical HST operations,	Testing phase/ Operation	Reporting	Two Years	Authority	Authority	Reporting	Research and report compilation	N/A	N/A

		including entrainment and dispersal patterns of dust in the HST slipstream. • Generated noise levels and duration from HST trainsets at typical operational speeds. • Noise contours depicting modeled noise levels at distance from the tracks. • Practical methods for reducing effects on agriculture.									
Parks, Recreation and Open Space											
PC-AM #1	Design Standards	The design standards applicable to the project are summarized in Section 3.3.8 in Air Quality and Global Climate Change, Section 3.4.6 in Noise and Vibration and Section 3.16.6 in Aesthetics and Visual Resources.	Design/Construction	Reporting	Monthly during construction	Contractor	Contractor	At incorporation or completion of design/Monthly Reporting during Construction	Condition of Design Build Contract	N/A	N/A
Aesthetics and Visual Quality											
AVR-AM #1	Design Standards	The Authority has adopted design standards and design guidelines that are established to create a minimum aesthetic quality for a long-lasting infrastructure. Many of these elements are described in Table 3.16-2 in Section 3.16.5.3, High-Speed Train Alternatives. In addition to the features described in Table 3.16-2, the Authority's Urban Design Guidelines for the California High Speed Train Project (Authority 2011b) briefly discusses the principles of context-sensitive solutions to guide the design of stations. This approach is equally applicable to elevated guideways and will be employed to mitigate visual impacts through context-sensitive design. Aesthetic Guidelines for Non-Station Structures (TM 200-06) (Authority 2011a) will also guide the design of the HST components. These standards and guidelines work to minimize and avoid aesthetic effects on the adjacent surroundings, where possible	Design/Construction/ Operation	Reporting	Monthly during construction and as needed during operation	Authority/Contractor	Authority/ Contractor	At incorporation or completion of design/Monthly Reporting during Construction and as needed during operation	Condition of Design Build Contract	AVR #4	Lower Visual Quality
Cultural and Paleontological Resources											
CUL- AM #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.	Design/Construction/ Operation	Reporting/Meetings with Agencies	As needed	Authority/Contractor	Authority/ Contractor	At incorporation or completion of design/As needed	Meetings with interested agencies and compilation of reports/Reporting	Impact Cul #1 Impact Cul #2 Impact Cul #3	Potential Adverse Effects on Archaeological Resources due to Construction Activities Potential Adverse Effects on Historic Architectural Resources due to Construction Activities Potential Adverse Effects on Paleontological Resources due to Construction Activities
CUL -AM #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.	Design/Construction	Reporting	Weekly	Contractor	Contractor	At incorporation or completion of design/Weekly reporting or as dictated by the BETP and the MOA	BETP PA	Impact Cul #2	Potential Adverse Effects on Historic Architectural Resources due to Construction Activities

Transportation											
TRA-AM #1	Off-Street Parking for Construction-Related Vehicles	Identify adequate off-street parking for all construction-related vehicles throughout the construction period. If adequate parking cannot be provided on the construction sites, designate a remote parking area and use a shuttle bus to transfer construction workers to the job site.	Design/Construction	Design/Build and Construction Transportation Plan to be prepared prior to construction, followed by reporting.	Weekly	Contractor	Contractor	At incorporation or completion of design/ Implementation during construction	Condition of Design Build Contract	Impact TR #1	Construction (Not Including Stations) Impacts on Circulation and Emergency Access
										Impact TR #2	Impacts on Circulation from Fresno Station Construction
										Impact TR #3	Impacts on Circulation from Kings/ Tulare- East Station Construction
										Impact TR #5	Impacts on Circulation from Bakersfield Station Construction
										Impact TR #7	Impacts on Circulation from Rural Area Construction
										Impact TR #9	Construction (Not Including Stations) Impacts on School Districts
TRA-AM #2	Maintenance of Pedestrian Access	Prepare specific construction management plans to address maintenance of pedestrian access during the construction period. Actions to 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. Pedestrian access should be maintained unless maintaining access would be unsafe for pedestrians.	Design/Construction	Design/Build and Construction Transportation Plan to be prepared prior to construction, followed by reporting.	Weekly	Contractor	Contractor	At incorporation or completion of design/ Implementation during construction	Condition of Design Build Contract	Impact TR #1	Construction (Not Including Stations) Impacts on Circulation and Emergency Access
										Impact TR #2	Impacts on Circulation from Fresno Station Construction
										Impact TR #3	Impacts on Circulation from Kings/ Tulare- East Station Construction
										Impact TR #5	Impacts on Circulation from Bakersfield Station Construction
										Impact TR #7	Impacts on Circulation from Rural Area Construction
										Impact TR #9	Construction (Not Including Stations) Impacts on School Districts
TRA-AM#3	Maintenance of Bicycle Access	Prepare specific construction management plans to address maintenance of bicycle access during the construction period. Actions to 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. Bicycle access will be maintained where feasible.	Design/Construction	Design/Build and Construction Transportation Plan to be prepared prior to construction, followed by reporting.	Weekly	Contractor	Contractor	At incorporation or completion of design/ Implementation during construction	Condition of Design Build Contract	Impact TR #1	Construction (Not Including Stations) Impacts on Circulation and Emergency Access
										Impact TR #2	Impacts on Circulation from Fresno Station Construction
										Impact TR #3	Impacts on Circulation from Kings/ Tulare- East Station Construction
										Impact TR #5	Impacts on Circulation from Bakersfield Station Construction
										Impact TR #7	Impacts on Circulation from Rural Area Construction
										Impact TR #9	Construction (Not Including Stations) Impacts on School Districts
TRA-AM#4	Restriction on Construction Hours	Limit construction material deliveries between 7 a.m. and 9 a.m. and between 4 p.m. and 6 p.m. on weekdays. The number of construction employees arriving or departing the site between the hours of 7 a.m. to 8:30 a.m. and 4:30 p.m. to 6 p.m. would be limited.	Construction	Design/Build and Construction Transportation Plan to be prepared prior to construction, followed by reporting.	Weekly	Contractor	Contractor	Implementation during construction	Condition of Design Build Contract	Impact TR #1	Construction (Not Including Stations) Impacts on Circulation and Emergency Access
										Impact TR #2	Impacts on Circulation from Fresno Station Construction
										Impact TR #3	Impacts on Circulation from Kings/ Tulare- East Station Construction
										Impact TR #5	Impacts on Circulation from Bakersfield Station Construction
										Impact TR #7	Impacts on Circulation from Rural Area Construction
										Impact TR #9	Construction (Not Including Stations) Impacts on School Districts

TRA-AM#5	Construction Truck Routes	Deliver all construction-related equipment and materials on the appropriate truck routes. Prohibit heavy-construction vehicles from accessing the site via other routes.	Construction	Design/Build and Construction Transportation Plan to be prepared prior to construction, followed by reporting.	Weekly	Contractor	Contractor	Implementation during construction	Condition of Design Build Contract	Impact TR #1	Construction (Not Including Stations) Impacts on Circulation and Emergency Access
										Impact TR #2	Impacts on Circulation from Fresno Station Construction
										Impact TR #3	Impacts on Circulation from Kings/ Tulare-East Station Construction
										Impact TR #5	Impacts on Circulation from Bakersfield Station Construction
										Impact TR #7	Impacts on Circulation from Rural Area Construction
										Impact TR #9	Construction (Not Including Stations) Impacts on School Districts
TRA-AM #6	Protection of Public Roadways during Construction	Repair any structural damage to public roadways, returning any damaged sections to their original structural condition. Survey the condition of the public roadways along truck routes providing access to the proposed project site both before construction and after construction is complete. Complete a before- and after-survey report and submit to the Authority for review, indicating the location and extent of any damage.	Construction	Design/Build and Construction Transportation Plan to be prepared prior to construction, followed by reporting.	Weekly	Contractor	Contractor	Implementation during construction	Condition of Design Build Contract	Impact TR #1	Construction (Not Including Stations) Impacts on Circulation and Emergency Access
										Impact TR #2	Impacts on Circulation from Fresno Station Construction
										Impact TR #3	Impacts on Circulation from Kings/ Tulare-East Station Construction
										Impact TR #5	Impacts on Circulation from Bakersfield Station Construction
										Impact TR #7	Impacts on Circulation from Rural Area Construction
										Impact TR #9	Construction (Not Including Stations) Impacts on School Districts
TRA-AM#7	Maintenance of Public Transit Access and Routes	Coordinate with the appropriate transit jurisdiction before limiting access to public transit or limiting movement of public transit vehicles. Potential actions that would impact access to transit include, but are not limited to, relocating or removing bus stops, limiting access to bus stops or transfer facilities, or otherwise restricting or constraining public transit operations. Public transit access and routing will be maintained where feasible.	Design/Construction	Design/Build and Construction Transportation Plan to be prepared prior to construction, followed by reporting.	Weekly	Contractor	Contractor	At incorporation or completion of design/ Implementation during construction	Condition of Design Build Contract	Impact TR #1	Construction (Not Including Stations) Impacts on Circulation and Emergency Access
										Impact TR #2	Impacts on Circulation from Fresno Station Construction
										Impact TR #3	Impacts on Circulation from Kings/ Tulare-East Station Construction
										Impact TR #5	Impacts on Circulation from Bakersfield Station Construction
										Impact TR #7	Impacts on Circulation from Rural Area Construction
										Impact TR #9	Construction (Not Including Stations) Impacts on School Districts
TRA-AM #8	Construction Transportation Plan	The design-builder will prepare a detailed Construction Transportation Plan for the purpose of minimizing the impact of construction and construction traffic on adjoining and nearby roadways. The Construction Transportation Plan will be prepared in close consultation with the pertinent city or county, and will be reviewed and approved by the Authority prior to commencing any construction activities. This plan will 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,	Design/Construction	Design/Build and Construction Transportation Plan to be prepared prior to construction, followed by reporting.	Weekly	Contractor	Contractor	At incorporation or completion of design/ Implementation during construction	Condition of Design Build Contract	Impact TR #1	Construction (Not Including Stations) Impacts on Circulation and Emergency Access
										Impact TR #2	Impacts on Circulation from Fresno Station Construction
										Impact TR #3	Impacts on Circulation from Kings/ Tulare-East Station Construction
										Impact TR #5	Impacts on Circulation from Bakersfield Station Construction
										Impact TR #7	Impacts on Circulation from Rural Area Construction
										Impact TR #9	Construction (Not Including

		if any. The plan will provide traffic controls pursuant to the California Manual on Uniform Traffic Control Devices sections on temporary traffic controls (Caltrans 2012) and will include a traffic control plan that includes, at minimum, the following elements: • 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 will be considered as an alternative to temporary closures where practical 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 practical. 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 will 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 will provide a temporary bus stop at a convenient location away from where construction is occurring. Adequate measures will 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 ensure the safety of school children • Project Design Features 1-7 and 9-11.									Stations) Impacts on School Districts
TRA-AM #9	Construction during Special Events	Provide a mechanism to prevent roadway construction activities from reducing roadway capacity during major athletic events or other special events that attract a substantial number of visitors. Mechanisms include the presence of police officers directing traffic, special event parking, use of within-the-curb parking, or shoulder lanes for through-traffic, traffic cones, and so on. Through such mechanisms, roadway capacity would be maintained.	Construction	Design/Build and Construction Transportation Plan to be prepared prior to construction, followed by reporting.	Weekly	Contractor	Contractor	Implementation during construction	Condition of Design Build Contract	Impact TR #1	Construction (Not Including Stations) Impacts on Circulation and Emergency Access
										Impact TR #2	Impacts on Circulation from Fresno Station Construction
										Impact TR #5	Impacts on Circulation from Bakersfield Station Construction
TRA-AM#10	Protection of Freight and Passenger Rail during Construction	Repair any structural damage to freight or public railways, 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	Construction	Design/Build and Construction Transportation Plan to be prepared prior to construction, followed by reporting.	Weekly	Contractor	Contractor	Implementation during construction	Condition of Design Build Contract	Impact TR #1	Construction (Not Including Stations) Impacts on Circulation and Emergency Access

TRA-AM #11	Additional Features in the Cities of Fresno and Bakersfield	In addition to the measures listed above, the Authority will also perform the following in the cities of Fresno and Bakersfield: • Maintain detection at signalized intersections where alignment changes or widening are 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. The Authority will also include the following measures specific to the city of Fresno: • Clinton Avenue over SR 99 and Ashlan Avenue over the UPRR will be offset from their existing alignments to allow for 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	Construction	Design/Build and Construction Transportation Plan to be prepared prior to construction, followed by reporting.	Weekly	Contractor	Contractor	Implementation during construction	Condition of Design Build Contract	Impact TR #1 Impact TR #2 Impact TR #5	Construction (Not Including Stations) Impacts on Circulation and Emergency Access Impacts on Circulation from Fresno Station Construction Impacts on Circulation from Bakersfield Station Construction

Attachment A
Transportation Mitigation Measures

MMRP Attachment A
Transportation Mitigation

	Caused by Alignment Construction[1]	Caused by HST Station Operation and Future Growth[2]	Mitigation Detail	FEIR/FEIS CH3.2 Table Location	Implementing Party and Monitoring/Reporting Party	Implementation / Reporting Schedule	Implementation Mechanism
Fresno Station							
Intersections							
4 – Van Ness Ave/SR 41 SB Ramp	N/A	**TR MM#3:** Add Signal to Intersection to Improve LOS/Operation.	Install a traffic signal at the intersection prior to Fresno Station opening.	**Table 3.2-40** Future (2035) Plus Project Mitigation Measures – Fresno Station Area	**TR MM#3 - Implementing Party:** Authority and Contractor (station contractor) **Monitoring/Reporting Party:** Authority and Contractor (station contractor)	**TR MM#3:** Prior to Fresno Station opening	**TR MM #3:** MOU with City of Fresno and/or Caltrans, as necessary; contract with station contractor
6 – SR 99 NB Ramps/Ventura Ave	N/A	**TR MM#3:** Add Signal to Intersection to Improve LOS/Operation.	Install a traffic signal at the intersection prior to Fresno Station opening.	**Table 3.2-40** Future (2035) Plus Project Mitigation Measures – Fresno Station Area	**TR MM#3 - Implementing Party:** Authority and Contractor (station contractor) **Monitoring/Reporting Party:** Authority and Contractor (station contractor)	**TR MM#3:** Prior to Fresno Station opening	**TR MM #3:** MOU with City of Fresno and/or Caltrans, as necessary; contract with station contractor
7 – E St/Ventura Ave	N/A	**TR MM#3:** Add Signal to Intersection to Improve LOS/Operation.	Install a traffic signal at the intersection prior to Fresno Station opening.	**Table 3.2-40** Future (2035) Plus Project Mitigation Measures – Fresno Station Area	**TR MM#3 - Implementing Party:** Authority and Contractor (station contractor) **Monitoring/Reporting Party:** Authority and Contractor (station contractor)	**TR MM#3:** Prior to Fresno Station opening	**TR MM #3:** MOU with City of Fresno, as necessary; contract with station contractor
25 – H St/Tulare St	N/A	**TR MM#2:** Modify Signal Phasing.	Re-time the existing signal in PM to 60 prior to Fresno Station opening.	**Table 3.2-40** Future (2035) Plus Project Mitigation Measures – Fresno Station Area	**TR MM#2 - Implementing Party:** Authority and Contractor (station contractor) **Monitoring/Reporting Party:** Authority and Contractor (station contractor)	**TR MM#2:** Prior to Fresno Station opening	**TR MM #2:** MOU with City of Fresno, as necessary; contract with station contractor
30 – U St/Tulare St	N/A	**TR MM#6:** Widen Approaches to Intersections; **TR MM#7** - Add Exclusive Turn Lanes to Intersections.	Install southbound left-turn lane. Restripe southbound shared through-/left lane to through-lane prior to Fresno Station opening.	**Table 3.2-40** Future (2035) Plus Project Mitigation Measures – Fresno Station Area	**TR MM#6 and #7 - Implementing Party:** Authority and Contractor (station contractor) **Monitoring/Reporting Party:** Authority and Contractor (station contractor)	**TR MM#6 and #7:** Prior to Fresno Station opening	**TR MM #6 and #7:** MOU with City of Fresno and/or Caltrans, as necessary; contract with station contractor
33-0 – Divisadero St/SR 41 NB Ramps/Tulare St (Existing Plus Project)	**TR MM#6:** Widen Approaches to Intersections; **TR MM#7** - Add Exclusive Turn Lanes to Intersections. [3]	N/A	Widen the westbound approach to provide one exclusive left-turn lane, two through-lanes, and one exclusive right-turn lane at the intersection concurrent with alignment construction.	**Table 3.2-39** Existing Plus Project Mitigation Measures – Fresno Station Area	**TR MM#6 and 7 - Implementing Party:** Authority and Alignment Contractor; **Monitoring/Reporting Party:** Same	**TR MM#6 and #7** - Concurrent with alignment construction	**TR MM #6 and 7** - MOU with City of Fresno and/or Caltrans, as necessary; Contract with alignment contractor
37 – SR 99 Southbound Ramps/ Fresno St	N/A	**TR MM#6:** Widen Approaches to Intersections; **TR MM#7** - Add Exclusive Turn Lanes to Intersections.	Widen the eastbound approach to provide two exclusive through-lanes and one exclusive right-turn lane at the intersection prior to Fresno Station opening.	**Table 3.2-40** Future (2035) Plus Project Mitigation Measures – Fresno Station Area	**TR MM#6 and #7 - Implementing Party:** Authority and Contractor (station contractor) **Monitoring/Reporting Party:** Authority and Contractor (station contractor)	**TR MM#6 and #7:** Prior to Fresno Station opening	**TR MM #6 and #7:** MOU with City of Fresno and/or Caltrans, as necessary; contract with station contractor

MMRP Attachment A
Transportation Mitigation

	Caused by Alignment Construction[1]	Caused by HST Station Operation and Future Growth[2]	Mitigation Detail	FEIR/FEIS CH3.2 Table Location	Implementing Party and Monitoring/Reporting Party	Implementation / Reporting Schedule	Implementation Mechanism
38 – SR 99 NB Ramps/Fresno St	N/A	**TR MM#4:** Restripe Intersections; **TR MM#7:** Add Exclusive Turn Lanes of Intersections.	Restripe westbound right-turn lane to a shared through-/right-turn lane prior to Fresno Station opening.	**Table 3.2-40** Future (2035) Plus Project Mitigation Measures – Fresno Station Area	**TR MM#4 and #7 - Implementing Party:** Authority and Contractor (station contractor) **Monitoring/Reporting Party:** Authority and Contractor (station contractor)	**TR MM#4 and #7:** Prior to Fresno Station opening	**TR MM #4 and 7:** MOU with City of Fresno, as necessary; contract with station contractor
42 – Van Ness Ave/Fresno St	N/A	**TR MM#4:** Restripe Intersections; **TR MM#7:** Add Exclusive Turn Lanes to Intersections.	Install southbound right lane, restripe shared southbound lane to southbound through-lane prior to Fresno Station opening.	**Table 3.2-40** Future (2035) Plus Project Mitigation Measures – Fresno Station Area	**TR MM#4 and #7 - Implementing Party:** Authority and Contractor (station contractor) **Monitoring/Reporting Party:** Authority and Contractor (station contractor)	**TR MM#4 and #7:** Prior to Fresno Station opening	**TR MM #4 and 7:** MOU with City of Fresno, as necessary; contract with station contractor
46 – Fresno St/Divisadero St	N/A	**TR MM#4:** Restripe Intersections; **TR MM#7:** Add Exclusive Turn Lanes to Intersections.	Install westbound left-turn lane and restripe shared through-/left lane to through-lane prior to Fresno Station opening.	**Table 3.2-40** Future (2035) Plus Project Mitigation Measures – Fresno Station Area	**TR MM#4 and #7 - Implementing Party:** Authority and Contractor (station contractor) **Monitoring/Reporting Party:** Authority and Contractor (station contractor)	**TR MM#4 and #7:** Prior to Fresno Station opening	**TR MM #4 and 7:** MOU with City of Fresno, as necessary; contract with station contractor
52 – E Street/Stanislaus St	N/A	**TR MM#6:** Widen Approaches to Intersections; **TR MM#7:** Add exclusive turn lanes to intersections.	Widen the eastbound approach to provide one exclusive left-turn lane, one exclusive through-lane, and one exclusive right-turn lane at the intersection prior to Fresno Station opening.	**Table 3.2-40** Future (2035) Plus Project Mitigation Measures – Fresno Station Area	**TR MM#6 and #7 - Implementing Party:** Authority and Contractor (station contractor) **Monitoring/Reporting Party:** Authority and Contractor (station contractor)	**TR MM#6 and #7:** Prior to Fresno Station opening	**TR MM #6 and #7:** MOU with City of Fresno, as necessary; contract with station contractor
53 – Broadway St/Stanislaus St	N/A	**TR MM#6:** Widen Approaches to Intersections; **TR MM#7:** Add exclusive turn lanes to intersections.	Widen the eastbound approach to provide one exclusive left-turn lane, one exclusive through-lane, and one exclusive right-turn lane at the intersection prior to Fresno Station opening.	**Table 3.2-40** Future (2035) Plus Project Mitigation Measures – Fresno Station Area	**TR MM#6 and #7 - Implementing Party:** Authority and Contractor (station contractor) **Monitoring/Reporting Party:** Authority and Contractor (station contractor)	**TR MM#6 and #7:** Prior to Fresno Station opening	**TR MM #6 and #7:** MOU with City of Fresno, as necessary; contract with station contractor
54 – Van Ness Ave/Stanislaus St	**TR MM#5:** Revise Signal Cycle Length	**TR MM#6:** Widen Approaches to Intersections; **TR MM#7**: Add exclusive turn lanes to intersections	Re-time the existing signal in PM to 60 concurrent with alignment construction. Prior to Fresno Station opening, widen the westbound approach to provide one exclusive left-turn lane, one exclusive through-lane, and one shared through-/right-turn lane at the intersection.	**Table 3.2-39** Existing Plus Project Mitigation Measures – Fresno Station Area **Table 3.2-40** Future (2035) Plus Project Mitigation Measures – Fresno Station Area	**TR MM#5 - Implementing Party**: Authority and alignment Contractor; **Monitoring/Reporting Party**: same; **TR MM#6 and #7 - Implementing Party:** Authority and station contractor; **Monitoring/Reporting Party:** same	**TR MM#5 -** Concurrent with alignment construction; **TR MM#6 and# 7**: Prior to station opening.	**TR MM#5 -** Contract with alignment contractor, and MOU with Fresno as necessary; **TR MM #6 and #7:** MOU with City of Fresno as necessary, and contract with station contractor

MMRP Attachment A
Transportation Mitigation

	Caused by Alignment Construction[1]	Caused by HST Station Operation and Future Growth[2]	Mitigation Detail	FEIR/FEIS CH3.2 Table Location	Implementing Party and Monitoring/Reporting Party	Implementation / Reporting Schedule	Implementation Mechanism
55 – N. Blackstone Ave/Stanislaus St	N/A	**TR MM#6:** Widen Approaches to Intersections; **TR MM#7:** Add exclusive turn lanes to intersections	Widen the westbound approach to provide one exclusive left-turn lane, one exclusive through-lane, and one shared through-/right-turn lane at the intersection prior to Fresno Station opening.	**Table 3.2-40** Future (2035) Plus Project Mitigation Measures – Fresno Station Area	**TR MM#6 and #7 - Implementing Party:** Authority and Contractor (station contractor) **Monitoring/Reporting Party:** Authority and Contractor (station contractor)	**TR MM#6 and #7:** Prior to Fresno Station opening	**TR MM #6 and #7:** MOU with City of Fresno, as necessary; contract with station contractor
63 – H St/Divisadero St3	**TR MM#5:** Revise Signal Cycle Length.	N/A	Re-time the existing signal in AM to 120 concurrent with alignment construction.	**Table 3.2-39** Existing Plus Project Mitigation Measures – Fresno Station Area	**TR MM#5 - Implementing Party:** Authority and Alignment Contractor; **Monitoring/Reporting Party:** Same	**TR MM#5** - Concurrent with alignment construction	**TR MM#5** - MOU with City of Fresno, as necessary; Contract with alignment contractor
74 – N. Blackstone Ave/E. Belmont Ave	N/A	**TR MM#6:** Widen Approaches to Intersections; **TR MM#7**: Add exclusive turn lanes to intersections	Install eastbound right-turn lane. Restripe shared southbound through-/left-turn to left-turn lane. Restripe shared southbound through-right lane to through-lane. Install southbound right-turn lane prior to Fresno Station opening.	**Table 3.2-40** Future (2035) Plus Project Mitigation Measures – Fresno Station Area	**TR MM#6 and #7 - Implementing Party:** Authority and Contractor (station contractor) **Monitoring/Reporting Party:** Authority and Contractor (station contractor)	**TR MM#6 and #7:** Prior to Fresno Station opening	**TR MM #6 and #7:** MOU with City of Fresno, as necessary; contract with station contractor
80 – N. Blackstone Ave/SR 180 Westbound Ramps	**TR MM#4:** Restripe Intersections. **TR MM#7**: Add Exclusive Turn Lanes to Intersections.	**TR MM#4:** Restripe Intersections. (N/A because restriping done for alignment construction impacts mitigates station traffic impact)	Concurrent with alignment construction: (a) Restripe shared eastbound lane to eastbound through- and eastbound right-turn lane and (b) Restripe the eastbound approach to provide one exclusive left-turn lane and one shared left-turn/right-turn/ through-lane at the intersection.	**Table 3.2-39** Existing Plus Project Mitigation Measures – Fresno Station Area **Table 3.2-40** Future (2035) Plus Project Mitigation Measures – Fresno Station Area	**TR MM#4 and #7 - Implementing Party:** Authority and Alignment Contractor; **Monitoring/Reporting Party:** Authority and Alignment Contractor	**TR MM#4, TR MM#7** - Concurrent with alignment construction	**TR MM#4 and 7** - MOU with City of Fresno and/or Caltrans, as necessary; Contract with alignment contractor
84 – G St/Mono S	N/A	**TR MM#3:** Add Signal to Intersection to Improve LOS/Operation.	Install a traffic signal at the intersection prior to Fresno Station opening.	**Table 3.2-40** Future (2035) Plus Project Mitigation Measures – Fresno Station Area	**TR MM#3 - Implementing Party:** Authority and Contractor (station contractor) **Monitoring/Reporting Party:** Authority and Contractor (station contractor)	**TR MM#3:** Prior to Fresno Station opening	**TR MM #3:** MOU with City of Fresno, as necessary; contract with station contractor
86 – H St/Ventura St	**TR MM#3:** Add Signal to Intersection to Improve LOS/Operation.	**TR MM#3:** Add Signal to Intersection to Improve LOS/Operation. (N/A because signal add done for alignment construction impacts mitigates station traffic impact)	Install a traffic signal at the intersection concurrent with alignment construction.	**Table 3.2-39** Existing Plus Project Mitigation Measures – Fresno Station Area **Table** 3.2-40 Future (2035) Plus Project Mitigation Measures – Fresno Station Area	**TR MM#3 - Implementing Party:** Authority and Alignment Contractor; **Monitoring/Reporting Party:** Authority and Alignment Contractor	**TR MM#3** - concurrent with alignment construction.	**TR MM#3** - MOU with City of Fresno, as necessary; Contract with alignment contractor
90 – Broadway St/Santa Clara St	N/A	**TR MM#3:** Add Signal to Intersection to Improve LOS/Operation.	Install a traffic signal at the intersection prior to Fresno Station opening.	**Table 3.2-40** Future (2035) Plus Project Mitigation Measures – Fresno Station Area	**TR MM#3 - Implementing Party:** Authority and Contractor (station contractor) **Monitoring/Reporting Party:** Authority and Contractor (station contractor)	**TR MM#3:** Prior to Fresno Station opening	**TR MM #3:** MOU with City of Fresno, as necessary; contract with station contractor

MMRP Attachment A
Transportation Mitigation

	Caused by Alignment Construction[1]	Caused by HST Station Operation and Future Growth[2]	Mitigation Detail	FEIR/FEIS CH3.2 Table Location	Implementing Party and Monitoring/Reporting Party	Implementation / Reporting Schedule	Implementation Mechanism
92 – S. Van Ness Ave/E. California Ave	N/A	**TR MM#3:** Add Signal to Intersection to Improve LOS/ Operation; **TR MM#7:** Add Exclusive Turn Lanes to Intersections.	Install a traffic signal at the intersection; also provide exclusive left-turn lanes in both northbound and southbound directions, and change phasing on the northbound left and southbound left to protected plus permissive prior to Fresno Station opening.	**Table 3.2-40** Future (2035) Plus Project Mitigation Measures – Fresno Station Area	**TR MM#3 and #7 - Implementing Party:** Authority and Contractor (station contractor) **Monitoring/Reporting Party:** Authority and Contractor (station contractor)	**TR MM#3 and #7:** Prior to Fresno Station opening	**TR MM #3 and TR MM #7:** MOU with City of Fresno and/or Caltrans as necessary; contract with station contractor
96 – Golden State Blvd/E. Church Ave	N/A	**TR MM#2:** Modify signal phasing; **TR MM#6:** Add Exclusive Turn Lanes to Intersections.	Provide an exclusive right-turn lane in the northbound direction, and change signal phasing on all approaches to provide a protected plus permissive left turn phase prior to Fresno Station opening.	**Table 3.2-40** Future (2035) Plus Project Mitigation Measures – Fresno Station Area	**TR MM#2 and #6 - Implementing Party:** Authority and Contractor (station contractor) **Monitoring/Reporting Party:** Authority and Contractor (station contractor)	**TR MM#2 and #6:** Prior to Fresno Station opening	**TR MM #2 and TR MM #6:** MOU with City of Fresno and/or Caltrans as necessary; contract with station contractor
101 – S. East Ave/Golden State Blvd	N/A	**TR MM#2:** Modify signal phasing.	Increase cycle length in the PM Peak Hour prior to Fresno Station opening.	**Table 3.2-40** Future (2035) Plus Project Mitigation Measures – Fresno Station Area	**TR MM#2 - Implementing Party:** Authority and Contractor (station contractor) **Monitoring/Reporting Party:** Authority and Contractor (station contractor)	**TR MM#2:** Prior to Fresno Station opening	**TR MM #2:** MOU with City of Fresno, as necessary; contract with station contractor
102 – Golden State Blvd/E. Jensen Ave	N/A	**TR MM#7:** Add Exclusive Turn Lanes to Intersections.	Provide an exclusive right-turn lane for both northbound and southbound approaches prior to Fresno Station opening.	**Table 3.2-40** Future (2035) Plus Project Mitigation Measures – Fresno Station Area	**TR MM#7 - Implementing Party:** Authority and Contractor (station contractor) **Monitoring/Reporting Party:** Authority and Contractor (station contractor)	**TR MM#7:** Prior to Fresno Station opening	**TR MM #7:** MOU with City of Fresno, as necessary; contract with station contractor
105 – Stanislaus St/99 SB Off	N/A	**TR MM#6:** Widen Approaches to Intersections; **TR MM#7:** Add Exclusive Turn Lanes to Intersections.	Widen the southbound approach to provide one shared left turn/through-lane and one exclusive right-turn lane at the intersection prior to Fresno Station opening.	**Table 3.2-40** Future (2035) Plus Project Mitigation Measures – Fresno Station Area	**TR MM#6 and #7 - Implementing Party:** Authority and Contractor (station contractor) **Monitoring/Reporting Party:** Authority and Contractor (station contractor)	**TR MM#6 and #7:** Prior to Fresno Station opening	**TR MM #6 and TR MM #7:** MOU with City of Fresno and/or Caltrans as necessary; contract with station contractor
106 – Stanislaus St/99 NB On	N/A	**TR MM#6:** Widen Approaches to Intersections; **TR MM#7:** Add Exclusive Turn Lanes to Intersections.	Widen the southbound approach to provide one shared left turn/through-lane and one exclusive right-turn lane at the intersection prior to Fresno Station opening.	**Table 3.2-40** Future (2035) Plus Project Mitigation Measures – Fresno Station Area	**TR MM#6 and #7 - Implementing Party:** Authority and Contractor (station contractor) **Monitoring/Reporting Party:** Authority and Contractor (station contractor)	**TR MM#6 and #7:** Prior to Fresno Station opening	**TR MM #6 and TR MM #7:** MOU with City of Fresno and/or Caltrans as necessary; contract with station contractor
111 – Stanislaus St/ Fulton St	N/A	**TR MM#6:** Widen Approaches to Intersections; **TR MM#7:** Add Exclusive Turn Lanes to Intersections.	Widen the southbound approach to provide one shared left turn/through-lane, and one exclusive right-turn lane at the intersection prior to Fresno Station opening.	**Table 3.2-40** Future (2035) Plus Project Mitigation Measures – Fresno Station Area	**TR MM#6 and #7 - Implementing Party:** Authority and Contractor (station contractor) **Monitoring/Reporting Party:** Authority and Contractor (station contractor)	**TR MM#6 and #7:** Prior to Fresno Station opening	**TR MM #6 and TR MM #7:** MOU with City of Fresno, as necessary; contract with station contractor

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Transportation Mitigation

	Caused by Alignment Construction[1]	Caused by HST Station Operation and Future Growth[2]	Mitigation Detail	FEIR/FEIS CH3.2 Table Location	Implementing Party and Monitoring/Reporting Party	Implementation / Reporting Schedule	Implementation Mechanism
115 – Stanislaus St/M St	N/A	**TR MM#6:** Widen Approaches to Intersections; **TR MM#7:** Add Exclusive Turn Lanes to Intersections.	Widen the southbound approach to provide one shared left-turn/through lane, and one exclusive right-turn lane at the intersection prior to Fresno Station opening.	**Table 3.2-40** Future (2035) Plus Project Mitigation Measures – Fresno Station Area	**TR MM#6 and #7 - Implementing Party:** Authority and Contractor (station contractor) **Monitoring/Reporting Party:** Authority and Contractor (station contractor)	**TR MM#6 and #7:** Prior to Fresno Station opening	**TR MM #6 and TR MM #7:** MOU with City of Fresno, as necessary; contract with station contractor
117 – Stanislaus St/N St	**TR MM#3:** Add Signal to Intersection to Improve LOS/Operation.	**TR MM#6:** Widen Approaches to Intersections; **TR MM#7:** Add Exclusive Turn Lanes to Intersections.	Install a traffic signal at the intersection concurrent with alignment construction. Prior to Fresno Station opening, widen the westbound approach to provide one exclusive left-turn lane, one exclusive through-lane, and one shared through-/right-turn lane at the intersection.	**Table 3.2-39** Existing Plus Project Mitigation Measures – Fresno Station Area **Table 3.2-40** Future (2035) Plus Project Mitigation Measures – Fresno Station Area	**TR MM#3 - Implementing Party:** Authority and Alignment Contractor; **Monitoring/Reporting Party:** Authority and Alignment Contractor; **TR MM#6 and #7 - Implementing Party:** Authority and Contractor (station contractor) **Monitoring/Reporting Party:** Authority and Contractor (station contractor)	**TR MM#3** - Concurrent with alignment construction **TR MM#6 and #7:** Prior to Fresno Station opening.	**TR MM#3 -** Contract with alignment contractor, and MOU with Fresno as necessary; **TR MM #6 and 7:** MOU with City of Fresno as necessary, and contract with station contractor
124 – West Olive Ave/SR 99 SB Ramps	N/A	**TR MM#6:** Widen Approaches to Intersections; **TR MM#7:** Add Exclusive Turn Lanes to Intersections.	Widen southbound approach to provide an exclusive left-turn lane prior to Fresno Station opening.	**Table 3.2-40** Future (2035) Plus Project Mitigation Measures – Fresno Station Area	**TR MM#6 and #7 - Implementing Party:** Authority and Contractor (station contractor) **Monitoring/Reporting Party:** Authority and Contractor (station contractor)	**TR MM#6 and #7:** Prior to Fresno Station opening	**TR MM #6 and TR MM #7:** MOU with City of Fresno and/or Caltrans, as necessary; contract with station contractor
125 – West Olive Ave/SR 99 NB Ramps	N/A	**TR MM#6:** Widen Approaches to Intersections; **TR MM#7:** Add Exclusive Turn Lanes to Intersections.	Widen northbound approach to provide an exclusive left-turn lane prior to Fresno Station opening.	**Table 3.2-40** Future (2035) Plus Project Mitigation Measures – Fresno Station Area	**TR MM#6 and #7 - Implementing Party:** Authority and Contractor (station contractor) **Monitoring/Reporting Party:** Authority and Contractor (station contractor)	**TR MM#6 and #7:** Prior to Fresno Station opening	**TR MM #6 and TR MM #7:** MOU with City of Fresno and/or Caltrans, as necessary; contract with station contractor
129 – West Belmont Ave/SR 99 Southbound Ramps	N/A	**TR MM#3:** Add Signal to Intersection to Improve LOS/Operation.	Install a traffic signal at the intersection with a protected westbound left-turn phase prior to Fresno Station opening.	**Table 3.2-40** Future (2035) Plus Project Mitigation Measures – Fresno Station Area	**TR MM#3 - Implementing Party:** Authority and Contractor (station contractor) **Monitoring/Reporting Party:** Authority and Contractor (station contractor)	**TR MM#3:** Prior to Fresno Station opening	**TR MM #3:** MOU with City of Fresno and/or Caltrans, as necessary; contract with station contractor
130 – West Belmont Ave/SR 99 NB Ramps	N/A	**TR MM#3:** Add Signal to Intersection to Improve LOS/Operation.	Install a traffic signal at the intersection prior to Fresno Station opening.	**Table 3.2-40** Future (2035) Plus Project Mitigation Measures – Fresno Station Area	**TR MM#3 - Implementing Party:** Authority and Contractor (station contractor) **Monitoring/Reporting Party:** Authority and Contractor (station contractor)	**TR MM#3:** Prior to Fresno Station opening	**TR MM #3:** MOU with City of Fresno and/or Caltrans, as necessary; contract with station contractor

MMRP Attachment A
Transportation Mitigation

	Caused by Alignment Construction[1]	Caused by HST Station Operation and Future Growth[2]	Mitigation Detail	FEIR/FEIS CH3.2 Table Location	Implementing Party and Monitoring/Reporting Party	Implementation / Reporting Schedule	Implementation Mechanism
Roadway Segments							
7 – Stanislaus St, between Van Ness Ave and O St	N/A	**TR MM#8:** Add New Lanes to Roadway.	Widen the roadway to provide one additional lane in each direction prior to Fresno Station opening.	**Table 3.2-40** Future (2035) Plus Project Mitigation Measures – Fresno Station Area	**TR MM#8 - Implementing Party:** Authority and Contractor (station contractor) **Monitoring/Reporting Party:** Authority and Contractor (station contractor)	**TR MM#8:** Prior to Fresno Station opening	**TR MM #8:** MOU with City of Fresno, as necessary; contract with station contractor
14 – Fresno Street, between P Street and M Street	N/A	**TR MM#8:** Add New Lanes to Roadway.	Widen the roadway to provide one additional lane in each direction prior to Fresno Station opening.	**Table 3.2-40** Future (2035) Plus Project Mitigation Measures – Fresno Station Area	**TR MM#8 - Implementing Party:** Authority and Contractor (station contractor) **Monitoring/Reporting Party:** Authority and Contractor (station contractor)	**TR MM#8:** Prior to Fresno Station opening	**TR MM #8:** MOU with City of Fresno, as necessary; contract with station contractor
21 – Tulare St, between R St and U St	N/A	**TR MM#8:** Add New Lanes to Roadway.	Widen the roadway to provide one additional lane in each direction prior to Fresno Station opening.	**Table 3.2-40** Future (2035) Plus Project Mitigation Measures – Fresno Station Area	**TR MM#8 - Implementing Party:** Authority and Contractor (station contractor) **Monitoring/Reporting Party:** Authority and Contractor (station contractor)	**TR MM#8:** Prior to Fresno Station opening	**TR MM #8:** MOU with City of Fresno, as necessary; contract with station contractor
56 – Stanislaus St, between M St and N St	N/A	**TR MM#8:** Add New Lanes to Roadway.	Widen the roadway to provide one additional lane in each direction prior to Fresno Station opening.	**Table 3.2-40** Future (2035) Plus Project Mitigation Measures – Fresno Station Area	**TR MM#8 - Implementing Party:** Authority and Contractor (station contractor) **Monitoring/Reporting Party:** Authority and Contractor (station contractor)	**TR MM#8:** Prior to Fresno Station opening	**TR MM #8:** MOU with City of Fresno, as necessary; contract with station contractor
58 – Van Ness Ave, south of Tuolumne Street	N/A	**TR MM#8:** Add New Lanes to Roadway.	Widen the roadway to provide one additional lane in each direction prior to Fresno Station opening.	**Table 3.2-40** Future (2035) Plus Project Mitigation Measures – Fresno Station Area	**TR MM#8 - Implementing Party:** Authority and Contractor (station contractor) **Monitoring/Reporting Party:** Authority and Contractor (station contractor)	**TR MM#8:** Prior to Fresno Station opening	**TR MM #8:** MOU with City of Fresno, as necessary; contract with station contractor
Kings Tulare Regional Station – East							
Intersections							
1 – Ninth Ave/SR 198	N/A	**TR MM#3:** Add Signal to Intersection to Improve LOS/Operation.	Widen the roadway to provide one additional lane in each direction prior to Kings Tulare Regional Station–East opening.	**Table 3.2-42** Future (2035) Plus Project Mitigation Measures – Kings/Tulare Regional Station–East Alternative	**TR MM#3 - Implementing Party:** Authority and Contractor (station contractor) **Monitoring/Reporting Party:** Authority and Contractor (station contractor)	**TR MM#3:** Prior to Kings Tulare Regional Station–East opening.	**TR MM #3:** MOU with County of Kings and/or Caltrans, as necessary; contract with station contractor
3 – SR 43/SR 198 Eastbound Ramps	N/A	**TR MM#3:** Add Signal to Intersection to Improve LOS/Operation.	Widen the roadway to provide one additional lane in each direction prior to Kings Tulare Regional Station–East opening.	**Table 3.2-42** Future (2035) Plus Project Mitigation Measures – Kings/Tulare Regional Station–East Alternative	**TR MM#3 - Implementing Party:** Authority and Contractor (station contractor) **Monitoring/Reporting Party:** Authority and Contractor (station contractor)	**TR MM#3:** Prior to Kings Tulare Regional Station–East opening.	**TR MM #3:** MOU with County of Kings and/or Caltrans, as necessary; contract with station contractor

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	Caused by Alignment Construction[1]	Caused by HST Station Operation and Future Growth[2]	Mitigation Detail	FEIR/FEIS CH3.2 Table Location	Implementing Party and Monitoring/Reporting Party	Implementation / Reporting Schedule	Implementation Mechanism
4 – Seventh Ave/SR 198	N/A	**TR MM#3:** Add Signal to Intersection to Improve LOS/Operation.	Widen the roadway to provide one additional lane in each direction prior to Kings Tulare Regional Station–East opening.	**Table 3.2-42** Future (2035) Plus Project Mitigation Measures – Kings/Tulare Regional Station–East Alternative	**TR MM#3 - Implementing Party:** Authority and Contractor (station contractor) **Monitoring/Reporting Party:** Authority and Contractor (station contractor)	**TR MM#3:** Prior to Kings Tulare Regional Station–East opening.	**TR MM #3:** MOU with County of Kings and/or Caltrans, as necessary; contract with station contractor
6 – Sixth Ave/SR 198	N/A	**TR MM#3:** Add Signal to Intersection to Improve LOS/Operation.	Widen the roadway to provide one additional lane in each direction prior to Kings Tulare Regional Station–East opening.	**Table 3.2-42** Future (2035) Plus Project Mitigation Measures – Kings/Tulare Regional Station–East Alternative	**TR MM#3 - Implementing Party:** Authority and Contractor (station contractor) **Monitoring/Reporting Party:** Authority and Contractor (station contractor)	**TR MM#3:** Prior to Kings Tulare Regional Station–East opening.	**TR MM #3:** MOU with County of Kings and/or Caltrans, as necessary; contract with station contractor
7 – Second Ave/SR 198	N/A	**TR MM#3:** Add Signal to Intersection to Improve LOS/Operation.	Widen the roadway to provide one additional lane in each direction prior to Kings Tulare Regional Station–East opening.	**Table 3.2-42** Future (2035) Plus Project Mitigation Measures – Kings/Tulare Regional Station–East Alternative	**TR MM#3 - Implementing Party:** Authority and Contractor (station contractor) **Monitoring/Reporting Party:** Authority and Contractor (station contractor)	**TR MM#3:** Prior to Kings Tulare Regional Station–East opening.	**TR MM #3:** MOU with County of Kings and/or Caltrans, as necessary; contract with station contractor
8 – SR 43/Lacey Blvd	N/A	**TR MM#3:** Add Signal to Intersection to Improve LOS/Operation.	Widen the roadway to provide one additional lane in each direction prior to Kings Tulare Regional Station–East opening.	**Table 3.2-42** Future (2035) Plus Project Mitigation Measures – Kings/Tulare Regional Station–East Alternative	**TR MM#3 - Implementing Party:** Authority and Contractor (station contractor) **Monitoring/Reporting Party:** Authority and Contractor (station contractor)	**TR MM#3:** Prior to Kings Tulare Regional Station–East opening.	**TR MM #3:** MOU with County of Kings and/or Caltrans, as necessary; contract with station contractor
Bakersfield Station							
Intersections							
6 – Union Ave/E. Brundage Lane	N/A	**TR MM#6:** Widen Approaches to Intersections. **TR MM#7:** Add Exclusive Turn Lanes to Intersections.	Widen the westbound approach to provide an additional exclusive left-turn lane at the intersection.	**Table 3.2-46** Future (2035) Plus Project Mitigation Measures – Bakersfield Stations	**TR MM#6 and #7 - Implementing Party:** Authority and Contractor (station contractor) **Monitoring/Reporting Party:** Authority and Contractor (station contractor)	**TR MM#6 and #7:** Prior to Bakersfield Station opening	**TR MM #6 and TR MM #7:** MOU with City of Bakersfield, as necessary; contract with station contractor
15 – SR 99 NB Ramps/ California Ave	N/A	**TR MM#4:** Restripe Intersections. **TR MM#7:** Add Exclusive Turn Lanes to Intersections.	Restripe the northbound approach to provide one exclusive left-turn lane, one shared left-turn/through-/right-turn lane, and one exclusive right-turn lane at the intersection.	**Table 3.2-46** Future (2035) Plus Project Mitigation Measures – Bakersfield Stations	**TR MM#4 and #7 - Implementing Party:** Authority and Contractor (station contractor) **Monitoring/Reporting Party:** Authority and Contractor (station contractor)	**TR MM#4 and #7:** Prior to Bakersfield Station opening	**TR MM #4 and TR MM #7:** MOU with City of Bakersfield and/or Caltrans, as necessary; contract with station contractor

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Transportation Mitigation

	Caused by Alignment Construction[1]	Caused by HST Station Operation and Future Growth[2]	Mitigation Detail	FEIR/FEIS CH3.2 Table Location	Implementing Party and Monitoring/Reporting Party	Implementation / Reporting Schedule	Implementation Mechanism
16 – Oak St/California Ave	N/A	**TR MM#5:** Revise Signal Cycle Length.	Modify the existing traffic signal to provide protected left-turn phases for the northbound and southbound approaches at the intersection.	**Table 3.2-46** Future (2035) Plus Project Mitigation Measures – Bakersfield Stations	**TR MM#5 - Implementing Party:** Authority and Contractor (station contractor) **Monitoring/Reporting Party:** Authority and Contractor (station contractor)	**TR MM#5:** Prior to Bakersfield Station opening	**TR MM #5:** MOU with City of Bakersfield, as necessary; contract with station contractor
23 – Union Ave/California Ave (North and Hybrid Alternatives only)	N/A	**TR MM#5:** Revise Signal Cycle Length.	Re-time the signal in AM and PM	**Table 3.2-46** Future (2035) Plus Project Mitigation Measures – Bakersfield Stations	**TR MM#5 - Implementing Party:** Authority and Contractor (station contractor) **Monitoring/Reporting Party:** Authority and Contractor (station contractor)	**TR MM#5:** Prior to Bakersfield Station opening	**TR MM #5:** MOU with City of Bakersfield, as necessary; contract with station contractor
41 – Union Ave/Golden State Ave/21st St	N/A	**TR MM#6:** Widen Approaches to Intersections. **TR MM#7:** Add Exclusive Turn Lanes to Intersections.	Widen the northbound approach to provide an additional through-lane to go on Union Ave.	**Table 3.2-46** Future (2035) Plus Project Mitigation Measures – Bakersfield Stations	**TR MM#6 and #7 - Implementing Party:** Authority and Contractor (station contractor) **Monitoring/Reporting Party:** Authority and Contractor (station contractor)	**TR MM#6 and #7:** Prior to Bakersfield Station opening	**TR MM #6 and TR MM #7:** MOU with City of Bakersfield, as necessary; contract with station contractor
42 – F St/23rd St	N/A	**TR MM#6:** Widen Approaches to Intersections. **TR MM#7:** Add Exclusive Turn Lanes to Intersections.	Widen the eastbound approach to provide one exclusive left turn lane, two exclusive through lanes, and one shared through-/right-turn lane at the intersection.	**Table 3.2-46** Future (2035) Plus Project Mitigation Measures – Bakersfield Stations	**TR MM#6 and #7 - Implementing Party:** Authority and Contractor (station contractor) **Monitoring/Reporting Party:** Authority and Contractor (station contractor)	**TR MM#6 and #7:** Prior to Bakersfield Station opening	**TR MM #6 and TR MM #7:** MOU with City of Bakersfield, as necessary; contract with station contractor
51 – Q St/Golden State Ave	N/A	**TR MM#5:** Revise Signal Cycle Length.	Re-time the signal in AM and PM	**Table 3.2-46** Future (2035) Plus Project Mitigation Measures – Bakersfield Stations	**TR MM#5 - Implementing Party:** Authority and Contractor (station contractor) **Monitoring/Reporting Party:** Authority and Contractor (station contractor)	**TR MM#5:** Prior to Bakersfield Station opening	**TR MM #5:** MOU with City of Bakersfield, as necessary; contract with station contractor
56 – M St/28 St/Golden State Ave	N/A	**TR MM#6:** Widen Approaches to Intersections. **TR MM#7:** Add Exclusive Turn Lanes to Intersections.	Widen the northbound approach to provide an additional through-lane to go on Union Ave.	**Table 3.2-46** Future (2035) Plus Project Mitigation Measures – Bakersfield Stations	**TR MM#6 and #7 - Implementing Party:** Authority and Contractor (station contractor) **Monitoring/Reporting Party:** Authority and Contractor (station contractor)	**TR MM#6 and #7:** Prior to Bakersfield Station opening	**TR MM #6 and TR MM #7:** MOU with City of Bakersfield, as necessary; contract with station contractor

MMRP Attachment A
Transportation Mitigation

	Caused by Alignment Construction[1]	Caused by HST Station Operation and Future Growth[2]	Mitigation Detail	FEIR/FEIS CH3.2 Table Location	Implementing Party and Monitoring/Reporting Party	Implementation / Reporting Schedule	Implementation Mechanism
60 – F St/Golden State Ave	N/A	**TR MM#6:** Widen Approaches to Intersections. **TR MM#7:** Add Exclusive Turn Lanes to Intersections.	Widen the eastbound approach to provide one exclusive left turn lane, two exclusive through lanes, and one shared through-/right-turn lane at the intersection.	**Table 3.2-46** Future (2035) Plus Project Mitigation Measures – Bakersfield Stations	**TR MM#6 and #7 - Implementing Party:** Authority and Contractor (station contractor) **Monitoring/Reporting Party:** Authority and Contractor (station contractor)	**TR MM#6 and #7:** Prior to Bakersfield Station opening	**TR MM #6 and TR MM #7:** MOU with City of Bakersfield, as necessary; contract with station contractor
71 – Truxtun Ave/Tulare St	N/A	**TR MM#3:** Add Signal to Intersection to Improve LOS/Operation.	Install traffic signal.	**Table 3.2-46** Future (2035) Plus Project Mitigation Measures – Bakersfield Stations	**TR MM#3 - Implementing Party:** Authority and Contractor (station contractor) **Monitoring/Reporting Party:** Authority and Contractor (station contractor)	**TR MM#3:** Prior to Bakersfield Station opening	**TR MM #3:** MOU with City of Bakersfield, as necessary; contract with station contractor

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CALIFORNIA HIGH-SPEED TRAIN

Project Environmental Impact Report/Environmental Impact Statement

Fresno to Bakersfield

Mitigation Monitoring and Enforcement Plan Amendments

October 2014

CALIFORNIA High-Speed Rail Authority

U.S. Department of Transportation
Federal Railroad Administration

California High-Speed Train Project EIR/EIS

Fresno to Bakersfield Section

CALIFORNIA
High-Speed Rail Authority

Mitigation Monitoring and Enforcement Plan Amendments

Prepared by: _____ 10/2/14

Stephanie Roberts, PMT Environmental Planner — Date

Checked by: _____ 2 October 2014

Andrew Bayne, PMT Environmental Planner — Date

Approved by: _____ 10/3/14

Bryan Porter, PMT Environmental Manager — Date

Released by: _____ 10/3/14

Mark McLoughlin, Director of
Environmental Planning
California High-Speed Rail Authority — Date

Released by: _____ October 8, 2014

David Valenstein, Division Chief
Environment and Systems Planning
Federal Railroad Administration — Date

Document/Amended	Date	Description
0	27 June 2014	FRA Record of Decision
1	August 2014	Staff update to add mitigation measures ordered by the Surface Transportation Board and California Code of Regulations as requested by California Public Utilities Commission

Note: Signatures apply for the latest MMEP amendments as noted above.

Introduction

In April 2014, the Federal Railroad Administration (FRA) and California High-Speed Rail Authority (Authority) published a joint Final Project Environmental Impact Report/ Environmental Impact Statement (EIR/EIS) for the Fresno to Bakersfield Section of the California High-Speed Train (HST) Project (Project). The Final Project EIR/EIS satisfies the requirements of National Environmental Policy Act (NEPA) and was the basis for the FRA's Record of Decision (ROD). As part of the ROD (June 27, 2014), the FRA selected the BNSF Alternative in combination with the Corcoran Bypass, Allensworth Bypass, and the Bakersfield Hybrid alternatives and the Kings/Tulare Regional Station-East Alternative and the Bakersfield Station-Hybrid Alternative.

A Mitigation Monitoring and Enforcement Plan (MMEP) was prepared for the Fresno to Bakersfield Section of the HST Project that adheres to the Council on Environmental Quality's (CEQ) regulations (40 Code of Federal Regulations [CFR] Section 1505) and FRA Procedures for Considering Environmental Impacts (64 Federal Register 28545, May 26, 1999). The FRA adopted the MMEP for the mitigation identified in the Final Project EIR/EIS. The MMEP 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), which assists federal agencies to develop mitigation programs that provide effective documentation, implementation, and monitoring of mitigation commitments.

The following are additions and/or amendments to the adopted MMEP via order from the Surface Transportation Board (STB), Service Date August 12, 2014, Docket Number FD 35724 (Sub-No. 1) and additional California Public Utilities Commission (CPUC) requirements per their October 13, 2011 comment letter on the Draft EIR/EIS.

On August 23, 2013, the STB became a cooperating agency, as defined by 40 C.F.R. § 1508.5, for the preparation of a final project-specific EIS, as well as for the other EISs currently being prepared or in the planning stages for the remainder of the proposed HST System. Subsequently, the STB's Office of Environmental Analysis (OEA) worked with the Authority and the FRA in the preparation of a Final EIS for this, the Fresno to Bakersfield Project Section. The STB accepted OEA's recommendation to adopt the Final EIS, which took a "hard look" at the potential environmental impact of the project, selected an environmentally preferred route from a range of alternatives, and recommended extensive environmental conditions to avoid, minimize, or mitigate the project's potential environmental impact. After weighing the entire record on both the transportation merits and the environmental issues, the Board granted the Authority's petition for exemption subject to various environmental mitigation conditions, including: (1) construction of the route designated by FRA as environmentally preferable, (2) compliance with the mitigation imposed by FRA in its ROD, and (3) compliance with three additional environmental conditions recommended by OEA[1].

The CPUC, in its October 13, 2011 letter, requested several requirements to be listed in the Mitigation Monitoring Section of the FEIR/EIS and for this to be forwarded to the CPUC. However, these considerations and requirements were not listed in either the Final EIR/EIS or the adopted MMEP.

Table 1 describes mitigation measures that would mitigate for potential adverse environmental impacts from construction and operation based upon the STB Order. Tables 2 and 3 would address new and/or additional avoidance and minimization measures for potential impacts to construct and operate the HST Project regarding both STB Order and CPUC consideration and requirement. Items highlighted in yellow are new additions while redline items are changes to the adopted MMEP.

[1] Language from the STB Service Date August 12, 2014, Docket Number FD 35724 (Sub-No. 1).

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Table 1

Amendment to the Mitigation Monitoring and Enforcement Plan per Surface Transportation Board Order

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact #	Impact Text
Noise and Vibration											
N&V-MM #7	Mercy Hospital Noise Avoidance	During project-related construction, the Authority is prohibited from using pile drivers within 300 feet of the south side of Mercy Hospital's existing building located at 2215 Truxtun Avenue, Bakersfield, California	Design	Establish the 300 buffer from the south side of Mercy Hospital and note in all design and construction plans that "pile driving shall not be implemented in this area."	100% Record Set Design	Contractor	Contractor	Weekly	Contract Requirements/ Specifications	N&V#1	Construction Noise

Table 2

Amendment to the Avoidance and Minimization Measures per Surface Transportation Board Order

Avoidance and Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact #	Impact Text
Station Planning, Land Use and Development											
LU-AM#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 including freight railroad operations, and implementation of dust control measures during project construction.	Design/Construction	Reporting	Monthly	Contractor	Contractor	At incorporation or completion of design/Monthly Reporting during Construction	Condition of Design Build Contract	LU Impact #1:	Temporary and intermittent disruption of access to some properties, temporarily inconvenience nearby residents, and temporarily change the intensity of agricultural operations on some lands along 31 miles of the BNSF Alternative, along the Corcoran Bypass, and Allensworth Bypass
Socioeconomics. Communities and Environmental Justice											
SO-AM #1	Construction Management Plan	The Authority will require that the design-build contractor will develop and implement a construction management plan to address communications, community impacts, visual protection, air quality, safety controls, noise controls, and traffic controls to minimize impacts on low-income households and minority populations. The plan will assure property access is maintained for local businesses, residences, and emergency services. This plan will include maintaining customer and vendor access to local businesses throughout construction by using signs to instruct customers about access to businesses during construction. The plan will address potential project-related construction impacts to freight railroad operations. In addition, the plan will include efforts to consult with local transit providers to minimize impacts on local and regional bus routes in affected communities. Construction Management Plans are standard for large infrastructure projects such as this one, and are considered effective in minimizing community impacts.	Design/Construction	Reporting	Monthly	Contractor	Contractor	At incorporation or completion of design/Monthly Reporting during Construction	Condition of Design Build Contract	N/A	N/A

Table 3

Amendment to the Avoidance and Minimization Measures per California Public Utility Commission Consideration and Requirement

Avoidance and Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact #	Impact Text
Public Utilities/ Energy Design Features											
PUB-AM #2	CPUC Railroad Crossing Requirements	At the request of the CPUC the following requirements per the California Code of Regulations Title 20, Division 1 Public Utilities Commission, Chapter 1 Rules of Practice and Procedure, Article 3 Particular Applications are provided: § 3.7. (Rule 3.7) Public Road Across Railroad. Applications to construct a public road, highway, or street across a railroad must be made by the municipal, county, state, or other governmental authority which proposes the construction. Such applications shall be served on the affected railroad corporations, and shall contain the following information: (a) The rail milepost and either a legal description of the location of the proposed crossing or a location description using a coordinate system that has accuracy comparable to a legal description. (b) Crossing identification numbers of the nearest existing public crossing on each side of the proposed crossing. (Numbers may be obtained from the crossing sign at the crossing, or from the office of the railroad.) (c) If the proposed crossing is at-grade, (1) a statement showing the public need to be served by the proposed crossing; (2) a statement showing why a separation of grades is not practicable; and (3) a statement showing the signs, signals, or other crossing warning devises which applicant recommends be provided at the proposed crossing. (d) A map of suitable scale (50 to 200 feet per inch) showing accurate locations of all streets, roads, property lines, tracks, buildings, structures or other obstructions to view for a distance of at least 400 feet along the railroad and 200 feet along the highway in each direction from the proposed crossing. Such map shall show the character of surface or pavement and width of same, either existing or proposed, on the street or road adjacent to the proposed crossing and on each side thereof. (e) A map of suitable scale (1,000 to 3,000 feet per inch) showing the relation of the proposed crossing to existing roads and railroads in the general vicinity of the proposed crossing. (f) A profile showing the ground line and grade line and rate of grades of approach on all highways and railroads affected by the proposed crossing. § 3.8. (Rule 3.8) Alter or Relocate Existing Railroad Crossing. An application to alter or relocate an existing railroad crossing shall comply with Rule 3.7, except that it shall state the crossing identification number of the affected crossing, instead of the nearest crossings, and shall state if the affected crossing will remain within the existing right-of-way. § 3.9. (Rule 3.9) Railroad Across Public Road.	Design	CPUC approval required before construction of railroad crossings over public roads, under public roads, over railroads or under railroads is allowed	100% record set design	Contractor	Contractor	At incorporation or completion of 100% record set design	Condition of Design Build Contract	Not Applicable	CPUC requirements added at the request of the CPUC

Avoidance and Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact #	Impact Text
		An application to construct a railroad across a public road, highway or street shall be served on the municipal, county, state or other governmental authority having jurisdiction and control over the highway or charged with its construction and maintenance, and shall include, in addition to the information required by Rule 3.7, the following information: (a) A copy of the franchise or permit, if any be requisite, from the authority having jurisdiction, which allows the railroad to cross the public road, highway, or street involved. If such franchise or permit has already been filed, the application need only make specific reference to such filing. (b) The proposed crossing identification number. (c) The map referred to in Rule 3.7(d) shall also show, by distinct colorings or lines, all new tracks or changes in existing tracks, within the limits of the drawing, which are to be made in connection with the construction of the proposed crossing. § 3.10. (Rule 3.10) Railroad Across Railroad. Applications to construct a railroad or street railroad across a railroad or street railroad shall be served on the affected railroad or street railroad corporations, and shall contain the following: (a) The rail milepost and either a legal description of the location of the proposed crossing or a location description using a coordinate system that has accuracy comparable to a legal description. (b) A map of suitable scale (50 to 200 feet per inch) showing accurate locations of all streets, roads, property lines, tracks, buildings, structures or other obstructions to view in the immediate vicinity. (c) A map of suitable scale (1,000 to 3,000 feet per inch) showing the relation of the proposed crossing to existing railroads in the general vicinity. (d) A profile showing the ground line and grade line of approaches on all railroads affected. (e) A true copy of the contract executed by the parties, or other evidence that the carrier to be crossed is willing that the crossing be installed.									

CALIFORNIA HIGH-SPEED TRAIN

Project Environmental Impact Report/Environmental Impact Statement

Fresno to Bakersfield

Mitigation Monitoring and Enforcement Program Amendments

September 2015

CALIFORNIA High-Speed Rail Authority

U.S. Department of Transportation
Federal Railroad Administration

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California High-Speed Train Project EIR/EIS

Fresno to Bakersfield Section

Mitigation Monitoring and Enforcement Plan Amendments

Prepared by: _____ 8/24/15
Stephanie Roberts, RDP Environmental Planner — Date

Checked by: _____ 24 August 2015
Andrew Bayne, RDP Environmental Planner — Date

Approved by: _____ 8/27/2015
Lisa Nangesser, RDP Environmental Manager — Date

Released by: _____ August 28, 2015
Mark McLoughlin, Director of
Environmental Planning
California High-Speed Rail Authority — Date

Released by: _____ September 14, 2015
David Valenstein, Division Chief
Environment and Systems Planning
Federal Railroad Administration — Date

Document/Amended	Date	Description
0	27 June 2014	FRA Record of Decision
1	August 2014	Staff update to add mitigation measures ordered by the Surface Transportation Board and California Code of Regulations as requested by California Public Utilities Commissions
2	June 2015	Staff update to clarify contract requirements

Note: Signatures apply for the latest MMEP amendments as noted above.

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Introduction

In April 2014, the Federal Railroad Administration (FRA) and California High-Speed Rail Authority (Authority) published a joint Final Project Environmental Impact Report/ Environmental Impact Statement (EIR/EIS) for the Fresno to Bakersfield Section of the California High-Speed Train (HST) Project (Project). The Final Project EIR/EIS satisfies the requirements of National Environmental Policy Act (NEPA) and was the basis for the FRA's Record of Decision (ROD). As part of the ROD (June 27, 2014), the FRA selected the BNSF Alternative in combination with the Corcoran Bypass, Allensworth Bypass, and the Bakersfield Hybrid alternatives and the Kings/Tulare Regional Station-East Alternative and the Bakersfield Station-Hybrid Alternative.

A Mitigation Monitoring and Enforcement Plan (MMEP) was prepared for the Fresno to Bakersfield Section of the HST Project that adheres to the Council on Environmental Quality's (CEQ) regulations (40 Code of Federal Regulations [CFR] Section 1505) and FRA Procedures for Considering Environmental Impacts (64 Federal Register 28545, May 26, 1999). The FRA adopted the MMEP for the mitigation identified in the Final Project EIR/EIS. The MMEP 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), which assists federal agencies to develop mitigation programs that provide effective documentation, implementation, and monitoring of mitigation commitments.

On August 23, 2013, the STB became a cooperating agency, as defined by 40 C.F.R. § 1508.5, for the preparation of a final project-specific EIS, as well as for the other EISs currently being prepared or in the planning stages for the remainder of the proposed HST System. Subsequently, the STB's Office of Environmental Analysis (OEA) worked with the Authority and the FRA in the preparation of a Final EIS for this, the Fresno to Bakersfield Project Section. The STB accepted OEA's recommendation to adopt the Final EIS, which took a "hard look" at the potential environmental impact of the project, selected an environmentally preferred route from a range of alternatives, and recommended extensive environmental conditions to avoid, minimize, or mitigate the project's potential environmental impact. After weighing the entire record on both the transportation merits and the environmental issues, the Board granted the Authority's petition for exemption subject to various environmental mitigation conditions, including: (1) construction of the route designated by FRA as environmentally preferable, (2) compliance with the mitigation imposed by FRA in its ROD, and (3) compliance with three additional environmental conditions recommended by OEA[1].

The following is an amendment to the adopted MMEP to clarify contract requirements and enforce adherence to the Valley Fever avoidance and minimization measures S&S – AM #4b and S&S – AM 4c. This change was identified by the Authority's Construction Managers to enable them to manage and oversee design-build contractors' construction activities. Table 1 describes avoidance and minimization measures S&S – AM #4b S&S – AM #4c respectively and provides the changes shown in yellow highlight.

[1] Language from the STB Service Date August 12, 2014, Docket Number FD 35724 (Sub-No. 1).

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Table 1

Amendment to the Avoidance and Minimization Measure for Contract Clarification

S&S - AM #4b	Valley Fever	The following recommendations were provided by the Environmental Protection Agency and refined through discussion with the California Department of Public Health (CDPH). • Prior to construction , provide 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); • Continue outreach and coordination with the California Department of Public Health. In addition, reach out to 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, Provide a qualified person dedicated to overseeing implementation of Valley Fever prevention measures to encourage a culture of safety of the contractors and subcontractors. ~~The individual should have the authority to adaptively manage the implementation of Valley Fever prevention and effect change in coordination with the county Public Health Officer.~~ 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 will be maintained following applicable and appropriate confidentiality protections.	Design/Construction/ Operation	Design/Reporting	Monthly or as needed during construction and operation	Authority/Contractor	Authority/ Contractor	At incorporation or completion of design/As needed during construction and operation	At incorporation or completion of design/As needed during construction and operation	Impact S&S #1	Accidents at Construction Sites
										Impact AQ #1	Common Regional Air Quality Impacts During Construction
										Impact AQ #6	Localized Air Quality Impacts During Guideway/Alignment Construction
										Impact AQ #7	Localized Air Quality Impacts to Schools during Construction
										Impact AQ #9	Localized Air Quality Impacts from HMF and MOWF Construction

S&S - AM #4c	Valley Fever	The VFHS designee in coordination with the County Public [redacted] added to the requirements for the Construction Safety and Health Plans (CSHPs) regarding preventive measures to avoid Valley Fever exposure (Ch. 3.11, Design Features, 3.11.6). [redacted] be included in the existing design feature for Ch. 3.11, "Safety and Security," [redacted] 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. Equip heavy equipment cabs with high efficiency particulate air (HEPA) filters; and, 4. Make NIOSH approved respiratory protection with particulate filters as recommended by the CDPH available to workers who request them.	Design/Construction/ Operation	Design/Reporting	Monthly or as needed during construction and operation	Authority/Contractor	Authority/ Contractor	At incorporation or completion of design/As needed during construction and operation	At incorporation or completion of design/As needed during construction and operation	Impact S&S #1	Accidents at Construction Sites
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CALIFORNIA HIGH-SPEED TRAIN

Project Environmental Impact Report/Environmental Impact Statement

Fresno to Bakersfield

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March 2018

CALIFORNIA High-Speed Rail Authority

U.S. Department of Transportation
Federal Railroad Administration

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California High-Speed Train Project EIR/EIS

Fresno to Bakersfield Section

CALIFORNIA High-Speed Rail Authority

Mitigation Monitoring and Enforcement Plan Amendments

Prepared by: Jesse Halsted — 9/11/19
Jesse Halsted, Environmental Science Associates — Date

Checked by: [signature] — 30 October 2019
Andrew Bayne, Fresno to Bakersfield Environmental Manager — Date

Approved by: [signature] — 10/30/19
Serge Stanich, Central Valley Director of Projects — Date

Released by: [signature] — October 30, 2019
Mark McLoughlin, Director of Environmental Planning
California High-Speed Rail Authority — Date

Document/Amended	Date	Description
0	27 June 2014	FRA Record of Decision
1	August 2014	Staff update to add mitigation measures ordered by the Surface Transportation Board and California Code of Regulations as requested by California Public Utilities Commissions
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The following is an amendment to the adopted MMEP to address the addition of the federally endangered Buena Vista Lake ornate shrew (BVLOS) (*Sorex ornatus relictus*) to the list of potentially effected species. Based on coordination with the U.S. Fish and Wildlife Service (USFWS) changes to the known range of the species have occurred since the Final Project EIR/EIS was published. On July 28, 2017 the USFWS issued an amendment to the Biological Opinion for the Fresno to Bakersfield Section of the HST Project to address potential effects to the BVLOS and its habitat. Based on the conservation measures identified in the amended Biological Opinion, this amendment to the MMEP adds three new Mitigation Measures, Bio- MM#66 through Bio- MM#68, specific to the BVLOS. Table 1 provides the text and implementation notes for these new mitigation measures.

[1] Language from the STB Service Date August 12, 2014, Docket Number FD 35724 (Sub-No. 1).

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Table 1

Amendment to the Avoidance and Minimization Measures

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact #	Impact Text
Biological Resources											
BIO- MM#66	Implement Avoidance and Minimization Measures for The Buena Vista Lake Ornate Shrew	In all suitable (mesic and xeric) habitat areas for the shrew, all above-ground herbaceous vegetation within the construction footprint will be cleared using hand tools (which can include weed whackers or mowers) under the supervision of a USFWS-approved biological monitor. All leaf litter will be removed using rakes, or similar hand tools. All woody vegetation will be cut as closely to the ground as possible using hand tools (which can include chainsaws). Vegetation will be removed immediately and stored away from suitable shrew habitat. Such vegetation hand-removal efforts will be implemented in those areas that require vegetation removal in order to clearly detect shrew, and will continue at each habitat area until it is reasonably certain that shrew can be detected within the cleared areas. After vegetation has been cleared from shrew suitable habitat areas, non-disturbance exclusion fencing will be installed. In those areas where installation of fencing may not be feasible, the Service will be contacted and will provide direction on a case by case basis. The fencing will be installed under the supervision of the USFWS-approved Project biologist along the Project footprint within suitable shrew habitat areas. Fencing will be placed between areas of active construction and adjacent or nearby suitable habitat to preclude shrews from running across the construction site and into harm's way. The configuration of the fencing will likely vary between areas, and placement will be at the direction of the USFWS-approved Project biologist with input from the USFWS, as required. Fencing may consist of a combination of both Environmentally Sensitive Areas (ESA) Fencing and Wildlife Exclusion fencing (WEF) with one-way exit/ escape points. If a shrew is subsequently found within the fenced work area, work will cease immediately and a section of fence removed so that the shrew may leave the fenced area on their own volition. The USFWS-approved biologist will monitor the shrew to ensure that any shrew has moved and remains outside the fence.	Construction	Vegetation Removal, Establish Exclusion Fencing	Weekly or at other appropriate interval	Contractor	Contractor	Report weekly upon vegetation removal and exclusion fencing establishment Report within 24 hours of encountering a shrew within the fenced area	Pursuant to a Change Order to the conditions of the Design Build Contract	BIO#2	Construction of the Preferred Alternative would disturb suitable habitat that has the potential to support special-status mammal species.
										BIO#6	Project impacts from the Preferred Alternative would permanently impact suitable habitat that has the potential to support special-status mammal species.
										BIO#7	Project impacts from the Preferred Alternative would disturb portions of recovery plans.

BIO- MM#67	Prepare and Implement a Buena Vista Lake Ornate Shrew Monitoring and Relocation Plan	Prior to the start of construction activities in areas of marginal and suitable habitat (more mesic and more xeric) for shrew, the FRA and Authority will prepare a shrew monitoring and relocation plan. The plan will identify the handling and relocation methodology for any shrews encountered during construction activities. Handling and relocation will be conducted consistent with the USFWS's 2012 *Survey Protocol for Determining Presence of the Buena Vista Lake Ornate Shrew*. The plan will identify the process for the relocating any captured shrews and will be approved by the USFWS prior to construction.	Pre-construction, Construction	Prepare Monitoring and Relocation Plan, Implement Shrew Relocation	Weekly or at other appropriate interval	Authority, Contractor	Authority, Contractor	Report weekly	Pursuant to a Change Order to the conditions of the Design Build Contract	BIO#2	Construction of the Preferred Alternative would disturb suitable habitat that has the potential to support special-status mammal species.
										BIO#6	Project impacts from the Preferred Alternative would permanently impact suitable habitat that has the potential to support special-status mammal species.
										BIO#7	Project impacts from the Preferred Alternative would disturb portions of recovery plans.
BIO- MM#68	Compensate for Impacts on Buena Vista Lake Ornate Shrew	Impacts to more mesic suitable habitat for the shrew will be compensated at a 3:1 ratio through acquisition and preservation in perpetuity of occupied more mesic suitable shrew habitat, or creation of occupiable more mesic suitable shrew habitat. All proposed suitable shrew habitat compensation properties will be reviewed and approved by the USFWS. Impacts to more xeric suitable habitat for the shrew will be compensated, as follows: • 1:1 for suitable xeric habitat within 200 feet of suitable mesic habitat; • 0.33:1 for other suitable xeric habitat. Compensation for impacts to more xeric suitable habitat can be accomplished by one of the following methods: • for each acre of more xeric suitable habitat disturbed within the Project area, provide one acre of more xeric suitable habitat directly associated with (within 200 feet of) more mesic suitable habitat within a preserved or created mitigation parcel; • or preserve or create one acre of more mesic suitable habitat for every three acres of more xeric suitable habitat disturbed. Final habitat compensation may consist of a combination of these, as approved by the USFWS. The overall goal is to provide contiguous blocks of more mesic habitat accompanied by more xeric habitat which supports the mesic areas, or to provide suitable habitat of either type to serve as dispersal corridors among larger occupied or occupiable areas.	Pre-construction, Construction, Post-construction	Compliance Report	Prior to Operation	Authority	Authority	Prior to Operation	Authority to compensate based on amount of suitable habitat for the Buena Vista lake ornate shrew impacted by the Contractor	BIO#2	Construction of the Preferred Alternative would disturb suitable habitat that has the potential to support special-status mammal species.
										BIO#6	Project impacts from the Preferred Alternative would permanently impact suitable habitat that has the potential to support special-status mammal species.
										BIO#7	Project impacts from the Preferred Alternative would disturb portions of recovery plans.

California High-Speed Rail Authority

Fresno to Bakersfield Section: Locally Generated Alternative

Mitigation Monitoring and Enforcement Plan Amendments

October 2019

CALIFORNIA High-Speed Rail Authority

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 Supplemental EIS

Fresno to Bakersfield Section

CALIFORNIA High-Speed Rail Authority

Mitigation Monitoring and Enforcement Plan Amendments

Prepared by: Amanda Durgen — 10/30/19
Amanda Durgen, LSA Associates — Date

Checked by: — 30 October 2019
Andrew Bayne, RDP Environmental Planner — Date

Approved by: — 10/30/19
Serge Stanitch, Central Valley Director of Projects — Date

Released by: — October 30, 2019
Mark McLoughlin, Director of Environmental Planning, California High-Speed Rail Authority — Date

Document/Amended	Date	Description
0	27 June 2014	FRA Record of Decision
1	August 2014	Staff update to add mitigation measures ordered by the Surface Transportation Board and California Code of Regulations as requested by California Public Utilities Commissions
2	September 2015	Staff update to clarify contract requirements
3	February 2018	Staff update to add considerations of the Buena Vista Lake ornate shrew
4	October 2019	Authority Supplemental Record of Decision for Locally Generated Alternative

Note: Signatures apply for the latest MMEP amendments as noted above.

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1 INTRODUCTION

In October 2019, the California High-Speed Rail Authority (Authority), as the federal lead agency pursuant to the National Environmental Policy Act (NEPA) Assignment Memorandum of Understanding (July 23, 2019) prepared a Final Supplemental Environmental Impact Statement (EIS) for the Fresno to Bakersfield Section of the California High-Speed Rail (HSR) Project (Project). The Final Supplemental EIS satisfies the requirements of NEPA and is the basis for the Authority's Supplemental Record of Decision (ROD), issued on October 31, 2019. As part of the Supplemental ROD, the Authority has selected the Fresno to Bakersfield Locally Generated Alternative (F-B LGA) and the F Street Station.

In 2014, a Mitigation Monitoring and Enforcement Plan (MMEP) was prepared for the Fresno to Bakersfield Section of the HSR Project and incorporated into the June 2014 ROD, which was prepared for the Fresno to Bakersfield Section and included the May 2014 Project. The MMEP is a formal commitment by the Authority to carry out all of the measures identified therein as a condition of Project approval. The approved 2014 MMEP is applicable to the F-B LGA (see below for more specifics).

Since June 2014, there have been three amendments to the MMEP, all of which are also applicable to the F-B LGA and the May 2014 Project (see below for more specifics). In October 2014, the June 2014 MMEP was amended (Amendment #1) to address an order from the Surface Transportation Board (Service Date August 12, 2014, Docket Number FD 35724 (Sub-No. 1)) and additional California Public Utilities Commission requirements. In September 2015, the MMEP was amended (Amendment #2) to clarify contract requirements and enforce adherence to the Valley Fever avoidance and minimization measures as identified by the Authority's Construction Managers to enable them to manage and oversee design-build contractors' construction activities. In February 2018, in coordination with the U.S. Fish and Wildlife Service, the MMEP was amended (Amendment #3) to address the addition of the federally endangered Buena Vista Lake ornate shrew (BVLOS) (*Sorex ornatus relictus*) to the list of potentially affected species.

This current amendment is Amendment #4 to the MMEP and describes mitigation measures that will avoid, minimize, or mitigate potential adverse environmental impacts that result from constructing and operating the F-B LGA of the California HSR System. Amendment #4 applies to the F-B LGA only (i.e., it does not apply to or amend any mitigation measures applicable to the Fresno to Bakersfield Section north of Poplar Avenue) and addresses two topics: Mitigation Measures (Table 1 and MMEP Attachment A, Transportation Mitigation) and Impact Avoidance and Minimization Measures (Table 2).

- Mitigation Measures (Table 1 and MMEP Attachment A): Mitigation measures applicable to the F-B LGA consist of (a) all the mitigation measures in this MMEP Amendment #4 Table 1 and MMEP Attachment A, Transportation Mitigation and (b) all the mitigation measures in the original MMEP and Amendments #1, #2, and #3 unless the measure is also contained in this MMEP Amendment #4 (in which case the measure as stated in this Amendment #4 controls).[1]
- Impact Avoidance and Minimization Measures (Table 2): Impact Avoidance and Minimization Measures (IAMMs) applicable to the F-B LGA are contained entirely in this MMEP Amendment #4 Table 2.[2]

The MMEP and its amendments adhere to the Council on Environmental Quality's (CEQ) regulations (40 Code of Federal Regulations Section 1505) 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.

[1] For example, N&V-MM#3 is contained in the June 2014 MMEP and also appears in this MMEP Amendment #4. N&V-MM#3 as stated in this MMEP Amendment #4 controls as to the F-B LGA (and as stated in the 2014 MMEP controls north of the F-B LGA) because it has been tailored to cover issues and analysis specific to the F-B LGA.

[2] While many of the IAMMs are the same as contained in the original MMEP and Amendments #1, #2, and #3, they are placed in this MMEP Amendment #4, along with any amended F-B LGA-specific IAMMs, for ease of complete tracking.

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Table 1
Amendment to the Mitigation Monitoring and Enforcement Program per the Fresno to Bakersfield Section Final Supplemental EIS (Measures Specific to the F-B LGA)

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact #	Impact Text
Noise and Vibration											
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, pre-construction 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 contractor will arrange for the repair of damaged buildings or will pay compensation to the property owner.	Pre-construction/ Construction/ Post-construction	Reporting	Weekly	Contractor	Contractor	Ongoing monitoring during construction/post-construction monitoring as needed to assess damage to buildings.	Contract Requirements/ Specifications	N&V #2	Impact text has not changed. Details about this impact can be found in the 2014 MMEP and its amendments.
										LU #1	The generation of noise will temporarily inconvenience nearby residents on some lands along 19.18 miles of the F-B LGA.
										PK#1	Construction activities will increase noise exposure at the Kern River Parkway.
N&V-MM #3	Implement Proposed California High-Speed Train Project Noise Mitigation Guidelines	To determine the appropriate mitigation measure for properties experiencing severe noise impacts, noise mitigation guidelines would be applied as follows: • Prior to operation of the HSR, the Authority will install sound barriers where they can achieve between 5 and 15 dB 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	Pre-construction/ Construction/ Post-construction	Reporting	Weekly	Authority	Authority	Ongoing monitoring during construction/post-construction monitoring as needed to assess damage to buildings	Contract Requirements/ Specifications Noise and Vibration Mitigation Guidelines	BIO #6	Impact text has not changed. Details about this impact can be found in the 2014 MMEP and its amendments.
										N&V#3	Moderate and severe noise impacts from project operation to sensitive receivers. Project noise impacts from Preferred Alternative: 2,776 moderate, and 1,994 severe impacts.
										PK#4	Kern River Parkway. Project impacts from operation of the HSR will increase noise exposure.

Table 1

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Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact #	Impact Text
		(examples are shown in Figure 3.4-14 of the [2014] 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									

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Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact #	Impact Text
		accept higher noise thresholds than the FRA's current noise thresholds. • 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 dB) 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 dB) 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 walls or sound installation 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. • Table 3.4-27 shows the reasonableness of each feasible									

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Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact #	Impact Text
		noise barrier. Of the six noise barriers evaluated, all noise barriers were determined to be feasible and reasonable because the barrier would provide a noise level reduction of 5 dBA or more and the cost to construct the barriers would not exceed $55,000 per benefited receiver. Table 3.4-27 also shows the height, approximate length, number of benefited receivers, total construction cost, the number of unmitigated severe impacts, and number of residual impacts (with mitigation) for each barrier height. Table 3.4-28 shows the breakdown of residual severe impacts based on each land use in each category. Figure 3.4-7 through Figure 3.4-10 show the noise barrier locations. A total of 31 receivers that would be severely impacted were not evaluated with a noise barrier because they are located in areas that do not meet the minimum number of 10 severely impacted receivers and a minimum barrier length of 800 feet. The 31 receivers consist of 28 residential land uses, 1 park, 1 Category 2 land use, and 1 Category 3 land use. Therefore, these receivers would be eligible for either sound insulation or payment of property for noise easements.									
N&V-MM#4	Vehicle Noise Specification	In the procurement of an HST 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-dB-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.	Pre-construction/ Construction/ Post-construction	Reporting	Weekly	Authority	Authority	Ongoing monitoring during construction/post-construction monitoring as needed	Contract Requirements/ Specifications Noise and Vibration Mitigation Guidelines	N&V#3	Moderate and severe noise impacts from project operation to sensitive receivers. Project noise impacts from Preferred Alternative: 2,776 moderate, and 1,994 severe impacts.
N&V-MM#5	Special trackwork	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	Pre-construction/ Construction/ Post-construction	Reporting	Weekly	Authority	Authority	Ongoing monitoring during construction/post-construction monitoring as needed	Contract Requirements/ Specifications Noise and Vibration Mitigation Guidelines	N&V#3	Moderate and severe noise impacts from project operation to sensitive receivers. Project noise impacts

Table 1
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Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact #	Impact Text
		cannot be moved from sensitive areas, the project can use special types of trackwork that eliminate the gap. Table 3.4-29 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.									from Preferred Alternative: 2,776 moderate, and 1,994 severe impacts.
										N&V #5	Impact text has not changed. Details about this impact can be found in the 2014 MMEP and its amendments.
N&V-MM#6	Additional Noise Analysis Following Final Design	If final design or final vehicle specifications result in changes to the assumptions underlying the noise analysis, reassess noise impacts and recommendations for mitigation and provide supplemental environmental documentation, as required by CEQA.	Preconstruction/ Design/ Operation	Reporting	Final design/Final vehicle specification	Contractor/Authority (vehicle)	Contractor/Authority (vehicle)	Final design/Final vehicle specification	Submit assessment and supplemental environmental documentation	N&V#3	Moderate and severe noise impacts from project operation to sensitive receivers. Project noise impacts from Preferred Alternative: 2,776 moderate, and 1,994 severe impacts.
N&V-MM#7	Station, Maintenance of Infrastructure Facility, and Traction Power Supply Station	In order to reduce the noise from the facilities, the following noise mitigation measures are recommended: • 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.	Pre-construction/Design/ Construction/Operation	Reporting	Final design	Contractor/Authority	Contractor/Authority	Final design and Construction/ Weekly reporting	Contract Requirements/ Specification	N&V #3	Moderate and severe noise impacts from project operation to sensitive receptors. Project noise impacts from Preferred Alternative: 2,776 moderate, and 1,994 severe impacts.
										N&V#6	The F Street Station will increase traffic volume and result in an increase in the future peak-hour noise level.
										N&V #7	Impact text has not changed. Details about this impact can be found in the 2014

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Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact #	Impact Text
		• Close facility doors where the rails enter the facility during nighttime activities. • Locate 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 barrier along the maintenance tracks in order to protect the adjacent noise-sensitive receivers. • Locate all mechanical equipment (compressors, pumps, generators, etc.) should be located within the facility structure. • Locate 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. • Point all ventilation ducting for the facility should be pointed away from the adjacent noise-sensitive receivers.									MMEP and its amendments.
Biological Resources											
BIO-MM#66	Implement Avoidance and Minimization Measures for BVLOS	The following Avoidance and Minimization Measures will be implemented for BVLOS: • The FRA and Authority will conduct habitat suitability determinations in potentially suitable BVLOS habitat not subject to previous field assessments to determine if the area falls into the suitable more xeric or suitable more mesic habitat categories. A report documenting the result of the habitat assessment and concluding if the area is either not suitable, marginal habitat, or suitable mesic or xeric habitat will be	Pre-construction, Construction, Post-construction	Conduct habitat suitability determinations, vegetation removal and small mammal trapping; compliance reporting	Weekly or as established by regulatory compliance permits	Contractor	Contractor	Weekly or as established by regulatory compliance permits	Condition of design-build contract condition of regulatory permits	BIO#1, 2, 6	Impact text has not changed. Details about these impacts can be found in the 2014 MMEP and its amendments.
										BIO#5	Project effects on special-status plant species

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Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact #	Impact Text
		prepared and submitted to the USFWS for review and concurrence. • In all suitable habitat areas, all above-ground herbaceous vegetation within the construction footprint will be cleared using hand tools (which can include weed whackers or mowers) under the supervision of a USFWS-approved BVLOS biological monitor. All leaf litter will be removed using rakes, or similar hand tools. All woody vegetation will be cut as closely to the ground as possible using hand tools (which can include chainsaws). Vegetation will be removed immediately and stored away from suitable BVLOS habitat. Such vegetation hand-removal efforts will be implemented in those areas that require vegetation removal in order to clearly detect Buena Vista Lake ornate shrew, and will continue at each habitat area until it is reasonably certain that Buena Vista Lake ornate shrew can be detected within the cleared areas. • After vegetation has been cleared from BVLOS-suitable habitat areas, nondisturbance exclusion fencing will be installed. In those areas where installation of fencing may not be feasible, the USFWS will be contacted and will provide direction on a case-by-case basis. The fencing will be installed under the supervision of the USFWS-approved biologist along the project footprint within BVLOS-suitable habitat areas. Fencing will be placed between areas of active construction and adjacent or nearby suitable habitat to preclude BVLOS from running across the construction site and into harm's way. The configuration of the fencing will likely vary between areas, and placement will be at the direction of the USFWS-approved biologist with input from the USFWS,									

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Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact #	Impact Text
		as required. Fencing may consist of a combination of both Environmentally Sensitive Area fencing and Wildlife Exclusion fencing with one-way exit/escape points. • If a shrew is subsequently found within the fenced work area, work will cease immediately and a section of fence removed so that the shrew may leave the fenced area on their own volition. The USFWS-approved biologist will monitor the shrew to ensure that any shrew has moved and remains outside the fence. • Prior to the start of construction activities in areas of marginal and suitable habitat (more mesic and more xeric) for BVLOS, the FRA and Authority will prepare a BVLOS monitoring and relocation plan. The plan will identify the handling and relocation methodology for any BVLOS encountered during construction activities. Handling and relocation will be conducted consistent with the USFWS's Survey Protocol for Determining Presence of the Buena Vista Lake Ornate Shrew (USFWS 2012). The plan will identify the process for the relocating of any captured BVLOS and will be approved by the USFWS prior to construction.								
BIO-MM#67	Compensate for Impacts on BVLOS	The compensatory mitigation ratios for BVLOS are based on the type of habitat being affected (more mesic or more xeric) by the project. Impacts to more mesic suitable habitat will be compensated at a 3:1 ratio through acquisition and preservation into perpetuity of occupied more mesic suitable habitat, or creation of occupiable more mesic suitable habitat. All proposed suitable BVLOS habitat compensation properties will be reviewed and approved by the USFWS.	Pre-construction, Construction, Post-construction	Compliance Report	Prior to operation or as established by regulatory compliance permits	Authority	Authority	Prior to operation or as established by regulatory compliance permits	Authority to provide compensatory mitigation for impacts on biological resources affected by the Contractor. Offsite habitat restoration, enhancement, and preservation program will be designed, implemented, and monitored consistent with the terms and conditions of regulatory permit requirements they apply to	BIO#2, 6	Impact text has not changed. Details about these impacts can be found in the 2014 MMEP and its amendments.

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Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact #	Impact Text
		Impacts to more xeric suitable habitat will be compensated at a 1:1 ratio by providing one acre of more xeric suitable habitat directly associated with (within 200 feet of) more mesic suitable habitat within a preserved or created mitigation parcel; or at a 0.33:1 ratio by preserving or creating one acre of more mesic suitable habitat for every three acres of more xeric suitable habitat disturbed. Final habitat compensation may consist of a combination of these, as approved by the USFWS. The overall goal is to provide contiguous blocks of more mesic habitat accompanied by more xeric habitat which supports the more mesic areas, or to provide suitable habitat of either type to serve as dispersal corridors among larger occupied or occupiable areas.							their jurisdiction and resources onsite.		
Hydrology and Water Resources											
HWR-MM#1	Floodplain Protection: Construction	The following measures shall be implemented during the construction period to mitigate potential impacts to floodplains, including the following: Implement standard floodplain measures, including best management practices (BMP), 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, and application of hydraulic mulch on disturbed streambanks. Designated construction employees and local districts shall monitor weather for heavy storms and potential flood flows. If a heavy storm or flood event is identified, construction equipment shall be relocated outside of the floodplain.	Construction	Reporting and monitoring	Weekly	Contractor local districts	Contractor	Construction weekly reporting	Reporting contract requirements/specifications	HWR#4	Temporary impacts on floodplains
HWR-MM#2	Floodplain Protection: Operation	The following measures shall be implemented as part of the project to reduce impacts to floodplains:	Construction	Reporting and monitoring	Weekly	Contractor hazardous materials monitor	Contractor	Construction/weekly reporting	Reporting contract requirements/specifications	HWR#8	Permanent impacts on floodplains

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Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact #	Impact Text
		A Conditional Letter of Map Revision to Federal Emergency Management Agency shall be required for all construction activities inside the Kern River. Potential impacts and mitigation measures for the Kern River shall require coordination with the Central Valley Flood Protection Board, the United States Army Corps of Engineers, the City of Bakersfield, and County of Kern.									
Safety and Security											
S&S-MM #2	Halliburton Facility	The following site-specific mitigation shall be implemented based on the Authority's Policy for Elevated Structures to allow continued use of the Halliburton Facility with development of the F-B LGA over a portion of the facility's parcel. The Authority shall be required to purchase the property underneath the F-B LGA viaduct, plus a10-foot maintenance access buffer on each side of the viaduct. An easement will then be negotiated with Halliburton for its continued use of the parcel, subject to conditions set forth by the Authority. The easement negotiated with Halliburton shall include the following stipulations: • Relocation of all privately controlled structures such as the old office building, acid dock, and truck wash from underneath the F-B LGA viaduct. • Relocation of all hazardous materials from underneath the F-B LGA viaduct. This includes the diesel fuel storage tanks, the nitrogen tank, the radioactive material bunker, the acid dock, and all of the storage of hazmat totes. The existing height of the barrier for the explosives bunker shall be increased to provide line-of-sight protection for the HSR trainway on the F-B LGA viaduct, per Bureau of Alcohol, Tobacco, Firearms, and Explosives regulatory requirements.	Construction/post-construction/operation	Property acquisition and easement negotiation	Weekly	Authority Contractor	Authority Contractor	Property purchase and easement negotiation	Easement negotiation with outlined stipulations	S&S #7	Risk of fire and explosions at specific parcels

Table 1
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Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact #	Impact Text
		Maintenance of the space underneath the F-B LGA viaduct to remove all hazardous materials and to minimize combustible materials such as wood, debris, and vegetation. Allow audits of security protocols and processes to ensure security measures continue the level of protection warranted. Allow HSR security personnel access, with notice, to the grounds around the F-B LGA viaduct 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. Notice must be provided to the Authority by Halliburton in the event of any missing explosives or shortage in explosives inventory.									
S&S-MM #3	Rain-for-Rent Facility	The following site-specific mitigation shall be implemented based on the Authority's Policy for Elevated Structures to allow continued use of the Rain-for-Rent Facility with development of the F-B LGA over a portion of the facility's parcel: The Authority shall be required to purchase the property underneath the F-B LGA viaduct, plus a10-foot maintenance access buffer on each side of the viaduct. An easement will then be negotiated with Rain-for-Rent for its continued use of the parcel, subject to conditions set forth by the Authority. The easement negotiated with Rain-for-Rent shall include the following stipulations: • Restriction against storage or temporary location of regulated quantities of hazardous materials from underneath the F-B LGA viaduct. • Maintenance of the space underneath the viaduct to eliminate	Construction/post-construction/operation	Property acquisition and easement negotiation	Weekly	Authority Contractor	Authority Contractor	Property purchase and easement negotiation	Easement negotiation with outlined stipulations	S&S #7	Risk of fire and explosions at specific parcels

Table 1

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Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact #	Impact Text
		all flammable and hazardous materials. • Allow the Authority to audit Rain-for-Rent security protocols and processes to ensure security measures continue the level of protection warranted. • Allow HSR security personnel access, with notice, to the area around the F-B LGA viaduct 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. • Allow only passenger cars and small trucks and vans to be parked in the employee parking under the F-B LGA viaduct on the Rain-for-Rent parcel.								
Socioeconomics and Communities											
SO-MM#1	Implement measures to reduce impacts associated with the division of residential neighborhoods	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. 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, and moving of homes and replacement of services and utilities, as appropriate. Before land acquisition, the Authority will conduct community	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.	SO #6	Disruption to community cohesion or division of existing communities from project operation

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Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact #	Impact Text
		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).									
SO-MM#3	Implement measures to reduce impacts associated with the displacement of key community facilities	The Authority will minimize impacts resulting from the disruption to key community facilities including the Golden Empire Transit District, Valley Oaks Charter School, Bakersfield Department of Motor Vehicles, the Shafter Golden Living Center (a nursing 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	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.	SO #1	Disruption to community cohesion or division of existing communities from project construction
										SO #6	Displacement of the Golden Empire Transit District, Valley Oaks Charter School, Bakersfield Department of Motor Vehicles, the Shafter Golden Living Center (a nursing facility)
										SO #12	Displacement of community facilities
										SO #18	Potential for physical deterioration

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Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact #	Impact Text
Agricultural Lands											
AG-MM#1	Preserve the Total Amount of Prime Farmland, Farmland of Statewide Importance, Farmland of Local Importance, and Unique Farmland	The Authority will enter into an agreement with the DOC California Farmland Conservancy Program to preserve farmland. 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 nonagricultural use by the Project. In addition, the Authority will provide an additional increment of Important Farmland mitigation acreage, above the 1:1 ratio minimum, at a level consistent with the terms of a settlement agreement the Authority reached with agricultural interests in County of Madera, et al. v. California High-Speed Rail Authority. This approach will provide a consistent approach to calculating the total amount of acres of agricultural conservation easements across the Central Valley. The California Farmland Conservancy Program will work with local, regional, or statewide entities whose purpose includes the acquisition and stewardship of agricultural conservation easements. The Authority and California Farmland Conservancy Program will develop selection criteria under this agreement to guide the pursuit and purchase of conservation easements. These will include, but are not limited to, provisions to ensure that the easements will conform to the requirements of Public Resources Code Section 10252 and to prioritize the acquisition of willing seller easements on lands that are adjacent to other protected agricultural lands or that	Pre-construction	Reporting	Monthly	Authority and California Farmland Conservancy	Authority	Prior to construction/monthly reporting	The Authority will enter into an agreement with the DOC California Farmland Conservancy Program to implement the preservation of farmland. The Authority and California Farmland Conservancy Program will develop selection criteria under this agreement to guide the pursuit and purchase of conservation easements.	AG#4	Impact text has not changed. Details about these impacts can be found in the 2014 MMEP and its amendments.
										AG#6	Effects on land under Williamson Act, Farmland Security Zone Contracts, or Local Zoning
										LU #2	Impact text has not changed. Details about these impacts can be found in the 2014 MMEP and its amendments.
										LU#3	Impact text has not changed. Details about these impacts can be found in the 2014 MMEP and its amendments.
										LU#5	Impact text has not changed. Details about these impacts can be found in the 2014 MMEP and its amendments.

Table 1
Amendment to the Mitigation Monitoring and Enforcement Program per the Fresno to Bakersfield Section Final Supplemental EIS (Measures Specific to the F-B LGA)

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact #	Impact Text
		would support the establishment of greenbelts and urban separators.									
AG-MM #2	Conserve Additional Important Farmland (Prime Farmland, Farmland of Statewide Importance, Farmland of Local Importance, and Unique Farmland) for Indirect Impacts Adjacent to HSR Permanently Fenced Infrastructure	The Authority will fund the purchase of agricultural conservation easements from willing sellers through the California Farmland Conservancy Program at a ratio of not less than 0.5:1 for Important Farmland within a 25-foot-wide area adjacent to permanently fenced HSR infrastructure, but only to the extent that such acreage is not otherwise subject to mitigation under AG-MM#1. The Authority shall document implementation of this measure through issuance of a compliance memorandum.	Pre-construction/construction	Compensation	Once	Authority	Authority	The Authority will fund the purchase of agricultural conservation easements from willing sellers through the California Farmland Conservancy Program.	The Authority shall document implementation of this measure through issuance of a compliance memorandum.	AG#4	Permanent conversion of agricultural land to nonagricultural use.
										AG#5	Effects on agricultural land from parcel severance
Parks, Recreation, and Open Space											
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	Prior to construction/ construction/post construction/operations. Authority to coordinate with local jurisdictions	The Authority will coordinate with the affected jurisdictions to identify appropriate funding amounts.	PK#2	Project acquisition of parks, recreation, and open space resources
Aesthetics and Visual Resources											
AVR-MM#2c	Screen At-Grade, Raised Embankments, and Elevated Guideways Adjacent to Residential Areas	Consistent with the design features developed under AVR-MM#2a, the contractor will plant trees along the edges of the rights-of-way in locations adjacent to residential areas. This will help reduce the visual contrast between the elevated guideway or raised	Construction/post-construction	Reporting	Monthly	Contractor and Authority	Contractor	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	AVR#4	Lower visual quality in the Rural San Joaquin Valley Landscape Unit: Burbank Street
										AVR#4	Lower visual quality in the North Bakersfield

Table 1

Amendment to the Mitigation Monitoring and Enforcement Program per the Fresno to Bakersfield Section Final Supplemental EIS (Measures Specific to the F-B LGA)

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact #	Impact Text
		embankment and the residential area. The species of trees to be installed will be selected on the basis of their mature size and shape, growth rate, hardiness, and drought tolerance. No species that is listed on the Invasive Species Council of California's list of invasive species will be planted. The crowns of trees used should ultimately be tall enough so that upon maturity they will partially or fully block or screen views of the elevated guideway or raised embankment from adjacent at-grade areas. Trees should allow ground-level views under the crowns (with pruning if necessary) while not interfering with the 15-foot clearance requirement for the guideway. The trees will be continuously maintained and appropriate irrigation systems will be installed within the tree planting areas.							the work, at which time the Authority shall assume responsibility for landscaping or maintenance.		Landscape Unit: Norris Road west of SR 99
AVR-MM#2g	Provide Sound Barrier Treatments	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). 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: • 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. Vegetation will be installed consistent with the provisions of AVR-MM#2f. Surface enhancements will be consistent	Pre-construction/construction	Reporting	Monthly	Contractor	Contractor	Construction/monthly reporting	Contract requirements/ specifications	AVR#4	Lower visual quality in the Shafter Town, Rural San Joaquin Valley, North Bakersfield, and Kern River Landscape Units
										AVR#5	Lower visual quality at Valley Oaks Charter School

Table 1
Amendment to the Mitigation Monitoring and Enforcement Program per the Fresno to Bakersfield Section Final Supplemental EIS (Measures Specific to the F-B LGA)

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact #	Impact Text
		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.									
AVR-MM#2i	Install Decorative Parapet Design at Kern River Crossing. Consistent with Mitigation Measure AVR-MM#2a.	During final design of the elevated viaduct over the Kern River and the Kern River Parkway Bike Trail, the Authority will consult with the City of Bakersfield to design a decorative parapet that fits with the viaduct's visual context. Reveals or recessed surfaces and motifs reflecting the natural environment of the Kern River shall be used on the outside surface of the parapet. The parapet and box girder shall be designed as a unified visual composition.	Final design	Consultation with City of Bakersfield, preparation of final design	Once	Authority	Authority	Consultation with City of Bakersfield and preparation of final design	Incorporation of agreed decorative design elements into final design	AVR#4	Change to visual quality as a result of the elevated viaduct over the Kern River and the Kern River Parkway Bike Trail

Authority = California High-Speed Rail Authority
BMP = best management practice
BVLOS = Buena Vista Lake ornate shrew
CEQA = California Environmental Quality Act
dB = decibel
DOC = California Department of Conservation
F-B LGA = Fresno to Bakersfield Locally Generated Alternative
FRA = Federal Railroad Administration
HSR = high-speed rail
MMEP = Mitigation Monitoring and Enforcement Plan
mph = miles per hour
USFWS = U.S. Fish and Wildlife Service

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Table 2
Fresno to Bakersfield Section Locally Generated Alternative Impact Avoidance and Minimization Measures

Impact Avoidance and Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact #	Impact Text
Air Quality											
AQ-IAMM #1	Truck Equipment	This action reduces construction related air quality emissions by requiring the covering of all materials (truck beds) transported on public roads.	Construction	Reporting	Daily	Contractor	Contractor	Daily Reporting	Condition of Design-Build Contract	AQ #1	Common regional air quality impacts during construction
										AQ #2	Compliance with air quality plans
										AQ #7	Localized air quality impacts to schools during construction
AQ-IAMM #2	Fugitive Dust Emissions	This action reduces construction related air quality emissions by requiring the preparation of a fugitive dust control plan. This plan identifies the minimum features that will be implemented during ground-disturbing activities. Examples of these include covering all materials (truck beds) transported on public roads, watering exposed graded surfaces, limiting vehicle speed on the construction site, suspending operations during high wind events, stabilizing all disturbed graded areas, wetting of exterior surfaces of structures during demolition, and removing any accumulation of mud or dirt from adjacent public streets. These types of construction best management practices are proven methods of minimizing fugitive dust generation associated with ground disturbing and demolition construction activities. Each air district traversed by the HSR has adopted rules and/or regulations requiring dust control plans for construction activities. These dust control plans are a part of each district's overall strategy for compliance with federal and state air quality standards.	Construction	Reporting	Weekly	Contractor	Contractor	Weekly Reporting	Condition of Design-Build Contract	AQ #1	Common Regional Air Quality Impacts during Construction
										AQ #2	Compliance with air quality plans
										AQ #7	Localized air quality impacts to schools during construction
AQ-IAMM #3	Trackouts	This action reduces construction related air quality emissions by requiring the removal of any accumulation of mud or dirt from adjacent public streets.	Construction	Contractor	Daily	Contractor	Contractor	Daily Reporting	Condition of Design-Build Contract	AQ #1	Common regional air quality impacts during construction
										AQ #2	Compliance with air quality plans
AQ-IAMM #4	Material Selection	This commitment reduces overall construction emissions by limiting the type of paint to those containing volatile organic compound (VOC) of less than 10 percent (low) to be used during construction. Using paint that releases fewer organic compounds into the air after application is an air quality management measure effective in reducing construction emissions and achieving federal and state air quality standards.	Design/Construction	Contractor	Monthly	Contractor	Contractor	At incorporation or completion of design/During construction report monthly	Condition of Design-Build Contract	AQ #7	Localized air quality impacts to schools during construction

Table 2
Fresno to Bakersfield Section Locally Generated Alternative Impact Avoidance and Minimization Measures

Impact Avoidance and Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact #	Impact Text
Noise and Vibration											
NV-IAMM #1	General Construction Guidelines-Noise and Vibration	This measure will reduce potential noise and vibration impacts from construction by requiring the Contractor to document how federal guidelines for minimizing noise and vibration will be employed when construction is occurring near sensitive receptors (such as hospitals, residential neighborhoods and schools).	Construction	Contractor	Monthly	Contractor	Contractor	At incorporation or completion of design/During construction report monthly	Condition of Design-Build Contract	N&V #1	Construction noise mitigation measures
										N&V #2	Construction vibration mitigation measures
EMI/EMF standards											
EMI/EMF-IAMM #1	EMCPP Design Features	This measure reduces potential exceedances to electromagnetic interference/electromagnetic field (EMI/EMF) standards by requiring the Contractor to work with railroad engineering departments and apply standard design practices to prevent interference with the electronic equipment operated on parallel railroad facilities. This measure reduces potential exceedances to EMI/EMF standards by requiring the Contractor to design the HSR to international guidelines and comply with federal and state laws and regulations related to electromagnetic fields/electromagnetic interference. Prior to construction, the Contractor will prepare an electromagnetic field/electromagnetic interference technical memorandum for review and approval by the Authority. Project design will follow the Implementation Stage Electromagnetic Compatibility Program Plan (ISEP) to avoid EMI and to provide for HSR operational safety. Similarly, project design will follow the EMCPP to avoid EMI and to ensure HST operational safety. Some features of the EMCPP include: During the planning stage through system design, the Authority will perform EMC/EMI safety analyses, which will 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	Design/Construction	Reporting	Monthly	Contractor	Contractor/ Authority	At incorporation or completion of design/During construction report monthly	Reporting Contractor	EMF/EMI #5	Impacts to sensitive equipment from EMI

Table 2
Fresno to Bakersfield Section Locally Generated Alternative Impact Avoidance and Minimization Measures

Impact Avoidance and Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact #	Impact Text
		the barrier, specific insulation design measures would be implemented. HST standard corrosion protection measures would be implemented to eliminate risk of substantial corrosion of nearby metal objects.									
EMI/EMF-IAMM #2	Controlling Electromagnetic Fields/Electromagnetic Interferences	This measure reduces potential exceedances to EMF/EMI standards by requiring the construction Contractor to design the HSR to international guidelines and comply with federal and state laws and regulations related to electromagnetic fields/electromagnetic interference. Prior to construction the Contractor will prepare an electromagnetic field/electromagnetic interference technical memorandum for review and approval by the Authority. Project design will follow the Implementation Stage Electromagnetic Compatibility Program Plan (ISEP) to avoid EMI and to provide for HSR operational safety.	Design/Construction	Reporting	Monthly	Contractor	Contractor/ Authority	At incorporation or completion of design/During construction report monthly	Reporting Contractor	EMF/EMI #5	Impacts to sensitive equipment from EMI
Public Utilities and Energy											
PUB-IAMM #1	Minimization of Utility Interruption	This measure requires that when relocating an irrigation facility is necessary, if feasible the Contractor will provide a new operational facility prior to disconnecting the original facility where feasible. Irrigation facility relocation preferences are included in the design-build contract and reduce unnecessary impacts to continued operation of irrigation facilities. This obligation reduces impacts to public utility interruptions by coordinating planned interruptions providing utility users an opportunity to plan appropriately for the service interruption. Prior to construction in areas where utility service interruptions are unavoidable, the Contractor will 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 will specify the estimated duration of the planned outage and would be published no less than seven days prior to the outage. Construction will be coordinated to avoid interruptions of utility service to hospitals and other critical users. The Contractor will submit the public communication plan to the Authority in advance of the work for verification that appropriate notification was provided. This measure reduces impacts to public utility interruptions by coordinating planned interruptions providing utility providers an opportunity to plan	Design/Construction	Reporting	Monthly	Contractor	Contractor	At incorporation or completion of design/During construction report monthly	Condition of Design-Build Contract	PU&E#8	Potential conflicts with fixed electrical facilities

Table 2
Fresno to Bakersfield Section Locally Generated Alternative Impact Avoidance and Minimization Measures

Impact Avoidance and Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact #	Impact Text
		appropriately for the service interruption. Prior to construction the Contractor shall prepare a technical memorandum documenting how construction activities will be coordinated with service providers to minimize or avoid interruptions, including upgrades of existing power lines to connect the HSR System to existing utility substations.									
Biological Resources											
BIO-IAMM #1	Environmental Design	At multiple locations, the route of the alternative alignments was altered to avoid impacts and effects to biological resources. 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.	Design/Construction	Contractor	Monthly	Contractor	Contractor	At incorporation or completion of design/During construction report monthly	Condition of Design-Build Contract	N/A	N/A
BIO-IAMM#2	Wildlife Crossing	Wildlife crossing opportunities will be available through a variety of engineered structures, including dedicated wildlife crossing structures, elevated structures, bridges over riparian corridors, road overcrossings and undercrossings, and drainage facilities (i.e., large-diameter [60- to 120-inch] culverts and paired 30-inch culverts). For a more detailed discussion of the crossing structures, including figures depicting the frequency and locations of these structures, refer to Figures 3-3a through 3-3d and Section 5.6 of the *Fresno to Bakersfield Section: Biological Resources and Wetlands Technical Report* (Authority and FRA 2012a).	Design/Construction	Contractor	Monthly	Contractor	Contractor	At incorporation or completion of design/During construction report monthly	Condition of Design-Build Contract	N/A	N/A
Hydrology and Water Resources											
HYD-IAMM #1	Storm Water Management and Treatment	This obligation reduces potential impacts to hydrology and water resources by requiring the preparation of a stormwater management and treatment plan (SWMTP). Implementation of the SWMTP reduces potential stormwater management impacts by evaluating each receiving storm water system's capacity to accommodate project runoff and identifying stormwater management designed to capture runoff and provide treatment prior to discharge of pollutant-generating surfaces. Such surfaces include station parking areas,	Design/ Construction	Contractor	Monthly	Contractor	Contractor	At incorporation or completion of design/During construction report monthly	Condition of Design-Build Contract	HWR #6	Permanent impact on surface water quality

Table 2
Fresno to Bakersfield Section Locally Generated Alternative Impact Avoidance and Minimization Measures

Impact Avoidance and Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact #	Impact Text
		access roads, new road overpasses and underpasses, reconstructed interchanges, and new or relocated roads and highways. Constructed wetland systems, biofiltration and bioretention systems, wet ponds, organic mulch layers, planting soil beds, and vegetated systems (biofilters), vegetated swales, and grass filter strips will be used where appropriate. If needed, stormwater infiltration or detention facilities will be built in compliance with the design standards.									
HYD-IAMM #2	Flood Protection	This measure reduces potential impacts to hydrology and water resources by requiring the Contractor to prepare a Flood Protection Plan (FPP) for Authority review and approval. Through implementation of the FPP, the project will be designed to both remain operational during flood events and to minimize increases in 100-year or 200-year flood elevations, as applicable to locale.	Design/ Construction	Authority/ Contractor	Monthly	Contractor	Contractor	At incorporation or completion of design/During construction report monthly	Condition of Design-Build Contract	HWR #8	Permanent impact on floodplains
HYD-IAMM #3	Construction Stormwater Pollution Prevention Plan	This action reduces potential impacts to hydrology and water resources by requiring the Contractor to prepare a construction period Stormwater Pollution Prevention Plan (SWPPP). Implementation of the SWPPP will provide 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 will include measures to provide permeable surfaces where feasible and to retain or detain and treat stormwater onsite.	Design/Construction	Reporting	Monthly	Contractor	Contractor	At incorporation or completion of design/During construction report monthly	Condition of Design-Build Contract	HWR #2	Temporary water quality impact
HYD-IAMM #4	Regional Dewatering Permit	The Central Valley RWQCB, Order No. R5-2008-0081, Waste Discharge Requirements General Order for Dewatering and Other Low Threat Discharges to Surface Waters, is a permit that covers construction dewatering discharges and some other listed discharges that do not contain significant quantities of pollutants, and that either (1) are 4 months, or less, in duration, or (2) have an average dry-weather discharge that does not exceed 0.25 million gallons per day.	Design	Permit	As required by permit conditions	Authority	Authority	Permit Application and Reporting	Reporting per Permit Requirements	HWR #3	Temporary impacts on groundwater quality and volume
HYD-IAMM #5	Flood Protection	The CVFPB regulates specific river, creek, and slough crossings for flood protection. These crossings must meet the provisions of Title 23 of the CCR. Title 23 requires that new crossings maintain hydraulic capacity through such measures as in-line piers, adequate streambank height (freeboard), and measures to protect against streambank and channel erosion. Section 208.10 requires that improvements, including crossings,	Design	Permit	As required by permit conditions	Authority	Authority	Permit Application and Reporting	Reporting per Permit Requirements	HWR #8	Permanent impact on floodplains

Table 2
Fresno to Bakersfield Section Locally Generated Alternative Impact Avoidance and Minimization Measures

Impact Avoidance and Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact #	Impact Text
		be constructed in a manner that does not reduce the channel's capacity or functionality, or that of any federal flood control project. The CVFPB reviews applications for encroachment permits for approval of a new channel crossing or other channel modification. For a proposed crossing or placement of a structure near a federal flood control project, the CVFPB coordinates review of the encroachment permit application with USACE pursuant to assurance agreements with USACE and the USACE Operation and Maintenance Manuals under Title 33 CFR, Section 208.10 and Title 33 U.S.C., Section 408. Under Section 408 of the Rivers and Harbors Act, the USACE must approve any proposed modification that involves a federal flood control project. A Section 408 permit would be required if construction modifies a federal levee. A Section 208.10 permit would be required where the project encroaches on a federal facility but does not modify it.								
HYD-IAMM #6	Industrial Stormwater Pollution Prevention Plan	This commitment reduces potential impacts to hydrology and water resources by requiring the Contractor to prepare an industrial facility SWPPP. The industrial facility SWPPP will include best management practices to control stormwater runoff from HSR industrial facilities such as vehicle maintenance yards. The SWPPP will include a monitoring plan for stormwater discharged from industrial facilities.	Design	Permit	As required by permit conditions	Authority	Authority	Permit Application and Reporting	Reporting per Permit Requirements	HWR #6	Permanent impact on surface water quality
Geologic Resources											
GEO-IAMM #1	General Guidelines to be Followed	2010 American Association of State Highway and Transportation Officials (AASHTO) Load and Resistance Factor Design Bridge Design Specifications and the 2009 AASHTO Guide Specifications for Load and Resistance Factor Design Seismic Bridge Design: 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 will provide minimum specifications for evaluating the seismic response of the soil and structures. Federal Highway Administration Circulars and Reference Manuals: These documents provide detailed guidance on the characterization of geotechnical conditions at sites, methods for performing foundation design, and recommendations on foundation construction. These guidance documents include methods for designing retaining walls used for retained	Design/Construction/ Operation	Design/ Reporting	Yearly	Contractor	Contractor	At incorporation or completion of design/During construction report monthly	Implementation of guidelines during design, construction, and operation phases	GSSP #1 through #11	

Table 2
Fresno to Bakersfield Section Locally Generated Alternative Impact Avoidance and Minimization Measures

Impact Avoidance and Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact #	Impact Text
		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 Manual: These guidelines deal with rail systems. Although they cover many of the same general topics as AASHTO, they are more focused on best practices for rail systems. The manual includes principles, data, specifications, plans, and economics pertaining to the engineering, design, and construction of railways. California Building Code: The code is based on 2009 International Building Code (IBC). This code contains general building design and construction requirements relating to fire and life safety, structural safety, and access compliance. IBC 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 ground shaking, minimum standards for structural design, and inspection and testing requirements. 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 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 Best Management Practices (BMPs) Manual and Construction Site Best Management Practice (BMP) Field Manual and Troubleshooting Guide that provide guidance and Best Management Practices for dewatering options and management, erosion control									

Table 2
Fresno to Bakersfield Section Locally Generated Alternative Impact Avoidance and Minimization Measures

Impact Avoidance and Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact #	Impact Text
		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. Most of the guidelines and standards cited above use ASTM or a corresponding series of standards from AASHTO to assure that quality is achieved in the constructed project.									
GEO-IAMM #2	Groundwater Withdrawal	This measure reduces potential impacts on geologic resources by requiring the Contractor to prepare a Construction Management Plan (CMP) which would address groundwater withdrawal. The CMP outlines how HSR engineering design appropriately addresses these geologic constraints.	Construction/Operation	Contractor	Yearly	Contractor	Contractor	Monthly record keeping and yearly reporting	Condition of Design-Build Contract	N/A	N/A
GEO-IAMM #3	Monitor Slopes	The measure calls for slope monitoring that will reduce potential impacts from geologic conditions by establishing an operation and maintenance procedure for locations identified in the CMP where potential for long-term instability exists. Such instability could result in loss of track support or where slope failure could result in additional earth loading to foundations supporting elevated structures. The monitoring program will provide a mechanism supplying early detection of potential slope instability.	Design/Construction	Contractor	Monthly	Contractor	Contractor	At incorporation or completion of design	Condition of Design-Build Contract	GSSP #1 GSSP #6	Encountering unstable soils during construction Effects of unstable soils on operations
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.	Design/Construction	Authority/ Contractor	Monthly	Authority/Contractor	Authority/ Contractor	At incorporation or completion of design	Condition of Design-Build Contract	N/A	N/A
GEO-IAMM #5	Improve Unstable Soils	The CMP would address unstable soils. The CMP outlines how HSR engineering design appropriately addresses these geologic constraints. This measure reduces impacts to geologic resources by requiring the Contractor to incorporate established engineering design guidelines and standards during the HSR design phase so HSR facilities are constructed to accepted engineering standards.	Design/Construction	Contractor	Monthly	Contractor	Contractor	At incorporation or completion of design	Condition of Design-Build Contract	GSSP #1 GSSP #6	Encountering unstable soils during construction Effects of unstable soils on operations

Table 2
Fresno to Bakersfield Section Locally Generated Alternative Impact Avoidance and Minimization Measures

Impact Avoidance and Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact #	Impact Text
GEO-IAMM #6	Improve Settlement-Prone Soils	The CMP would address subsidence. The CMP outlines how HSR engineering design appropriately addresses these geologic constraints. This measure provides for subsidence monitoring as part of HSR design and will reduce potential impacts resulting from geologic conditions by providing a remote monitoring program. Trains with autonomous equipment for daily track surveys will monitor and detect reduced track tolerance resulting in changed operations until track tolerances are restored to design specifications.	Design/Construction	Contractor	Monthly	Contractor	Contractor	Monthly Record Keeping	Condition of Design-Build Contract	GSSP #2	Soil settlement at structures or along trackway during construction
										GSSP #7	Effects of soil settlement on operations
GEO-IAMM #7	Prevent Water and Wind Erosion	The CMP would address water and wind. The CMP outlines how HSR engineering design appropriately addresses these geologic constraints.	Construction	Contractor	Monthly	Contractor	Contractor	Monthly Record Keeping	Contract Requirements/ Specifications	GSSP #3	Soil erosion during construction
GEO-IAMM #8	Modify or Remove and Replace Soils with Shrink-Swell Potential and Corrosion Characteristics	The CMP would address soils with shrink-swell potential. The CMP outlines how HSR engineering design appropriately addresses these geologic constraints.	Construction	Contractor	Monthly	Contractor	Contractor	Monthly Record Keeping	Condition of Design-Build Contract	GSSP #8	Effects of moderate to high shrink-swell potential on operations
										GSSP #9	Effects of moderately to highly corrosive soils on operations
GEO-IAMM #9	Evaluate and Design for Large Seismic Ground Shaking	This measure reduces impacts from geologic conditions by requiring evaluation and design for large seismic ground shaking in the engineering of all HSR components.	Design/Construction	Authority/ Contractor	Monthly	Authority/Contractor	Authority/ Contractor	Monthly Record Keeping	Condition of Design-Build Contract	GSSP #11	Effects of seismicity on operations
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.	Construction	Contractor	Monthly	Contractor	Contractor	Monthly Record Keeping	Condition of Design-Build Contract	GSSP #11	Effects of seismicity on operations
GEO-IAMM #11	Suspend Operations During or After an Earthquake	This commitment requires motion-sensing instruments be part of HSR design and will reduce potential impacts resulting from geologic conditions by providing a control system to shut down HSR operations temporarily during or after a potentially damaging earthquake.	Design/Construction/ Operation	Reporting	As Needed	Contractor/Authority	Contractor/ Authority	At incorporation or completion of design/During construction report monthly	As needed based on an Earthquake Event	GSSP #11	Effects of seismicity on operations
Hazardous Materials and Waste											
HMW-IAMM #1	Transportation of Materials	This action reduces potential impacts because of hazardous materials and waste by requiring a written hazardous materials and waste plan describing responsible parties and procedures for hazard waste	Construction/Operation	Reporting	Monthly	Contractor	Contractor	Weekly Record Keeping and Monthly Reporting	Condition of Design-Build Contract	HMW #1	Temporary transport, use, storage, and disposal of hazardous materials and wastes

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Impact Avoidance and Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact #	Impact Text
		transport. This reduces the likelihood of hazardous waste spills.								HMW #6	Transport, use, storage, and disposal of hazardous materials and wastes
HMW-IAMM #2	Property Acquisition	This action reduces potential impacts resulting from hazardous materials and waste by requiring completion of a Phase 1 environmental site assessment during the right-of-way acquisition phase. If documentation exists about potential hazardous waste on any parcel to be acquired, appropriate testing and remediation (if necessary) will be conducted in coordination with state and local agency officials.	Design/Construction	Reporting	Monthly	Contractor	Contractor	Phase 1 Report	Condition of Design-Build Contract	HMW #2	Inadvertent disturbance of hazardous materials or waste
										HMW #3	Construction on or in proximity to PEC sites
HMW-IAMM #3	Landfill	This measure reduces potential impacts resulting from hazardous materials and waste by requiring additional methane protection construction procedures for work within 1,000 feet of a landfill including detection systems and personnel training.	Construction	Reporting	Monthly	Contractor	Contractor	Monthly Record Keeping	Condition of Design-Build Contract	N/A	N/A
HMW-IAMM #4	Work Barriers	This action reduces potential impacts resulting from hazardous materials and waste by requiring additional construction procedures that limit the potential release of subsurface containments during construction.	Design/Construction	Reporting	Monthly	Contractor	Contractor	Monthly Record Keeping	Condition of Design-Build Contract	HMW #2	Inadvertent disturbance of hazardous materials or waste
										HMW #3	Construction on or in proximity to PEC sites
HMW-IAMM #5	Undocumented Contamination	This measure reduces potential impacts because of hazardous materials and waste by requiring preparation of a CMP addressing procedures for disturbing undocumented contaminated soil. The Contractor will work closely with state and local agencies to resolve any such encounters and address necessary cleanup or disposal.	Construction	Reporting	As Needed	Contractor	Contractor	Reporting as Needed	Condition of Design-Build Contract	HMW #2	Inadvertent disturbance of hazardous materials or waste
										HMW #4	Temporary hazardous material and waste activities in the proximity of schools
HMW-IAMM #6	Demolition Plans	This commitment reduces potential impacts resulting from hazardous materials and waste by requiring a demolition plan for the safe dismantling and removal of building components and debris including a plan for lead and asbestos abatement which can be prevalent in older structures. This measure reduces potential impacts resulting from hazardous materials and waste through preparation of a hazardous materials business plan addressing HSR operations.	Construction	Reporting	As Needed	Contractor	Contractor	Reporting as Needed	Condition of Design-Build Contract	HMW #2	Inadvertent disturbance of hazardous materials or waste
										HMW #4	Temporary hazardous material and waste activities in the proximity of schools
HMW-IAMM #7	Spill Prevention	This measure reduces potential impacts because of hazardous materials and waste by requiring a written CMP including a construction period spill prevention	Construction	Reporting	As Needed	Contractor/Authority	Contractor/ Authority	Reporting as Needed	Condition of Design-Build Contract	HMW #2	Inadvertent disturbance of hazardous materials or waste

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Impact Avoidance and Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact #	Impact Text
		plan. The plan will identify construction best management procedures designed to contain and prevent accidental spills, including procedures to clean up any accidental hazardous material release. This measure reduces potential impacts resulting from hazardous materials and waste through preparation of a spill prevention, control, and countermeasure plan addressing HSR operations.								HMW #4	Temporary hazardous material and waste activities in the proximity of schools
HMW-IAMM #8	Storage of Hazardous Materials	This measure reduces potential impacts resulting from hazardous materials and waste by requiring a written hazardous materials and waste plan describing responsible parties and procedures for hazard waste transport containment and storage best management practices. This reduces the likelihood of hazardous waste spills.	Construction/Operation	Reporting	Monthly	Contractor/Authority	Contractor	Weekly Record Keeping and Monthly Reporting	Condition of Design-Build Contract	HMW #1	Temporary transport, use, storage, and disposal of hazardous materials and wastes
										HMW #6	Transport, use, storage, and disposal of hazardous materials and wastes
HMW-IAMM #9	Material Selection	This requirement reduces potential impacts resulting from hazardous materials and waste through implementation of an annual review of hazardous materials used during construction and operation, and determining if there are acceptable nonhazardous materials substitutes.	Design/Construction/ Operation	Reporting	Yearly	Contractor/Authority	Contractor/ Authority	At Incorporation or Completion of Design/Yearly Reporting and Inventory	Condition of Design-Build Contract	HMW #1	Temporary transport, use, storage, and disposal of hazardous materials and wastes
										HMW #6	Transport, use, storage, and disposal of hazardous materials and wastes
Safety and Security											
S&S-IAMM #1	Emergency Vehicle Access	This action reduces potential safety and security impacts by requiring the Contractor to prepare a construction transportation plan that describes the Contractor's coordination efforts with local jurisdictions for maintaining emergency vehicle access during HSR construction.	Design/Construction	Design/Reporting	Monthly or as Needed during Construction	Contractor	Contractor	At Incorporation or Completion of Design/As Needed during Construction	Condition of Design-Build Contract	S&S #1	Accidents at construction sites
S&S-IAMM #2	Operation and Transportation Hazards	This action reduces potential safety and security impacts by requiring the Contractor to prepare a preliminary hazard analysis (PHA), collision hazard analysis (CHA), and threat and vulnerability assessment (TVA). The PHA follows the U.S. Department of Defense's System Safety Program Plan Requirements (MIL-STD-882) to identify and determine the facility hazards and vulnerabilities so that they can be addressed by and either eliminated or minimized through system design. CHAs follow the FRA's Collision Hazard Analysis Guide: Commuter and Intercity Passenger Service (FRA 2007) which provides a step-	Design/Construction	Design/Reporting	Monthly or as needed during construction	Contractor	Contractor	At Incorporation or Completion of Design/As Needed during Construction	Condition of Design-Build Contract	S&S #4	Train accidents

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Impact Avoidance and Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact #	Impact Text
		by-step procedure on how to perform a hazard analysis and how to develop effective mitigation strategies that will improve passenger rail safety. TVAs establish provisions for the deterrence and detection of, as well as the response to, criminal and terrorist acts for rail facilities and system operations.									
S&S-IAMM #3	Criminal and Terrorist Acts	TVAs establish provisions for the deterrence and detection of, as well as the response to, criminal and terrorist acts for rail facilities and system operations.	Design/Construction	Design/Reporting	Monthly or as needed during construction	Contractor	Contractor	At incorporation or completion of design/As needed during construction	Condition of Design-Build Contract	S&S #16	Criminal activity aboard trains and at stations
S&S-IAMM #4	Construction Safety Plan	The SSMP will include construction safety and security plans to establish minimum safety and security guidelines during construction and security programs that address the safety of passengers and employees during emergency response.	Design/Construction	Design/Reporting	Monthly or as needed during construction	Contractor	Contractor	At incorporation or completion of design/As needed during construction	Condition of Design-Build Contract	S&S #1	Accidents at construction sites
S&S-IAMM#4b	Valley Fever	Provide a qualified person dedicated to overseeing implementation of Valley Fever prevention measures to encourage a culture of safety of the construction contractors and subcontractors.	Design/Construction	Design/Reporting	Monthly or as needed during construction	Contractor	Contractor	At incorporation or completion of design/As needed during construction	Condition of Design-Build Contract	S&S #1	Accidents at construction sites: Valley Fever
S&S-IAMM#4c	Valley Fever	Addition of measures to the requirements of the Construction Safety and Health Plans regarding preventive measures to avoid Valley Fever exposure.	Design/Construction	Design/Reporting	Monthly or as needed during construction	Contractor	Contractor	At incorporation or completion of design/As needed during construction	Condition of Design-Build Contract	S&S #1	Accidents at construction sites: Valley Fever
S&S-IAMM #5	Fire/Life Safety Programs	The SSMP will include construction safety and security plans to establish minimum safety and security guidelines during construction and fire/life safety and security programs that address the safety of passengers and employees during emergency response.	Design/Construction/ Operation	Design/Reporting	Monthly or as needed during construction/ operation	Authority/Contractor	Authority/ Contractor	At incorporation or completion of design/As needed during construction	Condition of Design-Build Contract	S&S #4	Train accidents
S&S-IAMM #6	System Security Plans	The PHA follows the U.S. Department of Defense's System Safety Program Plan Requirements (MIL-STD-882) to identify and determine the facility hazards and vulnerabilities so that they can be addressed by and either eliminated or minimized through system design. CHAs follow the FRA's Collision Hazard Analysis Guide: Commuter and Intercity Passenger Service (FRA 2007), which provides a step-by-step procedure on how to perform a hazard analysis and how to develop effective mitigation strategies that will improve passenger rail safety.	Design/Construction/ Operation	Design/Reporting	Monthly or as needed during construction/ operation	Authority/Contractor	Authority/ Contractor	At incorporation or completion of design/As needed during construction	Condition of Design-Build Contract	S&S #4	Train accidents
										S&S #6	HSR accidents associated with seismic events
										S&S #7	Risk of fire
										S&S #9	Increased response times for fire, rescue, and emergency services associated with access to elevated track

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Impact Avoidance and Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact #	Impact Text
S&S-IAMM #7	Operating Procedure	The SSMP will reduce potential impacts on safety and security by requiring the Contractor to document how various federal (FRA), state Occupational Safety and Health Administration (OSHA) and Authority (design guidelines), plans, programs and guidelines were considered in HSR design, construction and eventual operation to protect the safety and security of construction workers and users of the HSR.	Operation	Design/Reporting	Monthly or as needed during operation	Authority	Authority	As needed during operation	Reporting	S&S #16	Criminal activity aboard trains and at stations
S&S-IAMM #8	FRA Requirements	The SSMP will reduce potential impacts on safety and security by requiring the Contractor to document how various FRA plans, programs, and guidelines were considered in HSR design, construction, and eventual operation to protect the safety and security of construction workers and users of the HSR.	Design/Construction/ Operation	Design/Reporting	Monthly or as needed during construction/operation	Authority/Contractor	Authority/ Contractor	At incorporation or completion of design/As needed during construction and operation	Condition of Design-Build Contract	S&S #4	Train accidents
										S&S #6	HSR accidents associated with seismic events
										S&S #7	Risk of fire
										S&S #9	Increased response times for fire, rescue, and emergency services associated with access to elevated track
S&S-IAMM #9	Worker Safety	This measure requires the Contractor to prepare a Safety and Security Management Plan (SSMP). It will reduce potential impacts on safety and security by requiring the Contractor to document how various federal (FRA), state Occupational Safety and Health Administration (OSHA) and Authority (design guidelines), plans, programs and guidelines were considered in HSR design, construction and eventual operation to protect the safety and security of construction workers and users of the HSR.	Design/Construction/ Operation	Design/Reporting	Monthly or as needed during construction and operation	Authority/Contractor	Authority/ Contractor	At incorporation or completion of design/As needed during construction and operation	Condition of Design-Build Contract	Impact S&S #4	Train accidents
										S&S #15	Hazards to HSR passengers and employees from flooding
										S&S #16	Criminal activity aboard trains and at stations
S&S-IAMM #10	Environmental Design	PHAs identify and determine the facility hazards and vulnerabilities so that they can be addressed by and either eliminated or minimized through system design; CHAs follow the FRA's Collision Hazard Analysis Guide: Commuter and Intercity Passenger Service (FRA 2007), which provides a step-by-step procedure on how to perform a hazard analysis and how to develop effective mitigation strategies that will improve passenger rail safety. TVAs establish provisions for the deterrence and detection of, as well as the response to, criminal and terrorist acts for rail facilities and system operations.	Design/Construction/ Operation	Design/Reporting	Yearly	Authority/Contractor	Authority/ Contractor	At incorporation or completion of design/As needed during construction and operation	Design process and reporting	S&S #16	Criminal activity aboard trains and at stations

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Impact Avoidance and Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact #	Impact Text
Socioeconomics and Communities											
SO-IAMM #1	Construction Management Plan	This measure will reduce potential impacts to neighborhoods and communities by requiring the Contractor to prepare a Construction Management Plan that includes measures that minimize impacts on community residents and businesses. The plan will include actions pertaining to communications, visual protection, air quality, safety controls, noise controls, and traffic controls.	Design/Construction	Reporting	Monthly	Contractor	Contractor	At incorporation or completion of design/Monthly Reporting during Construction	Condition of Design-Build Contract	N/A	N/A
SO-IAMM #2	Uniform Act and California Relocation Assistance Act Compliance	This action identifies how compliance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act, as amended (Uniform Act) would reduce potential impacts to socioeconomics and communities. 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. 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. Implementation of the Uniform Act reduces potential socioeconomic impacts by providing relocation assistance for people displaced through right-of-way acquisition. This measure will reduce potential impacts to property owners by requiring the Authority to develop a relocation mitigation plan, specific to the issues of each project section, to minimize the economic disruption related to relocation.	Design/Construction/ Operations	Reporting and meeting with interested parties	Monthly	Authority	Authority	Monthly Reporting and Record Keeping	Compliance with Acts, Creation of Ombudsmen Office and Reporting	N/A	N/A
Station Planning, Land Use, and Development											
LU-IAMM#1	Zone of Responsibility	This measure will reduce potential land use impacts by implementing sound design principles within the “zone of responsibility” around each HSR station. The Authority prepared Urban Design Guidelines (2011) to provide urban planning assistance to achieve great place making in the station areas. The application of sound urban design principles to the HSR 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 HSR system corridor.	Design/Construction/ Operation	Reporting	As needed during construction	Contractor/Authority	Contractor/ Authority	At incorporation or completion of design/Yearly Reporting during Construction	Meetings with local authority and contract specifications	N/A	N/A

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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.	Design/Construction	Reporting	Monthly	Contractor	Contractor	At incorporation or completion of design/Monthly Reporting during Construction	Condition of Design-Build Contract	N/A	N/A
Agricultural Land											
AG-IAMM #1	Restoration of Land Used for Temporary Staging Areas	This action reduces temporary impacts on Important Farmland by conserving agricultural land top soil through temporary stockpiling and then using that soil to restore agricultural lands to pre-project conditions after construction is completed. By stockpiling topsoil (the rich upper layer in which most plants have their roots), the agricultural productivity of the restored agricultural lands would be comparable to pre-project conditions.	Construction	Reporting	Monthly	Contractor	Contractor	Reporting	Condition of Design-Build Contract	N/A	N/A
AG-IAMM #2	Farmland Consolidation Program	This measure reduces impacts on agricultural farmland by administering a farmland consolidation program to sell remnant agricultural parcels to neighboring landowners for combining with adjacent farmland properties and continued agricultural productivity. Program implementation will reduce the amount of agricultural lands affected by HSR construction and operation.	Design/Construction	Reporting	Monthly	Authority	Authority	At incorporation or completion of design/Monthly Reporting during Construction	Weekly record keeping and monthly reporting	AG#4	Permanent Conversion of Agricultural Land to Nonagricultural Use
AG-IAMM #3	Permit Assistance	This commitment reduces permanent impacts to agricultural operations (confined animal facility) by providing land use and regulatory agency permit assistance to landowners needing to obtain new or amended permits to continue operation of a confined animal facility whose operations would modified or facilities relocated resulting from high-speed rail (HSR) construction and operation. Obtaining land use and regulatory permits for modified or relocated confined animal facilities can be a lengthy and arduous process that can result in the inability to modify or relocate such facilities in a timely manner. By providing permitting assistance, the Authority can reduce potential impacts on agricultural operations.	Design/Construction	Reporting	Monthly	Authority	Authority Representative	At incorporation or completion of design/Monthly Reporting during Construction	Weekly record keeping and monthly reporting/Authority Representative Assignment	N/A	N/A

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Impact Avoidance and Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact #	Impact Text
Parks, Recreation, and Open Space											
PRO-IAMM #1	Design Standards	This measure will reduce potential impacts on parks, recreation and open space by requiring the Contractor to incorporate design features into HSR design that provide for safe and attractive access to present park and recreation facilities. It also requires the Contractor to provide sufficient separation of the HSR guideway system to maintain the intended user experience (passive or active recreation or wilderness experience) to the extent feasible.	Design/Construction	Reporting	Monthly during construction	Contractor	Contractor	At incorporation or completion of design/Monthly Reporting during Construction	Condition of Design-Build Contract	N/A	N/A
Aesthetics and Visual Quality											
AVR-IAMM #1	Design Standards	This measure reduces the aesthetic and visual impacts of the HSR infrastructure components, including stations and elevated guideways, by applying design approaches to integrate structures within a community and to reduce the intrusiveness of large, elevated structures. It will also provide some consistency in the HSR design throughout the program. This action reduces the aesthetic and visual impacts of the HSR by providing urban design guidelines to be evaluated and applied increasing the compatibility of the HSR infrastructure within an existing, specific local design context.	Design/Construction/ Operation	Reporting	Monthly during construction and as needed during operation	Authority/Contractor	Authority/ Contractor	At incorporation or completion of design/Monthly Reporting during Construction and as needed during operation	Condition of Design-Build Contract	AVR #4	Lower visual quality
Cultural Resources											
CUL-IAMM #1	Protective Measures	This measure reduces potential cultural resource impacts by providing training on measures to avoid or protect built historic resources, and to recognize archaeological resources that may be encountered, and mandatory procedures to follow should potential cultural resources be exposed during construction. The training also provides project avoidance and mitigation features to project construction crews. Regularly updated mandatory training reduces potential impacts on cultural resources by producing a well-informed construction crew versed in operational procedures that must be followed during construction activity. This reduces the potential for unplanned impacts to cultural resources during construction activities. This measure calling for a Pre-Construction Conditions Assessment, Plan for Protection of Historic Built Resources and Repair of Inadvertent Damage. reduces potential impacts on historic cultural resources by identifying techniques to minimize inadvertent damage.	Design/Construction/ Operation	Reporting/ Meetings with Agencies	As needed	Authority/Contractor	Authority/ Contractor	At incorporation or completion of design/As needed	Meetings with interested agencies and compilation of reports/Reporting	CUL #1	Potential adverse effects on archaeological resources due to construction activities
										CUL #2	Potential adverse effects on historic architectural resources due to construction activities

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		If damage occurs, the plan calls for establishing standards of repair consistent with Secretary of the Interior's Standards for the Treatment of Historic Properties. This commitment to stabilize and protect historic buildings and structures susceptible to damage during construction reduces potential impacts on cultural resources. Temporary stabilization and protection measures will be removed after construction is completed. Properties will be restored to their pre-construction condition. Committing to prepare an archaeological sensitivity monitoring plan that identifies and maps areas of archaeological sensitivity reduces impacts on cultural resources by developing a systematic approach to cultural resource monitoring. The sensitivity of such areas is based on one or a combination of any of the following: known locations of archaeological sites, tribal consultation, landforms, depositional processes, distance to water, or historic mapping. This commitment to implement the plan by conducting archaeological and tribal monitoring during construction activities reduces impacts on cultural resources by providing assurances that construction activities will be conducted in a manner consistent with HSR cultural resource protocols procedures. Oversight by the Cultural Resource Compliance Manager and monitoring by qualified cultural resource and tribal monitors of construction activities near archaeologically sensitive areas reduces the potential for inadvertent construction impacts to cultural resources. This commitment to prepare and implement a built environment monitoring plan will reduce potential impacts on cultural resources by detailing an implementation strategy for monitoring historic structures and tying implementation of the measures to discrete steps in the construction process. The monitoring plan will define responsibilities and timing (spot check versus full time monitoring) to verify that monitoring occurs in an appropriate manner consistent with HSR cultural resource protocols and procedures.								
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	Design/Construction	Reporting	Weekly	Contractor	Contractor	At incorporation or completion of design/Weekly reporting or as dictated by the	BETP PA	CUL #2	Potential adverse effects on historic architectural resources

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		caused by the HSR System, in compliance with Section 106 and NEPA. As stipulated in the Section 106 programmatic agreement for the HSR program, implementation of a MOA is required for each project section, to be negotiated and agreed upon among the Authority, Federal Railroad Administration (FRA), and State Historic Preservation Officer (SHPO), and other signatories and consulting parties. The purpose is to reduce impacts on cultural resources by identifying agreed-upon resources that will or may be adversely affected by the Project. The MOA requires archaeological and built environment treatment plans to be prepared and include requirements that specify how commitments to the protection of cultural resources will be implemented for each HSR construction segment.						BETP and the MOA			due to construction activities
Transportation											
TRA-IAMM #1	Off-Street Parking for Construction-Related Vehicles	This measure will reduce potential impacts to transportation by requiring the Contractor to identify adequate off-street parking for all construction-related vehicles and use these spaces throughout the construction period, thereby reducing impacts to local on-street parking supply.	Design/Construction	Design-Build and Construction Transportation Plan to be prepared prior to construction, followed by reporting.	Weekly	Contractor	Contractor	At incorporation or completion of design/ Implementation during construction	Condition of Design-Build Contract	TR #1	Construction (not including stations) impacts on circulation and emergency access
										TR #5	Impacts on circulation from Bakersfield station construction
										TR #7	Impacts on circulation from rural area construction
										TR #9	Construction (not including stations) impacts on school districts
TRA-IAMM #2	Maintenance of Pedestrian Access	This action will reduce potential impacts to transportation by requiring the Contractor to prepare and implement specific construction management plans to address maintenance of pedestrian access during the construction period.	Design/Construction	Design-Build and Construction Transportation Plan to be prepared prior to construction, followed by reporting	Weekly	Contractor	Contractor	At incorporation or completion of design/ Implementation during construction	Condition of Design-Build Contract	TR #1	Construction (not including stations) impacts on circulation and emergency access
										TR #5	Impacts on circulation from Bakersfield station construction
										TR #7	Impacts on circulation from rural area construction

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										TR #9	Construction (not including stations) impacts on school districts
TRA-IAMM#3	Maintenance of Bicycle Access	This measure will reduce potential impacts to transportation by requiring the Contractor to prepare and implement specific construction management plans to address maintenance of bicycle access during the construction period.	Design/Construction	Design-Build and Construction Transportation Plan to be prepared prior to construction, followed by reporting	Weekly	Contractor	Contractor	At incorporation or completion of design/ Implementation during construction	Condition of Design-Build Contract	TR #1	Construction (not including stations) impacts on circulation and emergency access
										TR #5	Impacts on circulation from Bakersfield station construction
										TR #7	Impacts on circulation from rural area construction
										TR #9	Construction (not including stations) impacts on school districts
TRA-IAMM#4	Restriction on Construction Hours	This commitment will reduce potential impacts to transportation by limiting construction material deliveries and the number of construction employees arriving or departing the site during peak period travel resulting in reduced impacts on roadway performance levels.	Construction	Design-Build and Construction Transportation Plan to be prepared prior to construction, followed by reporting	Weekly	Contractor	Contractor	Implementation during construction	Condition of Design-Build Contract	TR #1	Construction (not including stations) impacts on circulation and emergency access
										TR #5	Impacts on circulation from Bakersfield station construction
										TR #7	Impacts on circulation from rural area construction
										TR #9	Construction (not including stations) impacts on school districts
TRA-IAMM#5	Construction Truck Routes	This measure will reduce potential impacts to transportation by requiring the Contractor to deliver all construction-related equipment and materials on the appropriate truck routes avoiding impacts on streets not designed to accommodate truck traffic.	Construction	Design-Build and Construction Transportation Plan to be prepared prior to construction,	Weekly	Contractor	Contractor	Implementation during construction	Condition of Design-Build Contract	TR #1	Construction (not including stations) impacts on circulation and emergency access
										TR #5	Impacts on circulation from Bakersfield station construction

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				followed by reporting						TR #7	Impacts on circulation from rural area construction
										TR #9	Construction (not including stations) impacts on school districts
TRA-IAMM #6	Protection of Public Roadways during Construction	This obligation will reduce potential impacts to transportation by requiring the Contractor to provide a photographic survey documenting the condition of the public roadways along truck routes providing access to the construction sites. 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 their original pre HSR construction structural condition, or better.	Construction	Design-Build and Construction Transportation Plan to be prepared prior to construction, followed by reporting.	Weekly	Contractor	Contractor	Implementation during construction	Condition of Design-Build Contract	TR #1	Construction (not including stations) impacts on circulation and emergency access
										TR #5	Impacts on circulation from Bakersfield station construction
										TR #7	Impacts on circulation from rural area construction
										TR #9	Construction (not including stations) impacts on school districts
TRA-IAMM#7	Maintenance of Public Transit Access and Routes	This action will reduce potential impacts to transportation by requiring the Contractor to prepare and implement specific construction management plans to address maintenance of public transit access during the construction period, including bus and rail transit service, stops, stations, and layover facilities.	Design/Construction	Design-Build and Construction Transportation Plan to be prepared prior to construction, followed by reporting	Weekly	Contractor	Contractor	At incorporation or completion of design/ Implementation during construction	Condition of Design-Build Contract	TR #1	Construction (not including stations) impacts on circulation and emergency access
										TR #5	Impacts on circulation from Bakersfield station construction
										TR #7	Impacts on circulation from rural area construction
										TR #9	Construction (not including stations) impacts on school districts
TRA-IAMM #8	Construction Transportation Plan	This commitment will reduce potential impacts to transportation by requiring the Contractor to prepare a detailed Construction Transportation Plan (CTP) for minimizing the impact of construction and construction	Design/Construction	Design-Build and Construction Transportation Plan to be	Weekly	Contractor	Contractor	At incorporation or completion of design/ Implementation	Condition of Design-Build Contract	TR #1	Construction (not including stations) impacts on circulation and emergency access

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Fresno to Bakersfield Section Locally Generated Alternative Impact Avoidance and Minimization Measures

Impact Avoidance and Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact #	Impact Text
		traffic on adjoining and nearby roadways. The CTP will address, in detail, the activities to be executed 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.		prepared prior to construction, followed by reporting				during construction		TR #5	Impacts on circulation from Bakersfield station construction
										TR #7	Impacts on circulation from rural area construction
										TR #9	Construction (not including stations) impacts on school districts
TRA-IAMM #9	Construction during Special Events	This action will reduce potential impacts to transportation by requiring the Contractor provide a mechanism to prevent roadway construction activities from reducing roadway capacity during major athletic or other special events that substantially (10 percent or more) increase traffic on roadways affect by Project construction activities.	Construction	Design-Build and Construction Transportation Plan to be prepared prior to construction, followed by reporting	Weekly	Contractor	Contractor	Implementation during construction	Condition of Design-Build Contract	TR #1	Construction (not including stations) impacts on circulation and emergency access
										TR #5	Impacts on circulation from Bakersfield station construction
TRA-IAMM#10	Protection of Freight and Passenger Rail during Construction	This measure will reduce potential impacts to transportation by requiring the Contractor to repair any structural damage to freight or public railways, 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.	Construction	Design/-Build and Construction Transportation Plan to be prepared prior to construction, followed by reporting.	Weekly	Contractor	Contractor	Implementation during construction	Condition of Design-Build Contract	TR #1	Construction (not including stations) impacts on circulation and emergency access
TRA-IAMM #11	Additional Features in the Cities of Fresno and Bakersfield	In addition to the measures listed above, the Authority will also perform the following in the cities of Fresno and Bakersfield: • 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	Construction	Design-Build and Construction Transportation Plan to be prepared prior to construction, followed by reporting.	Weekly	Contractor	Contractor	Implementation during construction	Condition of Design-Build Contract	TR #1	Construction (not including stations) impacts on circulation and emergency access
										TR #5	Impacts on circulation from Bakersfield station construction

Table 2
Fresno to Bakersfield Section Locally Generated Alternative Impact Avoidance and Minimization Measures

Impact Avoidance and Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact #	Impact Text
		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. The Authority will also include the following measures specific to the city of Fresno: • 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									

Table 2
Fresno to Bakersfield Section Locally Generated Alternative Impact Avoidance and Minimization Measures

Impact Avoidance and Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact #	Impact Text
		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.									

AASHTO = American Association of State Highway and Transportation Officials
ASCE = American Society of Civil Engineers
ASTM = American Society for Testing and Materials
Authority = California High-Speed Rail Authority
BETP = Built Environment Treatment Plan
BMP = best management practice
C.F.R. = Code of Federal Regulations
Caltrans = California Department of Transportation
CCR = California Code of Regulations
CHA = collision hazard analysis
CIDH = cast-in-drill-hole
CMP = Construction Management Plan
CMS = changeable message signs
CTP = construction transportation plan
CVFPB = Central Valley Flood Control Board
EMC = Electromagnetic Compatibility
EMCPP = Electromagnetic Compatibility Program Plan
EQ = Earthquake
FPP = Flood Protection Plan
FRA = Federal Railroad Administration
HSR = high-speed rail
IBC = International Building Code
MOA = Memorandum of Agreement
N/A = not applicable
NEPA = National Environmental Policy Act
OSHA = Occupational Safety and Health Administration
PA = Programmatic Agreement
PEC = potential environmental concern
PHA = preliminary hazard analysis
RWQCB = Regional Water Quality Control Board
SHPO = State Historic Preservation Officer
SR = State Route
SSMP = Safety and Security Management Plan
SWMTP= stormwater management and treatment plan
SWMTP= stormwater management and treatment plan
SWPPP = Stormwater Pollution Prevention Plan
TVA = threat and vulnerability assessment
Uniform Act = Uniform Relocation Assistance and Real Property Acquisition Policies Act, as amended
UPRR = Union Pacific Railroad
USACE = U.S. Army Corps of Engineers

MMEP Attachment A
Transportation Mitigation

	Caused by Alignment Construction	Caused by HSR Station Operation and Future Growth	Mitigation Detail	Final SEIR/EIS CH3.2 Table Location	Implementing Party and Monitoring/Reporting Party	Implementation / Reporting Schedule	Implementation Mechanism
Bakersfield Station							
Intersections							
7 – Mohawk Street/Hageman Road	N/A	**TR MM #3:** Add signal to intersection to improve LOS/operation. Add traffic signals to affected non-signalized intersections surrounding the proposed HSR station locations to improve LOS and intersection operation.	Install a traffic signal at the intersection.	**Table 3.2-28** Existing Plus Project F-B LGA Bakersfield Station Area Intersection Analysis **Table 3.2-29** Future (2035) Plus Project F-B LGA Bakersfield Station Area Intersection Levels of Service	**TR MM#3 - Implementing Party:** Authority and Contractor (station contractor) **Monitoring/Reporting Party:** Authority and Contractor (station contractor)	**TR MM#3:** Prior to Bakersfield Station opening	**TR MM #3:** MOU with City of Bakersfield, as necessary; contract with station contractor
8 – Mohawk Street/Rosedale Highway	N/A	**TR MM #4:** Restripe intersections. Restripe specific intersections surrounding the proposed HSR station locations to improve LOS and intersection operation.	Add a second westbound left-turn lane. This improvement already exists but is currently closed due to construction activity at the intersection.	**Table 3.2-29** Future (2035) Plus Project F-B LGA Bakersfield Station Area Intersection Levels of Service	**TR MM#4 - Implementing Party:** Authority and Contractor (station contractor) **Monitoring/Reporting Party:** Authority and Contractor (station contractor)	**TR MM#4:** Prior to Bakersfield Station opening	**TR MM #4:** MOU with City of Bakersfield and/or Caltrans, as necessary; contract with station contractor
12 – SR 99 Southbound Ramps/Olive Drive	N/A	**TR MM #3:** Add signal to intersection to improve LOS/operation. Add traffic signals to affected non-signalized intersections surrounding the proposed HSR station locations to improve LOS and intersection operation.	Install a traffic signal at the intersection.	**Table 3.2-28** Existing Plus Project F-B LGA Bakersfield Station Area Intersection Analysis	**TR MM#3- Implementing Party:** Authority and Contractor (station contractor) **Monitoring/Reporting Party:** Authority and Contractor (station contractor)	**TR MM#3:** Prior to Bakersfield Station opening	**TR MM #3:** MOU with City of Bakersfield, as necessary; contract with station contractor
13 – Dole Court/Snow Road	N/A	**TR MM #10:** Convert intersection stop control. Convert intersection stop-control from a two-way stop to an all-way stop.	Convert to all-way stop control.	**Table 3.2-23** Intersections Future (2035) Plus Project Levels of Service Summary – Kern County	**TR MM#10 - Implementing Party:** Authority and Contractor (station contractor) **Monitoring/Reporting Party:** Authority and Contractor (station contractor)	**TR MM#10:** Prior to Bakersfield Station opening	**TR MM #10:** MOU with City of Bakersfield, as necessary; contract with station contractor
14 – Norris Road/Snow Road	N/A	**TR MM #3:** Add signal to intersection to improve LOS/operation. Add traffic signals to affected non-signalized intersections surrounding the proposed HSR station locations to improve LOS and intersection operation.	Install a traffic signal at the intersection.	**Table 3.2-23** Intersections Future (2035) Plus Project Levels of Service Summary – Kern County	**TR MM#3 - Implementing Party:** Authority and Contractor (station contractor) **Monitoring/Reporting Party:** Authority and Contractor (station contractor)	**TR MM#3:** Prior to Bakersfield Station opening	**TR MM #3:** MOU with City of Bakersfield, as necessary; contract with station contractor

MMEP Attachment A
Transportation Mitigation

	Caused by Alignment Construction	Caused by HSR Station Operation and Future Growth	Mitigation Detail	Final SEIR/EIS CH3.2 Table Location	Implementing Party and Monitoring/Reporting Party	Implementation / Reporting Schedule	Implementation Mechanism
22 – Oak Street/Rosedale Highway-24th Street	N/A	**TR MM #6:** Widen approaches to intersections. Widen approaches to allow for additional turning or through-lanes to improve LOS and intersection operation. **TR MM #7:** Add exclusive turn lanes to intersections. Add exclusive turn lanes at specific intersections to improve LOS and intersection operation.	Widen the eastbound approach to provide one exclusive left-turn lane, three exclusive through lanes, and one exclusive right-turn lane.	**Table 3.2-29** Future (2035) Plus Project F-B LGA Bakersfield Station Area Intersection Levels of Service	**TR MM#6 and #7 - Implementing Party:** Authority and Contractor (station contractor) **Monitoring/Reporting Party:** Authority and Contractor (station contractor)	**TR MM#6 and #7:** Prior to Bakersfield Station opening	**TR MM #6 and TR MM #7:** MOU with City of Bakersfield, as necessary; contract with station contractor
26 – Oak Street/Truxtun Avenue	N/A	**TR MM #5:** Revise signal cycle length. Revise signal cycle length at specific intersections surrounding the proposed HSR station locations to improve LOS and intersection operation in consultation with the local appropriate jurisdiction.	Re-time the signal in the a.m. and p.m. peak hours.	**Table 3.2-29** Future (2035) Plus Project F-B LGA Bakersfield Station Area Intersection Levels of Service	**TR MM#5 - Implementing Party:** Authority and Contractor (station contractor) **Monitoring/Reporting Party:** Authority and Contractor (station contractor)	**TR MM#5:** Prior to Bakersfield Station opening	**TR MM #5:** MOU with City of Bakersfield, as necessary; contract with station contractor
26 – SR 43/Ash Avenue		**TR MM #8:** Add new lanes to roadway. Add additional roadway lanes to improve LOS and intersection operation. **TR MM #9:** Restripe roadway segment. Restripe specific roadway segments in the vicinity of the proposed HSR station locations to improve LOS and roadway segment operation.	Add a two-way left-turn lane on SR 43.	**Table 3.2-21** Intersections Future (2035) Plus Project Levels of Service Summary – City of Shafter	**TR MM#8 and #9 - Implementing Party:** Authority and Contractor (station contractor) **Monitoring/Reporting Party:** Authority and Contractor (station contractor)	**TR MM#8 and #9:** Prior to Bakersfield Station opening	**TR MM #8 and TR MM #9:** MOU with City of Bakersfield, as necessary; contract with station contractor
32 – Beech Avenue/Riverside Street		**TR MM #10:** Convert intersection stop control. Convert intersection stop-control from a two-way stop to an all-way stop.	Convert to all-way stop control.	**Table 3.2-21** Intersections Future (2035) Plus Project Levels of Service Summary – City of Shafter	**TR MM#10 - Implementing Party:** Authority and Contractor (station contractor) **Monitoring/Reporting Party:** Authority and Contractor (station contractor)	**TR MM#10:** Prior to Bakersfield Station opening	**TR MM #10:** MOU with City of Bakersfield, as necessary; contract with station contractor
36 – F Street/24th Street		**TR MM #5:** Revise signal cycle length. Revise signal cycle length at specific intersections surrounding the proposed HSR station locations to improve LOS and intersection operation in consultation with the local appropriate jurisdiction.	Re-time the signal in the p.m. peak hour.	**Table 3.2-29** Future (2035) Plus Project F-B LGA Bakersfield Station Area Intersection Levels of Service	**TR MM#5 - Implementing Party:** Authority and Contractor (station contractor) **Monitoring/Reporting Party:** Authority and Contractor (station contractor)	**TR MM#5:** Prior to Bakersfield Station opening	**TR MM #5:** MOU with City of Bakersfield, as necessary; contract with station contractor

MMEP Attachment A
Transportation Mitigation

	Caused by Alignment Construction	Caused by HSR Station Operation and Future Growth	Mitigation Detail	Final SEIR/EIS CH3.2 Table Location	Implementing Party and Monitoring/Reporting Party	Implementation / Reporting Schedule	Implementation Mechanism
37 – F Street/23rd Street		**TR MM #5:** Revise signal cycle length. Revise signal cycle length at specific intersections surrounding the proposed HSR station locations to improve LOS and intersection operation in consultation with the local appropriate jurisdiction. **TR MM #6:** Widen approaches to intersections. Widen approaches to allow for additional turning or through-lanes to improve LOS and intersection operation. **TR MM #7:** Add exclusive turn lanes to intersections. Add exclusive turn lanes at specific intersections to improve LOS and intersection operation. **TR MM #8:** Add new lanes to roadway. Add additional roadway lanes to improve LOS and intersection operation.	Widen the eastbound approach to provide one exclusive left-turn lane, two exclusive through lanes, and one shared through/right-turn lane. Re-time the signal in the a.m. and p.m. peak hours.	**Table 3.2-28** Existing Plus Project F-B LGA Bakersfield Station Area Intersection Analysis **Table 3.2-29** Future (2035) Plus Project F-B LGA Bakersfield Station Area Intersection Levels of Service	**TR MM#5, #6, #7, and #8 - Implementing Party:** Authority and Contractor (station contractor) **Monitoring/Reporting Party:** Authority and Contractor (station contractor)	**TR MM#5, #6, #7, and #8:** Prior to Bakersfield Station opening	**TR MM #5, TR MM #6, TR MM #7, and TR MM #8:** MOU with City of Bakersfield, as necessary; contract with station contractor
60 – M Street/SR 204/28th Street	N/A	**TR MM #6:** Widen approaches to intersections. Widen approaches to allow for additional turning or through-lanes to improve LOS and intersection operation. **TR MM #7:** Add exclusive turn lanes to intersections. Add exclusive turn lanes at specific intersections to improve LOS and intersection operation.	Widen the northbound approach to provide an exclusive left-turn lane and shared through/right-turn lane at the intersection.	**Table 3.2-29** Future (2035) Plus Project F-B LGA Bakersfield Station Area Intersection Levels of Service	**TR MM#6 and #7 - Implementing Party:** Authority and Contractor (station contractor) **Monitoring/Reporting Party:** Authority and Contractor (station contractor)	**TR MM#6 and #7:** Prior to Bakersfield Station opening	**TR MM #6 and TR MM #7:** MOU with City of Bakersfield, as necessary; contract with station contractor
89 – Union Avenue/California Avenue	N/A	**TR MM #5:** Revise signal cycle length. Revise signal cycle length at specific intersections surrounding the proposed HSR station locations to improve LOS and intersection operation in consultation with the local appropriate jurisdiction.	Re-time the signal in the p.m. peak hour.	**Table 3.2-29** Future (2035) Plus Project F-B LGA Bakersfield Station Area Intersection Levels of Service	**TR MM#5 - Implementing Party:** Authority and Contractor (station contractor) **Monitoring/Reporting Party:** Authority and Contractor (station contractor)	**TR MM#5:** Prior to Bakersfield Station opening	**TR MM #5:** MOU with City of Bakersfield, as necessary; contract with station contractor

MMEP Attachment A
Transportation Mitigation

	Caused by Alignment Construction	Caused by HSR Station Operation and Future Growth	Mitigation Detail	Final SEIR/EIS CH3.2 Table Location	Implementing Party and Monitoring/Reporting Party	Implementation / Reporting Schedule	Implementation Mechanism
101 – Beale Avenue/Jefferson Street-SR 178 Westbound Ramps	N/A	**TR MM #3:** Add signal to intersection to improve LOS/operation. Add traffic signals to affected non-signalized intersections surrounding the proposed HSR station locations to improve LOS and intersection operation.	Install a traffic signal at the intersection.	**Table 3.2-29** Future (2035) Plus Project F-B LGA Bakersfield Station Area Intersection Levels of Service	**TR MM#3 - Implementing Party:** Authority and Contractor (station contractor) **Monitoring/Reporting Party:** Authority and Contractor (station contractor)	**TR MM#3:** Prior to Bakersfield Station opening	**TR MM #3:** MOU with City of Bakersfield, as necessary; contract with station contractor
Roadway Segments							
3 – F Street, between 30th Street and 24th Street	N/A	**TR MM #9:** Restripe roadway segment. Restripe specific roadway segments in the vicinity of the proposed HSR station locations to improve LOS and roadway segment operation.	Convert center two-way left-turn lane to a dedicated northbound through lane	**Table 3.2-27 Future (2035) Plus Project** F-B LGA Bakersfield Station Area Roadway Segment Analysis	**TR MM#9 - Implementing Party:** Authority and Contractor (station contractor) **Monitoring/Reporting Party:** Authority and Contractor (station contractor)	**TR MM#9:** Prior to Bakersfield Station opening	**TR MM #9:** MOU with City of Bakersfield, as necessary; contract with station contractor
41 – Central Valley Highway (SR 43), north of E Los Angeles Avenue	N/A	**TR-MM#8:** SR 43 north of E. Los Angeles Avenue: Widen SR 43 from 2 to 4 lanes.	Widen the roadway to provide one additional lane in each direction prior to Bakersfield Station opening.	**Table 3.2-18 Future (2035) Plus F-B LGA** Roadway Segment Analysis – City of Shafter	**TR MM#8 - Implementing Party:** Authority and Contractor (station contractor) Monitoring/Reporting Party: Authority and Contractor (station contractor)	**TR MM#8:** Prior to Bakersfield Station opening	**TR MM #8:** MOU with City of Bakersfield, as necessary; contract with station contractor
64 – 30th Street between F Street and H Street	N/A	**TR MM #9:** Restripe roadway segment. Restripe specific roadway segments in the vicinity of the proposed HSR station locations to improve LOS and roadway segment operation.	Eliminate on-street parking to convert 30th Street from 2-lane Collector to 4-lane Collector	**Table 3.2-26 Existing Plus Project** F-B LGA Bakersfield Station Area Roadway Segment Analysis **Table 3.2-27 Future (2035) Plus Project** F-B LGA Bakersfield Station Area Roadway Segment Analysis	**TR MM#9 - Implementing Party:** Authority and Contractor (station contractor) **Monitoring/Reporting Party:** Authority and Contractor (station contractor)	**TR MM#9:** Prior to Bakersfield Station opening	**TR MM #9:** MOU with City of Bakersfield, as necessary; contract with station contractor

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APPENDIX D: STATE HISTORIC PRESERVATION OFFICER CONCURRENCE LETTER

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STATE OF CALIFORNIA – THE NATURAL RESOURCES AGENCY EDMUND G. BROWN, JR., *Governor*

OFFICE OF HISTORIC PRESERVATION
DEPARTMENT OF PARKS AND RECREATION
1725 23rd Street, Suite 100
SACRAMENTO, CA 95816-7100
(916) 445-7000 Fax: (916) 445-7053
calshpo@parks.ca.gov
www.ohp.parks.ca.gov

September 14, 2017

Reply in Reference To: FRA100524C

Amy MacKinnon
Cultural Resources Specialist
California High-Speed Rail Authority
770 L Street, Suite 620
Sacramento, CA 95814

Re: Supplemental Section 106 Findings of Effect, Locally Generated Alternative, Fresno to Bakersfield Section High-Speed Train Project, Fresno County, California

Dear Ms. Allred:

Thank you for the letter received August 31, 2017, continuing consultation regarding the above-referenced deliverable. The High Speed Rail Authority (Authority) is consulting, on behalf of the Federal Railroad Administration (FRA), pursuant 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 Rail Authority regarding Compliance with Section 106 of the National Historic Preservation Act, as it Pertains to the California High-Speed Train Project* (PA) and Stipulation IV of the subsequent 2016 *First Amended Memorandum of Agreement Among the Federal Railroad Administration, the California High-Speed Rail Authority, the Surface Transportation Board, the U.S. Army Corps of Engineers, Sacramento District, the California State Historic Preservation Officer, and the Advisory Council on Historic Preservation Regarding the Fresno-Bakersfield Section of the California High-Speed Train System in Fresno, Kings, Tulare, and Kern Counties* (MOA).

Included with the consultation package was the following document:

- *California High-Speed Rail Authority Fresno to Bakersfield Section Supplemental Section 106 Findings of Effect, Locally Generated Alternative*, prepared by JRP Historical Consulting, LLC, in September, 2017

The Findings of Effect (FOE) report for the Locally Generated Alternative (LGA) of the Fresno to Bakersfield (F-B) Section of the HSR Project analyzes potential effects on historic properties from the LGA alternative between Poplar Street in Shafter and Oswell Street in Bakersfield. The LGA FOE analyzes potential effects on 14 historic properties within the historic architecture APE for the F-B LGA. The LGA FOE concludes that the F-B LGA would cause unavoidable indirect adverse effects on four historic properties (MR #00A, #00B, #042, and #075) and no direct effects, as shown in the table below.

Table 1. Summary of Section 106 Effects Findings for Historic Properties within the APE for the F-B LGA

Map ID No.	APN	Resource Name and Address	City, County	Year Built	Effect Findings
MR #00A	027-030-08	Santa Fe Passenger Train and Freight Depot 150–200 Central Valley Highway	Shafter, Kern	1917, circa 2000	**Adverse Effect - Indirect**
MR #00B	N/A	San Francisco & San Joaquin Valley Railroad, Shafter Section House 434 Central Valley Highway	Shafter, Kern	1898	**Adverse Effect - Indirect**
MR #00C	N/A	Friant-Kern Canal	N/A, Kern	1945–1951	No Adverse Effect
MR #025	116-021-08 116-021-09 116-021-08 116-070-14	San Joaquin Compress and Warehouse Company 4130 State Road	Bakersfield, Kern	1925	No Adverse Effect
MR #133	N/A	Statue of Father Garces	Bakersfield, Kern	1939	No Adverse Effect
MR #042	002-240-02	Republic Supply Company (Golden Empire Gleaners) 1326 30th Street	Bakersfield, Kern	1937–1946	**Adverse Effect - Indirect**
MR #055	002-120-07	Division of Forestry Services Office 2731-2738 "O" Street; 1120 Golden State Avenue	Bakersfield, Kern	1942–1948	No Adverse Effect
MR #075	014-350-09	Kern County Land Company Warehouse 210 Sumner Street	Bakersfield, Kern	1880	**Adverse Effect - Indirect**
MR #097	016-050-05	Noriega's 525 Sumner Street	Bakersfield, Kern	1893–1940	No Adverse Effect
MR #107	016-060-12	Amestoy Hotel (formerly Cesmat Hotel and Narducci's) 622 E 21st Street	Bakersfield, Kern	1899	No Adverse Effect
MR #116	014-370-01	Southern Pacific Depot 730 Sumner Street	Bakersfield, Kern	1889, 1941	No Adverse Effect
MR #120	016-070-12 016-070-13 016-070-14	Fire Station Number Two 716 E 21st Street	Bakersfield, Kern	1940	No Adverse Effect

Map ID No.	APN	Resource Name and Address	City, County	Year Built	Effect Findings
MR #00D	141-130-25	Folk Victorian 2509 E California Avenue	Bakersfield, Kern	c. 1898	No Adverse Effect
MR #030	N/A	State Route 204/Golden State Avenue	Bakersfield, Kern	1933-1963	No Adverse Effect

The Authority revised the FOE following the State Historic Preservation Officer's (SHPO) comments of June 1, 2017. Those comments recommended additional consultation with consulting parties regarding the general mitigation measures included in the FOE. The Authority undertook the recommended consultation and will continue to work with consulting parties on property-specific mitigation, which will be included in the treatment plans for the undertaking.

The Authority and FRA have made the finding that the undertaking will result in an indirect adverse effect to the four properties noted in the table above; the remaining 10 properties will not be adversely affected. After reviewing the information submitted with your letter, I offer the following comments:

- I concur that the undertaking will result in an indirect adverse effect to the four properties noted in the table above, per 36 CFR § 800.5(d)(2).

Thank you for considering historic properties during project planning and I look forward to continuing this consultation with you. If you have any questions, please contact Kathleen Forrest of my staff at (916) 445-7022 or Kathleen.Forrest@parks.ca.gov.

Sincerely,

Julianne Polanco
State Historic Preservation Officer

Cc: Stephanie Perez, FRA
Dave Navecky, Surface Transportation Board
Erin Hess, U.S. Army Corps of Engineers, Sacramento District
Sarah Stokely, Advisory Council on Historic Preservation

APPENDIX E: SECTION 4(F) CONCURRENCE LETTER

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BAKERSFIELD

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www.bakersfieldparks.us

Recreation and Parks enhances the quality of life through a variety of programs, parks and partnerships.

City of Bakersfield Recreation & Parks

Fax

To: Mark McLoughlin **From:** Dianne Hoover

email: mark.mcloughlin@hsr.ca.gov **Fax:** ~~Fax:~~ **Pages:** 5

Phone: 916-324-1541 **Date:** 9/17/18

Re: HSR - Bakersfield - Section 4(f) **cc:** / /

☐ **Urgent** ☐ **For Review** ☐ **Please Comment** ☐ **Please Reply** ☐ **Please Recycle**

• **Comments:**

CALIFORNIA
High-Speed Rail Authority

September 4, 2018

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.

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

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

770 L Street, Suite 620, Sacramento, CA 95814 • T: (916) 324-1541 • F: (916) 322-0827 • www.hsr.ca.gov

APPENDIX F: JULY 28, 2017, BIOLOGICAL OPINION (BUENA VISTA LAKE ORNATE SHREW)

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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

In Reply Refer to:
08ESMF00-
2012-F-0247-R001

JUL 28 2017

Marlys A. Osterhues
Chief, Environmental & Corridor Planning Division
Office of Railroad Policy and Development
U.S. Department of Transportation, Federal Railroad Administration
1200 New Jersey Avenue, SE
Washington, D.C. 20590

Subject: Reinitiation of Formal Consultation on the California High-Speed Train System: Fresno to Bakersfield Section Project, Fresno, Tulare, Kings, and Kern Counties Biological Opinion (08ESMF00-2012-F-0247)

Dear Ms. Osterhues:

This letter is in response to the April 17, 2017 letter from the California High-Speed Rail Authority (Authority), on behalf of the Federal Railroad Administration (FRA), requesting reinitiation of formal consultation with the U.S. Fish and Wildlife Service (Service) on the California High-Speed Train System: Fresno to Bakersfield Section Project (Project), in Fresno, Tulare, Kings, and Kern Counties, California, Construction Packages 1c, 2-3 and 4 (CP 1c, CP 2-3, CP 4). The biological opinion was originally issued on February 28, 2013, and amended April 1, 2014 (2013 FB-BO) (Service File Number 08ESMF00-2012-F-0247). In addition, in a letter dated June 24, 2016, the Authority on behalf of the FRA requested a minor amendment to the 2013 FB-BO for modifications to the approved project due to proposed Early Work Variations for CP 2-3, including roadway work for mitigation of transportation impacts, use and demolition of acquired properties, and creation of a temporary geotechnical test embankment and associated borrow site. This response is provided under the authority of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.* (Act) and in accordance with the implementing regulations pertaining to interagency cooperation (50 CFR§402).

At issue is the revision of the Biological Opinion to include the federally-listed as endangered Buena Vista Lake ornate shrew (*Sorex ornatus relictus*); remove the federally-listed as threatened valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*); revise effects to include additional activities for the federally-listed as endangered Tipton kangaroo rat (*Dipodomys nitratoides nitratoides*) and blunt-nosed leopard lizard (*Gambelia sila*); address the effects of additional activities for the federally-listed as threatened Central California Distinct Population Segment of the California tiger salamander (*Ambystoma californiense*); and revise effects due to increased disturbance acreage for the federally-listed as endangered blunt-nosed leopard lizard, San Joaquin kit fox (*Vulpes macrotis mutica*), Tipton kangaroo rat, Kern mallow (*Eremalche kernensis*), San Joaquin woolly-threads (*Monolopia congdonii*) and the federally-listed as threatened Hoover's spurge (*Chamaesyce hooveri*).

The 2013 FB-BO issued on February 28, 2013, analyzed the Project's effects on federally-listed species and exempted take for the Project, which originally ran from the proposed Fresno station in downtown Fresno southeast to the Bakersfield station east of downtown Bakersfield. At the request of the Authority and the FRA in their letter of October 8, 2013 (FRA 2013), we amended the 2013 FB-BO to reflect 140 administrative edits proposed by the Authority that clarified language throughout the 2013 FB-BO but did not alter the Project's description. In addition, we included slight changes proposed by the Authority to the Project's footprint as a result of realigning one track, and we added habitat preservation and restoration activities proposed by the Authority on their purchased mitigation parcel located along Cross Creek in Kings and Tulare counties. We exempted take associated with these changes and restoration activities through our amended BO letter to the FRA, dated April 1, 2014 (2013 FB-BO as amended April 1, 2014).

The Project's original Biological Assessment (BA) prepared by the Authority (Authority and FRA 2012) did not consider Buena Vista Lake Ornate Shrew (BVLOS) as a potentially affected species, based on limited available information on the species' range. As a result, the 2013 FB-BO did not analyze impacts to BVLOS. Results of recent trapping and camera detection efforts (Brian Cypher et al. 2017) and the discovery of a carcass in an area previously not known to support BVLOS (Bill Vanherweg pers. comm. 2017) indicate that the range of BVLOS overlaps the Project alignment, and that the Project's footprint contains areas of suitable habitat as well as marginally suitable habitat. Therefore, this document represents the Service's biological opinion on the effects of the proposed action on BVLOS.

In September 2014, the Service published a notice in the Federal Register to withdraw a proposal to delist the valley elderberry longhorn beetle (VELB) (Service 2014). In the withdrawal notice, the Service refined the range of the VELB to a smaller area than what was initially published in the delisting proposal. The range revision resulted from a Service review of published scientific literature and consultations with experts on the VELB. As a result, the Service no longer considers Kings, Kern, and Tulare counties within the VELB range. Further, consultations with experts since September 2015, indicate that the VELB likely does not occur in Fresno and Madera counties, further reducing the species' known range. Any elderberry shrubs within these counties are no longer considered VELB habitat and are not subject to the Service's VELB guidelines and conservation measures. Currently, the Service considers the VELB range to be along the valley floor and low foothills from Tehama County south through Merced County.

The 2013 FB-BO did not analyze effects to Tipton kangaroo rat (TKR) as a result of relocation activities and burrow excavation (trapping, handling, holding, transporting, and relocating), and Cultural Resources Management (CRM) activities required to mitigate the Project's impacts to cultural resources. Further, the 2013 FB-BO did not analyze effects to blunt-nosed leopard lizard (BNLL) and Central California tiger salamander (CTS) as a result of burrow excavation (handling, holding, transporting, and relocating) and Cultural Resources Management (CRM) activities. Therefore, this reinitiation addresses effects to TKR, BNLL and CTS as a result of these activities.

In addition, this reinitiation addresses modifications to the approved Project and revises estimates of habitat loss to six of the 12 federally-listed species as a result of the Early Work Variations. Finally, this reinitiation reflects the refinement of the potential effects analysis on Hoover's spurge as provided by the Authority in a memorandum dated June 18, 2014.

This reinitiation is based on the following: (1) the April 17, 2017 letter requesting reinitiation of formal consultation and the April 2017 *Fresno to Bakersfield Project Section Construction Packages 2/3 and 4 Biological Assessment Addendum 003* (BVLOS BA), enclosed with the April 17 letter; (2) email

correspondence between representatives of the Service and the Authority, including the May 4, 2017 email from the Authority requesting clarifications to the status of the VELB and covered activities for take of TKR; (3) the June 24, 2016 letter requesting a project update amendment to the 2013 FB-BO and the June 2016 *Biological Opinion Informal Consultation for Fresno to Bakersfield Early Work Variations Amendment 001* (Early Works BA), enclosed with the June 24 letter; (4) the June 18, 2014 memorandum from the Authority refining the analysis of potential effects on Hoover's spurge; (5) telephone correspondence between representatives of the Service and the Authority; and (6) other information available to the Service including notification of recent additional positive and negative BVLOS detection efforts (Cypher et al. 2017).

Table A. Estimates of habitat loss for the Federally-listed Buena Vista Lake ornate shrew within the Fresno to Bakersfield Section Project.

BVLOS Habitat Type	Total*
More Mesic Suitable Habitat	39.02
More Xeric Suitable Habitat	37.79
Suitable Habitat Total	**76.81**
Marginal Habitat Total	**51.18**

* This column includes calculations of features that were characterized as suitable habitat in both more mesic habitat (moist soil associated with canals and water impoundments, riparian vegetation, emergent wetland vegetation) and more xeric habitat (grasslands and alkali sink scrub within 200 feet of canals and other water sources). The acreage included in the more xeric suitable habitat features was calculated assuming a 60-foot-wide construction corridor along the proposed roadwork at Avenue 88 from the edge of the canal west to Road J33. This acreage may be refined upon final design of the roadwork. In addition, this column includes calculations of marginal habitat that are present within the project footprint and are in addition to the areas of suitable habitat.

Table B. Revised estimates of habitat loss for Federally-listed species within the Fresno to Bakersfield Section Project.

Federally-listed Species (habitat)	2013 FB-BO Incidental Take Statement*	Additions from Early Work Variations	Revised Total
San Joaquin kit fox (highly suitable)	754.56	14.38	**768.94**
San Joaquin kit fox (other habitat)	4,596.67	35.70	**4,632.37**
Tipton kangaroo rat	453.85	14.17	**468.02**
blunt-nosed leopard lizard	98.06	10.41	**108.47**
vernal pool tadpole shrimp (*Lepidurus packardi*) (direct)	0.0041	0.00	**0.0041**
vernal pool tadpole shrimp (indirect)	0.0560	0.00	**0.0560**
California jewelflower (*Caulanthus californicus*)	15.00	0.00	**15.00**
Kern mallow	214.36	3.57	**217.93**
San Joaquin woolly-threads	489.34	2.43	**491.77**
California tiger salamander (aquatic)	18.30	0.00	**18.30**
California tiger salamander (upland)	18.70	0.00	**18.70**
vernal pool fairy shrimp (*Branchinecta lynchi*) (direct)	29.77	0.00	**29.77**
vernal pool fairy shrimp (indirect)	103.52	0.00	**103.52**
Hoover's spurge	2.54	3.57	**6.11**

* This column includes changes included in the April 12, 2014 amendment, and presents the Project's maximum estimated habitat disturbance, which was evaluated using a minimum and maximum acreage range for each of these species. The Service anticipates actual impact acreage will be less, and will be refined once the Authority has gained access to all construction areas.

The Service has determined that these revisions within CP 2-3 and CP 4 do not change our jeopardy determination provided in the 2013 FB-BO.

BIOLOGICAL OPINION

The 2013 FB-BO is amended as follows. New sections and paragraphs are added to their corresponding sections and page numbers, and deleted paragraphs are identified. Minor text changes (i.e., individual numbers or sentences) are shown as underlined for added text and strike-out for deleted text.

On page 7, at the end of **Consultation History, add:**

June 18, 2014:	The Service received the Authority's Memorandum refining the analysis of potential effects on Hoover's spurge, consistent with the final environmental impact report/final environmental impact statement.
June 24, 2016:	The Service received the Authority's request to amend the 2013 FB-BO to address the June 2016 *Biological Opinion Informal Consultation for Fresno to Bakersfield Early Work Variations Amendment 001* enclosed.
July 12, 2016:	The Service received via email the undated revised *Tulare County Road Overlay Work Areas at Road 24 and Road 40 in Support of the California High Speed Rail, Construction Package 2-3 Biological Resources Assessment.*
August 26, 2016:	The Service provided via email comments on the undated draft *Project Description and Proposed Small Mammal Trapping (Presence/Absence) for HSR CP2-3 Road Overlay Work at Road 24 and Road 40 in Tulare County.*
November 1, 2016	The Service received via email the *2016 Blunt-nosed Leopard Lizard Survey Results* for CP 4 dated September 15.
November 15, 2016	The Service attended a site visit with the Authority to known BVLOSe occurrence locations including Kern National Wildlife Refuge (KNWR), Main Drain Canal, and Atwell Island.
February 22, 2017	The Service attended a meeting with the Authority and its consultants at the consultant's office to discuss BVLOS conservation measures.
March 1, 2017	The Service attended a site visit with the Authority, FRA and CDFW to a recent BVLOS occurrence location at Pixley National Wildlife Refuge (PNWR). In addition, BVLOS habitat at Poso Creek and Lake Alpaugh was visited, and potential TKR relocation sites were visited.
March 31, 2017	The Service provided comments and substantially updated data gathered from field visits to the Authority on the draft *Analysis of Potential Habitat for the Buena Vista Lake Shrew – Phase 1* dated January 2017.
April 3, 2017	The Service provided additional field data to further refine the draft *Analysis of Potential Habitat for the Buena Vista Lake Shrew – Phase 1* dated January 2017.

April 19, 2017 The Service received via email the April 17, 2017 letter from the Authority requesting reinitiation of formal consultation with the April 2017 *Fresno to Bakersfield Section Construction Packages 2/3 and 4 Biological Assessment Addendum 003* enclosed.

April 24, 2017 The Service received via email the *San Joaquin Kit Fox Den Replacement Plan: CP 4, Kern County California* dated April 12, 2017.

April 26, 2017 The Service received via email the *Construction Phase Weed Control Plan* for CP 4.

May 3 and 8, 2017 The Service received via email draft BNLL survey area maps prepared by the CP 2-3 Design/Build team and draft BNLL survey area maps from the CP 4 PCM team

June 14-30, 2017: The Service received emails from the Authority providing and refining BVLOS acreage calculations for the Early Work Variations, and providing distance calculations for recent BVLOS detections to closest water sources. The Service also received via email a letter report dated June 8, 2017, concerning a Kern mallow observation along the CP, 2-3 alignment. The Service exchanged emails with the Authority concerning corrected listed species acreage calculations for the Early Work Variations.

July 3, 6, and 21, 2017: The Service provided via email information to the Authority concerning BVLOS habitat north of Jackson Avenue in response to a June 20, 2017 email request. The Authority provided via email information to the Service concerning revised habitat calculations for the Early Work Variation.

Description of the Proposed Action

On page 8, under **Project Description, delete** the fifth paragraph concerning elderberry shrubs.

On page 24, **add** before **Construction Methods**:

Other Project Components

Since certification of the *Fresno to Bakersfield Section California High-Speed Train (HST) Final Project Environmental Impact Report/Environmental Impact Statement* (EIR/EIS, Authority and FRA 2014) and through the design-build process, refined infrastructure improvements and modified project elements have been identified. These additional project components are described briefly below.

Mitigation of transportation impacts in Tulare County

Mitigation measures in the Final EIR/EIS require that if a proposed permanent road closure restricts access, alternative access shall be provided through connections to existing roadways or through new road connections, if feasible. Extension of the HST alignment through southwestern Tulare County will result in closures of local roadways and redirection of traffic to grade-separated crossings. The Authority and the County of Tulare have entered into a cooperative agreement to address modifications to transportation infrastructure necessary to implement the approved HST project and to satisfy required mitigation measures.a

The following provides a summary of the proposed improvements:

- Avenue 136 – Add an additional lane, plus shoulders
- Road 24 – Resurface
- Avenue 120 – Add an additional lane, plus shoulders (Hess Avenue)
- A new frontage road between Avenue 120 that would be an extension of Road 40 to north of Avenue 112 within Tulare County's right-of-way – Construct new roadway, plus shoulders
- Road 40 Resurface
- Avenue 88 – Construct new roadway, plus shoulders.

The following provides a summary of the proposed improvements on roadways adjacent to Allensworth:

- Avenue 56 (County Road J22) – Resurface and add shoulders – Resurface and add additional lane
- Avenue 24 – Resurface and add additional lane

A bridge structure is proposed over the Kings County Canal (i.e., Homeland Canal) along Avenue 88 to provide for connectivity of access for this mitigation feature. In addition, a box three-season undercrossing with 15.5 feet of vertical clearance and a 24-foot width will be provided where Avenue 24 crosses the HST alignment.

There would be a total of 87.79 acres of land in Tulare County modified for the roadway improvements. This includes 29.96 acres required for construction staging that would result in short-term temporary impacts and 57.83 acres of permanent impacts.

Demolition activities

The proposed Early Work Variations include demolition actions on five properties and conversion to temporary construction easement use on an additional three properties for a total of 4.56 acres. Portions of each of the eight properties were included in the original Final EIR/EIS footprint and were therefore assessed in the 2014 FB-BO. The Early Work Variations involve extending the project footprint to the entire extent of these parcels, and demolition of structures (four residences and one animal pen) on the five remaining properties. The areas within each property that were not included in the Final EIR/EIS footprint, and therefore are not analyzed in the 2014 FB-BO, are the areas that are part of the Early Work Variations footprint.

Geotechnical test embankment and borrow site

To address the potential for soil settlement, a temporary geotechnical test embankment will be built to simulate an HST embankment and evaluate the amount and rate of settlement of existing soils along the southern end of CP 2-3. The total area of disturbance, including the test site, access ramp and borrow location, would be 10.19 acres. The geotechnical test embankment would be located on the proposed HST alignment, south of Avenue 32 near Allensworth. Access to the geotechnical test location would be from California Highway 43 through Palmer Avenue, Road 84, Avenue 39, Young Road, and Avenue 32. Prior to construction, the temporary geotechnical test area would be prepared in a similar manner to what is anticipated for the HST embankments. The test embankment area is located on lands that have been continually disked by the landowners. The geotechnical test embankment would be built using 40,000 cubic yards of soil from a borrow site located within the HST alignment near Avenue 56. The test embankment would cover an area of

approximately 220 feet by 260 feet at its base (at current grade elevation) and an area of 60 feet by 100 feet on top of the test embankment, and would be approximately 40 feet above the existing grade. Side slopes would be 1 foot vertical for each 2 feet of horizontal. The soil would be compacted to the same standards as the proposed HST embankments. If the soils are suitable for embankment to support the HST tracks, they will remain in place as part of the permanent embankment. If determined to be unsuitable, the material will be removed and used on other portions of the project where it would meet grading specifications, such as overcrossings. If the embankment remains in place, the borrow site would be either backfilled or graded to meet the final elevation as proposed in the final design.

On page 25, under **Project Description, Construction Methods,** *Pre-Construction Activities*, **add** the following paragraph to the end of 6:

CRM activities may be required in the event of unanticipated archaeological resource discoveries during any necessary cultural resource investigations or during routine construction activities. To mitigate the Project's impacts to cultural resources, a variety of equipment and excavation techniques may be used. Additional testing during survey activities may require excavation of 0.25-x-0.5 meter hand shovel excavated test pits and screening the soil through wire mesh. Discovery of an archaeological site would require evaluation taking the form of excavating larger areas by hand with a shovel and hand auger, and screening the soil through wire mesh. Archaeological discoveries in soil too difficult to excavate by hand, located in areas difficult or dangerous for humans to access, or large enough to require mechanical assistance would require a mechanical excavator or backhoe trenching. Excavations of this size usually need a water screening installation to process the large amount of soil removed. A typical water screening installation would include one or two large container boxes with several screens set up and a system of hoses to run the water through excavated soil. In some cases the use of ground-penetrating radar to focus in on subsurface archaeological deposits may be necessary. Most archaeological deposits found in the San Joaquin Valley are within 3 feet of the ground surface. However, archaeological deposits have been found in excess of 20 feet. Paleontological deposits may be even deeper.

On page 45, under **Conservation Measures, Species Specific Conservation Measures,** *Tipton kangaroo rat* **delete** 3.a.

On page 46, under **Conservation Measures, Species Specific Conservation Measures,** *Tipton kangaroo rat* **revise** last sentence of 3.b. Small mammal trapping and relocation will be performed by a Service approved biologist(s) ~~with a valid 10(a)(1)(a) permit~~.

On page 46, under **Conservation Measures, Species Specific Conservation Measures, add** the following between TKR and CTS:

Buena Vista Lake ornate shrew

1.a FRA and Authority will conduct habitat suitability determinations in potentially suitablea BVLOS habitat not subject to previous field assessments to determine if the area falls intoa the suitable more xeric or suitable more mesic habitat categories. A report documenting thea result of the habitat assessment and concluding if the area is either not suitable, marginala habitat or suitable mesic or xeric habitat will be prepared and submitted to the Service fora review and concurrence.a

2. In all suitable (mesic and xeric) habitat areas, all above-ground herbaceous vegetation within the construction footprint will be cleared using hand tools (which can include weed whackers or mowers) under the supervision of a Service-approved BVLOS biological monitor. All leaf litter will be removed using rakes, or similar hand tools. All woody vegetation will be cut as closely to the ground as possible using hand tools (which can include chainsaws). Vegetation will be removed immediately and stored away from suitable BVLOS habitat. Such vegetation hand-removal efforts will be implemented in those areas that require vegetation removal in order to clearly detect BVLOS, and will continue at each habitat area until it is reasonably certain that BVLOS can be detected within the cleared areas

3. After vegetation has been cleared from BVLOS suitable habitat areas, non-disturbance exclusion fencing will be installed. In those areas where installation of fencing may not be feasible, the Service will be contacted and will provide direction on a case by case basis. The fencing will be installed under the supervision of the Service-approved Project biologist along the Project footprint within BVLOS suitable more mesic and more xeric habitat areas. Fencing will be placed between areas of active construction and adjacent or nearby suitable habitat to preclude BVLOS from running across the construction site and into harm's way. The configuration of the fencing will likely vary between areas, and placement will be at the direction of the Service-approved Project biologist with input from the Service, as required. Fencing may consist of a combination of both Environmentally Sensitive Areas (ESA) Fencing and Wildlife Exclusion fencing (WEF) with one way exit/escape points.

4. If a shrew is subsequently found within the fenced work area, work will cease immediately and a section of fence removed so that the shrew may leave the fenced area on their own volition. The Service-approved biologist will monitor the shrew to ensure that any shrew has moved and remains outside the fence.

5. Prior to the start of construction activities in areas of marginal and suitable habitat (more mesic and more xeric) for BVLOS, the FRA and Authority will prepare a BVLOS monitoring and relocation plan. The plan will identify the handling and relocation methodology for any BVLOS encountered during construction activities. Handling and relocation will be conducted consistent with the Service's Survey Protocol for Determining Presence of the Buena Vista Lake Ornate Shrew (Service 2012a). The plan will identify the process for the relocating any captured BVLOS and will be approved by the Service prior to construction.

6. Impacts to more mesic suitable habitat for the BVLOS will be compensated, per conservation measure #22, at a 3:1 ratio through acquisition and preservation in perpetuity of occupied more mesic suitable BVLOS habitat, or creation of occupiable more mesic suitable BVLOS habitat. All proposed suitable BVLOS habitat compensation properties will be reviewed and approved by the Service. Impacts to more xeric suitable habitat for the BVLOS will be compensated, as described in Table C. Compensation for impacts to more xeric suitable habitat can be accomplished by one of the following methods: for each acre of more xeric suitable habitat disturbed within the Project area, provide one acre of more xeric suitable habitat directly associated with (within 200 feet of) more mesic suitable habitat within a preserved or created mitigation parcel; or preserve or create one acre of more mesic suitable habitat for every three acres of more xeric suitable habitat disturbed. Final habitat compensation may consist of a combination of these, as approved by the Service. The overall goal is to provide contiguous blocks of more mesic habitat accompanied by more

xeric habitat which supports the mesic areas, or to provide suitable habitat of either type to serve as dispersal corridors among larger occupied or occupiable areas.

Table C. Proposed Buena Vista Lake ornate shrew habitat compensation ratios.

BVLOS Habitat Type Taken	Mitigation Ratio	BVLOS Habitat Type to be Preserved/Created
More Mesic Suitable Habitat	3:1	More mesic suitable habitat
More Xeric Suitable Habitat	1:1	More xeric suitable habitat within 200 feet of more mesic suitable habitat
	0.33:1	More mesic suitable habitat

On page 50, under **Conservation Measures, Species Specific Conservation Measures,** *Valley elderberry longhorn beetle*, **delete** all three species-specific conservation measures.

On page 52, under **Action Area, replace with:**

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." For the purposes of the effects assessment, the action area includes the CHST-FB alignment footprint, lands surrounding it, the Early Work Variations area, and the 405-acre FCMS.

Several potential alignments have been identified in the Revised Draft Environmental Impact Report/Supplemental Draft Environmental Impact Statement for the proposed project. These alternatives include varying siting for not only rail alignments, but also other project infrastructure, including passenger stations, power delivery structures, maintenance-of-way facilities, operations control centers, and a Heavy Maintenance Facility. Since an alternative has not been selected to date for all components of the Fresno to Bakersfield Section, this biological opinion includes a project description and effects analysis for all alternative alignments, and assesses effects to federally-listed species based on a range of impacts from minimum to maximum (expressed in acreages). Regardless of the final alignment selected, project impacts will be similar geographically as well as in general nature and magnitude.

The project footprint extends to the physical limits of the construction activities associated with the proposed action. The project footprint includes all areas that will be permanently or temporarily affected by the proposed action. The footprint consists of the limits of cut and fill plus all access roads and areas required for operating, storing, and refueling construction equipment. The estimated project footprint for the CHST-FB Project alignment is expected to be no greater than approximately 7,189 acres.

The estimated length of the Fresno to Bakersfield alignment will extend up to 117 miles. The area affected by disturbance from noise and vibrations, dust, and lighting during project construction is expected to extend up to 1,000 feet from both sides of the track. Associated project structures, such as roadway improvements, overcrossings, related ancillary facilities, and other permanent project elements, are included in the estimated project action area for the CHST- FB Project. The project action area for the Fresno to Bakersfield alignment, including the project footprint, the Early Work Variations area, and the 405-acre FCMS is estimated to be no greater than 48,856 acres, which will be considered for the purposes of this opinion.

On page 53, under **Status of the Species,** between TKR and BNLL **add:**

Buena Vista Lake ornate shrew

Listing Status: On June 1, 2000, the Service proposed to list the BVLOS as endangered (Service 2000), and on March 6, 2002, the Service determined that the BVLOS was endangered (Service 2002). Fragmentation and habitat loss are the primary causes for the decline and endangered status of the BVLOS. On August 19, 2004, the Service proposed designating a total of 4,649 acres of critical habitat in five units in Kern County for the subspecies (Service 2004), and on January 24, 2005, the Service designated 84 acres of critical habitat at the Kern Lake parcel in Kern County (Service 2005a). That rule was legally challenged, and as part of the settlement agreement the Service agreed to reconsider the designation. On October 21, 2009, the Service published a revised proposal to designate the original 4,649 acres (Service 2009). In order to address several newly identified BVLOS occurrences, on July 10, 2012, the Service published a an additional revised proposed critical habitat rule identifying an additional 525 acres, and recalculated the original acreage to 4,657 acres, bringing the total proposed critical habitat to 5,182 acres in seven units in Kings and Kern counties (Service 2012b). On July 2, 2013, the Service published a final rule designating 2,485 acres of critical habitat in six units in Kings and Kern counties (Service 2013).

Description: Nine subspecies comprise the ornate shrew, which is widely distributed throughout California and northern Baja California (Maldonado et al. 2004). Ornate shrews are small, about the size of a mouse and have a long pointed snout, five toes on each foot, tiny beadlike eyes, soft dull black to grey-brown fur, visible external ears, and a scaly, well developed tail covered with very short hairs (Ingles 1965; Vaughan 1978; Jamerson and Peeters 1988; Churchfield 1990, as cited in Service 2002). Shrews are active during the day and night but are rarely seen due to their small size and cryptic behavior.

Distribution: The BVLOS formerly inhabited the interconnected network of tule marshes and other permanent and seasonal lakes, wetlands, and sloughs around the historic Tulare, Kern, and Buena Vista lakes, and presumably throughout the Tulare Basin (Williams and Harpster 2001). Joseph Grinnell described and named the Buena Vista Lake ornate shrew from three specimens collected along the east side of the old Buena Vista Lake in 1932 (Grinnell 1932). According to Grinnell (1932), Summit Lake is the highest point in the Kings River delta, where the Kings River northern distributaries would either flow north into the San Joaquin river system during periods of high water and high Tulare Lake levels, or more typically flow south to the Tulare Lake. Grinnell (1932) further noted that two shrews collected from the Kern River near Bakersfield in the collection of the Museum of Vertebrate Zoology showed characteristics associated with *relictus.*

At the time the BVLOS was described, its populations were already declining due to diversion and impounding of rivers, draining of lakes, and destruction of wetland and riparian habitat surrounding these water features primarily for agricultural development (Grinnell 1932). The current distribution of the shrew is not well known, but likely is very restricted due to the loss of over 95% of its apparently preferred wetland habitat and the lack of connectivity between populations, the channelization of streams and rivers and removal of vegetation along their edges, the unreliability of water resources at its remaining localities due to agricultural, and urban diversion. At the tim e the shrew was listed in 2002, it was only known to occur in four small localities with no estimate of population size. Although it has been found in additional locations since, habitat loss and fragmentation along with other anthropogenic and natural factors continues to threaten the species.

The BVLOS apparently historically occurred in wetlands around Buena Vista Lake, and presumably in wetland and riparian areas throughout the Tulare Basin (Grinnell 1932). The Tulare Basin, essentially occupying the southern half of the San Joaquin Valley, had no regular outlet to the ocean and contained Buena Vista, Kern, and Tulare lakes. These lakes were fed by the Kern, Kaweah, Tule and Kings rivers and their tributaries and were interconnected by hundreds of square miles of tule marshes and other permanent and seasonal lakes, wetlands, and sloughs (Williams and Harpster 2001). Tulare Lake was the largest freshwater lake in the U.S. west of the Mississippi River. Today the lakes and wetlands have been drained and converted into irrigated agricultural fields, though portions of the historical lake beds fill with water in years of extraordinary runoff (Williams and Kilburn 1992). The species began to decline due to the disappearance of lakes and sloughs when rivers were first impounded and diverted, lakes were drained, and the wetland and riparian areas around them were destroyed for agriculture in the late 1800's and early 1900's. As early as 1933, Grinnell found the distribution of the shrew to be highly restricted due to the widespread disappearance of its habitat (Grinnell 1933).

For more than 50 years the BVLOS was known only from the type locality at Buena Vista Lake, where it was presumed to be extinct because its wetland habitat had been replaced by agricultural lands. The BVLOS was rediscovered at Kern Lake Preserve in 1986, on private property, and at KNWR in 1992 (Williams and Harpster 2001).

When the species was listed in 2002, the BVLOS was only known to occur in four locations along an approximately 70 mile stretch on the west side of the Tulare Basin. The four locations were the former Kern Lake Preserve in the old Kern Lake bed, the Kern Fan recharge area, the Coles Levee Ecosystem Preserve, and the KNWR (Service 2002). By the time the Service published the *Buena Vista lake Ornate Shrew 5-Year Review: Summary and Evaluation* in September 2011, surveys for the BVLOS had been conducted at twenty-one sites and the shrew was found to be present in eight of them (Williams and Harpster 2001; ESRP 2005; Cypher (ESRP) pers. comm. 2010; J. Maldonado (Smithsonian Conservation Biology Institute) unpubl. data 2006, Maldonado pers. comm. 2011, as cited in Service 2011). These eight sites are Goose Lake, Atwell Island, Main Drain Canal/Chicca & Sons Twin Farms South Field Ranch, Lemoore Wetlands preserve, Coles Levee ecosystem preserve, Kern fan water recharge area, the Kern NWR, and the Kern Lake preserve.

Since 2011, BVLOS were detected during several additional trapping efforts (Table D) as well as incidentally during biological monitoring of two construction projects, and during a biological field survey at another site, as detailed below. These new detection locations show BVLOS are present in additional areas not previously known, and this information has served to 'fill-in' the known BVLOS range. None of the newly detected locations extend the range of this taxon. However, these new locations do indicate that BVLOS can persist in more xeric areas possessing certain habitat characteristics or can disperse in and through these areas during periods of sufficient moisture.

Table D. Buena Vista Lake live-trapping and camera detections and incidental detections since 2011.

Area	Dates	Suitable Habitat Type
Wind Wolves Preserve	Oct 2014 Oct 2016	More mesic
Bakersfield City Recharge Area	June 2014	More mesic
Kern River Overflow Canal at Semitropic Water Storage Canal Crossing	March 2017	More mesic
Kern River Overflow Canal (Goose Lake Canal population area)	April 2014	More mesic
Semitropic Ecological Reserve at Goose Lake Canal	October 2014	More mesic
Northern Semitropic Ridge Ecological Reserve	Oct - Nov 2016	More mesic
Kern National Wildlife Refuge	April 2014, Oct 2016	More xeric
Atwell Island Wetland and surrounding ditches	December 2016, March 2017	More mesic
Pixley National Wildlife Refuge	December 2016	More xeric
Kern Water Agency's Outlet Canal Crossing east-southeast of Tupman	October 2011 November 2011	More xeric
West Kern Water District's South Solar Project	May 2012	More xeric
North of Alpaugh, west of Highway 43	April 2017	More xeric

Status & Natural History: Shrews have a high rate of metabolism because their small size forces them to constantly search for food to maintain their body temperatures, especially in cold conditions (Newman and Rudd 1978; Aitchison 1987; Genoud 1988; McNab 1991, as cited in Service 2002). Shrews feed indiscriminately on the available larvae and adults of several species of aquatic and terrestrial insects, some of which are detrimental to agricultural crops (Holling 1959; Ingles 1965; Newman 1970; Churchfield 1990, as cited in Service 2002). They are also known to consume spiders, centipedes, slugs, snails, and earthworms on a seasonally available basis (Aitchison 1987; Jamerson and Peeters 1988, as cited in Service 2002). Food probably is not cached and stored, so the shrew must forage periodically day and night to maintain its high metabolic rate (Williams and Harpster 2001).

Due to lack of study, information about the home range size, breeding territory size, and population densities of the BVLOS is lacking. In other subspecies of ornate shrews, juveniles establish their home range, a small area in which they nest, forage, and explore, and remain in this area for most of their lives (Churchfield 1990, as cited in Service 2002). Ingles (1961) calculated an average home range size in a closely related species, the vagrant shrew (*Sorex vagrans*) found in the Sierra Nevada of California, at approximately 372 square meters (m^2) (4,000 square feet (ft^2)), with breeding males occupying larger territories than breeding females (Hawes 1977, as cited in Service 2002). The distribution, and size, of a shrew's territory varies, and is primarily influenced by the availability of food (Ma and Talmage 2001, as cited in Service 2002).

Nothing is known specifically about the reproduction and mating system of the BVLOS. In general, the reproductive period of the ornate shrew extends from late February through September and early October (Rudd 1955; Brown 1974; Rust 1978, as cited in Service 1998). The breeding season of shrews may begin in autumn and end with the onset of the dry season in May or June. In high-quality habitat in permanent wetlands, the breeding season may be

extended (Center for Conservation Biology 1990; Williams in litt. 1989, as cited in Service 1998). Up to two litters are produced per year containing four to six young (Owen and Hoffman 1983, as cited in Service 1998). Longevity in the wild is probably 12 to 16 months, similar to other *Sorex* species (Rudd 1955, Collins and Martin 1985). Late winter/early spring shrew populations are typically composed of adults born the previous year, while summer populations tend to consist of old adults and young of the year (Rudd 1955, Newman 1976, Owen and Hoffmann 1983). Shrews, on average, rarely live more than 12 months, and each generation is largely replaced annually (Rudd 1955).

The abundance of the BVLOS within the species range is unknown due to the lack of regular surveys in areas of past occurrences and in areas possessing suitable habitat. From 1989 through the present, focused surveys for the BVLOS have been conducted at more than 40 sites and shrews have been found at 12 of them (Tennant pers. comm. 2017, 2014; Aardvark Biological Services LLC in litt. 2017 a-j; Cypher 2016; Cypher et al. 2017; Stantec 2017; Williams and Harpster 2001; Maldonado unpubl. data 2006; Service in-house files). Most surveys, using cameras, live-traps, or both, were conducted in locations containing suitable BVLOS habitat. Some detection efforts using only cameras have been conducted in marginal habitat areas. Based on the results of these surveys, the BVLOS has been documented as far south as the Wind Wolves Preserve and as far north as Lemoore (Cypher et al. 2017; Williams (ESRP) pers. comm. 2011). Population size and health cannot be estimated with the available data, but based on the scarcity of suitable habitat present in the Tulare Basin and the low number of specimens collected in areas with high quality habitat; BVLOS is expected to be rare (Maldonado unpubl. data 2006).

Habitat

In general, shrews prefer moist habitat with an abundance of leaf litter and dense herbaceous cover containing terrestrial and aquatic insect prey (Kirkland 1991; Ma and Talmage 2001). Vegetation community types in which BVLOS have been captured include non-native grassland, freshwater marsh, riparian forest, vernal marsh, alkali sink scrub, and recently disturbed areas that may support ruderal vegetation. Typical grass and shrubs in these communities include sedges (*Carex* ssp.), foxtail barley (*Hordeum murinum*), wild rye (*Elymus* spp.), spikerushes (*Eleocharis* ssp.), saltgrass (*Distichlis* spp.), black mustard (*Brassica nigra*), rushes (*Juncus* spp.), bromes (*Bromes* ssp.), stinging nettle (*Urtica dioica*), mulefat (*Baccharis salicifolia*), alkali heath (*Frankenia salina*), bush lupine (*Lupinus albifrons*), wild rose (*Rosa californica*) along with cattails (*Typha* ssp.), tules (*Schoenoplectus acutus*), and other aquatic plants (ESRP 2005, Cypher et al. 2017). Areas with an overstory of willows (*Salix* spp.) or cottonwoods (*Populus* ssp.) appear to be favored, but may not be an essential habitat feature (ESRP 2005).

Williams and Harpster (2001) found habitat considered most suitable for the BVLOS contains riparian and wetland vegetation communities with an abundance of leaf litter and dense herbaceous cover. BVLOS were most commonly found in close proximity to a reliable body of water (Williams and Harpster 2001). BVLOS primarily have been found in communities characterized by dense mats of leaf litter or herbaceous vegetation. The insect prey of the shrew also thrives in the dense matted vegetation. The BVLOS currently exists on small remnant patches of natural habitat in and around the margins of a landscape that is otherwise dominated by agriculture (Service 2013).

Moist soil in areas with an overstory of willows or cottonwoods appears to be favored by BVLOS, but is not an essential habitat feature (Maldonado pers. comm. 2011). Maldonado et al. (2004) also noted that a high percentage of captured BVLOS were found within 1 meter of the water line and closely associated with a dense, riparian understory which provides food,

cover, and moisture. According to Cypher et al. (2017) "habitat conditions for shrews can be temporally and spatially dynamic due to seasonal, annual, or anthropogenic variation in moisture availability."

There appear to be two categories of suitable habitat for BVLOS: more mesic and more xeric. However, BVLOS tend to be found more consistently in the more mesic suitable habitat (Cypher pers. comm. 2017). The more mesic suitable habitat includes areas of moist soils associated with riparian and fresh emergent wetland vegetation along the edge of marshes, ponds, rivers, creeks, and unlined canals with unmaintained banks, often with a deep, well-developed leaf litter layer and a complex vegetative over story. This more mesic suitable habitat is the type typically described in publications and biological reports discussing BVLOS habitat, and where the majority of known occurrences have been recorded. However, these types of habitats are more often surveyed. Cypher et al. (2017) states "Some areas appear to at least retain moist soils, if not standing water, on a year-round basis in most years. Such areas likely constitute "refugia" for BVLS".

The more xeric suitable habitat category typically possesses fairly dense vegetation that provides cover for the BVLOS in certain grasslands, alkali desert scrub, alkali sink scrub, and sometimes disturbed habitats. These more xeric habitats may not be located immediately adjacent to standing or perennial water, but a seasonal or artificial water source tends to be present or is located in relative close proximity (typically within several hundred feet). The presence of such a feature is important because it may create or sustain the moist soils required to support the invertebrate prey base. Records of BVLOS detections around residential buildings may also be attributed to the residual moisture associated with human structures. According to Cypher et al. (2017) "As suitable habitat conditions expand in seasons or years with more moisture or due to anthropogenic activities, BVLS appear to expand into these temporally suitable areas. As these areas dry, shrews either retreat back to refugia or eventually die out." Examples of recent detections in these more xeric habitats are in Table E.

Table E. BVLOS Detections in More Xeric Habitats

Kern Lake Preserve near dry Gator Pond	December 1986	2 – 3 shrews observed in previously disced, weedy site; area dry but with high water table.
KNWR headquarters	1992 and 1994	1 shrew observed under sprinkler, 1 dead in live trap, 1 dead under sink (residual moisture around residence)
BLM Atwell Island headquarters house	2001 through 2011	2 dead and 2 live shrews observed around residence.
KNWR Tour Route, Unit 1	2014	2 shrews captured in dry, seasonally inundated annual grassland 100 feet from ponded area
Pixley National Wildlife Refuge	2016	Shrews detected at camera stations in area of saltgrass, annual grasses and forbs, within several hundred feet of Deer Creek
Construction site, east-southeast of Tupman	2011	2 shrews seen at canal construction site that carried water but with no bank vegetation.
Solar project west-northwest of I-5 and Highway 43 junction	2012	1 shrew seen near ground clearing at construction site
Levee Road, north of Alpaugh, Tulare County	2017	1 dead shrew in sparse annual grassland area adjacent to canal with no vegetation.

Besides suitable habitat, additional habitat areas may be categorized as 'marginal habitat'. These areas could be used by BVLOS for movement and dispersal, or in the absence of more suitable habitat. Marginal habitat areas may provide only one or two partial characteristics (flowing or standing water, or marginally complex vegetative cover, or marginal leaf litter, seasonal inundation, etc.) such that they potentially could provide limited support for BVLOS. These areas may be small and highly isolated by agricultural development.

Threats

Rapid agricultural, urban, and energy developments since the early 1900s have severely reduced and fragmented native habitats throughout the San Joaquin Valley (Mercer and Morgan 1991). Historically, the former Tulare, Buena Vista, Goose, and Kern lakes, along with their respective overflow marshes, covered 19 percent of the Tulare Basin in the southern San Joaquin Valley (Werschkull et al. 1992). Around the turn of the 20th century, the Tulare Basin had 104,890 ha (259,189 ac) of valley fresh water marsh, 177,005 ha (437,388 ac) of valley mixed-riparian forests, and 105,333 ha (260,283 ac) of valley sink scrub, for a total of 387,229 ha (956,860 ac) of potentially suitable BVLOS habitat. By the early 1980s, the combined total had been reduced to 19,019 ha (46,996 ac), less than 5 percent of the original habitat (Werschkull et al. 1992). As of 1995, intensive irrigated agriculture comprised 1,239,961 ha (3,064,000 ac) or about 96 percent of the total lands within the Tulare Basin.

All of the natural plant communities in the Tulare Basin have been affected by the transformation of this area to agriculture and energy development (Spiegel and Anderson 1992; Griggs et al. 1992). As more canals were built, and more water was diverted for irrigation of the floodplains of the major rivers of the southern San Joaquin Valley, less water was available to keep the riparian forests alive, and less water reached the lakes. By the early 1930s, the former Tulare, Buena Vista, Goose, and Kern lakes were virtually dry and had been connected to agriculture (Griggs et al. 1992).

Although no cases of disease related to BVLOS have been documented, their small population size and restricted distribution increases their vulnerability to epidemic diseases. The BVLOS, like most small mammals, are host to numerous internal and external parasites, such as round worms, mites, ticks, and fleas, which may infest individuals and local populations in varying degrees with varying adverse effects (Churchfield 1990; Maldonado pers. comm. 1998). However, the extent of disease has not been documented for this species.

Most vertebrate carnivores of the Tulare Basin, such as coyotes (*Canis latrans*), foxes, long-tailed weasels (*Mustela frenata*), raccoons (*Procyon lotor*), feral cats (*Felis catus*), and dogs (*Canis familiaris*), as well as certain avian predators such as hawks, owls, herons, jays, and egrets, are all known predators of small mammals. While many predators find shrews unpalatable because of the distasteful secretion and offensive odor from their flank glands and feces, several of the avian predators, such as barn owls (*Tyto alba*), short eared owls (*Asio flammeus*), long-eared owls (*Asio otus*), and great horned owls (*Bubo virginianus*) have a poor sense of smell and are known to prey on shrews (Ingles 1965; Aitchison 1987; Marti 1992; Holt and Leasure 1993; Marks et al. 1994; Houston et al. 1998), and probably BVLOS (Maldonado pers. comm. 1998). The overall impact that predation may have on the number of individuals and densities of the species remains unknown.

Selenium toxicity represents a serious threat to the continued existence and recovery of the BVLOS, not only at known locations, but any potential locations throughout the Tulare Basin. The soils on the western side of the San Joaquin Valley have naturally elevated selenium concentrations. Due to extensive agricultural irrigation, selenium has been leached from the soils and concentrated in the shallow groundwater along the western side of the San Joaquin Valley. Where this shallow

groundwater reaches the surface or subsurface, selenium can accumulate in biota (flora and fauna) and result in adverse effects to growth, reproduction, and survival. Elevated concentrations of selenium have caused major wildlife mortalities in places like Kesterson (Moore et al. 1989). Some of the highest selenium levels in the western United States have been measured from groundwater within the southern San Joaquin Valley, and in drainwater evaporation ponds servicing the agricultural lands immediately surrounding the known populations of BVLOS in the Tulare Basin (California Department of Water Resources 1997; Seiler et al. 1999).

BVLOS are exposed to the wide-scale use of pesticides throughout their range, because they currently exist on small remnant patches of natural habitat in and around the margins of an otherwise agriculturally dominated landscape. The animals could be directly exposed to lethal and sublethal concentrations of pesticides from drift or direct spraying of crops, canals and ditch banks, wetland or riparian edges, and roadsides where shrews might exist. Reduced reproduction in this listed species could be directly caused by pesticides through grooming, and secondarily from feeding on contaminated insects (Sheffield and Lochmiller 2001). BVLOS could also die from starvation by the loss of their prey base (Ma and Talmage 2001; Sheffield and Lochmiller 2001). Exposure to organophosphate and carbamate insecticides can inhibit brain acetylcholinesterase activity leading to alterations in behavior and motor activity. Laboratory experiments have shown that behavioral activities such as rearing, exploring for food, and sniffing can be depressed for up to 6 hours in the common shrew (*Sorex araneus*) from environmental and dietary exposure to sublethal doses of a widely used insecticide called dimethoate (Dell'Omo et al. 1999). In their natural habitat, depression in such behavioral and motor activities could make the shrews more vulnerable to predation, and starvation. In addition, shrews may feed heavily on intoxicated arthropods after application of insecticides, and, therefore, ingest higher concentrations of pesticides than would normally be available (Schauber et al. 1997; Sheffield and Lochmiller 2001). In California, Fresno, Kern, and Tulare counties were the three highest users of pesticides in 2015 (California Department of Pesticide Regulation 2015).

The only known populations of BVLOS are also vulnerable to environmental risks associated with small, restricted populations. Impacts to populations that can lead to extinction include the loss or alteration of essential elements for breeding, feeding, and sheltering; the introduction of limiting factors into the environment such as poison or predators; and catastrophic random changes or environmental perturbations, such as floods, droughts, or disease (Gilpin and Soulé 1986). Many extinctions are the result of a severe reduction of population size by some deterministic event such as lowered birth rates due to exposure to certain toxins such as selenium, followed by a random natural event such as a crash in insect populations from an extended drought which causes the extirpation of the species. The smaller a population is, the greater its vulnerability to such perturbations (Terborgh and Winter 1980; Gilpin and Soulé 1986; Shaffer 1987). The elements of risk that are amplified in very small populations include: (1) the impact of high death rates or low birth rates; (2) the effects of genetic drift (random fluctuations in gene frequencies) and inbreeding; and (3) deterioration in environmental quality (Gilpin and Soulé 1986; Lande 1999). When the number of individuals in a population of a species or subspecies is sufficiently low, the effects of inbreeding may result in the expression of deleterious genes in the population (Gilpin 1987). Deleterious genes reduce individual fitness in various ways, most typically by decreasing survivorship of young. Genetic drift in small populations decreases genetic variation due to random changes in gene frequency from one generation to the next. This reduction of variability within a population limits the ability of that population to adapt to environmental changes (Lande 1999).

On page 58, under **Status of the Species,** *Valley elderberry longhorn beetle*, **delete** this heading and sentence.

On page 58 insert the following section.

Status of Critical Habitat

The Service designated critical habitat for the BVLOS on January 24, 2005, (70 FR 3438) (Service 2005a) and a revised designation to the critical habitat was published on July 2, 2013 (78 FR 39836) (Service 2013). The final designated critical habitat encompasses approximately 2,485 acres in six units in Kings and Kern counties.

Critical habitat is defined in Section 3 of the Act as: (1) The specific areas within the geographical area occupied by a species, at the time it is listed in accordance with the Act, on which are found those physical or biological features (a) essential to the conservation of the species and (b) that may require special management considerations or protection; and (2) specific areas outside the geographical area occupied by a species at the time it is listed, upon a determination that such areas are essential for the conservation of the species. In determining which areas to designate as critical habitat, the Service considers those physical and biological features essential to the conservation of the species and that may require special management considerations or protection (50 CFR 424.12(b)). The Service is required to list the known physical and biological features that are essential for the conservation of the species together with the critical habitat description. Such physical and biological features include, but are not limited to, the following:

1. Space for individual and population growth, and for normal behavior;
2. Food, water, air, light, minerals, or other nutritional or physiological requirements;
3. Cover or shelter;
4. Sites for breeding, reproduction, rearing of offspring, or dispersal; and
5. Generally, habitats that are protected from disturbance or are representative of the historic geographical and ecological distributions of a species.

The physical and biological features that are essential for the conservation of the species defined for the BVLOS were derived from species specific physical or biological needs. The physical and biological features essential for the conservation of the species were determined from studies of this species' habitat, ecology, and life history. Based on the life history, biology, and ecology of the species, and the habitat requirements for sustaining the essential life-history functions of the species, the Service determined that the physical and biological features that are essential to the conservation of the BVLOS are:

Permanent and intermittent riparian or wetland communities that contain:

- A complex vegetative structure with a thick cover of leaf litter or dense mats of low-lying vegetation. Associated plant species can include, but are not limited to, Fremont cottonwoods, willows, glasswort, wild-rye grass, and rush grass. Although moist soil in areas with an overstory of willows or cottonwoods appears to be favored, such overstory may not be essential.
- Suitable moisture supplied by a shallow water table, irrigation, or proximity to permanent or semi-permanent water; and
- A consistent and diverse supply of prey. Although the specific prey species utilized by BVLOS have not been identified, ornate shrews are known to eat a variety of terrestrial and aquatic invertebrates, including amphipods, slugs, and insects.

On page 59, under **Environmental Baseline,** *Geography, topography, and climate*, **add** the following two sentences to the end of the fourth paragraph:

The San Joaquin Valley has a drainage area of approximately 34,100 square miles and is roughly divided into a northern San Joaquin River Basin and a southern Tulare Lake Basin. The project action area is located entirely within the Tulare Lake Basin. The Tulare Lake Basin is generally flat and used extensively for agriculture. The contributing rivers are normally diverted and dewatered before reaching the southern San Joaquin Valley floor (ECORP Consulting 2007). The Tulare Basin historically would have included the water features that drained into the Tulare Lake Bed. Under the natural hydrologic regime of the southern San Joaquin Valley, drainages from the Kings River south flowed into Tulare Lake. In wetter years, the northern distributaries of the Kings River flowed north into the San Joaquin River (ECORP Consulting 2007).

On page 61, under **Environmental Baseline,** *Land use*, **add** this sentence to the end of the lacustrine habitat paragraph:

Lacustrine habitat features along the project alignment may provide habitat for the federally-listed BVLOS.

On page 62, under **Environmental Baseline,** *Land use*, **add** this sentence to the end of the riverine habitat paragraph:

Moist soil associated with the edges of riverine habitat along the project alignment may provide dispersal habitat for the federally listed BVLOS.

On page 62, under **Environmental Baseline,** *Land use*, **add** this sentence to the end of the Valley foothill riparian vegetation paragraph:

The best habitat for BVLOS appears to be in riparian and wetland communities with an abundance of leaf litter or dense herbaceous cover (Williams and Harpster 2011), and riparian vegetation along the alignment may provide such high-quality habitat.

On page 62, under **Environmental Baseline,** *Land use*, **add** this sentence to the end of the fresh emergent wetland paragraph:

Fresh emergent wetland vegetation is a preferred habitat for the federally listed BVLOS, as there are several records of BVLOS being trapped near the water's edge in this habitat (Cypher et al. 2017, Williams and Harpster 2011). Emergent wetland vegetation along the alignment may provide such high-quality habitat.

On pages 65 and 66, under **Environmental Baseline,** *San Joaquin kit fox*, **replace** third paragraph **with:**

San Joaquin kit foxes are expected to occur within all areas of suitable habitat throughout the CHST-FB project action area. An estimated 5,401.23 acres of habitat (alkali desert scrub, annual grassland, pasture, barren, urban Bakersfield, and agricultural lands) occurs within the 7,189-acre CHST-FB Project alignment footprint. Approximately 1,770.46 of the 5,401.23 acres (~ 33 percent) occur within satellite and corridor areas. Highly suitable habitat for the San Joaquin kit fox supports denning, foraging, and breeding; in the CHST-FB project action area it is composed of annual grasslands, alkali desert scrub, pasture, and barren land cover, as mapped for

this project. Approximately 768.94 acres of the 5,401.23 acres (~ 14 percent) of habitat is considered highly suitable for use by the San Joaquin kit fox (Table 4). About 52 percent (403.31 acres) of the 768.94 acres of highly suitable habitat occurs within satellite and corridor areas. The remaining 4,632.29 acres of San Joaquin kit fox habitat consists of agricultural and urban habitats between Fresno and Bakersfield (Table 4).

On page 69, under **Environmental Baseline,** *San Joaquin kit fox*, **replace** Table 4 **with:**

Table 4. Range of potential habitat for the San Joaquin kit fox.

Land Prioritization	CWHR Vegetation Community or Wildlife Association	Impact Type	Areas of Effect (Acres)	
			MIN	MAX
Southwestern Tulare County Satellite Area	**Natural**		**86.26**	**165.01**
	Annual Grassland	Direct	86.12	112.59
	Alkali Desert Scrub	Direct	0.07	37.40
	Barren	Direct	0	9.98
	Pasture	Direct	0.07	5.04
	Valley Oak Woodland	Direct	0	0
	Agriculture		**511.36**	**687.86**
	Agriculture/Crop	Direct	184.72	209.39
	Dryland Grain Crop	Direct	30.17	38.70
	Deciduous Orchard	Direct	228.81	255.10
	Evergreen Orchard	Direct	0	0
	Irrigated Grain Crop	Direct	10.69	75.75
	Irrigated Row and Field Crop	Direct	0	0
	Irrigated Hayfield	Direct	56.97	108.92
	Vineyard	Direct	0	0-
	Urban/BNSF		**0**	**0**
	BNSF	Direct	0	0
	Urban development	Direct	0	0
Metropolitan Bakersfield Satellite Area (Urban Bakersfield)	**Natural**		**214.77**	**218.15**
	Annual Grassland	Direct	34.67	36.55
	Alkali Desert Scrub	Direct	10.13	11.14
	Barren	Direct	169.11	169.32
	Pasture	Direct	0.86	1.15
	Valley Oak Woodland	Direct	0	0
	Agriculture		**0**	**0**
	Agriculture/Crop	Direct	0	0
	Dryland Grain Crop	Direct	0	0
	Deciduous Orchard	Direct	0	0
	Evergreen Orchard	Direct	0	0
	Irrigated Grain Crop	Direct	0	0
	Irrigated Row and Field Crop	Direct	0	0
	Irrigated Hayfield	Direct	0	0
	Vineyard	Direct	0	0
	Urban/BNSF		**249.62**	**301.56**
	BNSF	Direct	13.5	13.67
	Urban development	Direct	236.12	287.89
Linkage Area	**Natural**		**0**	**20.15**
	Annual Grassland	Direct	0	1.27
	Alkali Desert Scrub	Direct	0	0
	Barren	Direct	0	18.88
	Pasture	Direct	0	0
	Valley Oak Woodland	Direct	0	0
	Agriculture		**104.69**	**377.73**
	Agriculture/Crop	Direct	3.01	96.55
	Dryland Grain Crop	Direct	0	0

	Deciduous Orchard	Direct	88.81	92.49
	Evergreen Orchard	Direct	0	0
	Irrigated Grain Crop	Direct	7.90	25.80
	Irrigated Row and Field Crop	Direct	0	6.08
	Irrigated Hayfield	Direct	4.97	29.83
	Vineyard	Direct	0	126.98
	Urban/BNSF		**0**	**0**
	BNSF	Direct	0	0
	Urban development	Direct	0	0
Remainder Areas (Outside of Recovery Areas)	**Natural**		**164.34**	**365.63**
	Annual Grassland	Direct	111.05	184.46
	Alkali Desert Scrub	Direct	2.03	9.16
	Barren	Direct	28.58	134.24
	Pasture	Direct	22.69	37.77
	Valley Oak Woodland	Direct	0	0
	Agriculture		**1,643.94**	**3,265.14**
	Agriculture/Crop	Direct	159.49	516.12
	Dryland Grain Crop	Direct	34.85	77.80
	Deciduous Orchard	Direct	733.19	1,199.49
	Evergreen Orchard	Direct	3.42	3.42
	Irrigated Grain Crop	Direct	160.47	382.44
	Irrigated Row and Field Crop	Direct	37.62	131.24
	Irrigated Hayfield	Direct	242.04	441.09
	Vineyard	Direct	272.84	513.54
	Urban/BNSF		**0**	**0**
	BNSF	Direct	0	0
	Urban development	Direct	0	0

On page 71, under **Environmental Baseline,** *Tipton kangaroo rat*, line 1 **replace** 453.85 **with 468.02. Add** new third paragraph:

The TKR was not captured during limited small mammal live-trapping efforts conducted in September and October 2016, along Road 24 and Road 40 in support of the Tulare County road overlay portion of the Early Work Variations. These efforts were conducted at locations with marginal habitat (road shoulders) that contained sign of kangaroo rat occupation (appropriately-sized burrows). Mammals captured included the relatively common Heermann's kangaroo rat (*Dipodomys heermanni*).

On page 71, under **Environmental Baseline, add** the following at the bottom of the page:

Buena Vista Lake ornate shrew

About 76.81 acres of suitable habitat (mesic and xeric) for BVLOS occurs within the project action area (Table 5). This includes the more mesic areas of moist soil associated with rivers, creeks, canals, and water impoundments, and the associated riparian and emergent wetland vegetation with extensive cover and leaf litter (about 39.02 acres), and the more xeric annual grassland and alkali desert scrub with varying amounts and types of cover and substrate within 200 feet of rivers, creeks, canals, water impoundments and other water sources (about 37.79 acres). In addition, about 51.18 acres of marginal habitat for BVLOS occurs within the project action area (Table 5). This habitat could be used by BVLOS for movement and dispersal, or in the absence of more suitable habitat, although the extent to which they might use these areas is currently unknown.

The known recent occurrence locations for BVLOS closest to the project footprint include the BVLOS carcass discovered within more xeric suitable habitat in April 2017, within about 0.30 miles south of required road work at Avenue 88 in Tulare County (part of the Early Work Variations), and BVLOS camera-detected in more xeric suitable habitat in December 2016, on the PNWR within about 1 mile east of the alignment along CP 2-3. Atwell Island, where BVLOS have been live-trapped and incidentally detected between 2001 and 2011, in both more mesic suitable habitat and marginal habitat, is about 4.5 miles west of the project footprint. Other known BVLOS occurrences are located just beyond a 10 mile distance from the project footprint.

BVLOS has not been detected during limited camera-detection efforts along the project footprint conducted from November 2016 through July 2017. These efforts were conducted in support of proposed geo-technical investigations, demolition of structures and clearing and grubbing activities at locations which varied from suitable habitat (Poso Creek, Kings River, Tule River, Cross Creek) to marginal habitat (Avenue 24 near Allensworth, Orange Avenue and 5th Avenue in Corcoran, Avenue 120 at Highway 43, Excelsior Avenue, Jackson Avenue) (Aardvark Biological Services LLC 2017a-j, Stantec 2017, Cypher 2016). BVLOS habitat requirements are not well understood, and the species distribution within the landscape is difficult to determine (Cypher 2016). Although BVLOS has not been detected within the project action area, the Service has concluded it is reasonably likely that the BVLOS may be present within the action area because suitable habitat is present and recent records indicate the presence of this species around the project action area. BVLOS are small, cryptic and difficult to detect, present in low numbers, and variable in numbers and distribution due to availability of habitat on the landscape. We do not know how they move within the landscape or how they utilize the landscape, but we know they must move through and around fragmented landscapes due to the nature of the sites in which they have been detected.

On page 72, under **Environmental Baseline,** *Central California tiger salamander*, **replace** the first paragraph **with**:

Up to 18.30 acres of potentially suitable aquatic habitat and 18.70 acres of potentially suitable upland habitat for the Central California tiger salamander occurs within the project action area (Table 5). Protocol-level surveys for this species have not been conducted within the entire project action area because of limited access to properties where suitable habitat may exist. It is likely that the species utilizes the action area for breeding, feeding, sheltering and movement due to the presence of suitable habitat features.

On page 72, under **Environmental Baseline,** *Blunt-nosed leopard lizard*, line 1 **replace** 98.06 **with 108.47. Add** new third and fourth paragraphs:

During protocol BNLL surveys conducted on parcels with permission to enter along the CP 4 alignment, at least five BNLL were observed during 2016, and two were observed in 2017 within and adjacent to the project footprint (Brian Berry pers. comm. 2017). In addition, a BNLL has been observed just over 300 feet west of the southern end of the CP 2-3 alignment (Matthew Weekes pers. comm. 2017). All of these recent observations along and adjacent to the alignment were made in the general Tulare County/Kern County line area.

It is likely that the BNLL may be present in other areas of the alignment because suitable habitat is present and CNDDB records indicate the presence of this species within and around the project action area.

On page 73, under **Environmental Baseline,** Vernal pool fairy shrimp, **delete the first sentence of the third paragraph.**
On page 74, under **Environmental Baseline, replace** Table 5 **with:**

Table 5. Range of potential habitat within the Fresno to Bakersfield alignment of the CHST Project (including the Early Work Variations but excluding mitigation properties) for Tipton kangaroo rat, Buena Vista Lake ornate shrew, Central California tiger salamander, blunt-nosed leopard lizard, vernal pool fairy shrimp, vernal pool tadpole shrimp, California jewelflower, Hoover's spurge, Kern mallow, and San Joaquin woolly-threads

Species	Habitat Type	Impact Type	Areas of Effect*	
			MIN	MAX
Tipton kangaroo rat	Alkali desert scrub, annual grassland, barren and pasture	Direct	367.18	468.02
Buena Vista Lake ornate shrew	More mesic suitable: moist soil associated with rivers, creeks, canals, water impoundments; associated riparian, emergent wetland vegetation; with cover and leaf litter	Direct	-	39.02
	More xeric suitable: grasslands, alkali desert scrub, alkali sink scrub within ~ 200 feet of rivers, creeks, canals, water impoundments, other water sources		-	37.79
Central California tiger salamander	AQUATIC: Vernal pools/seasonal wetlands	Direct	6.2	18.30
	UPLAND: alkali desert scrub, annual grasslands, pasture surrounding vernal pools/seasonal wetlands		18.6	18.70
Blunt-nosed leopard lizard	Alkali desert scrub, annual grassland, barren and valley foothill riparian	Direct	26.57	108.47
Vernal pool fairy shrimp	Vernal pools/seasonal wetlands	Direct	2.33	29.77
		Indirect	14.55	103.52
Vernal pool tadpole shrimp	Vernal pools/seasonal wetlands (delineated within the geographic range of the species)	Direct	0.0041	0.0041
		Indirect	0.0560	0.0560
California jewelflower	Unsurveyed alkali desert scrub, annual grassland, and pasture in Fresno County	Direct	0	15.00
Hoover's spurge	Vernal pools/seasonal wetlands in Tulare County	Direct and Indirect bisected	-	6.11
Kern mallow	Unsurveyed alkali desert scrub, annual grassland, and pasture in Tulare and Kern counties	Direct	0	217.93
San Joaquin woolly-threads	Unsurveyed alkali desert scrub, annual grassland, and pasture in Fresno, Kings, and Kern counties	Direct	0	491.77

*Areas of Effect are presented in acres. A minimum and maximum range is used because there are still project components (for example, the Bakersfield Locally Generated Alternative) for which alternative alignments are being

considered. Once all project components have been identified and finalized, these ranges will be replaced with the expected acreage of disturbance.

On page 75, under **Environmental Baseline,** *Valley elderberry longhorn beetle*, **delete** this heading and three paragraphs below it.

On page 76, under **Environmental Baseline,** *Hoover's spurge*; **replace** the first paragraph **with:**

Hoover's spurge occurs within only one county, Tulare County, of the four surrounding the project action area. This population of Hoover's spurge is located outside of the project area and consists of five documented occurrences (CNDDB 2017). However, Hoover's spurge may occur where suitable habitat is found within the project action area. The June 18, 2014 memorandum from the Authority concerning the refinement of potential effects to Hoover's spurge identified about 2.54 acres of potentially suitable habitat consisting of vernal pool and seasonal wetland habitat within the portion of the Fresno to Bakersfield alignment that occurs in Tulare County (Table 5). Calculations for the Early Work Variations in 2016 identified an additional 3.57 acres of potentially suitable Hoover's spurge habitat consisting of alkali desert scrub and annual grassland. Therefore, a total of 6.11 acres of potentially suitable Hoover's spurge habitat is present. Hoover's spurge was not identified during botanical surveys conducted during 2010 in areas where access was granted. However, protocol-level surveys for this species have not been conducted within the entire project action area because of limited access to other properties where suitable habitat may exist.

On page 76, under **Environmental Baseline,** *Hoover's spurge*; **replace** the last paragraph **with:**

It is reasonably likely that the Hoover's spurge may be present within the project action area because suitable habitat is present and records indicate the presence of this species within Tulare County.

On page 76, under **Environmental Baseline,** *Kern mallow*, **replace** 214.36 **with 217.93.**

On page 77, under **Environmental Baseline,** *Kern mallow*, after full paragraph **add** the paragraph:

In May 2017, two Kern mallow plants were discovered north of Avenue 16 and south of Avenue 24 within the CP 2-3 project footprint. These two plants were discovered in a pistachio orchard on generally flat terrain.

On page 77, under **Environmental Baseline,** *Kern mallow*, **replace** sixth full paragraph **with**:

It is reasonably likely that the Kern mallow may be present within other portions of the project action area because suitable habitat is present and CNDDB records indicate the presence of this species within and around the project action area.

On page 77, under **Environmental Baseline,** *San Joaquin woolly-threads*, **replace** 489.34 **with 491.77.**

On page 81, under **Effects of the Proposed Action, replace** first paragraph **with**:
The CHST-FB Project will result in temporary and permanent loss of habitat for the San Joaquin kit fox, the Tipton kangaroo rat, the BVLOS, the Central California tiger salamander, the blunt-nosed leopard lizard, the vernal pool fairy shrimp, the vernal pool tadpole shrimp, the California jewelflower, the Hoover's spurge, the Kern mallow, and the San Joaquin woolly-threads.

On page 82, under **Effects of the Proposed Action,** *San Joaquin kit fox, Effects associated with construction activities*, on line 3 **replace** (5,351) **with (5,401.23).**

On page 82, under **Effects of the Proposed Action,** *San Joaquin kit fox, Effects associated with construction activities*, **replace the first two full paragraphs with:**

The potentially suitable habitats occur as fragments or patches throughout the relatively narrow, linear project action area, primarily within Fresno, Tulare, Kings, and Kern Counties. Approximately 768.94 acres of the 5,401.23 acres (~ 14 percent) of suitable habitat along the alignment is considered to be highly suitable for use by the San Joaquin kit fox (alkali desert scrub, annual grassland, pasture, barren lands, summed from Table 4). The remaining 4,632.29 acres of San Joaquin kit fox habitat consists of agricultural and urban habitats between Fresno and Bakersfield (Table 4). The 768.94 acres of highly suitable habitat that will be permanently lost as a result of the CHST-FB Project, including the Early Work Variations represents a small fraction of the remaining highly suitable habitat within Fresno, Tulare, Kings, and Kern Counties (Cypher pers. comm. 2013).

Habitat loss and alteration may occur through degradation and placement of hardscape over suitable denning or foraging habitat as a result of the CHST-FB alignment component of the project. It is reasonably likely that construction activities will result in the destruction of dens. Highly suitable habitat that supports denning and breeding is essential for persistence of San Joaquin kit fox populations (Service 2010a; Cypher et al. 2013; Cypher et al. 2014). Approximately 768.94 acres of high quality habitat for the San Joaquin kit fox will be permanently lost as a result of the CHST-FB alignment project action area and the Early Work Variations. High quality habitat already is extensively fragmented throughout the CHST-FB alignment component of the project action area. Although the total habitat loss will be spread out over the length of the alignment, the permanent loss resulting from the 100-foot wide CHST-FB alignment footprint will decrease available resources for San Joaquin kit foxes utilizing those areas.

On page 88, under **Effects of the Proposed Action,** *Tipton kangaroo rat, Effects associated with construction activities*, **replace first two paragraphs with:**

Mortality or injury of Tipton kangaroo rats could occur from being crushed by project related equipment or vehicles, or construction debris within the action area during construction activities. Tipton kangaroo rat burrows may be collapsed by required ground-disturbing CRM mitigation activities. The collapse of small mammal burrows could expose individuals to predation or adverse environmental conditions. Tipton kangaroo rats may be injured during burrow excavation and subsequent hand capturing and holding, should an individual be unexpectedly encountered. Tipton kangaroo rats could fall into trenches, pits, or other excavations, and may be directly killed or unable to escape and be subjected to desiccation, entombment, or starvation. This disturbance and displacement may increase the potential for predation, desiccation, competition for food and shelter, or strike by vehicles on roadways. However, implementation of conservation measures proposed specifically for the Tipton kangaroo rat, such as minimizing the total area disturbed by project activities, conducting pre-construction surveys, inspecting burrows and trenches to make sure individuals are not inadvertently crushed, providing escape ramps in trenches, and wildlife exclusion fencing will minimize these effects.

Construction of the CHST-FB Project will result in the permanent loss of between 367.18 and 468.02 acres of potential habitat for the Tipton kangaroo rat (Table 5). At the time of listing, habitat

loss associated with agricultural development was identified as the main factor contributing to the decline of the Tipton kangaroo rat (Service 1988). The *Recovery Plan for Upland Species of the San Joaquin Valley, California* also cited habitat loss as the main reason for the decline for the Tipton kangaroo rat (Service 1998). In addition, the Tipton kangaroo rat is threatened by further habitat loss and fragmentation as a result of infrastructure development (Service 2010b). Between 1997 and 2010, the total of permanent loss of habitat was estimated to be about 14,824 acres (Service2010b).

On page 89 **replace third paragraph with:**

In the event that Tipton kangaroo rats are discovered within the project action area during pre-construction surveys or become accidently trapped within the project action area, the FRA and the Authority will immediately contact the Service. The FRA and the Authority have agreed to prepare anda implement a Service-approved small mammal trapping and relocation plan in general accordance with the survey protocols in the *California Valley Solar Ranch Project: Plan for Relocation of Giant Kangaroo Rats*. Tipton kangaroo rats may become disorientated during trapping, capture, handling, holding, transport, and after translocation, which can result in drastically increased vulnerability to mortality as a result of predation and competition with cohorts (Germano 2010). However, implementation of the Service-approved relocation plan will minimize effects of disorientation and the risk of mortality from translocation. In addition, translocation of Tipton kangaroo rats under a Service-approved relocation plan will minimize the risk of mortality as a result of construction activities and assist in expanding existing populations into unoccupied habitat.

On page 91, under **Effects of the Proposed Action,** *Tipton kangaroo rat, Conservation measures for the Tipton kangaroo rat*, **replace with:**

Implementation of the proposed conservation measures is expected to significantly reduce adverse effects to Tipton kangaroo rats during project construction, maintenance, and operational activities. However, some mortality of Tipton kangaroo rats may still occur because they may be difficult for operators of maintenance equipment and vehicles to observe. The CHST-FB Project will result in the permanent loss of up to 468.02 acres of habitat for the Tipton kangaroo rat (Table 5). The FRA and the Authority have proposed to mitigate for the final calculated permanent habitat loss for Tipton kangaroo rat through the acquisition of permittee-responsible mitigation sites within Tulare, Kings, and Kern counties that will be protected in perpetuity through conservation easements. These lands will be protected and managed for the conservation of the Tipton kangaroo rat and provide habitat for breeding, feeding, or sheltering commensurate with or better than habitat lost as a result of the proposed project.

On page 91, under **Effects of the Proposed Action, add** after TKR:

Buena Vista Lake ornate shrew

Effects associated with construction activities

Injury or mortality of BVLOS may occur from being crushed by project related equipment or vehicles, or construction debris within the action area during construction activities. Ground-disturbing CRM mitigation activities may crush dense vegetative ground cover or other refugia used by BVLOS, rendering the areas inaccessible to the species. The crushing of vegetation and other refugia could expose individuals to predation or adverse environmental conditions. BVLOS could fall into trenches, pits, or other excavations, and may be directly killed or unable to

escape and be subjected to desiccation, entombment, or starvation. Shrews must eat often in order to maintain body temperature due to their extremely small size and surface to volume ratio. Shrews can starve to death in a relatively short period of time absent regular feedings. BVLOS could run across active construction sites and might be hand-captured, held and released. Disturbance and displacement may increase the potential for predation, desiccation, competition for food and shelter, or strike by vehicles on roadways or in construction areas. However, implementation of conservation measures proposed specifically for the BVLOS, such as minimizing the total area disturbed by project activities, conducting pre-construction detection surveys, biological monitoring of construction activities (including daily clearance surveys), hand clearing and raking of vegetation within suitable habitat areas, inspecting burrows and trenches to make sure individuals are not inadvertently crushed, providing escape ramps in trenches, and wildlife exclusion fencing will minimize mortality or injury.

Effects associated with operation activities

Operation of the Fresno to Bakersfield Section may result in injury or mortality to BVLOS within the right-of-way. Security fencing along at-grade tracks may prohibit shrews from accessing the right-of-way and at-grade tracks or track ballast. Dedicated wildlife crossing structures specifically designated for use by this species have not been proposed for the CHST-FB Project. However, BVLOS may gain access across the alignment through any dedicated wildlife crossings intended for San Joaquin kit fox, drainage culverts, or under bridges that may be located within their limited habitat. While dispersal and movement patterns of BVLOS are not well understood, the Service is aware of a one-day movement record of a *Sorex ornatus salarius* individual at the mouth of the Salinas River in Monterey County wherein a shrew was re-captured 600 feet from its previous night capture location (Maldonado pers. comm. 2017). While this record provides evidence that a subspecies of ornate shrew can travel relatively long distances during a 24-hour period, it does not speak specifically to the movement capabilities of BVLOS.

There is a high density of dedicated wildlife crossings, small drainage culverts, and several bridges proposed for the section of the FB HST alignment where this species is most likely to occur. Bridge structures are planned for most features that have been characterized as 'more mesic suitable habitat' such as at Poso Creek, the Tule River, and at the shoreline of Lake Alpaugh.

If crossing opportunities are inadequate, movement of BVLOS within the project action area may be permanently altered as a result of the construction of at-grade tracks with security fencing in areas where installation of potential crossing structures are not proposed. This may also result in the permanent subdivision of BVLOS populations, fragmentation of habitat, and preclude recolonization of currently unoccupied historic habitat. Loss of connectivity among metapopulations among habitats surrounding the project action area may result in increased demographic stochasticity, genetic isolation and inbreeding (Gilpin and Soule 1986; Soule and Mills 1998; Mills 2007). Restricted movement of BVLOS may limit or entirely prohibit access to suitable habitat, resources, and mates on either side of the HST track.

Exposure to increased noise levels

The FRA has established noise exposure limits for all wildlife at a sound exposure level (SEL) of 100 dBA from passing trains. Construction equipment, such as bulldozers, may produce noise in the range of 85 dBA (Burgland and Lindvall 1995). Assuming no intervening structures and maximum speeds of 220 mph, the FRA and the Authority have estimated that 100 dBA SEL will occur within 100 feet from the trackway centerline for at-grade alignments, and estimated 15 feet from the

centerline for elevated sections on structures. This noise level is comparable to a helicopter operating at the same distance (Service 2006b).

Some shrew species are known to possess keen hearing and are known to use high-pitched squeaks in echolocation (Schmidt 1994). Non-auditory communication is important for many mammalian species. Some small mammals (such as kangaroo rats) use vibration by drumming feet, teeth or heads or stamping feet to denote territorial advertisement, agonistic interactions, co-coordinate mating interactions, sub-ordinance and unwillingness to interact, and alert their cohorts to potential danger (Randall and Lewis 1997; Randall 1997; Randall, 2001). The increased noise exposure may also interfere with auditory and non-auditory communication and disrupt feeding, breeding and other essential behaviors for this species. BVLOS may vacate habitats located adjacent to the HST in response to the increased exposure to noise and vibration resulting from operation of the HST or, this species may also become adapted to the increased noise exposure and vibration over time. However, there is insufficient information available to the Service at this time regarding the specific response of BVLOSs to exposure to increased noise disturbance and vibration. Therefore, it is difficult to anticipate the response of this species and potential for disruption of its natural behaviors such as feeding, breeding, burrowing, and communication among cohorts.

Conservation measures for the Buena Vista Lake ornate shrew

Implementation of the proposed conservation measures is expected to significantly reduce adverse effects to BVLOSs during project construction, maintenance, and operational activities. However, some mortality of BVLOS may still occur because they are cryptic and difficult for operators of maintenance equipment and vehicles to see. The CHST-FB Project will result in the permanent loss of up to 76.81 acres of suitable habitat (mesic and xeric) for the BVLOS (Table 5). In addition, the CHST-FB Project will result in the permanent loss of up to 51.18 acres of marginal habitat that may be used by BVLOS for movement and dispersal or in the absence of more suitable habitat. The FRA and the Authority have proposed to mitigate for the final calculated disturbance BVLOS suitable habitat (mesic and xeric) through the acquisition of permittee-responsible mitigation sites within Tulare, Kings, and Kern counties that will be protected in perpetuity through conservation easements. These lands will be protected and managed for the conservation of the BVLOS and provide habitat for breeding, feeding, or sheltering commensurate to or better than habitat lost as a result of the proposed project.

On page 91, under **Effects of the Proposed Action,** *Central California tiger salamander, Effects associated with construction activities*, **replace first paragraph with:**

Mortality or injury of Central California tiger salamanders may occur from being crushed by project related equipment, vehicles, or construction debris within the action area during construction activities. These small, cryptic animals may be crushed if burrows used as refugia are collapsed by required ground-disturbing CRM mitigation activities. Central California tiger salamanders could be crushed or harmed during excavation of burrows, should an individual be unexpectedly encountered. The collapse of small mammal burrows could expose individuals to predation or adverse environmental conditions. Central California tiger salamanders could fall into trenches, pits, or other excavations, and may be directly killed or unable to escape and be subjected to desiccation, entombment, or starvation. Disturbance from construction activities may increase the potential for predation, desiccation, competition for food and shelter, or strike by vehicles on roadways as animals move away from sources of disturbance. However, implementation of conservation measures proposed specifically for the Central California tiger salamander, such as minimizing the total area disturbed by project activities, conducting pre-

construction surveys, inspecting burrows and trenches to make sure individuals are not inadvertently crushed, providing escape ramps in trenches, and wildlife exclusion fencing will minimize mortality or injury. Up to 18.7 acres of upland habitat and 18.3 acres of aquatica habitat for the Central California tiger salamander will be permanently lost as a result of construction of the CHST-FB Project.

On page 93, under **Effects of the Proposed Action,** *Central California tiger salamander, Conservation measures for the Central California tiger salamander* **replace the second paragraph with:**

The CHST-FB Project will result in the permanent loss of up to 18.7 acres of upland habitat and 18.3 acres of aquatic habitat for the Central California tiger salamander (Table 5). The FRA and the Authority have proposed to mitigate for the final calculated permanent habitat loss for Central California tiger salamander through the purchase of mitigation credits at an approved conservation bank or the acquisition of permittee-responsible mitigation sites within Fresno, Tulare, and Kings counties that will be protected in perpetuity through conservation easements. These lands will be protected and managed for the conservation of the Central California tiger salamander and provide habitat for breeding, feeding, or sheltering commensurate with or better than habitat lost as a result of the proposed project.

On page 94, under **Effects of the Proposed Action,** *Blunt-nosed leopard lizard, Effects associated with construction activities*, **replace first paragraph with:**

Mortality or injury of blunt-nosed leopard lizards may occur from being crushed by project related equipment or vehicles, or construction debris within the action area during construction activities. Small mammal burrows that may be used as refugia by blunt-nosed leopard lizards may be collapsed by required ground-disturbing CRM mitigation activities. The collapse of small mammal burrows could expose individuals to predation or adverse environmental conditions. Blunt-nosed leopard lizards could fall into trenches, pits, or other excavations, and may be directly killed or unable to escape and be subjected to desiccation, entombment, or starvation. Disturbance and displacement may increase the potential for predation, desiccation, competition for food and shelter, or strike by vehicles on roadways. However, implementation of conservation measures proposed specifically for the blunt-nosed leopard lizard, such as minimizing the total area disturbed by project activities, conducting pre-construction surveys, daily clearance surveys, and inspecting burrows and trenches to make sure individuals are not inadvertently crushed, providing escape ramps in trenches, and wildlife exclusion fencing will minimize mortality or injury.

On page 95, under **Effects of the Proposed Action,** *Blunt-nosed leopard lizard, Conservation measures for the Blunt-nosed leopard lizard*, **replace with:**

Implementation of the proposed conservation measures will significantly reduce adverse effects to blunt-nosed leopard lizards during project construction, maintenance, and operational activities. However, some mortality of blunt-nosed leopard lizards may still occur because they may be difficult for operators of maintenance equipment and vehicles to observe. The CHST-FB Project will result in the permanent loss of up to 108.47 acres of suitable habitat for blunt-nosed leopard lizards (Table 5). The FRA and the Authority have proposed to mitigate for the final calculated permanent habitat loss for blunt-nosed leopard lizard through the acquisition of permittee-responsible mitigation sites within Tulare, Kings, and Kern counties that will be protected in perpetuity through conservation easements. These lands will be protected and managed for the conservation of the blunt-nosed leopard lizard and provide habitat for

breeding, feeding, or sheltering commensurate with or better than habitat lost as a result of the proposed project.

On pages 97 and 98, under **Effects of the Proposed Action,** *Valley elderberry longhorn beetle, Effects associated with construction activities, Conservation measures for the Valley elderberry longhorn beetle*, **delete** allt paragraphs, including Table 7 Summary of proposed compensation for permanent effects to suitablet habitat for the Valley elderberry longhorn beetle.t

On pages 98 and 99, under **Effects of the Proposed Action,** *California jewelflower, Hoover's spurge, Kern mallow, and San Joaquin woollythreads*, **replace with:**

Direct and indirect effects to California jewelflower, Hoover's spurge, Kern mallow, and San Joaquin woolly-threads will be presumed where suitable habitat occurs within the project action area. Effects to each of these listed plant species were calculated by summing the acreage of potentially suitable habitats within the project footprint that occur within the range of each species. The proposed project will result in the permanent loss of potentially suitable habitat for the California jewelflower (up to 15.00 acres), the Hoover's spurge (up to 6.11 acres), the Kern mallow (up to 217.93 acres), and the San Joaquin woolly-threads (up to 491.77 acres) (Table 5).

On page 101, under **Conclusion,** between TKR and CTS **add:**

Buena Vista Lake ornate shrewt

After reviewing the current status of the BVLOS, the environmental baseline for the action area, the effects of the proposed project, and the cumulative effects, it is the Service's biological opinion that the CHST-FB Project, as proposed, is not likely to jeopardize the continued existence of this listed species. Based on the proposed project design and all of the conservation measures, loss of suitable habitat anticipated is small relative to the availability of those similar habitat features throughout the BVLOS's range. The protection of habitats within permittee-responsible mitigation sites will minimize the effect on the BVLOS from incidental take resulting from permanent habitat loss. Permanent protection of any such lands through conservation easements will provide beneficial effects for this species and contribute to its survival and recovery.

On pages 102 and 103, under **Conclusion,** *Valley elderberry longhorn beetle*, **delete** the paragraph.

INCIDENTAL TAKE STATEMENT

On page 105, under **Amount or Extent of Take,** *San Joaquin kit fox*, **replace with:**

It is not possible to quantify the number of individual San Joaquin kit foxes that will be taken as a result of the proposed project because this species is relatively sparsely distributed and we believe that the number of individual foxes impacted will be relatively small. Therefore, the amount of habitat for this species that will be affected as a result of the CHST-FB Project will be used as a surrogate for quantifying take. The Service anticipates that any San Joaquin kit foxes that may be in the section of the action area undergoing construction at any given time, a total area of 11,941 acres (including the project footprint, areas within 200 feet of the project footprint, and the 405-acre FCMS) will be harassed by project activities in areas undergoing construction, operations, and maintenance activities which will result in the likelihood of injury by annoying foxes to such an extent as to significantly disrupt normal behavior patterns. In addition, the Service anticipates that 768.94 acres of highly suitable habitat will be directly impacted and permanently lost as a result of the CHST-FB Project alignment

resulting in harm to the species by significantly impairing essential behaviors, including breeding, foraging, and denning. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the CHST-FB Project in the form of harassment over 11,941 acres, and harm of the San Joaquin kit fox caused by the loss of 768.94 acres of highly suitable habitat, will become exempt from the prohibitions described under section 9 of the Act.

On page 105, under **Amount or Extent of Take,** *Tipton kangaroo rat*, **replace with:**

It is not possible to quantify the number of individual Tipton kangaroo rats that will be taken as a result of the proposed project because the number of individuals within the project action area is unknown. The anticipated loss of individuals of this species also may 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 this species that will be affected as a result of the CHST-FB Project will be used as a surrogate for quantifying take. The Service anticipates that up to 468.02 acres of suitable habitat for the Tipton kangaroo rat will be permanently lost as a result of the CHST-FB Project. Upon implementation of the Reasonable and Prudent Measures, these levels of incidental take associated with the CHST-FB Project in the form of harm, harassment, capture, injury, and death of the Tipton kangaroo rat caused by habitat loss, construction activities, capture, transport, handling and holding during relocation from the construction footprint, and any required ground-disturbing CRM mitigation and burrow excavation activities will become exempt from the prohibitions described under section 9 of the Act.

On page 105, **add** under **Amount or Extent of Take** between TKR and CTS:

Buena Vista Lake ornate shrew

It is not possible to quantify the number of individual BVLOS that will be taken as a result of the proposed project because it is small, cryptic, difficult to detect, limited survey efforts have been conducted, its current distribution across the landscape is not well known, and its life history is not well understood. Further, the specific habitat requirements of BVLOS are poorly defined, and the potential distribution of the species is difficult to delineate or predict (Cypher 2016). The amount of BVLOS suitable habitat (mesic and xeric) that will be impacted as a result of the CHST-FB Project will be used as a surrogate for quantifying take. The Service anticipates that 39.02 acres of more mesic and 37.79 acres of more xeric suitable habitat will be directly affected and permanently lost as a result of the CHST-FB Project alignment resulting in harm to the species by significantly impairing essential behaviors, including breeding, foraging, and sheltering. The Service further anticipates that an additional 51.18 acres of marginal habitat will be directly affected. Upon implementation of the Reasonable and Prudent Measures, these levels of incidental take associated with the CHST-FB Project in the form of harm, harassment, capture, injury, and death of the BVLOS caused by habitat loss, construction activities, transport, handling and holding during relocation from the construction footprint, and any required CRM mitigation activities will become exempt from the prohibitions described under section 9 of the Act.

On page 106, under **Amount or Extent of Take,** *blunt-nosed leopard lizard*, **replace with:**

It is not possible to quantify the number of individual blunt-nosed leopard lizards that will be taken as a result of the proposed project because the number of individuals within the project action area is unknown. The anticipated loss of individuals of this species also may 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 this species that will be

affected as a result of the CHST-FB Project will be used as a surrogate for quantifying take. Thea Service anticipates that up to 108.47 acres of suitable habitat for the blunt-nosed leopard lizard will be permanently lost as a result of the CHST-FB Project. Upon implementation of the Reasonable and Prudent Measures, these levels of incidental take associated with the CHST-FB Project in the form of harm, harassment, capture, injury, and death of the blunt-nosed leopard lizard caused by habitat loss, construction activities, exclusion from active construction areas, and any required ground-disturbing CRM mitigation activities or burrow excavation activities will become exempt from the prohibitions described under section 9 of the Act.

On page107, under **Amount or Extent of Take,** *Valley elderberry longhorn beetle*, **delete** the paragraph.

On page107, under **Effect of Take, replace with:**

The Service has determined this level of anticipated take is not likely to result in jeopardy to the San Joaquin kit fox, the Tipton kangaroo rat, the BVLOS, the Central California tiger salamander, the blunt-nosed leopard lizard, the vernal pool fairy shrimp, and the vernal pool tadpole shrimp.

On page107, under **Reasonable and Prudent Measure, replace with:**

The Service has determined that the following reasonable and prudent measure is necessary and appropriate to minimize and avoid effects of the CHST-FB Project on the San Joaquin kit fox, the Tipton kangaroo rat, the, BVLOS the Central California tiger salamander, the blunt-nosed leopard lizard, the vernal pool fairy shrimp, and the vernal pool tadpole shrimp.

All of the conservation measures as proposed by the FRA and the Authority in the biological assessments, and restated in the project description section of this biological opinion, must be fully implemented and adhered to.

On pages 107 and 108, under **Terms and Conditions, replace 1 and 2 with:**

1.a The FRA and the Authority will ensure that the FRA and the Authority and all of theira contractors fully implement and adhere to the proposed conservation measures. All terms anda conditions that apply to contractor activities will be conditioned in contracts for the work.a

2.a In order to monitor whether the amount or extent of incidental take anticipated froma implementation of the project is approached or exceeded, the FRA and the Authority willa adhere to the following reporting requirements. Should this anticipated amount or extent ofa incidental take be exceeded, the FRA and the Authority must immediately reinitiate formala consultation as per 50 CFR 402.16.a

   a.a For those components of the action that will result in habitat degradation or modificationa whereby incidental take in the form of harm is anticipated, the FRA and the Authority willa provide monthly updates to the Service with a precise accounting of the total acreage whena the following habitats are impacted: (1) habitat for the San Joaquin kit fox (Table 4); (2)a habitat for the Tipton kangaroo rat (Table 5); (3) habitat for the BVLOS (Table 5); (4)a upland habitat for the California tiger salamander (Table 5); (5) habitat for the blunt-noseda leopard lizard (Table 5); and (6) vernal pool habitat for vernal pool species (Table 5).a Updates will also include any information about changes in project implementation thata result in habitat disturbance not described in the *Description of the Proposed Action* and nota analyzed in this biological opinion.a

b.o ~~For those components of the action that may result in direct encounters between listedo wildlife species and project workers and their equipment whereby incidental take in theo form of harassment, harm, injury, or death is anticipated, within one day the FRA ando tAuthority will contact the Service's SFWO at (916) 414-6643, to report the encounter.~~ The FRA and the Authority will contact the Service's SFWO at (916) 414-6643 within oneo day to report direct encounters between listed wildlife species and project workers ando their equipment whereby incidental take in the form of harm, injury, or death occurred. Ifo the encounter occurs after normal working hours, the Service will be contacted at theo earliest possible opportunity the next working day. This reporting will allow the Serviceo and the FRA and Authority to evaluate those project components such that the potentialo for such direct encounters is minimized. If an encounter occurs after normal workingo hours, the FRA and the Authority will contact the SFWO at the earliest possibleo opportunity the next working day. When injured or killed individuals of the listed specieso are found, the FRA and the Authority will follow the steps outlined in the *Salvage ando Disposition of Individuals* section.o

c.o All pre-construction survey reports will be provided for the Service to review at least fiveo days prior to the initiation of the proposed work.o

d.o A post-construction report detailing compliance with the project design criteria ando proposed conservation measures described under the *Description of the Proposed Actiono* section of this biological opinion will be provided to the Service within 30 calendar days ofo completion of the project. The report will include: (1) dates of project groundbreakingo and completion; (2) pertinent information concerning the success of the project in meetingo compensation and other conservation measures; (3) an explanation of failure to meet sucho measures, if any; (4) known project effects on listed species, if any; (5) observed incidenceso of injury to or mortality of any listed species, if any; and, (6) any other pertinento information.o

On page109, under **Salvage and Disposition of Individuals, replace with:**

In the case of an injured and/or dead federally listed wildlife species, the Service will be notified of events within one day and the animal will only be handled by a Service-approved biologist. Injured federally listed wildlife species will be cared for by a licensed veterinarian or other qualified person. In the case of a dead federally listed wildlife species, the animal will be preserved, as appropriate, and will be bagged and labeled (i.e. species type; who found or reported the incident; when the report was made; when and where the incident occurred; and if possible, cause of death). Carcasses will be held in a secure location, such as a freezer or cooler, until instructions are received from the Service regarding the disposition of the specimen or until the Service, or another appropriate agency or qualified person, takes custody of the specimen.

The FRA must report to the Service within one calendar day any information about take or suspected take of federally-listed species not exempted in this opinion. Notification must include the date, time, and location of the incident or of the finding of a dead or injured animal. The Service contacts are Brian Arnold, Senior Fish and Wildlife Biologist, Sacramento Fish and Wildlife Office, at (916) 414-6643 and the Service's Law Enforcement Division at (916) 414-6660.o

CONSERVATION RECOMENDATIONS

On page 109, under Conservation Recommendation 1, **replace with:**

> The Service recommends the FRA develop and implement the appropriate conservation and restoration measures in areas designated in the *Recovery Plan for Upland Species of the San Joaquin Valley, California* (Service 1998), and the *Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon* (Service 2005b).

On page110, **add** Conservation Recommendation **4:**

4. Use of cameras to detect BVLOS should be conducted to further knowledge of this species' habitat requirements. This information would be helpful for future California High Speed Rail Sections, including the Shafter to Bakersfield portion of the Fresno to Bakersfield Section, as well as the Bakersfield to Palmdale Section. Camera detection efforts should use the close-focus cameras recommended by the ESRP that are in the possession of the Design/Build teams for CP 2-3 and CP 4. The cameras should be placed for four consecutive nights, and should be baited with Tenebrionid larvae placed in a small dish in front of the camera to encourage any BVLOS to come into view. A biologist should replenish the Tenebrionid larvae after the second night, at a minimum. Camera detection efforts can be conducted anywhere along the alignment, preferably in areas that have not been previously accessible to BVLOS camera detection or live-trapping efforts.

REINITIATION - CLOSING STATEMENT

This concludes reinitiation of formal consultation on the California High-Speed Train System: Fresno to Bakersfield Section Project. As provided in 50 CFR §402.16, reinitiation of formal consultation is required and will be requested by the federal agency or by the Service where discretionary federal agency involvement or control over the action has been retained or is authorized by law and:

(a) If the amount or extent of taking specified in the incidental take statement is exceeded;

(b) 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;

(c) 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

(d) 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 correspondence, please contact Brian Arnold, Senior Fish and Wildlife Biologist (brian_arnold@fws.gov), or Catrina Martin, Chief, Infrastructure Division (catrina_martin@fws.gov) at the letterhead address, (916) 414-6701, or by e-mail.

Sincerely,

Jennifer M. Norris
Field Supervisor

cc:
Mark McLoughlin, California High-Speed Rail Authority, Sacramento, California
Kathleen Dadey, U.S. Army Corps of Engineers, Sacramento, California
Julie Vance, California Department of Fish and Wildlife, Fresno, California
Clifton Meek, Environmental Protection Agency, San Francisco, California

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In Litteris

Aardvark Biological Services LLC. 2017a. Buena Vista Lake Ornate Shrew Assessment at Orange Avenue, to Matthew Weekes from Steven Chen, 4 pages including photographs. 10 May.

Aardvark Biological Services LLC. 2017b. Buena Vista Lake Ornate Shrew Assessment at Avenue 24, to Matthew Weekes from Steven Chen, 5 pages including photographs. 10 May.

Aardvark Biological Services LLC. 2017c. Buena Vista Lake Ornate Shrew Assessment at 208 5th Avenue, to Matthew Weekes from Steven Chen, 3 pages including photograph. 31 May.

Aardvark Biological Services LLC. 2017d. Buena Vista Lake Ornate Shrew Assessment at Sweet Canal on FB-16-0316, to Matthew Weekes from Steven Chen, 3 pages including photograph. 9 July.

Aardvark Biological Services LLC. 2017e. Buena Vista Lake Ornate Shrew Assessment FB-54-0508, to Matthew Weekes from Steven Chen, 6 pages including photographs. 9 July.

Aardvark Biological Services LLC. 2017f. Buena Vista Lake Ornate Shrew Assessment Excelsior Avenue, to Matthew Weekes from Steven Chen, 3 pages including photograph. 13 July.

Aardvark Biological Services LLC. 2017g. Buena Vista Lake Ornate Shrew Assessment Jackson Avenue, to Matthew Weekes from Steven Chen, 4 pages including photographs. 13 July.

Aardvark Biological Services LLC. 2017h. Buena Vista Lake Ornate Shrew Assessment Cross Creek, to Matthew Weekes from Steven Chen, 8 pages including photographs. 13 July.

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APPENDIX G: JULY 27, 2018, BIOLOGICAL OPINION (LOCALLY GENERATED ALTERNATIVE)

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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

In Reply Refer to:
08ESMF00-
2012-F-0247-5

JUL 2 7 2018

Mr. Mark McLoughlin
Director of Environmental Services
California High-Speed Rail Authority
770 L Street, Suite 620
Sacramento, California 95814

Subject: Reinitiation of Formal Consultation on the California High-Speed Train System: Fresno to Bakersfield Section Project, Fresno, Tulare, Kings, and Kern Counties Biological Opinion (08ESMF00-2012-F-0247)

Dear Mr. McLoughlin:

This letter is in response to the May 9, 2018 letter from the California High-Speed Rail Authority (Authority), on behalf of the Federal Railroad Administration (FRA), requesting reinitiation of formal consultation with the U.S. Fish and Wildlife Service (Service) on the California High-Speed Train System: Fresno to Bakersfield Section Project (project), in Fresno, Tulare, Kings, and Kern Counties, California. Your request was received by the Service on May 11, 2018 via email correspondence. At issue are revisions of effects on the following federally-listed species and critical habitats:

The federally-listed as endangered:

- San Joaquin kit fox (*Vulpes macrotis mutica*) (kit fox);
- Fresno kangaroo rat (*Dipodomys nitratoides exilis*);
- Tipton kangaroo rat (*Dipodomys nitratoides nitratoides*) (TKR);
- Buena Vista Lake ornate shrew (*Sorex ornatus relictus*) (shrew);
- blunt-nosed leopard lizard (*Gambelia sila*) (lizard);
- vernal pool tadpole shrimp (*Lepidurus packardi*) (tadpole shrimp) and designated critical habitat;
- California jewelflower (*Caulanthus californicus*);
- Kern mallow (*Eremalche kernensis*); and
- San Joaquin woolly threads (*Monolopia condonii*).

and the federally-listed as threatened:

- Central California distinct population segment of the California tiger salamander (*Ambystoma californiense*) (central California salamander) and designated critical habitat;
- vernal pool fairy shrimp (*Branchinecta lynchi*) (fairy shrimp) and designated critical habitat; and
- Hoover's spurge (*Chamaesyce hooveri*).

This response is provided under the authority of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*) (Act) and in accordance with the implementing regulations pertaining to interagency cooperation (50 CFR §402).

The Service previously issued the February 28, 2013 *Biological Opinion on the California High-Speed Train System:* Fresno to Bakersfield Section Project, Fresno, Tulare, Kings, and Kern Counties (Service File Number 08ESMF00-2012-F-0247) (2013 FB-BO). The 2013 FB-BO analyzed the project's effects on federally-listed species under several potential project alignments. Due to the design/build nature of the project, design refinements occur as construction progresses. In addition, acquisition of right-of-way provides access for surveys and updated habitat mapping. These changes in project description and effects to federally-listed species are addressed through reinitiation of formal consultation. We have previously amended the 2013 FB-BO as follows:

April 1, 2014: Addressed administrative edits requested by the Authority and FRA, evaluated changes to the project description due to slight changes in the project footprint, and added habitat preservation and restoration activities proposed on the site known at the time as the Fagundes Compensatory Mitigation Site (FCMS).

July 28, 2017: Evaluated the project's effects on the shrew, removed the valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*), addressed effects to TKR, lizards, and salamanders due to burrow excavation and relocation activities required under the project's Incidental Take Permit from the California Department of Fish and Wildlife (CDFW), evaluated changes to the project design as a result of the Early Work Variations, and refined effects to the Hoover's spurge.

In considering your request, we based our evaluation on the following: (1) the May 9, 2018 letter requesting reinitiation of formal consultation and the enclosed May 2018 *Fresno to Bakersfield Section Administrative Draft Supplemental Environmental Impact Report/Environmental Impact Statement Biological Assessment* (biological assessment), prepared by the Authority; (2) the April 2015 *Fresno to Bakersfield Compensatory Mitigation Plan*, prepared by URS/HMM/Arup Joint Venture; (3) draft site-specific mitigation plans, prepared by Westervelt Ecological Services; 4) email and telephone correspondence between representatives of the Service, the Authority, and Environmental Science Associates (consultant); and 5) additional information available to the Service.

This reinitiation addresses a new potential alternative alignment, referred to as the Fresno to Bakersfield Locally Generated Alternative (F-B LGA), between the city of Shafter and the city of Bakersfield. Under the F-B LGA, there may be overall minor increases in loss of habitat for the kit fox, the shrew, and the lizard and decreases in loss of habitat for the TKR and the fairy shrimp. In addition, the habitat compensation proposal by the Authority has been modified to include five new mitigation sites, replacing the previous FCMS proposal. The Service has determined that these revisions do not change our jeopardy determination provided in the 2013 FB-BO. New paragraphs are added to their corresponding sections and page numbers. Minor changes in text (i.e., individual numbers or sentences) are shown as underlined for added text and strike-out for deleted text. The 2013 FB-BO is amended as follows.

On page 5, in chronological order within **Consultation History, add**:

July 21, 2015:	In a meeting with representatives of the Service, the Environmental Protection Agency, CDFW, and the Central Valley Regional Water Quality Control Board, the Authority introduced the F-B LGA and elicited agency feedback.
April 7, 2017:	In a meeting with representatives of the Service, FRA, and the Authority, the F-B LGA survey methodology, anticipated impacts, and conservation strategies were discussed.
April 5, 2018:	In a meeting with representatives of the Service, FRA, the Authority, and the consultant, a strategy for reinitiation was discussed.
May 11, 2018:	The Service received the May 9, 2018 letter requesting reinitiation of formal consultation with the biological assessment enclosed.
May 29, 2018:	The Service received an email from the consultant providing additional information regarding changes in habitat impacts for federally-listed species.
July 12, 2018:	The Service received an email from the consultant providing additional information regarding changes in habitat impacts for the kit fox.
July 23, 2018:	The Service received a phone call from the consultant clarifying the effects to federally-listed species due to management of the mitigation sites.

BIOLOGICAL OPINION

On page 17, replace **Figure 1. Fresno to Bakersfield project footprint** with Figure 1 on the following page.

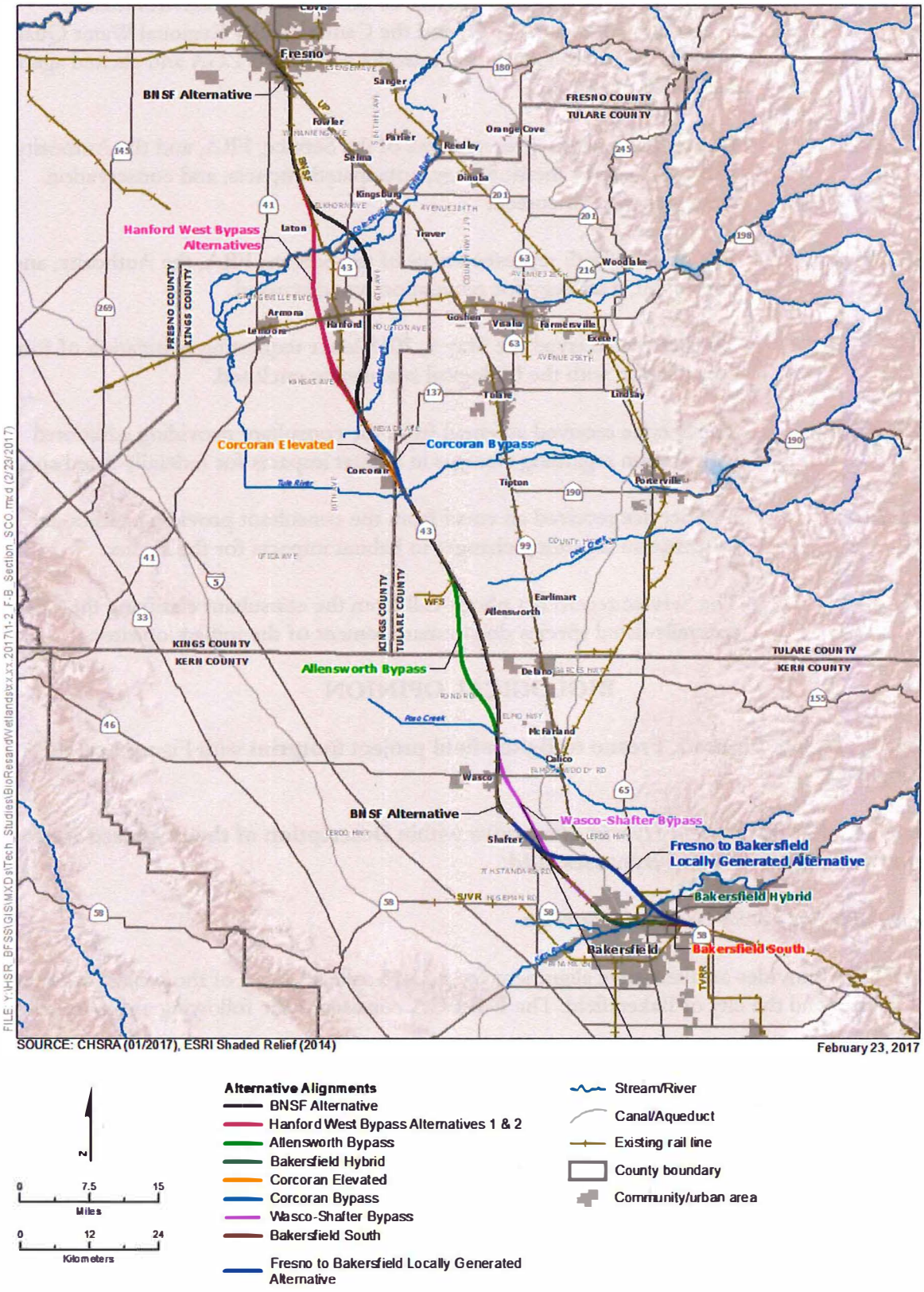
On page 24, after *Bakersfield Hybrid Alternative* within **Description of the Proposed Action, Alternative Alignments and Bypasses, add**:

Fresno to Bakersfield Locally Generated Alternative

The F-B LGA provides an alternative alignment for a 23.13-mile segment of the project between the city of Shafter and the city of Bakersfield. The F-B LGA consists of the following characteristics and elements:

- The total length of the F-B LGA alignment includes 10.52 miles on embankment or at-grade, 0.43 mile on bridges, 0.31 mile on steel truss, 1.97 miles on retained fill, and 9.90 miles on viaduct. No length of the alignment will be below grade or in a trench;
- The average height of the viaduct is 60 feet above existing ground;
- Straddle bents will be constructed in various locations where center support columns cannot be used in order to avoid constraints, such as roadways;

Figure 1. Fresno to Bakersfield project footprint.



- The F-B LGA alignment crosses several existing railroads, including various Burlington Northern Santa Fe Railway (BNSF) and Union Pacific Railroad tracks, one major waterway, the Kern River within the city of Bakersfield, and seven canals;
- The F-B LGA includes 43 road crossings, with 41 undercrossings and 2 overcrossings. Of these road crossings, 12 are within the city of Shafter, 30 will be within the city of Bakersfield, and one (7th Standard Road) will be co-located in the two cities;
- The existing interchange of 7th Standard Road and State Route (SR) 99 will be modified, including the addition of a new westbound to southbound on-ramp;
- The F-B LGA will require multiple roadway modifications in the cities of Shafter and Bakersfield, generally including addition of protective barriers, curbs, sidewalks, and medians. In some cases, the roadway traffic network will be modified where crossings are closed, and new crossings are constructed;
- The F-B LGA F Street Station will be located at the intersection of F Street and SR 204 in the city of Bakersfield. Circulation improvements that are part of the station plan include: elimination of the at-grade intersection of F Street and SR 204 and lowering of the F Street roadway below SR 204, a new roadway providing access from the 30th Street and Alder Street intersection, realignment of the Chester Avenue and 34th Street intersection, and conversion of the Chester Avenue and 32nd Street intersection to a right-in/right-out driveway into the station site;
- One infrastructure maintenance facility is proposed to be located in the city of Shafter between Fresno Avenue and Poplar Avenue; and
- Two electrical stations will be built within urban Bakersfield: one along Windsong Street in a barren lot, and a second in a barren lot bordered by 14th and S Streets, a canal, and an existing railway.

On page 31, **replace FCMS: Project Description** with:

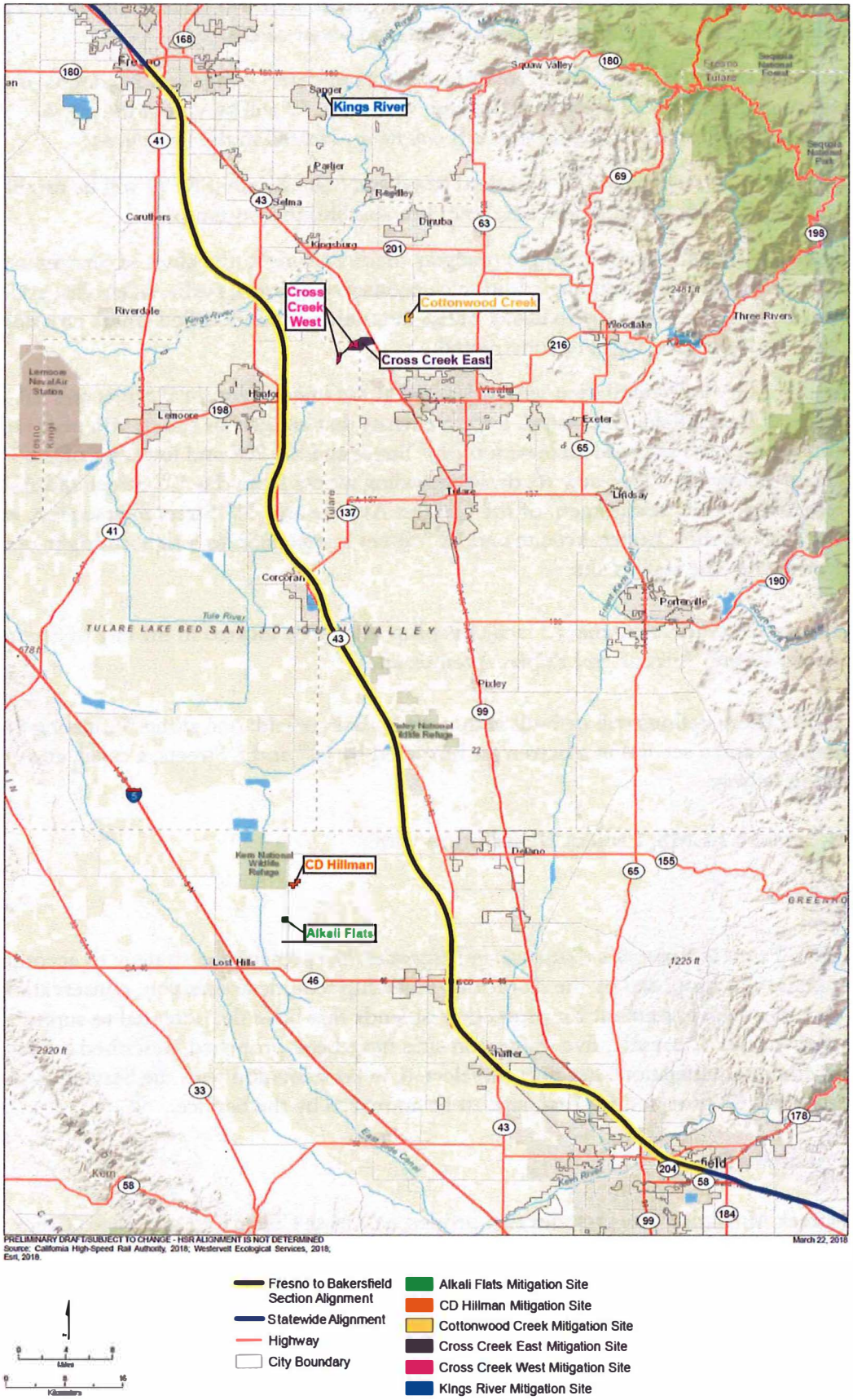
Mitigation Sites

The April 2015 *Fresno to Bakersfield Compensatory Mitigation Plan* presented a strategy to accomplish the habitat compensation proposed by the Authority, including fee-title acquisition, conservation easement, or other legal agreement for protection of lands that have the potential to support federally-listed species. Currently, five mitigation sites have been proposed, described below (Figure 3). Additional mitigation sites may be selected, in coordination with the Service. A detailed mitigation plan will be prepared for each site, to be approved by the Service.

Cross Creek Mitigation Site

The Cross Creek Mitigation Site includes two properties, Cross Creek East and Cross Creek West (the former FCMS), totaling approximately 1,220 acres. The site is located 9 miles south of the city of Kingsburg, in Tulare and Kings Counties. Habitat on the site is composed of wetlands, including vernal pools, seasonal streams, and annual grassland. The majority the site will be preserved, with long-term management intended to maintain and enhance the functions and values of the habitat for federally-listed species found on-site. In addition, activities have been proposed to improve existing riparian habitat on-site, including the installation of exclusion fencing and replanting of native plants

Figure 3. Locations of Proposed Mitigation Sites.



along the creek corridor. The *Fresno to Bakersfield Project Section Cross Creek Mitigation Site Final Mitigation Package*, including a Compensatory Mitigation Plan and Long Term Management Plan, was finalized in June 2018.

Cottonwood Creek Mitigation Site

The Cottonwood Creek Mitigation Site is located within the eastern portion of the Tulare-Buena Vista watershed, north of the city of Visalia. The 247-acre site is composed of wetlands, including vernal pools, intermittent drainages, annual grassland, mesic grassland, and agriculture (dry-farmed winter wheat). In addition to preservation of existing habitat, additional activities are proposed, including wetland rehabilitation, enhancement, and creation. Rehabilitation will entail removing the existing cultivation and introducing grazing of disturbed wetlands on the site. Enhancement will entail excavating deeper areas in existing, very shallow seasonal wetlands to increase their value to vernal pool species. Establishment will entail the excavation of vernal pool basins in uplands that historically did not contain vernal pools.

Grading associated with enhancement and establishment will occur during the dry season. In total, proposed activities on the Cottonwood Creek Mitigation Site will result in approximately 3.6 acres of wetland rehabilitation, excavation of 8.5 acres of vernal pools consisting of a combination of enhancement and establishment, and preservation of approximately 100 acres of wetlands. Enhancement and establishment also will include application of inoculum from vernal pools after excavation.

Kings River Mitigation Site

The Kings River Mitigation Site is approximately 53 acres located in the floodplain of the Kings River, just east of the city of Sanger. Seasonal riverine, seasonal wetland, and emergent marsh habitat will be re-established, rehabilitated, and enhanced. Wetland habitat will be re-established by grading upland portions of the site that are either within peak groundwater levels or adjacent to existing wetlands that support adequate surface hydrology to allow for expansion. After excavation of the re-establishment areas to design elevation, these areas will be planted with native riparian and wetland plant species and seeded with native grasses. Rehabilitation will be accomplished by either excavation or alteration of the existing management regime. Enhancement will take place by the removal of soil plugs to allow wetlands to hydrologically reconnect to adjacent features, as well as planting native wetland and riparian vegetation.

CD Hillman Mitigation Site

The CD Hillman Mitigation Site is located on the east side of Corcoran Road, approximately 2 miles south of Garces Highway in the Wasco area of northern Kern County. The site is composed of 239 acres of annual grassland, shadscale scrub, alkali sink scrub, and seasonal wetlands. The site will primarily be preserved, with long-term management intended to maintain and enhance the functions and values of the habitat for federally-listed species found on-site. In addition, treatment of invasive tamarisk will occur. Translocation of TKR from portions of the construction area may occur on the mitigation site following a site-specific plan developed in coordination with the Service.

Alkali Flats Mitigation Site

The Alkali Flats Mitigation Site is 158 acres, located approximately 4 miles south of the Kern National Wildlife Refuge and composed of an alkali sink community, including alkali rain pools. The only known previous use of the site is periodic grazing. No habitat restoration activities are planned at this site. Fencing will be installed along Corcoran Road and two debris piles will be removed.

On page 52, under **Action Area, replace with**:

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." For the purposes of the effects assessment, the action area includes the CHST-FB alignment footprint, lands surrounding it, the Early Work Variations area, and the ~~405-acre FCMS~~ all Service-approved mitigation sites.

Several potential alignments have been identified in the Revised Draft Environmental Impact Report/Supplemental Draft Environmental Impact Statement for the proposed project. These alternatives include varying siting for not only rail alignments, but also other project infrastructure, including passenger stations, power delivery stn1Ctures, maintenance-of-way facilities, operations control centers, and a Heavy Maintenance Facility. Since an alternative has not been selected to date for all components of the Fresno to Bakersfield Section, this biological opinion includes a project description and effects analysis for all alternative alignments, and assesses effects to federally-listed species based on a range of impacts from minimum to maximum (expressed in acreages). Regardless of the final alignment selected, project impacts will be similar geographically as well as in general nature and magnitude.

The project footprint extends to the physical limits of the construction activities associated with the proposed action. The project footprint includes all areas that will be permanently or temporarily affected by the proposed action. The footprint consists of the limits of cut and fill plus all access roads and areas required for operating, storing, and refueling construction equipment. The estimated project footprint for the CHST-FB Project alignment is expected to be no greater than approximately 7,189 acres.

The estimated length of the Fresno to Bakersfield alignment will extend up to 117 miles. The area affected by disturbance from noise and vibrations, dust, and lighting during project construction is expected to extend up to 1,000 feet from both sides of the track. Associated project structures, such as roadway improvements, overcrossings, related ancillary facilities, and other permanent project elements, are included in the estimated project action area for the CHST- FB Project. The project action area for the Fresno to Bakersfield alignment, including the project footprint, the Early Work Variations area, and the ~~405-acre FCMS~~ mitigation sites is currently estimated to be no greater than ~~48,856~~ 50,368 acres, which will be considered for the purposes of this opinion. Additional mitigation sites may be selected, in coordination with the Service, which will be considered part of the action area upon Service acceptance. Activities on these sites are expected to be similar in general nature and magnitude of those analyzed in this opinion.

On page 65, under **Environmental Baseline**, *San Joaquin kit fox*, at the end of second paragraph, **add**:

As of Junie 2018 no kit fox have been detected during preconstruction surveys or burrow monitoring and excavations within any portions of CP 2-3 or CP 4 that have been evaluated, including 851.00 acres of suitable habitat that has been reported as impacted.

On pages 65 and 66, under **Environmental Baseline**, *San Joaquin kit fox*, **replace** third paragraph **with**:

San Joaquin kit foxes are expected to occur within all areas of suitable habitat throughout the CHST-FB project action area. An estimated ~~5,401.23~~ 5,475.18 acres of habitat (alkali desert scrub, annual grassland, pasture, barred, urban Bakersfield, and agricultural lands) occurs within the 7,189-acre CHST-FB Project alignment footprint. Approximately ~~1,770.46~~ 1,771.09 of the ~~5,401.23~~ 5,472.18 acres (~~33~~ 32 percent) occur within satellite and corridor areas. Highly suitable habitat for the kit fox supports denning, foraging, and breeding; in the CHST-FB project action area it is composed of annual grasslands, alkali desert scrub, pasture, and barren land cover, as mapped for this project. Approximately ~~768.94~~ 795.04 acres of the ~~5,401.23~~ 5,472.18 acres (~~14~~ 15 percent) of habitat is considered highly suitable for use by the kit fox (Table 4) About ~~52~~ 51 percent (~~403.31~~ 403.94 acres) of the ~~768.94~~ 795.04 acres of highly suitable habitat occurs within satellite and corridor areas. The remaining ~~4,632.29~~ 4,677.14 acres of kit fox habitat consists of agricultural and urban habitats between Fresno and Bakersfield (Table 4).

On page 69, under **Environmental Baseline**, San Joaquin kit fox, replace Table 4 **with**:

Table 4. Range of potential habitat for the San Joaquin kit fox.

Land Prioritization[1]	CWHR Vegetation Community or Wildlife Association	Impact Type	Areas of Effect (Acres)[2]	
			MIN	MAX
Southwestern Tulare County Satellite Area	**Natural**		**86.26**	**165.01**
	Annual Grassland	Direct	86.12	112.59
	Alkali Desert Scrub	Direct	0.07	37.40
	Barren	Direct	0	9.98
	Pasture	Direct	0.07	5.04
	Valley Oak Woodland	Direct	0	0
	Agriculture		**511.36**	**687.86**
	Agriculture/Crop	Direct	184.72	209.39
	Dryland Grain Crop	Direct	30.17	38.70
	Deciduous Orchard	Direct	228.81	255.10
	Evergreen Orchard	Direct	0	0
	Irrigated Grain Crop	Direct	10.69	75.75
	Irrigated Row and Field Crop	Direct	0	0
	Irrigated Hayfield	Direct	56.97	108.2
	Vineyard	Direct	0	0-
	Urban/BNSF		**0**	**0**
	BNSF	Direct	0	0
	Urban Development	Direct	0	0
Metropolitan Bakersfield Satellite Area (Urban Bakersfield)	**Natural**		**~~214.77~~ 51.72**	**~~218.15~~ 218.78**
	Annual Grassland	Direct	34.67	~~36.55~~ 36.17
	Alkali Desert Scrub	Direct	~~10.13~~ 0	11.14
	Barren	Direct	~~169.11~~ 17.05	169.32
	Pasture	Direct	~~0.86~~ 0	1.15

Metropolitan Bakersfield Satellite Area (Urban Bakersfield)	Valley Oak Woodland	Direct	0	0
	Agriculture		0	0
	Agriculture/Crop	Direct	0	0
	Dryland Grain Crop	Direct	0	0
	Deciduous Orchard	Direct	0	0
	Evergreen Orchard	Direct	0	0
	Irrigated Grain Crop	Direct	0	0
	Irrigated Row and Field Crop	Direct	0	0
	Irrigated Hayfield	Direct	0	0
	Vineyard	Direct	0	0
	Urban/BNSF		**~~249.62~~ 238.34**	**301.56**
	BNSF	Direct	~~13.5~~ 2.22	13.67
	Urban development	Direct	236.12	287.89
Linkage Area	**Natural**		**0**	**20.15**
	Annual Grassland	Direct	0	1.27
	Alkali Desert Scrub	Direct	0	0
	Barren	Direct	0	18.88
	Pasture	Direct	0	0
	Valley Oak Woodland	Direct	0	0
	Agriculture		**104.69**	**377.73**
	Agriculture/Crop	Direct	3.01	96.55
	Dryland Grain Crop	Direct	0	0
	Deciduous Orchard	Direct	88.81	92.49
	Evergreen Orchard	Direct	0	0
	Irrigated Grain Crop	Direct	7.90	25.80
	Irrigated Row and Field Crop	Direct	0	6.08
	Irrigated Hayfield	Direct	4.97	29.83
	Vineyard	Direct	0	126.98
	Urban/BNSF		0	0
	BNSF	Direct	0	0
	Urban development	Direct	0	0
Remainder Areas (Outside of Recovery Areas)	**Natural**		**164.34**	**~~365.63~~ 391.10**
	Annual Grassland	Direct	111.05	~~184.46~~ 184.93
	Alkali Desert Scrub	Direct	2.03	9.16
	Barren	Direct	28.58	~~134.24~~ 159.24
	Pasture	Direct	22.69	37.77
	Valley Oak Woodland	Direct	0	0
	Agriculture		**~~1,643.94~~ 1,477.49**	**~~3,265.14~~ 3,309.99**
	Agriculture/Crop	Direct	~~159.49~~ 155.75	516.12
	Dryland Grain Crop	Direct	~~34.85~~ 10.89	77.80
	Deciduous Orchard	Direct	~~733.19~~ 628.02	1,199.49
	Evergreen Orchard	Direct	3.42	3.42
	Irrigated Grain Crop	Direct	~~160.47~~ 158.14	382.44
	Irrigated Row and Field Crop	Direct	~~37.62~~ 29.68	131.24
	Irrigated Hayfield	Direct	~~242.04~~ 218.75	441.09
	Vineyard	Direct	272.84	~~513.54~~ 558.39
	Urban/BNSF		0	0
	BNSF	Direct	0	0
	Urban development	Direct	0	0

[1]Land Prioritization categories are based on the *Recovery Plan of the Upland Species of the San Joaquin Valley, California* (Service 1999) and the *San Joaquin kit fox 5-Year Review* (Service 2010).

[1]The MIN-MAX tables presented within the Biological Assessment are not representative of any one alignment. The total acres of the table may exceed the project footprint because the sum of the maximum values is calculated across all potential project alignments.

On page 71, under **Environmental Baseline,** *Tipton kangaroo rat,* **replace** first line **with:**

Between ~~367.18~~ 221.18 and 468.02 acres of potentially suitable habitat, such as alkali desert scrub, annual grassland, barren, and pasture land, for the Tipton kangaroo rat occurs within the project action area (Table 5).

On page 71, under **Environmental Baseline,** *Buena Vista Lake ornate shrew,* **replace** first paragraph

About ~~76.81~~ 79.99 acres of highly suitable habitat for the shrew occurs within the project action area (Table 5). This includes the more mesic areas of moist soil associated with rivers, creeks, canals, and water impoundments, and the associated riparian and emergent wetland vegetation with extensive cover and leaf litter (about ~~39.02~~ 40.56 acres), and the more xeric annual grassland and alkali desert scrub with varying amounts and types of cover and substrate within 200 feet of rivers, creeks, canals, water impoundments and other water sources (about ~~37.79~~ 39.43 acres). In addition, about 51.18 acres of marginal habitat for the shrew occurs within the project action area (Table 5). This habitat could be used by the shrew for movement and dispersal, or in the absence of more highly suitable habitat, although the extent to which they might use these areas is currently unknown.

On page 72, under **Environmental Baseline,** *Blunt nosed leopard lizard,* **replace** first line **with:**
Between 26.57 and ~~108.47~~ 120.82 acres of potentially suitable habitat for the blunt-nosed leopard lizard, such as alkali desert scrub, annual grassland, barren lands, and valley foothill riparian occurs within the project action area (Table 5).

On page 72, under **Environmental Baseline,** *Blunt nosed leopard lizard,* **replace** third paragraph **with:**

In 2017, protocol surveys were conducted on a total of 625.73 acres within CP 2-3. No lizards were detected. Protocol surveys were conducted in two areas on CP 4 in 2016 and 2017. In 2016, one lizard was detected within the construction footprint, along County Line Road. In addition, four lizards were detected in the same survey area, along an access road east of the action area. In 2017, each survey area was able to be expanded, covering a total of 68.65 acres. Both adult and juvenile lizards were detected in the same area as the previous year, indicating that lizards are successfully breeding in the area.

On page 73, under **Environmental Baseline**, *Vernal pool fairy shrimp*, **replace** third line of first paragraph **with**:

Wetland delineation surveys identified between ~~2.33~~ 1.82 and 29.77 acres of potentially suitable seasonal wetland and vernal pool habitat that could support the fait-y shrimp within the project action area (Table 5).

On page 74, under **Environmental Baseline, replace** Table 5 **with:**

Table 5. Range of potential federally-listed species habitat within the Fresno to Bakersfield alignment of the project (excluding mitigation properties)

Species	Habitat Type	Impact Type	Areas of Effect*	
			MIN	MAX
Tipton kangaroo rat	Alkali desert scrub, annual grassland, barren and pasture	Direct	~~367.18~~ 221.18	468.02
Buena Vista Lake ornate shrew	More mesic Highly Suitable: moist soil associated with rivers, creeks, canals, water impoundments; associated riparian, emergent wetland vegetation; with cover and leaf litter	Direct	-	~~39.02~~ 40.56
	More xeric Highly Suitable: grasslands, alkali desert scrub, alkali sink scrub within ~ 200 feet of rivers, creeks, canals, water impoundments, other water sources		-	~~37.79~~ 39.43
Central California tiger salamander	AQUATIC: Vernal pools/seasonal wetlands	Direct	6.2	18.30
	UPLAND: alkali desert scrub, annual grasslands, pasture surrounding vernal pools/seasonal wetlands		18.6	18.70
Blunt-nosed leopard lizard	Alkali desert scrub, annual grassland, barren and valley foothill riparian	Direct	26.57	~~108.47~~ 120.82
Vernal pool fairy shrimp	Vernal pools/seasonal wetlands	Direct	~~2.33~~ 1.82	29.77
		Indirect	~~14.55~~ 14.46	103.52
Vernal pool tadpole shrimp	Vernal pools/seasonal wetlands (delineated within the geographic range of the species)	Direct	0.0041	0.0041
		Indirect	0.0560	0.0560
California jewelflower	Unsurveyed alkali desert scrub, annual grassland, and pash1re in Fresno County	Direct	0	15.00
Hoover's spurge	Vernal pools/seasonal wetlands in Tulare County	Direct and Indirect bisected	-	6.11
Kern mallow	Unsurveyed alkali desert scrub, annual grassland, and pasture in Tulare and Kern counties	Direct	0	217.93
San Joaquin woolly-threads	Unsurveyed alkali desert scrub, annual grassland, and pasture in Fresno, Kings, and Kern counties	Direct	0	491.77

On pages 78 to 81, **replace** the entire section **FCMS: Environmental Baseline with:**

Mitigation Sites: Environmental Baseline

Cross Creek Mitigation Site

The Cross Creek Mitigation Site provides 804.16 acres of annual grassland habitat for the kit fox. The closest kit fox occurrence in the CNDDB is on a neighboring parcel, east of the southern

portion of the mitigation site. No kit fox were detected during camera surveys conducted on the mitigation site in June 2017.

The site also provides 1,183.53 acres of upland habitat and at least 2.4 acres of aquatic habitat for the salamander. The entire site is within the Southern San Joaquin Region, Unit 5 of designated critical habitat for the salamander. There is a 1999 occurrence in the CNDDB of egg masses in the southwestern corner of the mitigation site. The closest known population is approximately 10 miles upstream on the Stone Corral Reserve. No salamanders were detected during surveys conducted on the mitigation site between December 2016 and April 2017.

In addition, the mitigation site provides 172.81 acres of wetland habitat suitable for the fairy shrimp and the tadpole shrimp. The site falls within the Cross Creek core area of the San Joaquin Valley Vernal Pool Region. The entire site is within critical habitat unit 26A for the fairy shrimp and 18A for the tadpole shrimp. There are three known occurrences of the fairy shrimp and six known occurrences of the tadpole shrimp on the mitigation site. During surveys conducted between December 2016 and March 2017, fairy shrimp were detected in 55 wetland features, and tadpole shrimp were found in 23 features.

No federally-listed plants were detected during surveys conducted on the Cross Creek Mitigation Site in August 2016 and April 2017.

Cottonwood Creek Mitigation Site

The Cottonwood Creek Mitigation Site provides 132.68 acres of annual grassland habitat for the kit fox. The closest kit fox occurrence in the CNDDB is approximately 0.5 mile south of the site, along the St. John's River. No kit fox were detected during camera surveys conducted on the mitigation site in June 2017.

The site has the potential to provide 226.25 acres of upland habitat and some aquatic habitat for the salamander; however the current build-up of thatch onsite may preclude use by salamanders. The entire site is within the Southern San Joaquin Region, Unit 5 of designated critical habitat for the salamander. The closest known population is approximately 4.5 miles upstream on the Stone Corral Reserve. No salamanders were detected during a one-day targeted survey in April 2017 or during surveys for vernal pool branchiopods conducted on the mitigation site between December 2016 and April 2017.

In addition, the mitigation site provides 3.8 acres of wetland habitat suitable for the fairy shrimp and the tadpole shrimp. The site falls within the Cross Creek core area of the San Joaquin Valley Vernal Pool Region. The entire site is within critical habitat unit 26A for the fairy shrimp and 18A for the tadpole shrimp. There is one known occurrence in the CNDDB for each of the fairy shrimp and the tadpole shrimp on the mitigation site. During surveys conducted in March 2017, tadpole shrimp were detected in six features. Although fairy shrimp were not detected, the limited survey was conducted late in the season. Based on the known occurrence and detections on the nearby Cross Creek Mitigation Site, it is likely that fairy shrimp may be found on the site.

No federally-listed plants were detected during surveys conducted on the Cottonwood Creek Mitigation Site in April, May, and September 2017.

Kings River Mitigation Site

Based on the habitat requirements of the federally-listed species known to occur in the vicinity of the Kings River Mitigation Site, none are currently expected to utilize the riparian and floodplain habitat on the mitigation site.

CD Hillman Mitigation Site

The CD Hillman Mitigation Site is directly across Corcoran Road from the Kern National Wildlife Refuge (NWR) and within the Tulare Basin Wildlife Management Area, which was established to protect and manage key habitats for sensitive species in the Tulare Basin. The site is also located within a core area for tl1e protection of natural lands identified in the *Recovery Plan for Upland Species of the San Joaquin Valley, California.*

The mitigation site provides 230.82 acres of alkali sink community habitat for the kit fox. There are three known occurrences of the kit fox in the CNDDB within 1 mile of the mitigation site. San Joaquin kit fox scat was detected on the mitigation site during transect surveys conducted in January and June 2017, indicating that kit fox are present on site.

The alkali sink community on the mitigation site also provides habitat for the TKR. Small mammal trapping conducted in June 2017 did not detect TKR, instead capturing 62 Heermann's kangaroo rats. However concurrent trapping on the adjacent parcel to the east detected TKR, including one individual within 100 meters of the site. Due to the presence of suitable habitat, nearby occurrences, and cyclic nature of kangaroo rat populations, it is likely that TKR are present on the mitigation site, at least in some years.

The mitigation site also provides habitat for the lizard, particularly in higher upland habitat that is not inundated during wet winter seasons. There are 14 known occurrences in the CNDDB within 5 miles of the mitigation site. Three transect surveys conducted during 2017 failed to detect lizards on site.

Kern mallow was documented on the CD Hillman Mitigation Site during a 2017 botanical survey.

Alkali Flats Mitigation Site

The Alkali Flats Mitigation Site is adjacent to parcels of the Semitropic Ridge Preserve managed by the Center for Natural Lands Management and within the Tulare Basin Wildlife Management Area, which was established to protect and manage key habitats for sensitive species in the Tulare Basin. The site is also located within a core area for the protection of natural lands identified in the *Recovery Plan for Upland Species of the San Joaquin Valley, California.*

The mitigation site provides 157.05 acres of alkali sink community habitat for the kit fox. There are multiple known occurrences of the kit fox in the CNDDB within 5 miles of the mitigation site. At least two San Joaquin kit fox were documented on site during a camera trapping effort in June 2017.

The alkali sink community on the mitigation site also provides habitat for the TKR and the lizard. Small mammal trapping conducted on the mitigation site in June 2017 detected 22 unique TKR, including reproductively active individuals. During transect surveys conducted in June 2017, one

lizard was detected. In addition, two lizards were incidentally observed during a site visit in late March 2018.

No federally-listed plants were detected during surveys conducted on the Alkali Flats Mitigation Site in August 2017.

On page 82, under **Effects of the Proposed Action**, *San Joaquin kit fox*, *Effects associated with construction activities*, **replace** the first three full paragraphs **with**:

The potentially suitable habitats occur as fragments or patches throughout the relatively narrow, linear project action area, primarily within Fresno, Tulare, Kings, and Kern Counties. Approximately ~~768.94~~ 795.04 acres of the ~~5,401.23~~ 5,472.18 acres (~ ~~14~~ 15 percent) of suitable habitat along the alignment is considered to be highly suitable for use by the San Joaquin kit fox (alkali desert scrub, annual grassland, pasture, barren lands, summed from Table 4). The remaining ~~4,632.29~~ 4,677.14 acres of San Joaquin kit fox habitat consists of agricultural and urban habitats between Fresno and Bakersfield (Table 4). The ~~768.94~~ 795.04 acres of highly suitable habitat that will be permanently lost as a result of the CHST-FB Project, including the Early Work Variations, represents a small fraction of the remaining highly suitable habitat within Fresno, Tulare, Kings, and Kern Counties (Cypher pers. comm. 2013).

Habitat loss and alteration may occur through degradation and placement of hardscape over suitable denning or foraging habitat as a result of the CHST-FB ali$_{gn}$ment component of the project. It is reasonably likely that construction activities will result in the destruction of dens. Highly suitable habitat that supports denning and breeding is essential for persistence of San Joaquin kit fox populations (Service 2010; Cypher et al. 2013; Cypher et al. 2014). Approximately ~~768.94~~ 795.04 acres of high quality habitat for the San Joaquin kit fox will be permanently lost as a result of the CHST-FB alignment project action area and the Early Work Variations. High quality habitat already is extensively fragmented throughout the CHST-FB alignment component of the project action area. Although the total habitat loss will be spread out over the length of the alignment, the permanent loss resulting from the 100-foot wide CHST-FB alignment footprint will decrease available resources for San Joaquin kit foxes utilizing those areas.

Habitat loss and alteration may occur through degradation and placement of hardscape over suitable denning or foraging habitat as a result of the CHST-FB alignment component of the project. It is reasonably likely that construction activities will result in the destruction of dens. Highly suitable habit that supports denning and breeding is essential for persistence of San Joaquin kit fox populations (Service 2010; Cypher et al. 2013; Cypher et al. 2014). Approximately ~~755~~ 795.04 acres of high quality habitat for the San Joaquin kit fox will be permanently lost as a result of the CHST-FB alignment project action area. High quality habitat is already extensively fragmented throughout the CHST-FB alignment component of the project action area. Although the total habitat loss will be spread out over length of the alignment, the permanent loss resulting from the 100-foot wide CHST-FB alignment footprint will decrease available resources for San Joaquin kit foxes utilizing those areas.

On page 83, **replace Effects of the Proposed Action,** *San Joaquin kit fox, FCMS: Construction Activities for Habitat Restoration,* **with:**

Effects associated with habitat restoration at mitigation sites

Due to the limited restoration activities and the conservation measures proposed, no adverse effects to the kit fox are expected to occur on any of the mitigation sites. Together, the mitigation sites will provide 387.87 acres of alkali sink community and 936.84 acres of annual grassland habitat for the kit fox that will be protected and managed for the conservation of the species in perpetuity.

On page 89, under **Effects of the Proposed Action,** *Tipton kangaroo rat, Effects associated with construction activities,* **replace** the first line of the first full paragraph **with:**

Construction of the CHST-FB Project will result in the permanent loss of between ~~367.18~~ 221.18 and 468.02 acres of potential habitat for the Tipton kangaroo rat (Table 5).

On page 89, under **Effects of the Proposed Action,** *Tipton kangaroo rat,* after the last full paragraph, **add:**

Effects associated with habitat restoration at mitigation sites

Due to the limited restoration activities at the CD Hillman and Alkali Flats Mitigation Sites and the conservation measures proposed, no adverse effects to the TKR are expected to occur. Together, the mitigation sites will provide 387.87 acres of alkali sink community habitat for the TKR that will be protected and managed for the conservation of the species in perpetuity.

On page 91, under **Effects of the Proposed Action,** *Tipton kangaroo rat, Conservation measures for the Tipton kangaroo rat,* **replace** first paragraph **with:**

Implementation of the proposed conservation measures is expected to significantly reduce adverse effects to Tipton kangaroo rats during project construction, maintenance, and operational activities. However, some mortality of Tipton kangaroo rats may still occur because they may be difficult for operators of maintenance equipment and vehicles to observe. ~~The CHST-FB Project will .result in the permanent loss of up to 168.02 acres of habitat for the Tipton kangaroo rat (Table 5).~~ The FRA and the Authority have proposed to mitigate for the final calculated permanent habitat loss for Tipton kangaroo rat through the acquisition of permittee-responsible mitigation sites within Tulare, Kings, and Kern counties that will be protected in perpetuity through conservation easements. These lands will be protected and managed for the conservation of the Tipton kangaroo rat and provide habitat for breeding, feeding, or sheltering commensurate with or better than habitat lost as a result of the proposed project.

On page 91, under **Effects of the Proposed Action,** *Buena Vista Lake ornate shrew, Effects associated with construction activities,* at the end of the first paragraph, **add:**

Up to 40.56 acres of suitable mesic habitat, 39.43 acres of suitable xeric habitat, and 51.18 acres of marginal habitat will be permanently lost as a result of construction of the project (Table 5).

On page 91, under **Effects of the Proposed Action,** *Buena Vista Lake ornate shrew, Conservation measures for the Buena Vista Lake ornate shrew,* **replace** first paragraph **with:**

Implementation of the proposed conservation measures is expected to significantly reduce adverse effects to BVLOSs during project construction, maintenance, and operational activities. However, some mortality of BVLOS may still occur because they are cryptic and difficult for operators of maintenance equipment and vehicles to see; they have been previously documented running across active construction sites. ~~The CHST-FB Project will result in the permanent loss of up to 76.81 acres of highly suitable habitat for the RVLOS (Table 5). In addition, the CHST-FB Project will result in the permanent loss of up to 51.18 acres of marginal habitat that may be used by BVLOS for movement and dispersal or in the absence of more highly suitable habitat.~~ The FRA and the Authority have proposed to mitigate for the final calculated disturbance to highly suitable habitat for BVLOS through the acquisition of permittee-responsible mitigation sites within Tulare, Kings, and Kern counties that will be protected in perpetuity through conservation easements. These lands will be protected and managed for the conservation of the BVLOS and provide habitat for breeding, feeding, or sheltering commensurate to or better than habitat lost as a result of the proposed project. In addition, avoidance and minimization measures will be implemented at all highly suitable habitat locations, as well as at all marginal habitat locations. Compensatory habitat mitigation will not be provided for those areas characterized as marginal habitat for BVLOS for which use and degree of suitability are unknown.

On page 92, **replace Effects of the Proposed Action,** *California tiger salamander, FCMS: Construction Activities for Habitat Restoration,* **with:**

Effects associated with habitat restoration at mitigation sites

Construction activities associated with the proposed wetland and riparian restoration will occur ~~within 33.6 acres of the 405 acre FCMS~~ on the Cottonwood Creek and Cross Creek Mitigation Sites, respectively. Construction activities will occur over a short duration (less than 3 months) during the dry season. Disturbance to upland habitat during construction activities is expected to be minimal ~~within the Vernal Pool Preservation Area~~ on the Cottonwood Creek Mitigation Site because established routes for movement of equipment will be designated and monitored by the Service-approved biologist. Pre-construction surveys for potentially occupied burrows may be used to designate areas to be avoided by construction equipment and workers. However, some central California tiger salamanders that were not detected while inhabiting burrows during preconstruction surveys may suffer injury or mortality if the burrows are crushed by construction equipment. The FRA and the Authority are proposing to develop a plan for relocating central California tiger salamanders from burrows within work areas to burrows in upland habitat that will not be disturbed by construction activities. The relocation plan will be submitted to the Service for review and approval prior to implementation. It is reasonably likely that central California tiger salamanders will be subject to harassment during the relocation.

Effects to the central California tiger salamander resulting from disturbance generated by use of construction equipment and construction activities are expected to be minimal and temporary because the proposed habitat restoration will occur over a short duration (less than 3 months) during the summer months, and there is sufficient alternative habitat available for use and movement by the this species within the ~~FCMS~~ mitigation sites.

The Authority has proposed conservation measures, such as use of Service-approved biological monitors and daily inspections of construction areas to avoid injury and mortality of central California tiger salamander. ~~The FCMS will provide 7.6 acres of preserved vernal habitat, 8.7 acres of vernal pool restoration, and 365.7 acres of upland habitat to support breeding, foraging, and sheltering for the central California tiger salamander, and will be protected and managed for the conservation of this species in perpetuity.~~ Together, the mitigation sites will provide over 2.4 acres of aquatic breeding habitat and 1,409.78 acres of upland habitat for the salamander that will be protected and managed for the conservation of the species in perpetuity.

On page 93, under **Effects of the Proposed Action,** *California tiger salamander; Conservation measures far the central California tiger salamander,* **replace** second paragraph **with:**

~~The CHST FB Project will result in the permanent loss of up to 18.7 acres of upland habitat and 18.3 acres of aquatic habitat for the Central California tiger salamander (Table 5).~~ The FRA and the Authority have proposed to mitigate for the final calculated permanent habitat loss for Central California tiger salamander through the purchase of mitigation credits at an approved conservation bank or the acquisition of permittee-responsible mitigation sites within Fresno, Tulare, and Kings counties that will be protected in perpetuity through conservation easements. These lands will be protected and managed for the conservation of the Central California tiger salamander and provide habitat for breeding, feeding, or sheltering commensurate with or better than habitat lost as a result of the proposed project.

On page 94, under **Effects of the Proposed Action,** *Blunt-nosed leopard lizard, Effects associated with construction activities,* **replace** second paragraph **with:**

Access to suitable habitat such as alkali desert scrub, annual grasslands, and barren habitats will become restricted or permanently lost due to permanent structures associated with the CHST-FB Project. The project will result in the permanent loss of up to 120.82 acres of suitable habitat for the lizard (Table 5). Movement of blunt-nosed leopard lizards within the project action area may be altered as a result of these effects.

On page 95, under **Effects of the Proposed Action,** *Blunt-nosed leopard lizard,* after the first paragraph, **add:**

Effects associated with management activities at mitigation sites

Due to the limited restoration activities at the CD Hillman and Alkali Flats Mitigation Sites and the conservation measures proposed, no adverse effects to the lizard are expected to occur. Together, the mitigation sites will provide 387.87 acres of alkali sink community habitat for the lizard that will be protected and managed for the conservation of the species in perpetuity.

On page 95, under **Effects of the Proposed Action,** *Blunt-nosed leopard lizard, Conservation measures for the blunt-nosed leopard lizard,* **replace** first paragraph **with:**

Implementation of the proposed conservation measures will significantly reduce adverse effects to blunt-nosed leopard lizards during project construction, maintenance, and operational activities. However, some mortality of blunt-nosed leopard lizards may still occur because they may be difficult for operators of maintenance equipment and vehicles to observe. ~~The CHST FB Project will result in the permanent loss of up to 108.47 acres of suitable habitat for blunt~~ -

~~nosed leopard lizards (Table 5).~~ The FRA and the Authority have proposed to mitigate for the final calculated permanent habitat loss for blunt-nosed leopard lizard through the acquisition of permittee-responsible mitigation sites within Tulare, Kings, and Kern counties that will be protected in perpetuity through conservation easements. These lands will be protected and managed for the conservation of the blunt-nosed leopard lizard and provide habitat for breeding, feeding, or sheltering commensurate with or better than habitat lost as a result of the proposed project.

INCIDENTAL TAKE STATEMENT

On page 105, under **Amount or Extent of Take,** *San Joaquin kit fox,* **replace with:**

It is not possible to quantify the number of individual San Joaquin kit foxes that will be taken as a result of the proposed project because this species is relatively sparsely distributed and we believe that the number of individual foxes impacted will be relatively small. Therefore, the amount of habitat for this species that will be affected as a result of the CHST-FB Project-will be used as a surrogate for quantifying take. The Service anticipates that any San Joaquin kit foxes that may be in the section of the action area undergoing construction at any given time, a total area of ~~11,941~~ 11,536 acres (including the project footprint, and areas within 200 feet of the project footprint~~, and the 405 acre FCMS~~) will be harassed by project activities in areas undergoing construction, operations, and maintenance activities which will result in the likelihood of injury by annoying foxes to such an extent as to significantly disrupt normal behavior patterns. In addition, the Service anticipates that ~~768. 94~~ 795.04 acres of highly suitable habitat will be directly impacted and permanently lost as a result of the CHST-FB Project alignment resulting in harm to the species by significantly impairing essential behaviors, including breeding, foraging, and denning. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the CHST-FB Project in the form of harm over ~~11,941~~ 11,536 acres, and harm of the San Joaquin kit fox caused by the loss of ~~768. 94~~ 795.04 acres of highly suitable habitat, will become exempt from the prohibitions described under section 9 of the Act.

On page 105, under **Amount or Extent of Take,** *Buena Vista Lake ornate shrew,* **replace with:**

It is not possible to quantify the number of individual BVLOS that will be taken as a result of the proposed project because it is small, cryptic, difficult to detect, limited survey efforts have been conducted and its current distribution across the landscape is not well known, and its life history is not well understood. Further, the specific habitat requirements of BVLOS are poorly defined, and the potential distribution of the species is difficult to delineate or predict (Cypher 2016). The amount of BVLOS highly suitable habitat that will be impacted as a result of the CHST-FB Project will be used as a surrogate for quantifying take. The Service anticipates that ~~39.02~~ 40.56 acres of more mesic and ~~37.79~~ 39.43 acres of more xeric highly suitable habitat will be directly affected and permanently lost as a result of the CHST-FB Project alignment resulting in harm to the species by significantly impairing essential behaviors, including breeding, foraging, and sheltering. The Service further anticipates that an additional 51.18 acres of marginal habitat will be directly affected. Upon implementation of the Reasonable and Prudent Measures, these levels of incidental take associated with the CHST-FB Project in the form of harm, capture, injury, and death of the BVLOS caused by habitat loss, construction activities, transport, handling and holding during relocation from the construction footprint, and any required CRM mitigation activities will become exempt from the prohibitions described under section 9 of the Act.

Accordingly, the Service will consider take exceeded if more than ~~39.02~~ 40.56 acres of more mesic and ~~37.79~~ 39.43 acres of more xeric highly suitable habitat is permanently lost as a result of the proposed action.

On page106, under **Amount or Extent of Take,** *blunt-nosed leopard lizard*, **replace with**:

It is not possible to quantify the number of individual blunt-nosed leopard lizards that will be taken as a result of the proposed project because the number of individuals within the project action area is unknown. The anticipated loss of individuals of this species also may 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 this species that will be affected as a result of the CHST-FB Project will be used as a surrogate for quantifying take. The Service anticipates that up to ~~108.47~~ 120.82 acres of suitable habitat for the blunt-nosed leopard lizard will be permanently lost as a result of the CHST-FB Project. Upon implementation of the Reasonable and Prudent Measures, these levels of incidental take associated with the CHST-FB Project in the form of harm, capture, injury, and death of the blunt-nosed leopard lizard caused by habitat loss, construction activities, exclusion from active construction areas, and any required ground-disturbing CRM mitigation activities or burrow excavation activities will become exempt from the prohibitions described under section 9 of the Act.

REINITIATION - CLOSING STATEMENT

This concludes reinitiation of formal consultation on the California High-Speed Train System: Fresno to Bakersfield Section Project. As provided in 50 CFR §402.16, reinitiation of formal consultation is required and will be requested by the federal agency or by the Service where discretionary federal agency involvement or control over the action has been retained or is authorized by law and:

(a) If the amount or extent of taking specified in the incidental take statement is exceeded;
(b) 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;
(c) 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
(d) 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 correspondence, please contact Lily Douglas, Senior Fish and Wildlife Biologist (lily_douglas@fws.gov), or Catrina Martin, Chief, Infrastructure Division (catrina_martin@fws.gov) at the letterhead address, (916) 414-6701, or by e-mail.

Sincerely,

for Jennifer M. Norris, Ph.D.
Field Supervisor

cc:
Marlys A. Osterhues, Federal Railroad Administration, Washington, D.C.