# APPENDIX C: MITIGATION MONITORING AND ENFORCEMENT PLAN

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California High-Speed Rail Authority

# Palmdale to Burbank Project Section

## Draft Mitigation Monitoring and Enforcement Plan

June 2024


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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# 1 INTRODUCTION

In June 2024, the California High-Speed Rail Authority (Authority), as the state lead agency and as the federal lead agency pursuant to the National Environmental Policy Act (NEPA) Assignment Memorandum of Understanding (MOU) (July 23, 2019), issued a Final Environmental Impact Report (EIR)/Environmental Impact Statement (EIS) for the Palmdale to Burbank Project Section (Project Section, or project) of the California High-Speed Rail (HSR) System (Authority 2024). The Final EIR/EIS satisfies the requirements of the California Environmental Quality Act (CEQA) and NEPA and is the basis for the Authority's decision. In the Board of Directors' Resolution and Record of Decision, the Authority selected the Preferred Alternative (SR14A Build Alternative).[1]

This Mitigation Monitoring and Enforcement Plan (MMEP)[2] has been prepared for the Preferred Alternative, SR14A Build Alternative.

Table 3-1 describes mitigation measures from the Burbank to Palmdale Project Section Final EIR/EIS that will mitigate the adverse impacts of the Preferred Alternative. These mitigation measures were developed by the Authority in consultation with appropriate agencies, as well as with input from the public, to meet the requirements of CEQA and NEPA. The mitigation measures in Table 3-1 are conditions of approval that the Authority is required to comply with as it implements the Preferred Alternative.

The Preferred Alternative incorporates Impact Avoidance and Minimization Features (IAMFs), including best management practices (BMPs), which are described in detail in the Final EIR/EIS Volume 2, Technical Appendices, Appendix 2-E, Impact Avoidance and Minimization Features, and in the technical reports that support the Final EIR/EIS. As a result of applying these IAMFs, the Preferred Alternative will avoid or minimize potential adverse environmental impacts in several resource areas including transportation; air quality and global climate change; noise and vibration; public utilities and energy; biological and aquatic resources; hazardous materials and wastes; hydrology and water resources; geology, soils, seismicity, and paleontological resources; safety and security; socioeconomics and communities; station planning, land use and development; agricultural farmland and forest land; parks, recreation, and open space; cultural resources; and aesthetics and visual quality. Cooperating agencies that are part of the NEPA review process include: the U.S. Army Corps of Engineers (USACE), Federal Aviation Administration (FAA), Bureau of Land Management, United States Forest Service (USFS), and Surface Transportation Board. As part of the CEQA process, the responsible California agencies include the following:

- California Department of Fish and Wildlife (CDFW)
- California Department of Transportation (Caltrans)
- California Public Utilities Commission, Los Angeles Office
- California Department of Water Resources
- California State Lands Commission
- State Water Resources Control Board
- Antelope Valley Air Quality Management District
- South Coast Air Quality Management District

[1] Although the Record of Decision references the "Selected Alternative," this document references it as the "Preferred Alternative" consistent with CEQA.

[2] The MMEP is consistent with CEQA requirements for mitigation monitoring as set forth in Section 15097 and Section 15091, subdivision (d) of the CEQA Guidelines (14 California Code of Regulations, Division 6, Chapter 3). Where mitigation is for NEPA purposes only or CEQA purposes only, it is identified accordingly.

Like the mitigation measures listed in Table 3-1, the project IAMFs and compliance with regulatory requirements are conditions of project approval and must be implemented by the Authority during design, construction, and operation of the project. The IAMFs that are part of the Preferred Alternative are described in Volume 2, Appendix 2-E of the Final EIR/EIS and listed in Table 3-2 of this document.

In a category distinct from mitigation measures and IAMFs, Offsetting Mitigation Measures (OMMs) consist of measures that could offset potential disproportionately high and adverse impacts on environmental justice communities. The OMMs that are part of the Preferred Alternative are described in Chapter 5, Environmental Justice, and are listed in Table 3-1.

Key legal requirements that the Preferred Alternative are subject to are detailed for each of the following resource areas in the corresponding sections of Chapter 3, Affected Environmental Consequences, and Mitigation Measures, of Volume 1, EIR/EIS, of the Final EIR/EIS:

- Transportation—Section 3.2.6 and 3.2.7
- Air Quality and Global Climate Change—Section 3.3.6 and 3.3.7
- Noise and Vibration—Section 3.4.6 and 3.4.7
- Electromagnetic Interference and Electromagnetic Fields—Section 3.5.6 and 3.5.7
- Public Utilities and Energy—Section 3.6.6 and 3.6.7
- Biological and Aquatic Resources—Section 3.7.6 and 3.7.7
- Hydrology and Water Resources—Section 3.8.6 and 3.8.7
- Geology, Soils, Seismicity, and Paleontological Resources—Section 3.9.6 and 3.9.7
- Hazardous Materials and Wastes—Section 3.10.6 and 3.10.7
- Safety and Security—Section 3.11.6 and 3.11.7
- Socioeconomics and Communities—Section 3.12.6 and 3.12.7
- Station Planning, Land Use, and Development—Section 3.13.6 and 3.13.7
- Agricultural Farmland and Forest Land—Section 3.14.6 and 3.14.7
- Parks, Recreation, and Open Space—Section 3.15.6 and 3.15.7
- Aesthetics and Visual Quality—Section 3.16.6 and 3.16.7
- Cultural Resources—Section 3.17.6 and 3.17.7
- Regional Growth—Section 3.18.6 and 3.18.7
- Cumulative Impacts—Section 3.19.6 and 3.19.7
- Environmental Justice—Section 5.8 and 5.9
- Section 4(f)—Section 4.6 and 4.8

The MMEP adheres to the Council on Environmental Quality's (CEQ) regulations (40 Code of Federal Regulations [C.F.R.] Part 1505)[3] and Federal Railroad Administration's *Procedures for Considering Environmental Impacts* (64 *Federal Register* [Fed. Reg.] 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.

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On April 20, 2022, CEQ issued Phase 1 Final Rule restoring regulatory provisions that were in effect before the 2020 rule modified them for the first time. On July 28, 2023, CEQ announced a Phase 2 Notice of Proposed Rulemaking—the "Bipartisan Permitting Reform Implementation Rule"—to revise its regulations for implementing the procedural provisions of NEPA, including to implement the amendments to NEPA by the Fiscal Responsibility Act of 2023. CEQ issued the Phase 2 Final Rule on May 1, 2024, and the text of the regulation indicates the regulations apply to any NEPA process begun after July 1, 2024 (40 CFR 1506.12). The NEPA process for the project was initiated before the effective date of the 2020, 2022, and 2024 CEQ regulations and is not subject to the current regulations, relying on the 1978 regulations [amended in 1986, 51 Federal Register 15618 (April 25,1986) as they existed prior to September 14, 2020. All subsequent citations to CEQ regulations in this environmental document refer to the 1978 regulations, pursuant to 40 C.F.R. 1506.13 (2020) and 40 C.F.R. 1506.12 (2024).

# 2 MITIGATION MONITORING AND ENFORCEMENT PLAN

The environmental effects of the Preferred Alternative would result in impacts considered significant under CEQA and in effects considered adverse under NEPA. Mitigation measures that will reduce or eliminate potential adverse environmental impacts are described in Chapter 3 of the Final EIR/EIS. The specific provisions contained in this MMEP are presented as Tables 3-1 and 3-2 and include mitigation measures identified in the Final EIR/EIS, organized by environmental issue and topical areas addressed in the Final EIR/EIS. This MMEP describes implementation and monitoring procedural guidance, responsibilities, and timing for each mitigation measure identified in the Final EIR/EIS. Components include:

- **Mitigation Measure/Title/Text:** These separate columns each provide the number, title, and text of the mitigation measures as identified in the Final EIR/EIS.
- **Phase:** Provides the phase during which the mitigation measure will be implemented (pre-construction, during construction, post-construction, or during operation).
- **Implementation Action/Text/Mechanism:** Each column identifies the actions required to implement the measures, including any required agreements and conditions.
- **Reporting Schedule:** Identifies the stage of the project and/or the frequency that reporting is to occur, if reporting is required.
- **Implementing Party/Reporting Party:** Except as noted, each column 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 construction contractor or operating 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. If an operating contractor is retained, long-term mitigation and monitoring responsibilities transfer to the operating contractor, with oversight responsibility by the Authority.
- **Impact Number and Impact Text:** Provides the impact number and description of the impact requiring mitigation as identified in the Final EIR/EIS.

Roles and Responsibilities

As the lead agency and proponent of this project, the Authority will implement the mitigation measures through its own actions, those of its contractor, and actions taken in cooperation with other agencies and entities. The Authority is ultimately accountable for the overall administration of the MMEP and for assisting relevant individuals and parties in their oversight and reporting responsibilities. The responsibilities of mitigation implementation, monitoring, and reporting extend to several entities as discussed above; however, the Authority will bear the primary responsibility for verifying that the mitigation measures are implemented. The Authority defines the mitigation measures required for the project. When project work is undertaken by the Authority's contractor, the contractor will implement the mitigation measures that are pertinent to its scope of work. The contractor will monitor construction activities to ensure that the mitigation measures are being properly implemented and accurately report their activity and results to the Authority. The Authority will periodically check the contractor's activity, reports, and effectiveness of mitigation activities.

- **Authority:** Although the Authority retains responsibility for the implementation of and reporting on mitigation measures and IAMFs as specified in this MMEP, activities may be carried out by an Authority representative or an Authority-approved contractor. Authority responsibilities may also include certain measures outside of the scope of the contractor such as future studies or operations-phase implementation. In addition, oversight of implementation and reporting may be provided by the Authority's contractor or

representatives as lead agency representatives to facilitate regulatory oversight agency coordination and compliance during implementation and reporting.

- **Contractor:** The contractor(s) (or the environmental team provided by the contractor) will be responsible for implementing or monitoring mitigation measures and IAMFs as specified in this MMEP. These responsibilities would be applicable to the construction contractor, design/build contractor, and the operating contractor.
- **Contractor Liaison(s)**: The contractor liaison(s) (or the environmental team provided by the Authority) will be responsible for facilitating the communication and collaboration of the contractor(s) with the environmental justice ombudsman.
- **Mitigation Manager:** The contractor's representative responsible for overseeing its environmental team's implementation and reporting of environmental commitments will be responsible for reporting the status of each mitigation measure to the Authority in accordance with this MMEP.
- **Project Biologist(s)**: The project biologist will be approved and appointed by the Authority. The project biologist will oversee the implementation of the MMEP and compliance assurance.
- **Biological Monitor(s):** The contractor-provided biological monitor(s) will be approved by and report directly to the contractor's biologist. The biological monitor(s) will be present on site within a reasonable monitoring distance during all ground-disturbing activities that have the potential to affect biological resources as directed by the project biologist and will be the principal agent(s) in the direct implementation of the MMEP and compliance assurance.
- **Cultural Resources Compliance Manager/Principal Investigator:** This position must be an archaeologist who meets relevant Secretary of the Interior's qualifications for an archaeologist. The cultural resources compliance manager/principal investigator is responsible for implementing mitigation measures in compliance with the terms and conditions outlined in the MMEP and treatment plans and coordinating the status of archaeological mitigation with the Authority in accordance with this MMEP, the Authority's Section 106 Programmatic Agreement, and the Palmdale to Burbank Project Section Memorandum of Agreement.
- **Cultural Resources Monitor(s):** The contractor-provided cultural resources monitor(s) will be approved by and report directly to the cultural resources compliance manager/principal investigator. This/these monitor(s) will be present on-site 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 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 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 on-site 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.

- **Environmental Justice (EJ) Ombudsman**: The Authority-provided EJ ombudsman position will address the needs of EJ communities. The EJ ombudsman will provide a point of contact for EJ communities to provide feedback on project impacts. The EJ ombudsman will have the authority to stop work if necessary. The EJ ombudsman responsibilities will also include obtaining community-specific feedback on plans not typically reviewed by the general public to minimize adverse effects on EJ populations.

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# 3 ENVIRONMENTAL MITIGATION MANAGEMENT AND ASSESSMENT SYSTEM

The Authority will implement an Environmental Mitigation Management and Assessment (EMMA) system consisting of strategic planning, policies, and procedures, organizational structure, staffing and responsibilities, milestones, schedule, and resources devoted to achieving the Authority's environmental commitments. The EMMA will also include a component that tracks the implementation of mitigation measures (as well as environmental commitments, BMPs, IAMFs, and OMMs) and can produce reports on compliance. The Authority staff 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 contractor, its consultants, and others to produce status reports regarding construction status, permitting activities, monitoring, inspections, and other compliance activities.

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**Table 3-1 Palmdale to Burbank Project Section: Mitigation Monitoring and Enforcement Plan**

| Mitigation | Title | Mitigation Text | Phase | Implementation | Reporting | Implementing | Reporting Party | Implementation | Implementation | Impact # and Impact Text |
|---|---|---|---|---|---|---|---|---|---|---|
| **Transportation[1]** | | | | | | | | | | |
| TR-MM#1 | Add Lanes to the Segment | Add travel lanes to the roadway segment to increase capacity and improve roadway operations. | Pre-construction/ Construction | Design/Facility operation | Prior to operations | Authority/ Contractor | Authority/ Contractor | Expand travel lanes to roadway segments | Condition of construction contract | Impact TRA#8: Project Construction Effects on Roadway Segments.<br>Impact TRA#13: Project Operation Effects on Roadway Segments.<br>Impact LU#3: Permanent Alterations to Existing and Planned Land Uses from Construction of the Build Alternatives. |
| TR-MM#2 | Modify Signal Timing | Modify signal timing (to optimize cycle length and splits) at specific intersections to improve LOS and intersection operations. | Pre-construction | Design/Facility operation | Prior to final design | Authority/ Contractor | Authority/ Contractor | Modify traffic signal timing | Condition of construction contract | Impact TRA#9: Project Construction Effects on Intersections.<br>Impact TRA#14: Project Operation Effects on Intersections.<br>Impact LU#3: Permanent Alterations to Existing and Planned Land Uses from Construction of the Build Alternatives. |
| TR-MM#3 | Modify Signal Phasing | Modify traffic signal phasing sequence to improve LOS and intersection operations. | Pre-construction | Design/Facility operation | Prior to final design | Authority/ Contractor | Authority/ Contractor | Modify traffic signal phasing | Condition of construction contract | Impact TRA#9: Project Construction Effects on Intersections.<br>Impact TRA#14: Project Operation Effects on Intersections.<br>Impact LU#3: Permanent Alterations to Existing and Planned Land Uses from Construction of the Build Alternatives. |
| TR-MM#4 | Provide a Traffic Signal | Add traffic signals to affected unsignalized intersections to improve LOS and intersection operation. Intersections proposed for signalization must meet traffic signal warrants to be considered as affected. | Pre-construction/ Construction | Design/Facility operation | Prior to operations | Authority/ Contractor | Authority/ Contractor | Add traffic signals to unsignalized intersections | Condition of construction contract | Impact TRA#9: Project Construction Effects on Intersections.<br>Impact TRA#14: Project Operation Effects on Intersections.<br>Impact LU#3: Permanent Alterations to Existing and Planned Land Uses from Construction of the Build Alternatives. |
| TR-MM#5 | Restripe Intersection | Restripe intersection approaches to improve LOS and intersection operations. | Pre-construction | Design/facility operation | Prior to final design | Authority/ Contractor | Authority/ Contractor | Restripe intersections | Condition of construction contract | Impact TRA#9: Project Construction Effects on Intersections.<br>Impact TRA#14: Project Operation Effects on Intersections.<br>Impact LU#3: Permanent Alterations to Existing and Planned Land Uses from Construction of the Build Alternatives. |
| TR-MM#6 | Widen Intersection | Widen intersection approaches by adding a through lane to improve LOS and intersection operations. | Pre-construction | Design/Facility operation | Prior to final design | Authority/ Contractor | Authority/ Contractor | Adding a through lanes to widen intersection approaches | Condition of construction contract | Impact TRA#9: Project Construction Effects on Intersections.<br>Impact TRA#14: Project Operation Effects on Intersections.<br>Impact LU#3: Permanent Alterations to Existing and Planned Land Uses from Construction of the Build Alternatives. |
| TR-MM#7 | Add Exclusive Turn Lanes | Add exclusive turn lanes to improve LOS and intersection operations. | Pre-construction | Design/Facility operation | Prior to final design | Authority/ Contractor | Authority/ Contractor | Adding exclusive turn lanes | Condition of construction contract | Impact TRA#14: Project Operation Effects on Intersections.<br>Impact LU#3: Permanent Alterations to |

| Mitigation Measure | Title | Mitigation Text | Phase | Implementation Action | Reporting Schedule | Implementing Party | Reporting Party | Implementation Text | Implementation Mechanism | Impact # and Impact Text |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | Existing and Planned Land Uses from Construction of the Build Alternatives. |
| TR-MM#8 | Reconfigure Intersection | Reconfigure intersection geometry to improve LOS and intersection operations. | Pre-construction | Design/Facility operation | Prior to final design | Authority/ Contractor | Authority/ Contractor | Reconfigure intersection geometry | Condition of construction contract | Impact TRA#9: Project Construction Effects on Intersections.<br>Impact TR#14: Project Operation Effects on Intersections.<br>Impact LU#3: Permanent Alterations to Existing and Planned Land Uses from Construction of the Build Alternatives. |
| TR-MM#9 | Transit Coordination Plan | Prepare a coordination plan with affected transit providers to ensure revisions needed to routes, stops, and schedules are carried out in order to address modifications to the local roadway network and changes in circulation. The coordination plan would be implemented to offset any reduction in service created by project construction. In particular, this plan will address how bus routes and schedules would need to be evaluated and revised to account for changes to the local roadway network and to access the HSR station transit facilities, modifications to transit services to meet the scheduled HSR trains, and potential increases in service to accommodate HSR riders. | Pre-construction | Coordination | Prior to construction | Authority | Authority/Affected Transit Providers. | Coordination plan to address modifications to routes | Condition of construction contract | Impact TRA#11: Project Construction Effects on Rail and Transit Services. |
| TR-MM#10 | Provide Pedestrian and Bicycle Facilities | Provide pedestrian and bicycle facilities to compensate for loss of existing facilities and to restore crossings/connections affected by modifications to the local roadway network. Coordinate with affected transit providers to ensure appropriate revisions to routes, stops, and schedules are carried out to address modifications to the local roadway network and changes in circulation. Ensure that the site plans for the HSR stations and station areas include adequate pedestrian facilities and amenities (such as sidewalks, crosswalks, and ADA-compliant designs), adequate bicycle facilities and amenities (such as safe and secure bicycle parking and connections to local/regional bicycle routes), wayfinding, and other similar elements. | Pre-construction | Compensation/ Coordination | Prior to final design | Authority | Authority | Provide pedestrian and bicycle facilities to compensate for the loss of facilities | Condition of construction contract | Impact TRA#12: Project Construction Effects on Non-Motorized Modes Near the Burbank Airport Station. |
| TR-MM#11 | In-Lieu Traffic Improvements | The Authority will enter cooperative agreements with HSR station host cities and partner transportation providers to implement transportation improvements in-lieu of general roadway traffic improvements to address identified traffic impacts. This approach supports the Authority's guidelines and policies to encourage HSR access via non-auto | Pre-construction | Design | Prior to commencement of operations | Authority/ Contractor | Authority/ Participating jurisdictions | Develop and implement cooperative agreement | Meetings/ Coordination with departments/ Agencies | Impact TRA#11: Project Construction Effects on Rail and Transit Services.<br>Impact TRA#12: Project Construction Effects on Non-Motorized Modes Near the Burbank Airport Station. |

| Mitigation Measure | Title | Mitigation Text | Phase | Implementation Action | Reporting Schedule | Implementing Party | Reporting Party | Implementation Text | Implementation Mechanism | Impact # and Impact Text |
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| | | modes, helping reduce traffic congestion and associated air quality impacts at and around HSR stations. In-lieu improvements will be negotiated with host cities and partner transportation providers and may include, but not be limited to, the following types of improvements:<br>• Pedestrian facilities, including, but not limited to, sidewalks, curb-cuts, pathways, multi-use trails, and signage and wayfinding within 0.5 mile of HSR stations<br>• Bicycle facilities, including, but not limited to, on-street bicycle lanes and cycle tracks, off-street bicycle or multi-use trails, signalization, bicycle parking, and bicycle rental, sharing or repair facilities, and signage and wayfinding within 3 miles of HSR stations<br>• On- and off-street bus transit facilities, including, but not limited to, transit centers, stations, stops, shelters, lighting, terminal layover facilities, operator restrooms, fare vending equipment, information and wayfinding, bus pads, electric charging stations, transit lanes, and traffic signal priority equipment and software within 3 miles or HSR stations<br>• Public transit bus rolling stock<br>• On- or off-street vehicle pickup/drop-off and queuing space within 0.25 mile of HSR stations<br>• Ongoing bus, streetcar, or urban rail service operations and maintenance funding to support expanded connecting transit service at HSR stations | | | | | | | | |
| TR-MM#12 | Prepare a Transportation Construction Management Plan | Prior to construction, the Authority will require the construction Contractor to develop a plan to manage circulation and connections for modes of travel during the construction duration. Coordinate with local agencies, emergency services, and public transit providers to ensure appropriate revisions to routes, stops, schedules, and signage are carried out to address modifications to the local roadway network and changes in circulation. Implementation of the transportation Construction Management Plan (CMP) will maintain the flow of traffic, bicyclists, pedestrians, and buses in and around the construction zones. Typical measures associated with a CMP include the following:<br>• Schedule a majority of construction- | Pre-construction | Prepare plan/Coordination | Prior to construction | Authority/ Contractor | Contractor | Prepare Construction Management Plan (CMP) | Condition of construction contract | Impact TRA#1: Spoils Hauling Effects on Roadway Segments.<br>Impact TRA#2: Spoils Hauling Effects on Intersections.<br>Impact TRA#4: Spoils Hauling Effects on Freeway Segments.<br>Impact TRA#5: Spoils Hauling Effects on Transit Services. |

| Mitigation Measure | Title | Mitigation Text | Phase | Implementation Action | Reporting Schedule | Implementing Party | Reporting Party | Implementation Text | Implementation Mechanism | Impact # and Impact Text |
|---|---|---|---|---|---|---|---|---|---|---|
| | | related travel during off-peak hours.<br>• Relocate spoils collection areas and access to minimize delays during peak hours.<br>• Develop detour routes to facilitate traffic movements through construction zones without substantially increasing cut-through traffic in adjacent residential neighborhoods.<br>• Where feasible, temporarily restripe roadways to maximize vehicular capacity at locations affected by construction closures.<br>• Where feasible, temporarily remove on-street parking to maximize vehicular capacity, transit capacity, and bicycle circulation at locations affected by construction closures.<br>• Where feasible, station traffic control officers at major intersections to minimize delays during peak hours.<br>• Develop alternative routes to reduce the number of trucks on sensitive facilities without substantially increasing cut-through traffic in adjacent residential neighborhoods.<br>• Develop and implement an outreach program to inform the public about the construction process and any planned roadway closures.<br>• Develop and implement a program with business owners to minimize impacts on businesses during construction activity. | | | | | | | | |
| **Air Quality and Global Climate Change** | | | | | | | | | | |
| AQ-MM#1 | Offset Project Construction Emissions through SCAQMD Emissions Offsets Programs | The Palmdale to Burbank Project Section's construction emissions that cannot be reduced by IAMFs and any other mitigation measures will, to the extent feasible, be offset through a South Coast Air Quality Management District (SCAQMD) rule or contractual agreement by funding equivalent emissions reductions that achieve reductions in the same years as construction emissions occur, thus offsetting project-related air quality impacts in real time. The project will implement measures and best practices to minimize emissions from project construction. After implementation of these measures, emission levels that still exceed thresholds will be offset to the extent necessary to satisfy General Conformity *de minimis* levels and to meet CEQA thresholds to the extent feasible. The Authority's | Pre-construction | Reporting/Funding | Prior to construction | Authority/ Contractor | Authority/ Contractor | Offset project construction criteria air pollutant emission exceedances through funding | Authority to coordinate purchase of offsets with SCAQMD per Contractor reports | Impact AQ#2: Regional Air Quality Impacts during Construction.<br>Impact AQ#3: Compliance with Air Quality Plans during Construction. |

| Measure | Title | Mitigation Text | Phase | Implementation Action | Reporting Schedule | Implementing Party | | Implementation Text | Implementation Mechanism | |
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| | | Sustainability Policy has a goal to achieve net zero emissions from construction. As the Palmdale to Burbank Project Section advances towards construction, the Authority will work with SCAQMD to assess the estimated emissions, availability of offsets, and cost for achieving the Authority's Sustainability Policy goal to the extent possible. | | | | | | | | |
| AQ-MM #3 | Construction Emissions Reductions – Requirements for use of Zero Emission (ZE) and/or Near Zero Emission (NZE) Vehicles and off-road equipment | This mitigation measure would reduce the impact of construction emissions from project-related on-road vehicles and off-road equipment. All remaining emissions after implementation of this measure will be offset, to the extent feasible, with emission offset credits required under AQ-MM#1 and AQ-MM#2.<br>The Authority and all project construction Contractors shall require that a minimum of 25 percent, with a goal of 100 percent, of all light-duty on-road vehicles (e.g., passenger cars, light-duty trucks) associated with the project (e.g., on-site vehicles, Contractor vehicles) use ZE or NZE technology.<br>The Authority and all project construction Contractors shall have the goal that a minimum of 25 percent of all heavy-duty on-road vehicles (e.g., for hauling, material delivery, and soil import/export) associated with the project use ZE or NZE technology.<br>The Authority and all project construction contractors shall have the goal that a minimum of 10 percent of off-road construction equipment use ZE or NZE vehicles.<br>If local or state regulations mandate a faster transition to using ZE and/or NZE vehicles at the time of construction, the more stringent regulations will be applied. For example, EO N-79-20, issued by California Governor Newsom September 23, 2020, currently states the following:<br>• Light-duty and passenger car sales be 100 percent ZEV by 2035<br>• Full transition to ZEV short haul/drayage trucks by 2035<br>• Full transition to ZEV heavy-duty long-haul trucks, where feasible, by 2045<br>• Full transition to ZE off-road equipment by 2035, where feasible<br>The project will have a goal of surpassing | Pre-construction | Contract requirements; compliance reporting | Monthly and annually | Authority/ Contractor | Authority/ Contractor | Daily record keeping and monthly/annual reporting | A copy of each unit's certified tier specification and any required CARB or air pollution control district operating permit will be made available by the Authority at the time of<br>mobilization of each piece of equipment | Impact AQ#2: Regional Air Quality Impacts during Construction.<br>Impact AQ#3: Compliance with Air Quality Plans during Construction.<br>Impact AQ#5: Localized Construction Effects |

| Mitigation Measure | Title | Mitigation Text | Phase | Implementation Action | Reporting Schedule | Implementing Party | Reporting Party | Implementation Text | Implementation Mechanism | Impact # and Impact Text |
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| | | the requirements of these or other future regulations as a mitigation measure. | | | | | | | | |
| **Noise and Vibration** | | | | | | | | | | |
| N&V-MM#1 | Construction Noise Mitigation Measures | Prior to construction (any ground-disturbing activities), the contractor will prepare a noise-monitoring program for Authority approval. The noise-monitoring program will describe how, during construction, the contractor will monitor construction noise to verify compliance with the noise limits (8-hour Leq dBA noise limits are 80 dBA during the day and 70 dBA at night for residential land use; 85 dBA both day and night for commercial land use; and 90 dBA both day and night for industrial land use) where a noise-sensitive receptor is present. The contractor would be given the flexibility to meet FRA construction noise limits in the most efficient and cost-effective manner. This can be done by either prohibiting certain noise-generating activities during nighttime hours or providing additional noise control measures to meet the noise limits. In addition, the noise-monitoring program will describe the actions required of the contractor to meet required noise limits. These actions will include the following nighttime and daytime noise control mitigation measures, as necessary:<br>• Install a temporary construction-site noise barrier near a noise source.<br>• Avoid nighttime construction in residential neighborhoods.<br>• Locate stationary construction equipment as far as possible from noise-sensitive sites.<br>• Re-route construction truck traffic along roadways that will cause the least disturbance to residents.<br>• During nighttime work, use smart back-up alarms, which automatically adjust the alarm levels based on background noise levels, or switch off back-up alarms and replace with spotters.<br>• Use low-noise emission equipment.<br>• Implement noise-deadening measures for truck loading and operations.<br>• Monitor and maintain equipment to meet noise limits.<br>• Line or cover storage bins, conveyors, and chutes with sound-deadening material.<br>• Use acoustic enclosures, shields, or shrouds for equipment and facilities. | Pre-construction/ Construction | Design/ Reporting | Prior to construction/ Weekly monitoring | Authority/ Contractor | Authority/ Contractor | Placement of temporary noise barriers and construction equipment to mitigate construction noise; weekly monitoring construction noise | Contract requirements and specifications | Impact N&V#1: Construction Noise Impacts on Sensitive Receivers.<br>Impact N&V#2: Spoils Haul Route Noise Impacts on Sensitive Receivers |

| Mitigation Measure | Title | Mitigation Text | Phase | Implementation Action | Reporting Schedule | Implementing Party | Reporting Party | Implementation Text | Implementation Mechanism | Impact # and Impact Text |
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| | | • Use high-grade engine exhaust silencers and engine-casing sound insulation.<br>• Prohibit aboveground jackhammering and impact pile driving during nighttime hours.<br>• Minimize the use of generators to power equipment.<br>• Limit use of public address systems.<br>• Grade surface irregularities on construction sites.<br>• Use movable noise barriers at the source of the construction activity.<br>• Limit or avoid certain noisy activities during nighttime hours.<br>• To mitigate noise related to pile driving, use an auger rather than a pile driver. If pile driving is necessary, limit the time of day that the activity can occur.<br>The Authority will establish and maintain (until construction is completed) a toll-free hotline for construction-related activities. The Authority will arrange for all incoming hotline messages to be logged (with summaries of the contents of each message) and for a designated representative of the Authority to respond to hotline messages within 24 hours (excluding weekends and holidays). The Authority will make a reasonable good-faith effort to address all concerns and answer all questions and shall include on the log its responses to all callers. The Authority shall make a log of the incoming messages including the Authority's responsive actions publicly available on its website.<br>The contractor will provide the Authority with an annual report by January 31 of the following year documenting how it implemented the noise-monitoring program. | | | | | | | | |
| N&V-MM#2 | Construction Vibration Mitigation Measures | Prior to construction involving impact pile driving within 50 feet of any building, the contractor shall provide the Authority with a vibration technical memorandum documenting how project pile driving criteria will be met. Upon approval of the technical memorandum by the Authority, and, where a noise-sensitive receptor is present, the contractor shall comply with the vibration reduction methods described in that memorandum. Potential construction vibration building damage is only anticipated from impact pile driving at very close distances to buildings. If pile driving occurs more than 25 to 50 feet from | Pre-construction/ Construction/post-construction | Reporting (technical memorandum) | Pre-construction surveys to establish baseline/Weekly monitoring during construction/Post-construction repairs, as needed | Authority/ Contractor | Authority/ Contractor | Pre-construction surveys to establish baseline/Weekly monitoring during construction/Post-construction repairs, as needed | Contract requirements and specifications | Impact N&V#3: Construction Vibration Impacts on Sensitive Receivers. |

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| | | buildings, or if alternative methods such as push piling or auger piling are used, damage from construction vibration is not expected to occur. When a construction scenario has been established, pre-construction surveys will be conducted by the contractor at locations within 50 feet of pile driving to document the existing condition of buildings in case damage is reported during or after construction. The contractor will arrange for the repair of damaged buildings or will pay compensation to the property owner. | | | | | | | | |
| N&V-MM#3 | Implement California HSR Project Noise Mitigation Guidelines | Various options exist to address the severe noise effects from California HSR System operations. The Authority has developed Noise Mitigation Guidelines (Appendix 3.4-C) for the statewide California HSR System that set forth three categories of mitigation measures to reduce or offset severe noise impacts from HSR operations: noise barriers, sound insulation, and noise easements. The guidelines also set forth an implementation approach that considers multiple factors for determining the reasonableness of noise barriers as mitigation for severe noise impacts, including structural and seismic safety, cost, number of affected receptors, and effectiveness. Noise barrier mitigation would be designed to reduce the exterior noise levels from HSR operations from severe to moderate, according to the provisions of the FRA guidance (FRA 2018) and Figure 3.4-12, Noise Impact Criteria for High-Speed Rail Projects.<br>**Noise Barriers**<br>Prior to operation of the California HSR System, the Authority shall prepare an HSR operation noise impact report. Based on the recommendations in the approved noise impact report, the Authority will install noise barriers where they can achieve between 5 and 15 dB of exterior noise reduction, depending on their height and location relative to the tracks. The primary requirements for an effective noise 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. | Pre-construction/ Construction/Post-construction | Design | Prior to final design/Prior to operation/Monthly reporting during operation | Authority/ Contractor | Authority/ Contractor | Implement sound barriers as needed or acquire easements on properties severely affected by noise | Contract requirements and specifications/ California High-Speed Rail Project Noise Mitigation Guidelines | Impact N&V #4: Operational Traffic Noise Impacts on Sensitive Receivers.<br>Impact N&V#6: Operational Train Noise Impacts<br>Impact N&V #9: Noise and Vibration from High-Speed Rail Stationary Facilities<br>Impact LU#3: Permanent Alterations to Existing and Planned Land Uses from Construction of the Build Alternatives. |

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| | | Because many materials meet these requirements, aesthetics, durability, cost, and maintenance considerations usually determine the selection of materials for noise barriers. Depending on the situation, noise barriers can become visually intrusive. Typically, the noise barrier style is selected with input from the local jurisdiction to reduce the visual effects of barriers on adjacent lands uses (refer to Aesthetic Options for Non-Station Structures, 2017). For example, noise barriers could be solid or transparent, and made of various colors, materials, and surface treatments.<br>Pursuant to the Noise Mitigation Guidelines, recommended noise barriers must meet the following criteria to be considered a reasonable and feasible mitigation measure:<br>• Achieve a minimum of 5 dB of noise reduction, which is then defined as a benefited receptor.<br>• The minimum number of affected sites should be at least 10.<br>• The length should be at least 800 feet.<br>• Must be cost-effective.<br>• The community should approve of implementation of the recommended noise barriers (75 percent of all affected parties).<br>The maximum noise barrier height would be 14 feet for at-grade sections. Berm and berm/wall combinations are the preferred types of noise barriers where space and other environmental constraints permit. On aerial structures, the maximum noise barrier height would also be 14 feet, but barrier material would be limited by engineering weight restrictions for barriers on the structure. All noise barriers would be designed to be as low as possible to achieve a substantial noise reduction.<br>Several sound barriers were determined to be feasible and effective using the criteria described above. The noise barriers will have a setback of approximately 12 feet from the proposed track centerline, and thus would not expand the project boundary. The noise barriers will provide between 5 dB and 15 dB of exterior noise reduction to a minimum of 10 affected sites with a minimum barrier length of 800 feet. The | | | | | | | | |

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| | | noise barriers would also need to be considered financially reasonable. A financially reasonable noise barrier is defined as a noise barrier determined not to exceed a construction cost of $95,000 per benefited receiver. Each potentially feasible noise barrier is described and evaluated for reasonableness in Table 3.4-48. Noise barriers identified as feasible and reasonable were modeled to demonstrate quantified reduction of associated noise impacts to a less than significant level.<br><br>As shown in Table 3.4-48, the Refined SR14 Build Alternative includes two proposed noise barriers, one of which eliminates all severe noise impacts while the other does not (two residual severe noise impacts would remain). For the SR14A Build Alternative in the Central Subsection one noise barrier is proposed which would eliminate all severe noise impacts at that location.<br>Figure 3.4-36 through Figure 3.43-9 depict the location of the noise barriers evaluated.<br>There are no operations mitigation measures required for the Burbank Subsection, which does not contain noise-sensitive or vibration-sensitive receivers. Thus, no noise barriers are needed in the Burbank Subsection.<br>**Install Building Sound Insulation**<br>If noise barriers are not proposed for receptors with severe impacts, receptors do not approve of proposed noise barriers, or if proposed noise barriers do not reduce exterior sound levels to below a severe impact level, the Authority will consider building sound insulation as a potential additional mitigation measure on a case-by-case basis. Sound insulation of residences and institutional buildings to improve outdoor-to-indoor noise reduction is a mitigation measure that can be considered when the use of noise barriers is not feasible in providing a reasonable level (5 to 7 dBA) of noise reduction. Although this approach has no effect on noise in exterior areas, it may be the best choice for sites where noise barriers are not feasible or desirable and for buildings where indoor sensitivity is of most | | | | | | | | |

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| | | concern. Substantial improvements in building sound insulation (on the order of 5 to 10 dBA) can often be achieved by adding an extra layer of glazing to windows, by sealing holes in exterior surfaces that act as sound leaks, and by providing forced ventilation and air conditioning so that windows do not need to be opened.<br>**Noise Easements**<br>If a substantial noise reduction cannot be completed through installation of noise barriers or building sound insulation, the Authority will consider acquiring a noise easement on properties with a severe impact on a case-by-case basis. An agreement between the Authority and the property owner can be established wherein the property owner releases the right to petition the Authority regarding the noise level and subsequent disruptions. This would take the form of a permanent easement that would encompass the property boundaries to the right-of-way of the rail line. The Authority would consider this mitigation measure only in isolated cases where other mitigation is ineffective or infeasible. | | | | | | | |
| N&V-MM#4 | Vehicle Noise Specification | During HSR vehicle technology procurement, the Authority will require bidders to meet the federal regulations (40 C.F.R. § 201.12/13) at the time of procurement for locomotives (currently a 90-dB-level standard) operating at speeds faster than 45 mph. | Post-construction | HSR vehicle purchasing | HSR operation | Authority | Authority | HSR vehicle noise specification | Contract requirements and specifications | Impact N&V#6: Intermittent Operational Train Noise Impacts |
| N&V-MM#5 | Special Track Work at Crossovers and Turnouts | Prior to construction, the contractor will provide the Authority with an HSR operation noise technical report for review and approval. The report will address the minimization/elimination of rail gaps at turnouts. Because the impacts of HSR wheels over rail gaps at turnouts increases HSR noise by approximately 6 dB over typical operations, turnouts can be a major source of noise impact. If the turnouts cannot be moved from sensitive areas, the noise technical report will recommend the use of special types of track work that would eliminate the gap. The Authority will require the project design to follow the recommendations in the approved noise impact report. | Pre-construction | Design | Prior to construction | Authority/ Contractor | Authority/ Contractor | Provide operation noise technical report to determine If special trackwork is required | Submit assessment and if required, supplemental environmental documentation | Impact N&V#6: Operational Train Noise Impacts |
| NV-MM#6 | Additional Noise | Prior to construction, the contractor will | Pre-construction | Design | Prior to | Authority/ Vehicle | Authority/ Vehicle | Reassessment of | Submit assessment | Impact N&V#6: Operational Train Noise |

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| | Analysis during Final Design | provide the Authority with an HSR operation noise technical report for review and approval. If final design or final vehicle specifications result in changes to the assumptions underlying the noise technical report, the Authority will prepare necessary environmental documentation, as required by CEQA and NEPA, to reassess noise impacts and mitigation. | | | Construction/Final vehicle specification | Contractor | Contractor | noise and vibration impacts and recommended mitigation following final design | and if required, supplemental environmental documentation | Impacts<br>Impact N&V#9: Noise and Vibration from High-Speed Rail Stationary Facilities.<br>Impact LU#3: Permanent Alterations to Existing and Planned Land Uses from Construction of the Build Alternatives. |
| N&V-MM#7 | Implement Operation Vibration Mitigation Measures | Vibration mitigation would be evaluated during project design. Mitigation for operational vibration impacts can occur at the source, at the sensitive receiver, or along the propagation path from the source to the receiver. Potential measures from the mitigation guidelines include the following:<br>• **Vehicle Suspension (Source)—**Rail vehicles should have low steady weight, soft primary suspension, minimum metal-on-metal contact between moving parts of the truck, and smooth wheels that are perfectly round.<br>• **Special Track Support Systems (Source)—**Floating slabs, resiliently supported ties, high-resilience fasteners, and ballast mats all help reduce vibration from the track support system.<br>• **Building Modifications (Receiver)—** For existing buildings, if vibration-sensitive equipment is affected by train vibration, the floor upon which the vibration-sensitive equipment is located may be stiffened and isolated from the remainder of the building. For new buildings, the building foundation should be supported by elastomer pads similar to bridge bearing pads.<br>• **Buffer Zones (Receiver)**—A vibration easement may be negotiated from the affected property owners or the rail right-of-way may be expanded.<br>Operational vibration impacts were only identified for the Central Subsection of the Refined SR14, SR14A, E1, and E1A Build Alternatives. Therefore, vibration mitigation measures only apply to the Refined SR14, SR14A, E1, and E1A Build Alternatives. Two locations in particular would require vibration mitigation:<br>• **Osborne Street to Montague Street—** Vibration mitigation of 1,600 feet is proposed in this location. To avoid impact, it is estimated that mitigation will need to be designed to reduce ground- | Pre-construction/ Construction/Post-construction | Design | Prior to commencement of construction/prior to operations/during operations | Authority | Authority | Assess potential measures that may mitigate ground-borne vibrations during project operations | Contract requirements and specifications | Impact N&V#8: Operational Train Vibration Impacts. |

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| | | borne vibration levels by at least 2 dB and reduce ground-borne noise levels by at least 4 dB. The type of mitigation will be determined in final design.<br>• **Wheatland Avenue to Lockheed Drive—**Vibration mitigation of 900 feet is proposed at this location. To avoid impact, it is estimated that mitigation will need to be designed to reduce ground-borne noise levels by at least 3 dB. The type of mitigation will be determined in final design. | | | | | | | | |
| **Electromagnetic Fields and Electromagnetic Interference** | | | | | | | | | | |
| EMI/EMF-MM#1 | Protect Sensitive Equipment | The Authority will contact entities where sensitive equipment is located and evaluate impacts of HSR-related EMFs, RF, and low-frequency EMI on medical equipment before completion of final design. Where necessary to avoid interference, the final design would include suitable design provisions, which may include establishing magnetic field shielding walls around sensitive equipment or installing RF filters into sensitive equipment.<br>HSR-related EMI may affect highly susceptible, unshielded sensitive RF equipment, such as older MRI systems and other measuring devices common to medical and research laboratories. Most of the devices manufactured today have adequate shielding from all potential EMI sources; however, the potential exists for older devices to be affected and require shielding.<br>A shielded enclosure is very effective at preventing external EMI. Metallic materials are used for shielding (specifically high-conductivity metals for high-frequency interference, such as from HSR operation), and high-permeability metals are used for low-frequency interference. Often, either the housing of the affected device is coated with a conductive layer or the housing itself is made conductive. In some situations, it may be necessary to significantly reduce EMI for a suite of devices by creating a shielded room or rooms.<br>Attenuation (i.e., the effectiveness of EMI shielding) is the difference between an electromagnetic signal's intensity before and after shielding. Attenuation is the ratio between field strength with and without the presence of a protective medium, measured in decibels (dB). This dB range changes on | Pre-construction | Design | Prior to completion of final design | Authority/ Contractor | Authority/ Contractor | Protect nearby equipment sensitive to EMI/EMF | Contract requirements and specifications | Impact EMI/EMF#1: Temporary Impacts from Use of Heavy Construction Equipment.<br>Impact EMI/EMF#3: Temporary Impacts from Operation of Electrical Equipment.<br>Impact EMI/EMF#7: EMI with Sensitive Equipment. |

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| | | a logarithmic scale, so an attenuation rating of 50 dB indicates a shielding strength 10 times that of 40 dB. In general, a shielding range between 60 and 90 dB may be considered a high level of protection, while 90 to 120 dB is exceptional. | | | | | | | | |
| **Public Utilities and Energy** | | | | | | | | | | |
| PUE-MM#1 | Water Supply Analysis for Construction | In recognition of the uncertainties with planning for water procurement years in advance and the various restrictions, limitations, and unknowns associated with water supplies in the project area, The Authority will prepare an updated water supply analysis for the selected Build Alternative that details and describes the minimum adequate water supply for the study area during normal, dry, and multiple dry years based on a more-detailed project design, and when more-detailed information about available water supply is known with greater certainty, and what will need to be done to facilitate use of available water in the project area The Authority will identify the sources of water that will meet water supply needs, if needed.<br>In the event that additional water supply is needed from the State Water Project, the Authority shall pay the water agencies its fair share of the State Water Project fees (per acre-foot of their allocations), which are used for constructing and operating the State Water Project conveyance facilities. Actual water available is dependent on allocations from the California Department of Water Resources, which are difficult to predict and can fluctuate year-to-year. AVEK uses a variety of SWP water types. AVEK's imported water supply is also composed of SWP turnback pool water, other SWP water, and other non-SWP water. Water purchased by others from the SWP would also be subject to Department of Water Resources allocations. AVEK's Water Shortage Contingency Plan ordinance would affect distribution of water during water shortages. The ordinance outlines the allocation of SWP water in the event of a water shortage. AVEK's Water Shortage Contingency Plan also notes that the SWP's physical conveyance infrastructure enables AVEK to convey any of its supplemental SWP purchases to augment drought year supplies. Water would be allocated based on historical | Pre-construction | Design | Prior to final Design | Authority | Authority | Authority to conduct water supply analysis and pay the water agencies its fair share of the State Water Project, as needed | Plan preparation/payment fair share costs and fees. | Impact PUE#3: Effects from Water Demand during Construction. |

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| | | taxes paid to AVEK by entities in each county and the amount of SWP water received relative to the amount of SWP water received by other AVEK customers. The HSR project would comply with this ordinance. However, temporary construction water uses would likely be the first kind of use to be curtailed in terms of addressing a water shortage. In addition, the Authority will be required to use non-potable water during construction, to the extent feasible. In addition, water used for tunnel construction and water coming out of tunnel construction areas could be recycled/reused for construction purposes. Water coming from the tunnels would be treated to reduce turbidity, and then recycled. This water would be used several times during construction for lubrication and cooling purposes, reducing demand from municipal water sources. | | | | | | | | |
| PUE-MM#2 | Reconfiguration of the Acton Water Treatment Plant | Prior to the start of construction, the Authority will coordinate with AVEK to facilitate the reconfiguration of the Acton Water Treatment Plant. The Authority will ensure that all replacement/relocated facilities are required to be in place, tested, and operational before any part of the existing Acton Water Treatment Plant is taken offline so that the Acton Water Treatment Plant would remain operable in conjunction with implementation of the Build Alternatives. The Authority will pay its fair share of the impact fee for reconfiguration of the Acton Water Treatment Plant. | Pre-construction | Design | Prior to final design | Authority | Authority | Reconfigure the Acton Water Treatment Plant | Plan preparation/payment of fair share costs and fees | Impact PUE#1: Planned Temporary Interruption of Utility Services. |
| **Biological and Aquatic Resources** | | | | | | | | | | |
| BIO-MM#1 | Conduct Presence/Absence Preconstruction Surveys for Special-Status Plant Species and Special-Status Plant Communities | Prior to any ground-disturbing activity, the Project Biologist shall conduct presence/absence botanical field surveys for special-status plant species and sensitive natural communities (including oak woodlands) in all potentially suitable habitats within a work area. The surveys shall be consistent with Protocols for Surveying and Evaluating Impacts to Special-Status Native Plant Populations and Sensitive Natural Communities (CDFW 2018) and Guidelines for Conducting and Reporting Botanical Inventories for Federally Listed, Proposed and Candidate Plants (USFWS 2000). The Project Biologist shall flag, map, and record the locations of any observed special-status plant species and sensitive natural communities (including oak woodlands) and provide appropriate buffers for avoidance. | Pre-construction | Surveying/Monitoring/Reporting | Report findings at least 30 days prior to ground disturbance | Authority/ Contractor/ Project Biologist | Authority/ Contractor/ Project Biologist | Conduct protocol-level surveys for special-status plant species and communities/Report findings at least 30 days prior to ground disturbance | Condition of construction contract following requirements established by regulatory compliance permits | Impact BIO#1: Project Construction Effects on Habitat for Special-Status Plants and Plant Communities. |

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| | | This mitigation measure is anticipated to be effective because it identifies, documents, and protects special-status plant species within 100 feet of the project footprint, reducing the potential for disturbance during construction. Implementation of this measure would not trigger secondary environmental impacts because it would not change the scope, scale, or location of construction activities beyond those that have been described as part of the Build Alternatives. | | | | | | | | |
| BIO-MM#2 | Prepare and Implement Plan for Salvage and Relocation of Special-Status Plant Species | Prior to any ground-disturbing activity, the Project Biologist shall collect seeds and plant materials and stockpile and segregate the top 4 inches of topsoil from locations within the work area where species listed as threatened or endangered under FESA; threatened, endangered, or candidate for listing under CESA; state-designated “Rare” species; and California Rare Plant Rank 1B and 2 species were observed during surveys, for use on off-site locations. Suitable sites to receive salvaged material include Authority mitigation sites, refuges, reserves, federal or state lands, and public/private mitigation banks.<br>If relocation or propagation is required by authorizations issued under FESA and/or CESA, the Project Biologist shall prepare a Special-Status Plant Species Salvage and Relocation Plan (Plan) to address monitoring, salvage, relocation, and/or seed banking of federal or state-listed plant species. The Plan will include provisions that address the techniques, locations, and procedures required for the collection, storage, and relocation of seed or plant material, and collection, stockpiling, and redistribution of topsoil and associated seed.<br>The Plan will include relocation sites where no impact on in situ populations of rare, endangered, or threatened plants will occur, provide detail on the number of years of monitoring, and a supplemental watering plan. This Plan will also include weed management; maintenance; requirements related to outcomes such as self-sustainability and percent absolute cover of highly invasive species, as defined by the California Invasive Plant Council (less than documented baseline conditions); and annual reporting, and reflect conditions required under regulatory authorizations issued for federal or state-listed species. The Authority shall coordinate with relevant regulatory agencies (USFWS, CDFW) as appropriate and in accordance with the authorizations under FESA and CESA.<br>This mitigation measure is anticipated to be | Pre-construction/ Construction/Post-construction | Surveying/ Monitoring/Reporting | In accordance with agency permit requirements | Authority/ Contractor/ Project Biologist | Authority/ Contractor/ Project Biologist | Prepare and implement monitoring, salvage, relocation, and propagation of special-status plant species/report findings | Condition of design- build contract/ | Impact BIO#1: Project Construction Effects on Habitat for Special-Status Plants and Plant Communities. |

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| | | effective because it salvages special-status species within the project footprint, relocates salvaged plants to suitable habitat acquired in the region, and monitors relocated plants per the Special Plant Species Management Plan to provide for suitable survival of special-status plant species, reducing the potential for impacts during construction. BIO-MM#2 would have a temporary impact on special-status plants through direct disturbance as part of salvage and relocation efforts, but ultimately would be beneficial because the Plan would salvage, relocate, and protect special-status plants. Implementation of this mitigation measure may also require the acquisition of suitable additional lands outside of the project footprint for the purposes of relocating special-status plants. This land may be converted from other current uses, such as agriculture, which in turn could have potential secondary environmental impacts on agricultural resources (through farmland conversion), other biological resources (through direct and indirect impacts on species habitat), and cultural resources (through disturbance of archaeological resources and impacts on historic properties). Such secondary impacts from off-site mitigation activities are addressed under BIO-MM#50. Impacts on additional environmental resources are not anticipated. | | | | | | | | |
| BIO-MM#3 | Conduct Preconstruction Surveys for Vernal Pool Wildlife Species | Prior to any ground-disturbing activities, the Project Biologist shall conduct an aquatic habitat assessment and survey for vernal pool wildlife species in seasonal wetlands and vernal pools that occur within both the work area and the area extending 250 feet from the outer boundary of the work area where access is available, consistent with USFWS vernal pool survey protocols. The Project Biologist will visit these areas after the first rain event of the season to determine whether seasonal wetlands and vernal pools have been inundated. A seasonal wetland/vernal pool will be considered to be inundated when it holds greater than 3 centimeters of standing water 24 hours after a rain event. Approximately 2 weeks after the pools have been determined to be inundated, the Project Biologist shall conduct surveys in appropriate seasonal wetland and vernal pool habitats. The Project Biologist will submit a report to the Authority within 30 days of completing the work. | Pre-construction | Surveying/Monitoring/Reporting | Prior to ground-disturbing activities or as established by regulatory compliance agencies | Project Biologist | Project Biologist | The Project Biologist shall conduct an aquatic habitat assessment and survey for vernal pool wildlife species | Condition of construction contract/condition of regulatory permits | Impact BIO#5: Project Construction Effects on Special-Status Invertebrate Habitat. |
| BIO-MM#4 | Implement Seasonal Vernal Pool Work Restriction | To the extent feasible, ground-disturbing activities will not occur within 250 feet of vernal pools or seasonal wetlands during the rainy season (October 15 to April 15). In | Construction | Exclusion fencing/Compliance reporting | Follow reporting requirements as established by | Authority/ Contractor | Authority/ Contractor | Follow reporting requirements as established by | Condition of construction contract/Condition | Impact BIO#1: Project Construction Effects on Habitat for Special-Status Plants and Plant Communities. |

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| | | the event ground-disturbing activities are to occur within the buffer area during the rainy season, such activities should, to the extent feasible, be undertaken when the aquatic features are not inundated. | | | regulatory compliance<br>permits | | | regulatory compliance<br>permits | of regulatory permits | Impact BIO#5: Project Construction Effects on Special-Status Invertebrate Habitat.<br>Impact BIO#8: Project Construction Effects on State and Federally Jurisdictional Aquatic Resources. |
| BIO-MM#5 | Implement and Monitor Vernal Pool Avoidance and Minimization Measures within Temporary Impact Areas | To the extent feasible, impacts on vernal pools in work areas outside of the permanent right-of-way will be avoided. The Project Biologist will install and maintain exclusionary fencing to prevent impacts on vernal pools from construction activities. When avoidance of impacts on vernal pools is not feasible, the construction activity will be scheduled to occur in the dry season where feasible. Prior to the initiation of a ground-disturbing activity occurring during the dry season, the Project Biologist shall collect a representative sampling of soils from the affected vernal pools to obtain viable plant seeds and vernal pool branchiopod cysts. After collecting soil, the Project Biologist may also put rinsed gravel in the vernal pools and cover with geotextile fabric to minimize damage to the soils and protect the pools' contours, as provided by regulatory authorizations issued under FESA.<br>The soils containing seeds and cysts may later be returned to the affected pool after work has been completed or incorporated into other vernal pools, as provided by regulatory authorizations issued under FESA. | Pre-construction/ Construction | Exclusion fencing; collection of soil material; off-site compensatory mitigation; compliance reporting | Monthly or reporting requirements as established by regulatory compliance permits | Project Biologist | Project Biologist | Implement barriers and practices to avoid impacts to vernal pools during construction | Contract requirements and specifications | Impact BIO#1: Project Construction Effects on Habitat for Special-Status Plants and Plant Communities.<br>Impact BIO#5: Project Construction Effects on Special-Status Invertebrate Habitat.<br>Impact BIO#8: Project Construction Effects on State and Federally Jurisdictional Aquatic Resources. |
| BIO-MM#6 | Prepare and Implement a Restoration and Revegetation Plan | Prior to any ground-disturbing activity, the Project Biologist will prepare a Restoration and Revegetation Plan (RRP) to address temporary impacts resulting from ground-disturbing activities within areas that potentially support special-status species, wetlands and any other aquatic resources. Restoration activities may include, but not be limited to, grading landform contours to approximate pre-disturbance conditions, revegetating disturbed areas with native plant species, and using certified weed-free straw and mulch. The Authority will implement the RRP in all temporarily disturbed areas outside of the permanent right-of-way that potentially support special-status species, wetlands and/or other aquatic resources.<br>Consistent with section 1415 of the Fixing America's Surface Transportation Act (FAST Act), restoration activities will provide habitat for native pollinators through plantings of native forbs and grasses. The Project Biologist will obtain a locally sourced native seed mix, including native seed collected from local populations, through propagation of seeds collected | Pre-construction/ Construction/Post-construction | Design/Surveying/ Monitoring/ Reporting | Prior to construction/<br>Monthly reporting | Authority/ Contractor/ Project Biologist | Authority/ Contractor/ Project Biologist | Prepare and implement RRP/Report findings | Condition of construction contract/Condition of regulatory permits | Impact BIO#1: Project Construction Effects on Habitat for Special-Status Plants and Plant Communities.<br>Impact BIO#2: Project Construction Effects on Special-Status Amphibian Habitat.<br>Impact BIO#3: Project Construction Effects on Special-Status Bird Habitat.<br>Impact BIO#4: Project Construction Effects on Special-Status Fish Habitat.<br>Impact BIO#5: Project Construction Effects on Special-Status Invertebrate Habitat.<br>Impact BIO#6: Project Construction Effects on Special-Status Mammal Habitat.<br>Impact BIO#7: Project Construction Effects on Special-Status Reptile Habitat.<br>Impact BIO#8: Project Construction Effects on State and Federally Jurisdictional Aquatic Resources.<br>Impact BIO#9: Project Construction Effects on Fish and Wildlife Resources Protected by Fish and Game Code Section 1600 et seq. |

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| | | locally, and from nursery stock. The sources of the seeds are not currently known but the Authority intends to develop the seed sourcing details as part of the restoration and revegetation plan. The Authority also intends to use seed stock from the same Hydrologic Unit Code as the revegetation or restoration area. The restoration success criteria will include limits on invasive species, as defined by the California Invasive Plant Council, to an increase no greater than 10 percent compared to the pre-disturbance condition, or to a level determined through a comparison with an appropriate reference site consisting of similar natural communities and management regimes. The RRP will outline, at a minimum:<br>• Procedures for documenting preconstruction conditions for restoration purposes.<br>• Sources of plant materials and methods of propagation, including native plant material containing host plants for native special-status invertebrates, as needed to offset the loss of host plants.<br>• 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.<br>• Specification of success criteria for re-established vegetation communities, including demonstration of an increase in density of host plants or overall acreage of vegetation communities compared to baseline conditions.<br>• Specification of the remedial measures to be taken if success criteria are not met.<br>• Methods and requirements for monitoring restoration/replacement efforts, which may involve a combination of qualitative and/or quantitative data-gathering.<br>• Maintenance, monitoring, and reporting schedules, including an annual report due to the Authority by January 31 of the following year.<br>The RRP will be submitted to the Authority and regulatory agencies, as defined in the conditions of regulatory authorizations, for review and approval. | | | | | | | Impact BIO#10: Project Construction Effects on Federally Designated Critical Habitat.<br>Impact BIO#11: Project Construction Effects on Significant Ecological Areas.<br>Impact BIO#12: Project Construction Effects on Protected<br>Impact BIO#13: Project Effects on Wildlife Movement Corridors. |
| BIO-MM#7 | Conduct Preconstruction | Prior to any ground-disturbing activities, the Project Biologist shall conduct | Pre-construction/ | Surveying/ | Prior to ground-disturbing activities | Authority/ Contractor/ Project | Authority/ Contractor/ Project | Presence-absence surveys of special- | Condition of construction | Impact BIO#2: Project Construction Effects on Special-Status Amphibian Habitat. |

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| | Surveys for Special-Status Reptile and Amphibian Species | preconstruction surveys in suitable habitat to determine the presence or absence of special-status reptiles and amphibian species within the work area. These surveys will be conducted in accordance with any required agency protocols. Surveys will be conducted no more than 30 days before the start of ground-disturbing activities in a work area providing enough time to complete a given species' protocol survey methodology. Protocol surveys for the detection of special-status reptiles and amphibians will be according to CDFW Survey and Monitoring Protocols and Guidelines (https://wildlife.ca.gov/Conservation/Survey-Protocols) and the USFWS Survey Protocols and Guidelines (https://www.fws.gov/library/collections/survey-protocols-and-guidelines-recovery-permits-pacific-southwest-region). Specific to western pond turtle, surveys will also follow the Draft USGS Western Pond Turtle Visual Survey Protocol for the Southcoast Ecoregion (USGS 2006a) and Draft USGS Western Pond Turtle Trapping Protocol for the Southcoast Ecoregion (USGS 2006b), available at: https://wildlife.ca.gov/Conservation/Survey-Protocols#377281282-amphibians.<br>The results of the preconstruction survey will be used to guide the placement of ESAs and protective fencing, and species relocation if needed. For federal or state-listed species, relocations will be undertaken in accordance with regulatory authorizations issued under the FESA and/or CESA and/or CFGC §§ 1002, 1002.5, 1003 and/or Cal. Code Regs., tit. 14, § 650.<br>The qualified Project Biologist shall prepare a Reptile and Amphibian Relocation and Avoidance Plan that includes species-specific avoidance buffers of at least 50 feet. If needed, relocation shall occur only during the period outside the breeding season with individuals moved to suitable sites outside the project footprint. The qualified Project Biologist shall submit a copy of the Reptile and Amphibian Relocation and Avoidance Plan to the CDFW and USFWS for approval prior to any clearing, grading, or excavation work on the project site.<br>This mitigation measure is anticipated to be effective because it identifies and documents special-status reptile and amphibian species and their habitat within the project footprint, informing methods for the species' avoidance, protective fencing placement, and relocation activities. | Construction/ | Monitoring/ Reporting | | Biologist/ | Biologist | status reptiles and amphibian species in accordance with CDFW Survey and Monitoring Protocols and Guidelines within the construction footprint conducted 30 days prior to ground disturbance/report findings | contract/Condition of regulatory permits | Impact BIO#7: Project Construction Effects on Special-Status Reptile Habitat. |

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| | | Implementation of this measure would have temporary impacts on special-status reptiles and amphibians resulting from take (harassment) of a few individuals, if identified during surveys. The sampling is an assessment that would be useful in understanding the species present and would help guide the implementation of the performance standards to be consistent with other mitigation requirements. In general, the surveys are minimally invasive and would not result in physical disturbance outside the project footprint. Implementation of this measure would not trigger secondary environmental impacts because it would not change the scope, scale, or location of construction activities beyond those that have been described as part of the six Build Alternatives. | | | | | | | | |
| BIO-MM#8 | Implement Avoidance and Minimization Measures for Special-Status Reptile and Amphibian Species | The Project Biologist will monitor all initial ground-disturbing activities that occur within suitable habitat for special-status reptiles and amphibians and will conduct clearance surveys of suitable habitat in the work area on a daily basis. If a special-status reptile or amphibian is observed, the Project Biologist will identify actions, sufficient to avoid impacts on the species and to allow it to leave the area of its own volition. Such actions may include establishing a 50-foot temporary environmentally sensitive area (ESA) exclusion buffer in the area where a special-status reptile or amphibian has been observed. If needed, the Project Biologist will relocate any of the species observed from the work area to avoid imminent harm. For federal or state-listed species, relocations will be undertaken in accordance with regulatory authorizations issued under FESA and/or CESA and/or CFGC §§ 1002, 1002.5, 1003 and/or Cal. Code Regs., tit. 14, § 650.<br>The ESA material shall not be made of solid material such that the species becomes entrapped within the buffer area. Additionally, the ESA exclusion buffer shall include an area of suitable habitat around the species observation such that the species has suitable area to perform normal life history functions and is able to move away from the project site of its own volition. At no point shall the ESA be isolated within the construction site from adjacent suitable habitat for the species. | Construction | Surveying/ Monitoring/ Reporting | Daily | Contractor/ Project Biologist/ | Project Biologist | Monitor initial ground-disturbing activities that occur within suitable habitat for special-status reptiles and amphibians, identify sufficient actions if special-status reptiles and amphibians are observed | Condition of construction contract/Condition of regulatory permits | Impact BIO#2: Project Construction Effects on Special-Status Amphibian Habitat.<br>Impact BIO#7: Project Construction Effects on Special-Status Reptile Habitat. |
| BIO-MM#14 | Conduct Preconstruction | Prior to any ground-disturbing activity, including vegetation removal, scheduled to | Pre-construction | Surveying/ Reporting | Weekly or as established by | Project Biologist | Project Biologist | Project Biologist shall conduct visual | Condition of construction | Impact BIO#3: Project Construction Effects on Special-Status Bird Habitat. |

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| | Surveys and Delineate Active Nest Buffers Exclusion Areas for Breeding Birds | occur during the bird breeding season (February 1 to September 1), the Project Biologist shall conduct visual preconstruction surveys within the work area for nesting birds and active nests (nests with eggs or young) of non-raptor species listed under the MBTA and/or the CFGC.<br>These surveys will be conducted in accordance with required protocols. In the event that active bird nests are observed during the preconstruction survey, the Project Biologist will delineate no-work buffers. No-work buffers will be set at a standard distance of 75 feet unless a larger buffer is required pursuant to regulatory authorizations. Consistent with standard practice, no-work buffers will be set from the base of the nesting site. No-work buffers will be maintained until nestlings have fledged and are no longer reliant on the nest or parental care for survival, or the Project Biologist determines that the nest has been abandoned. In circumstances where it is not feasible to maintain the standard no-work buffer, the no-work buffer may be reduced, as long as the Project Biologist monitors the active nest during the construction activity and ensures that the nesting birds do not become agitated. Additional measures that may be used when no-work buffers are reduced include visual screens and noise barriers.<br>This mitigation measure is anticipated to be effective because, in conjunction with, but not limited to, BIO-MM#15, these measures would require identification and documentation of active nests within 500 feet of the proposed construction area, establishment of protective buffers from construction around active nests, and monitoring of the nests until they are inactive. The buffers and subsequent nest monitoring prevent construction activities from disturbing nests while active, allowing young to develop and fledge. | | | regulatory compliance agencies | | | preconstruction surveys for nesting birds and active nests (nests with eggs or young) of non-raptor species listed under the MBTA and will delineate no-work buffers until | contract/condition of regulatory permits | |
| BIO-MM#15 | Conduct Preconstruction Surveys and Monitoring for Raptors | If construction or other vegetation removal activities are scheduled to occur during the breeding season for raptors (special-status or non special-status) (January 1 to September 1), no more than 14 days before the start of the activities, the Project Biologist shall conduct preconstruction surveys for nesting raptors in areas where | Pre-construction/ Construction | Surveying/ monitoring/ reporting | January 1 to September 1 | Project Biologist | Project Biologist | Pre-construction surveys of the habitat areas of non-special-status raptors within the construction footprint if construction or other | Condition of construction contract/condition of regulatory permits | Impact BIO#3: Project Construction Effects on Special-Status Bird Habitat. |

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| | | suitable habitat is present. Specifically, such surveys will be conducted in habitat areas within the construction footprint and, where access is available, within 500 feet of the boundary of the construction footprint. If breeding raptors with active nests are found, the Project Biologist will delineate a 500-foot buffer around the nest, to be maintained until the young have fledged from the nest and are no longer reliant on the nest or parental care for survival or until such time as the Project Biologist determines that the nest has been abandoned. A vertical buffer of no less than 500 feet shall also be maintained for any aerial (helicopter or drone) activities to be undertaken. Nest buffers may be adjusted if the Project Biologist determines that smaller buffers would be sufficient to avoid impacts on nesting raptors. | | | | | | vegetation removal activities are scheduled to occur during the breeding season. | | |
| BIO-MM#16 | Implement Avoidance Measures for California Condor | During any construction activities within the range of the California condor, as delineated in the USFWS database, the Authority will implement the following avoidance measures:<br>• The Project Biologist will be present for construction activities occurring within 2 miles of known California condor roosting sites.<br>• If USFWS informs the Authority or if the Authority is otherwise made aware that California condors are roosting within 0.5 mile of a work area, no construction activity will occur during the period between1 hour before sunset and 1 hour after sunrise.<br>• All construction materials located within work areas, including items that could pose a risk of entanglement, such as ropes and cables, will be properly stored and secured when not in use.<br>• Littering of trash and food waste is prohibited. All litter, small artificial items (screws, washers, nuts, bolts, etc.), and food waste will be collected and disposed of from work areas on at least a daily basis.<br>• All fuels and components with hazardous materials or wastes will be handled in accordance with applicable regulations. These materials will be kept in segregated, secured, and/or secondary containment facilities, as necessary. Any spills of liquid substances that could | Pre-construction/ Construction/ Post-construction | Surveying/ Monitoring/ Reporting | Prior to operation | Authority/ Contractor | Authority | Implement avoidance measures within the range of the California condor. | Condition of construction contract/condition of regulatory permits | Impact BIO#3: Project Construction Effects on Special-Status Bird Habitat. |

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| | | harm condors will be immediately addressed.<br>• The use of ethylene glycol-based anti-freeze or other ethylene glycol-based liquid substances will be avoided. All parked vehicles/equipment will be kept free of leaks, particularly anti-freeze.<br>• Polychemical lines will not be used or stored on-site, to prevent condors from obtaining and ingesting pieces of polychemical lines.<br>• If California condors land in any work area, the Project Biologist will assess construction activities occurring at the time and determine whether those activities present a potential hazard to the individual California condor. Activities determined by the Project Biologist to present a potential hazard to the California condor will be stopped until the bird has abandoned the area. Methods approved by USFWS for hazing California condors to encourage abandonment of the construction site, Guidance on Hazing California Condors (Southwest Condor Working Group 2014), may be used, as necessary.<br>• The Project Biologist will coordinate with USFWS prior to construction-related uses of helicopters to establish that no California condors are present in the area. If California condors are observed in the area in which helicopters will operate, including the helicopter's flight pattern from its origination, during construction use, and the return flight, helicopter use will not be permitted until the Project Biologist has determined that the California condors have left the area.<br>• CDFW shall be notified if the Authority is informed of or finds roosting California condors. CDFW shall also be notified prior to any construction-related helicopter use.<br>• The operation of any unoccupied aircraft system will be performed only by FAA-licensed personnel and all UAS operations will be compliant with California and federal aviation laws. Operation of UAS will observe all wildlife buffers and UAS operation will not occur over any condor roosting or nesting locations or other raptor nesting locations. All UAS operations would require the same buffer as other aerial | | | | | | | | |

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| | | equipment helicopters.<br>This mitigation measure is anticipated to be effective because it would restrict construction activities in areas within 0.5 mile of roosting California condors and provides specific measures for keeping the work area free of materials that would attract or potentially harm California condors. Implementation of this measure would not trigger secondary environmental impacts because it would not change the scope, scale, or location of construction activities beyond those that have been described as part of the Palmdale to Burbank Build Alternatives. | | | | | | | | |
| BIO-MM#17 | Conduct Surveys for Swainson's Hawk Nests | Surveys must be performed no more than1 year prior to the commencement of construction activities. The Project Biologist shall conduct surveys for Swainson's hawk during the nesting season (March through August) within both the work area and a 0.5-mile buffer surrounding the work area, provided access to such areas is available. No sooner than 30 days prior to any ground-disturbing activity, the Project Biologist shall conduct preconstruction surveys of nests identified during the earlier surveys to determine whether any are occupied. The initial nesting season surveys and subsequent preconstruction nest surveys will follow the protocols set out in the Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in California's Central Valley (Swainson's Hawk Technical Advisory Committee [SHTAC] 2000) and Swainson's Hawk Survey Protocols, Impact Avoidance, and Minimization Measures for Renewable Energy Projects in the Antelope Valley of Los Angeles and Kern Counties, California (California Energy Commission and CDFG 2010).<br>This mitigation measure is anticipated to be effective because it would require identification and documentation of active Swainson's hawk nests within 0.5 mile of the proposed construction area, and establishes protective buffers from construction around active nests. The buffers and subsequent nest monitoring prevent construction activities from disturbing raptor nests while active, allowing young to develop and fledge. Implementation of the mitigation measure | Pre- construction | Surveying/ Monitoring/ Reporting | Weekly or as established by regulatory compliance agencies | Authority/ Contractor/ Project Biologist | Authority/ Contractor/ Project Biologist | Conduct surveys for Swainson's hawk nests | Condition of construction contract/condition of regulatory permits | Impact BIO#3: Project Construction Effects on Special-Status Bird Habitat. |

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| | | would have temporary impacts on Swainson's hawks from the disruption or disturbance required to survey for them. Implementation of this measure would not trigger secondary environmental impacts because it would not change the scope, scale, or location of construction activities beyond those that have been described as part of the Build Alternatives. | | | | | | | | |
| BIO-MM#18 | Implement Avoidance and Minimization Measures for Swainson's Hawk Nests | Any active Swainson's hawk nests (defined as a nest used 1 or more times in the past 5 years) found within 0.5-mile of the boundary of the work area during the nesting season (February 1 to September 1) will be monitored daily by the Project Biologist to assess whether the nest is occupied. If the nest is occupied, the Project Biologist will establish no-work buffers following CDFW's Staff Report Regarding Mitigation for Impacts to Swainson's Hawks (*Buteo swainsoni*) in the Central Valley of California (CDFW 1994), and the status of the nest will be monitored until the young fledge or for the length of construction activities, whichever occurs first. A vertical buffer of no less than 0.5 mile shall also be maintained for any aerial (helicopter or drone) activities to be undertaken. Adjustments to the buffer(s) may be made in consultation with CDFW. Swainson's hawk nest trees will be avoided unless determined to be infeasible. Removal of such trees should occur only during the timeframe of October 1 and the last day in February. If an unoccupied Swainson's hawk nest tree is to be removed, a 2081 incidental take permit under CESA will be obtained, and impacts will be minimized and fully mitigated. The mitigation may include replacement habitat management lands within the Antelope Valley Swainson's hawk breeding range. | Construction | Surveying/ Monitoring/ Reporting | Daily if a nest is found or as established by regulatory compliance agencies | Authority/ Contractor/ Project Biologist | Authority/ Contractor/ Project Biologist | Monitor active Swainson's hawk nests/establish nest avoidance buffer zones/report findings | Condition of construction contract/condition of regulatory permits | Impact BIO#3: Project Construction Effects on Special-Status Bird Habitat. |
| BIO-MM#20 | Conduct Protocol Surveys for Burrowing Owls | Prior to any ground-disturbing activity, the Project Biologist shall conduct protocol-level surveys for burrowing owls within suitable habitat located in the work area and extending 500 feet from the boundary of the work area, where access is available. Surveys will be conducted in accordance with guidelines in the CDFW Staff Report on Burrowing Owl Mitigation (CDFW 2012).<br>BIO-MM#20 would have temporary impacts on burrowing owls from disruption of their normal behavior resulting from conducting | Pre-construction | Surveying/ Monitoring/ Reporting | Monthly or as established by regulatory compliance agencies | Authority/ Contractor/ Project Biologist | Authority/ Contractor/ Project Biologist | Protocol-level surveys for burrowing owls/report findings | Condition of construction contract/condition of regulatory permits | Impact BIO#3: Project Construction Effects on Special-Status Bird Habitat. |

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| | | surveys. Overall, the measure would be beneficial because it would allow the Build Alternatives to avoid affecting burrowing owls. Implementation of this measure would not result in additional physical disturbance outside the project footprint. Therefore, there is no potential for additional impacts on biological or other resources.<br>This mitigation measure is anticipated to be effective because it would require identification and documentation of active burrowing owl burrows and foraging habitat within 500 feet of the proposed construction area to avoid impacts from construction activities and guides future protective buffer placement and mitigation. Implementation of this measure would not trigger secondary environmental impacts because it would not change the scope, scale, or location of construction activities beyond those that have been described as part of the Build Alternatives. | | | | | | | |
| BIO-MM#21 | Implement Avoidance and Minimization Measures for Burrowing Owls | During nesting bird preconstruction surveys, if burrowing owls are observed within or adjacent to the project footprint, the Project Biologist shall establish a minimum 600-foot no-work buffer around occupied burrowing owl burrows during the nesting season (February 1 through September 1) to protect burrowing owls from project disturbance. Depending on the level of disturbance, the Project Biologist may increase the size of avoidance buffers. These avoidance buffers shall remain in place throughout nesting season and until the Project Biologist has determined that the juvenile owls are foraging independently and are capable of independent survival. Outside the nesting season, suitable burrows that may be at risk from disturbance shall be subject to burrow exclusions and closure (i.e., passive relocation methods), but burrows shall not be disturbed until the Project Biologist has verified that the burrows are unoccupied (based on monitoring). In the event that occupied burrows will be directly affected by ground-disturbing activities, the Authority shall rely on CDFW's Staff Report on Burrowing Owl Mitigation (CDFW 2012) when considering additional actions and/or alternatives to active relocation of burrowing owl.<br>BIO-MM#21 is anticipated to be effective | Pre-construction/Construction | Surveying/ Monitoring/ Reporting | Weekly or as established by regulatory compliance agencies | Authority/ Contractor/ Project Biologist | Authority/ Contractor/ Project Biologist | Establish no-work buffers around occupied burrowing owl burrows/relocation as needed/report findings | Condition of construction contract/condition of regulatory permits | Impact BIO#3: Project Construction Effects on Special-Status Bird Habitat. |

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| | | because it would require identification and documentation of active burrowing owl burrows, foraging habitat, and nest burrows; establishes avoidance buffers around active nest burrows; and monitors nest burrows to determine when they are no longer active, therefore allowing young to develop and fledge. This measure also includes passive relocation (outside of breeding season only) in the project footprint to avoid direct owl mortality from construction activities. Passive relocation could have indirect impacts on non-nesting burrowing owls because it would allow for the removal of unoccupied burrows (outside the nesting season), and therefore, result in loss of suitable habitat. Compensatory mitigation to offset loss of burrowing owl habitat shall be provided using 1 or more of the methods described in the Compensatory Mitigation Plan, BIO-MM#53. | | | | | | | | |
| BIO-MM#25 | Conduct Surveys for Bat Species | No more than 1 year (but with at least 1 maternity season remaining) prior to the replacement or modification of any bridges or removal of other structures (typically abandoned), and trees with large cavities or dense foliage identified as suitable bat habitat and where access is available, the Project Biologist shall conduct a survey of the bridges and other suitable bat habitat looking for evidence of roosting bats within the expected project footprint and a 500-foot buffer.<br>If bats or bat signs are detected, biologists shall conduct an evening visual and acoustic emergence survey (with monitoring using full spectrum bat detectors) of the bridges, structures, and/or trees with large cavities or dense foliage from a half hour before sunset to 1–2 hours after sunset for a minimum of 2 nights. To the extent possible, all surveys and follow-up monitoring shall be conducted during favorable weather conditions (calm nights with temperatures conducive to bat activity and no precipitation predicted). The purpose of these emergence surveys is to confirm presence/absence at each location, determine the species of bats, including whether the bats are non-special-status species (not protected by any regulation) or special-status species (protected pursuant to the CFGC), and estimate population size. The biologists will analyze the bat call data using appropriate software and will prepare | Pre-construction | Surveying/ Monitoring/ Reporting | Monthly or as established by regulatory compliance agencies | Authority/ Contractor/ Project Biologist | Authority/ Contractor/ Project Biologist | Conduct visual and acoustic surveys for evidence of bat species presence/report findings. | Condition of construction contract/condition of regulatory permits | Impact BIO#6: Project Construction Effects on Special-Status Mammal Habitat. |

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| | | a report that will be submitted to the Authority, including an assessment of the significance of the roost relative to local bat populations, particularly if the bats present are special-status-species, and therefore, protected pursuant to the CFGC.<br>Because bats are highly cryptic, the visual and acoustic emergence surveys shall be conducted during the appropriate time of year when bats are actively emerging from and returning to their roosts, generally March 1 – October 15, but may be extended outside this timeframe depending on temperature and other weather-related factors. Emergence surveys shall not be conducted when bats are in torpor (i.e., hibernacula; semi-hibernating during months with colder temperatures) when detection is unlikely.<br>If it is determined that bats are within the expected project disturbance footprint or 500-foot buffer, avoidance shall be the first option considered. If avoidance is not possible, bats shall be passively evicted using exclusion and deterrence methods, only when outside hibernation (i.e., torpor) and maternity roosting periods as described in BIO-MM#27. Should hibernacula or maternity roosts be detected within the expected project disturbance footprint or 500-foot buffer, and avoidance will not be possible, the Authority shall coordinate with CDFW regarding available options, as described in BIO-MM#26, with removal/relocation as a last and least preferred option.<br>This mitigation measure is anticipated to be effective because it would require identification and documentation of bat roosts (when bats are actively emerging/returning to the roost) within 500 feet of proposed construction work areas, determine if the bats are special-status or non-special-status species, determine population size, and guide additional protective actions, such as avoidance, passive eviction (using exclusion deterrence methods; refer to BIO-MM#27), or active relocation methods (refer to BIO-MM#26). This measure would have no impacts on roosting bats because non-invasive survey techniques would be used, and bats would not be disturbed during hibernating or maternity roosting periods before it can be determined if the bats are | | | | | | | | |

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| | | special-status species. Implementation of this measure would not trigger secondary environmental impacts because it would not change the scope, scale, or location of construction activities beyond those that have been described as part of the six Build Alternatives. | | | | | | | | |
| BIO-MM#26 | Bat Preconstruction, Avoidance, and Removal/ Relocation Methods | As part of project preconstruction survey efforts (generally within 30 days prior to any ground-disturbing activity), the Project Biologist shall assess the project footprint for the effectiveness of previous passive eviction measures implemented per BIO-MM#27 as well as assess the project footprint and 500-foot buffer for any potential new bat roosts, focusing on potentially suitable habitat in the form of bridges, structures (usually abandoned), and trees with large cavities or dense foliage. This additional preconstruction effort shall be conducted with the understanding that if bats are not active, they may be difficult to detect and/or determine if special-status, and should, therefore, be conducted outside the winter months to the extent possible.<br>If active hibernacula or maternity roosts are detected in the project footprint or 500-foot buffer extending from the project footprint, they will be avoided to the extent feasible. Any buffer required by permitting and regulatory authorizations will be instituted.<br>If avoidance is not possible and bats are actively emerging/returning from the roost (not hibernating and/or the young have actively begun flying), eviction methods shall be implemented. If avoidance is not possible and bats are not actively emerging, the Project Biologist shall coordinate with CDFW to prepare and implement a bat removal/relocation plan. This plan would only be considered if feasible and anticipated to provide equivalent or superior protection for bats.<br>The removal/relocation plan for removal and relocation of hibernacula and maternity roosts shall include, but are not limited to, the following:<br>• Identification of alternative bat roost location(s) at least 500 feet outside the work area and/or construction of artificial bat roosts (if needed, e.g., bat houses)<br>• Methods for removal/relocation, understanding that special-status bat | Pre-construction/ Construction | Surveying/ Monitoring/ Reporting | Weekly or as established by regulatory compliance agencies | Authority/ Contractor/ Project Biologist | Authority/ Contractor/ Project Biologist | Establish no-work buffers around occupied burrowing owl burrows/relocation as needed/report findings | Condition of construction contract/condition of regulatory permits | Impact BIO#6: Project Construction Effects on Special-Status Mammal Habitat. |

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| | | species may be addressed differently than non-special-status species<br>• Timing for removal/relocation<br>• Responsibilities and oversight for implementing removal/relocation<br>• Success criteria and follow-up monitoring of the alternative bat roosts to ensure effectiveness<br>• Adaptive management and contingency measures should alternative methods be necessary to ensure effectiveness relevant to avoidance/minimization of impacts to bats<br>• Methods to be implemented relative to bat protection during future project operations and maintenance<br>• Coordination with CDFW to ensure acceptable methods are implemented<br>• If the bats species being addressed are special-status, eviction methods will also be included in a removal/relocation plan<br>Any new roost sites (whether natural or artificially created) shall provide a stable microclimate and be in place and functional prior to the commencement of construction activities to allow sufficient time for bats to become established at the new roost site.<br>Implementation of this measure could trigger secondary environmental impacts to bats. However, to minimize impacts to bats subject to removal/relocation, particularly the protected special-status species, all eviction and/or removal/relocation methods will be guided and implemented in coordination with CDFW to ensure methods are acceptable and effective. | | | | | | | | |
| BIO-MM#27 | Implement Bat Exclusion and Deterrence Methods | During the survey efforts (whether it is the initial survey conducted well in advance of construction per BIO-MM#25 or the preconstruction survey per BIO-MM#26), if nonbreeding or non-hibernating (i.e., non-torpor) individuals or groups of bats are found roosting within the project disturbance footprint or 500-foot buffer, the Project Biologist shall facilitate the passive eviction (i.e., exclusion and deterrence) of the bats by either opening the roosting area to change the lighting and airflow conditions, installing one-way doors, or implementing other appropriate passive eviction methods used for evicting bats according to guidelines provided by the CDFW. Typical ideal periods for successful eviction are March 1 – April 15 and | Pre-construction/ Construction | Surveying/ Monitoring/ Reporting | Weekly or as established by regulatory compliance agencies | Authority/ Contractor/ Project Biologist | Authority/ Contractor/ Project Biologist | Safely evict bats from roosts except for established maternity roosts and occupied hibernation roosts/report findings | Condition of construction contract/condition of regulatory permits | Impact BIO#6: Project Construction Effects on Special-Status Mammal Habitat. |

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| | | September 1 – October 15, when outside the hibernation period and when young bats are volant (capable of flying). Implementation of passive eviction may be extended outside these timeframes depending on temperature and other weather-related factors.<br>To the extent feasible, the Authority shall leave the evicted roost area undisturbed by project activities for a minimum of1 week after implementing passive eviction methods, and through follow-up monitoring, shall ensure that all bats have left the roost area. Exclusion and deterrence features shall be left in place before and through construction to prevent bats from returning and re-occupying the previously evicted roost.<br>Should hibernacula or maternity roosts be detected, if feasible and anticipated to provide equivalent or better protection, maternity roosts and hibernacula may be actively removed/relocated subject to the criteria outlined in a removal/relocation plan prepared and implemented in coordination with CDFW (refer to BIO-MM#26). For bat species that are special-status, the removal/relocation plan shall also cover passive eviction activities and require the identification of alternative suitable natural roosting habitat or construction of artificial roosting habitat. If bats are non-special-status, passive eviction activities do not require plan preparation.<br>This mitigation measure is anticipated to be effective because implementation involves passive eviction of bats from within the project footprint and 500-foot buffer where bats could potentially be harmed by construction activities. Passive eviction would occur outside the hibernation period and after young are volant (capable of flying) to avoid bat mortality. This measure is also intended to deter bats from returning to the roost area after being passively evicted. Implementation of this measure would not trigger secondary environmental impacts because it would not change the scope, scale, or location of construction activities beyond those that have been described as part of the six Build Alternatives. | | | | | | | |
| BIO-MM#28 | Conduct Preconstruction | Prior to any ground-disturbing activity, the Project Biologist shall conduct | Pre-construction/ Cconstruction | Surveying/ Monitoring/ | Weekly or as established by | Authority/ Contractor/ Project | Authority/ Contractor/ Project | Conduct surveys for ringtail and ringtail | Condition of construction | Impact BIO#6: Project Construction Effects on Special-Status Mammal Habitat. |

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| | Surveys for Ringtail and Ringtail Den Sites and Implement Avoidance Measures | preconstruction surveys for ringtail and ringtail den sites within suitable habitat located within the work area and any areas extending 100 feet from the boundary of the work area, where access is available. These surveys will be conducted no more than 30 days before the start of ground-disturbing activities in a work area. The Project Biologist will establish 100-foot no-work buffers around occupied maternity dens throughout the pup-rearing season (May 1 through June 15) and a 50-foot no-work buffer around occupied dens during other times of the year. | | Reporting | regulatory compliance agencies | Biologist | Biologist | den sites/report findings/establish no-work buffers | contract/condition of regulatory permits | |
| BIO-MM#29 | Conduct Preconstruction Surveys for American Badger Den Sites and Implement Minimization Measures | Prior to any ground-disturbing activity, the Project Biologist shall conduct preconstruction surveys for American Badger den sites within suitable habitat located within the work area and any areas extending 100 feet from the boundary of the work area, where access is available. These surveys will be conducted no less than 14 days and no more than 30 days prior to the start of ground-disturbing activities in a work area. The Project Biologist will establish a 100-foot no-work buffer around occupied maternity dens throughout the pup-rearing season (February 15 through July 1) and a 50-foot no-work buffer around occupied dens during other times of the year. If non-maternity dens are found and cannot be avoided during construction activities, they will be monitored for badger activity. If the Project Biologist determines that dens may be occupied, passive den exclusion measures will be implemented for 3 to 5 days to discourage the use of these dens prior to project disturbance activities. | Pre-construction/ Construction | Surveying/Monitoring/Reporting | Weekly or as established by regulatory compliance agencies | Authority/ Contractor/ Project Biologist | Authority/ Contractor/ Project Biologist | Conduct surveys for the American Badger | Condition of construction contract/condition of regulatory permits | Impact BIO#6: Project Construction Effects on Special-Status Mammal Habitat. |
| BIO-MM#32 | Restore Temporary Riparian Habitat Impacts | Within 90 days of completing construction in a work area, the project biologist will direct the revegetation of any riparian areas temporarily disturbed as a result of the construction activities, using appropriate native plants and seed mixes (including host and nectar plants for butterflies). Native plants and seed mixes will be obtained from stock originating from areas within the local watershed, to the extent feasible. The project biologist will monitor restoration activities consistent with provisions in the RRP (BIO-MM#6). | Construction/Post-construction | Restoration/Monitoring/Reporting | Weekly or as established by regulatory compliance agencies | Authority/ Contractor/ Project Biologist | Authority/ Contractor/ Project Biologist | Revegetate disturbed riparian areas/report findings | Condition of construction contract/condition of regulatory permits | Impact BIO#1: Project Construction Effects on Habitat for Special-Status Plants and Plant Communities.<br>Impact BIO#2: Project Construction Effects on Special-Status Amphibian Habitat.<br>Impact BIO#3: Project Construction Effects on Special-Status Bird Habitat.<br>Impact BIO#4: Project Construction Effects on Special-Status Fish Habitat.<br>Impact BIO#8: Project Construction Effects on State and Federally Jurisdictional Aquatic Resources.<br>Impact BIO#9: Project Construction Effects on Fish and Wildlife Resources Protected by Fish and Game Code Section 1600 et seq. |

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| BIO-MM#33 | Restore Aquatic Resources Subject to Temporary Impacts | Within 90 days of the completion of construction activities in a work area, the Authority will begin to restore aquatic resources that were temporarily affected by the construction. Aquatic resources are those resources considered WOTUS under the CWA or waters of the state under the Porter-Cologne Act and/or regulated under CFGC section 1600 et seq. As set out in the RRP, such areas will, to the extent feasible, be restored to their natural topography. In areas where gravel or geotextile fabrics have been installed to protect substrate and to otherwise minimize impacts, the material will be removed, and the affected features will be restored. The Authority will revegetate affected aquatic resources using appropriate native plants and seed mixes (from local vendors where available). The Authority will conduct maintenance monitoring consistent with the provisions of the RRP. | Construction/Post-construction | Restoration/monitoring/reporting | Weekly or as established by regulatory compliance agencies | Authority/ Contractor /Project Biologist | Authority/ Contractor /Project Biologist | Restore disturbed aquatic resources/conduct revegetation/report findings | Condition of construction contract/condition of regulatory permits | Impact BIO#1: Project Construction Effects on Habitat for Special-Status Plants and Plant Communities.<br>Impact BIO#2: Project Construction Effects on Special-Status Amphibian Habitat.<br>Impact BIO#4: Project Construction Effects on Special-Status Fish Habitat.<br>Impact BIO#8: Project Construction Effects on State and Federally Jurisdictional Aquatic Resources.<br>Impact BIO#9: Project Construction Effects on Fish and Wildlife Resources Protected by Fish and Game Code Section 1600 et seq. |
| BIO-MM#34 | Monitor Construction Activities within Jurisdictional Waters | The Project Biologist will monitor construction activities that occur within or adjacent to aquatic resources, including activities associated with the installation of protective barriers (e.g., silt fencing, sandbags, fencing), installation and/or removal of creek material to accommodate crossings, construction of access roads, and removal of vegetation. As part of this effort, the Project Biologist will document compliance with applicable avoidance and minimization measures including measures set forth in regulatory authorizations issued under CWA, Porter-Cologne Act and/or CFGC section 1600 et seq. | Construction/Post-construction | Surveying/Monitoring/Reporting | Weekly or as established by regulatory compliance agencies | Authority/ Contractor/ Project Biologist | Authority/ Contractor/ Project Biologist | Monitor construction activities within or adjacent to aquatic resources/document compliance | Condition of construction contract/condition of regulatory permits | Impact BIO#1: Project Construction Effects on Habitat for Special-Status Plants and Plant Communities.<br>Impact BIO#2: Project Construction Effects on Special-Status Amphibian Habitat.<br>Impact BIO#4: Project Construction Effects on Special-Status Fish Habitat.<br>Impact BIO#8: Project Construction Effects on State and Federally Jurisdictional Aquatic Resources.<br>Impact BIO#9: Project Construction Effects on Fish and Wildlife Resources Protected by Fish and Game Code Section 1600 et seq. |
| BIO-MM#35 | Implement Transplantation and Compensatory Mitigation Measures for Protected Trees | Prior to ground-disturbing activities, the Project Biologist shall conduct surveys in the work area to identify protected trees.<br>The Project Biologist will establish ESAs around protected trees that have the potential to be affected by construction activities but do not require removal. The ESAs will extend outward 5 feet from the drip lines of such protected trees. The implementation of the compensatory mitigation measures will be conducted by a certified arborist, with oversight from Authority staff member(s).<br>The Authority will prepare and implement a Compensatory Mitigation Plan for impacts on protected trees, including impacts associated with removing or trimming a | Pre-construction/<br>Construction/Post-construction | Surveying/Monitoring/Reporting | Monthly or as established by regulatory compliance agencies | Authority/ Contractor/ Project Biologist | Authority/ Contractor/ Project Biologist | Conduct protected trees surveys/compensate for impacts and effects to protected tree resources/prepare and implement a monitoring and maintenance program to monitor transplanted trees/report findings | Condition of construction contract | Impact BIO#12: Project Construction Effects on Protected<br>Impact BIO#19: Project Operation Effects on Protected Trees. |

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| | | protected tree. Compensation will be based on requirements set out in applicable local government ordinances, policies, and regulations. Compensatory mitigation may include, but is not limited to, the following:<br>• Transplantation of protected trees to areas outside of the work area.<br>• Replacement of protected trees at an off-site location, based on the number of protected trees impacted, at a ratio not to exceed 3:1 for native trees or 1:1 for ornamental trees, unless higher ratios are required by local government ordinances or regulations.<br>• Removal or transplantation of Joshua trees shall require approval from CDFW, as no take of the species is authorized except under State law (CFGC §§ 86, 2062, 2067, 2068, 2080, 2085; Cal. Code Regs., tit. 14, § 786.9). For Joshua trees that occur outside areas with protected tree ordinances, Joshua trees will be replaced as set forth in the take authorization.<br>• Contribution to a tree-planting fund.<br>The Authority will use a certified arborist with knowledge of tree conservation to support the implementation of the protected tree measures. | | | | | | | | |
| BIO-MM#36 | Install Aprons or Barriers within Security Fencing | Prior to final construction design the Project Biologist will review the fencing plans along any portion of the permanent right-of-way that is adjacent to natural habitats and confirm that the permanent security fencing will be enhanced with a barrier (e.g., fine mesh fencing) that extends at least 12 inches below-ground and 12 inches aboveground to prevent special-status reptiles, amphibians, and mammals from moving through or underneath the fencing and gaining access to areas within the ROW. At the 12-inch depth of the below-grade portion of the apron, the barrier will extend or be bent at an approximately 90-degree angle and oriented outward from the ROW a minimum of 12 inches to prevent fossorial mammals, reptiles, and amphibians from digging or tunneling below the security fence and gaining access to the right-of-way. A climber barrier (e.g., rigid curved or bent overhang) will be installed at the top of the apron to prevent reptiles, amphibians, and mammals from climbing | Design/Pre-construction/ Construction | Design and installation of apron or fencing | As established by regulatory compliance agencies | Authority/ Contractor/ Project Biologist | Authority/ Contractor/ Project Biologist | Design of wildlife movement plans | Condition of construction contract/condition of regulatory permits | Impact BIO#2: Project Construction Effects on Special-Status Amphibian Habitat.<br>Impact BIO#6: Project Construction Effects on Special-Status Mammal Habitat.<br>Impact BIO#7: Project Construction Effects on Special-Status Reptile Habitat.<br>Impact BIO-#13: Project Effects on Wildlife Movement Corridors.<br>Impact BIO#14: Project Operation Effects on Habitat for Special-Status Species Individuals and Communities. |

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| | | over the apron.<br>The Project Biologist will ensure that the selected apron material and climber barrier do not cause harm, injury, or entanglement to, or entrapment of, wildlife species. The Authority will provide for quarterly inspection and repair of the fencing.<br>The specific design and method for installation of an apron or barrier may vary as required by regulatory authorizations issued under FESA and/or CESA. Prior to operation the Project Biologist will field inspect the fencing along any portion of the permanent right-of-way that is adjacent to natural habitats and confirm that the fencing has been appropriately installed. Fencing plan review and field inspection will be documented in a memorandum from the Project Biologist and provided to the Authority. | | | | | | | | |
| BIO-MM#37 | Minimize Effects on Wildlife Movement Corridors During Construction | To the extent feasible, the Authority will avoid placing fencing, either temporarily or permanently, within known wildlife movement corridors in those portions of the alignment where the tracks are elevated (e.g., viaducts or bridges). During ground-disturbing activities, the Authority will keep wildlife crossing structures, land above tunnels, and other potential wildlife movement areas as free as practicable of equipment, storage materials, construction materials, and other potential impediments. Before ground-disturbing activities, the contractor will submit a construction avoidance and minimization plan for potential wildlife movement areas to the Project Biologist for concurrence. For the purposes of this section, “potential wildlife movement areas” include ruderal and vegetated wildlands dominated by non-natives that would provide movement opportunities across the HSR alignment.<br>The Authority will avoid conducting ground-disturbing activities in wildlife movement corridors during nighttime hours, to the extent feasible, and will shield nighttime lighting to avoid illuminating wildlife movement corridors in circumstances where avoidance of such activities is not feasible. | Construction/post-construction | Design and installation of fencing | As established by regulatory compliance agencies | Yearly or at other appropriate intervals | Authority/ Contractor/ Project Biologist | Authority/ Contractor/ Project Biologist | Avoid placement of fencing adjacent to wildlife movement corridors/report findings | Impact BIO#13: Project Effects on Wildlife Movement Corridors. |
| BIO-MM#38 | Compensate for Impacts on Listed Plant Species | The Authority will provide compensatory mitigation for direct impacts on federally and state-listed plant species based on the number of acres of plant habitat directly | Pre-construction/Construction/Post- | Design/final design/mitigation | Monthly or as established by regulatory compliance | Authority/ Contractor/ Project Biologist | Authority/ Contractor/ Project Biologist | Compensate impacts on special-status plants at a 1:1 ratio based on | Condition of construction contract/condition of regulatory | Impact BIO#1: Project Construction Effects on Habitat for Special-Status Plants and Plant Communities. |

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| | | affected. Such mitigation will include the following measures:<br>• Compensatory mitigation will be provided at a 1:1 ratio to offset direct impacts on federally listed plant species habitat, unless a higher ratio is required pursuant to regulatory authorizations issued under FESA.<br>• Compensatory mitigation will be provided at a 1:1 ratio to offset direct impacts on state-listed plant species habitat, unless a higher ratio is required pursuant to regulatory authorizations issued under CESA.<br>• Compensatory mitigation will be provided using1 or more of the methods described in BIO-MM#8.<br>This mitigation measure is anticipated to be effective because it provides a minimum compensatory mitigation standard for special-status plants. Potential secondary impacts on biological and other resources from this measure would be the same as those described under BIO-MM#50. No other secondary impacts are anticipated. | construction | | agencies | | | actual acres of direct effects/report findings | permits | |
| BIO-MM#39 | Provide Compensatory Mitigation for Impacts on Vernal Pool Fairy Shrimp and Vernal Pool Tadpole Shrimp Habitat | The Authority will provide compensatory mitigation for direct and indirect impacts, including both temporary and permanent impacts, on vernal pool branchiopod habitat at a 1:1 ratio unless a higher ratio is required by the FESA.<br>Compensatory mitigation will be provided using1 or more of the methods described in the Compensatory Mitigation Plan, BIO-MM#53. | Post-construction | Design/final design/ surveying/ compensatory mitigation/ reporting | Monthly or as established by regulatory compliance agencies | Authority/ Contractor/ Project Biologist | Authority/ Contractor/ Project Biologist | Compensate impacts Vernal Pool Fairy Shrimp and Vernal Pool Tadpole Shrimp Habitat at a 1:1 ratio | Condition of construction contract | Impact BIO#5: Project Construction Effects on Special-Status Invertebrate Habitat.<br>Impact BIO#8: Project Construction Effects on State and Federally Jurisdictional Aquatic Resources. |
| BIO-MM#43 | Provide Compensatory Mitigation for Loss of Swainson's Hawk Nesting Trees and Habitat | To compensate for permanent impacts to active Swainson's hawk nest trees (i.e., trees in which Swainson's hawks were observed building nests during protocol-level surveys or nest sites that were used1 or more times in the last 5 years per the California Energy Commission and CDFG 2010 guidelines) and foraging habitat, the Authority shall provide project-specific compensatory mitigation that replaces affected nest trees and provides foraging habitat. Lands proposed as compensatory mitigation for Swainson's hawk would meet the following minimum criteria:<br>Support at least three mature native riparian trees suitable for Swainson's hawk nesting (i.e., valley oak, Fremont cottonwood, or willow) for each | Pre-construction/ Construction/Post-construction | Design/final design/ surveying/ compensatory mitigation/ reporting | Monthly or as established by regulatory compliance agencies | Authority/ Contractor/ Project Biologist | Authority/ Contractor/ Project Biologist | Compensatory mitigation that replaces Swainson's hawk nesting trees and provides natural lands for foraging/report findings | Condition of construction contract | Impact BIO#3: Project Construction Effects on Special-Status Bird Habitat. |

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| | | Swainson's hawk nest tree removed by construction of the Palmdale to Burbank Project Section.<br>• Support at least1 Swainson's hawk nesting territory during the past 5 years.<br>• Contribute to the Palmdale to Burbank Project Section's mitigation commitment for Swainson's hawk foraging habitat, which will be calculated based on the following ratios:<br>  ○ 1:1 for impacts on active primary foraging habitat (primary foraging habitat is the area of suitable foraging habitat within 1 mile of a known nest)<br>  ○ 0.75:1 for impacts on active secondary foraging habitat (secondary foraging habitat is the area of suitable foraging habitat between 1 and 5 miles of a known nest)<br>  ○ 0.5:1 for impacts on active tertiary foraging habitat (tertiary foraging habitat is the area of suitable foraging habitat between 5 and 10 miles of a known nest)<br>• Final mitigation strategy and details will be included as part of the Compensatory Mitigation Plan prepared pursuant to BIO-MM#53. Compensatory mitigation planning for Swainson's hawk will address the following details:<br>  ○ Specific data and analyses used to determine whether replacement habitat would provide functional foraging habitat and the quality of potential replacement habitat<br>  ○ Refined definitions of "primary", "secondary", and "tertiary" foraging habitat based on size of foraging habitat patches and given distances from known Swainson's hawk nests (active or inactive)<br>  ○ The mitigation ratios required pursuant to CESA<br>  ○ Compensatory mitigation for Swainson's hawk will be finalized in coordination with CDFW. | | | | | | | | |
| BIO-MM#44 | Provide Compensatory Mitigation for Loss of | To compensate for permanent impacts on nesting, occupied, and satellite burrows for burrowing owls and/or their habitat, the Authority will provide compensatory | Pre-construction/ Construction/Post-construction | Design/final design/ surveying/ compensatory | Monthly or as established by regulatory | Authority/ Contractor/ Project Biologist | Authority/ Contractor/ Project Biologist | Compensate impacts Active Burrowing Owl | Condition of construction contract/condition | Impact BIO#3: Project Construction Effects on Special-Status Bird Habitat. |

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| | Active Burrowing Owl Burrows and Habitat | mitigation at a ratio of 2:1 using1 or more of the methods described in the Compensatory Mitigation Plan, BIO-MM#53.<br>This mitigation measure is anticipated to be effective because it provides minimum compensatory mitigation standards for burrowing owls. Implementation of this mitigation measure may also require the acquisition of suitable additional lands outside the project footprint for the purposes of providing habitat for burrowing owls. This land may be converted from other current uses, such as agriculture, which in turn could have potential secondary environmental impacts on agricultural resources (through farmland conversion). Such secondary impacts from off-site mitigation activities are addressed under BIO-MM#50. | | mitigation/ reporting | compliance agencies | | | Burrows and Habitat at a 2:1 ratio | of regulatory permits | |
| BIO-MM#46 | Provide Compensatory Mitigation for Permanent Impacts on Riparian Habitat | The Authority will compensate for permanent impacts on riparian habitats at a ratio of 2:1, unless a higher ratio is required by agencies with regulatory jurisdiction over the resource. Compensatory mitigation may occur through habitat restoration, the acquisition of credits from an approved mitigation bank, or participation in an in-lieu fee program. | Pre-construction/ construction/post-construction | Design/final design/ surveying/ compensatory mitigation/reporting | Yearly or as established by regulatory compliance agencies | Authority/ Contractor/ Project Biologist | Authority/ Contractor/ Project Biologist | Mitigate permanent riparian habitat impacts through compensation/report findings | Condition of construction contract/condition of regulatory permits | Impact BIO#1: Project Construction Effects on Habitat for Special-Status Plants and Plant Communities.<br>Impact BIO#2: Project Construction Effects on Special-Status Amphibian Habitat.<br>Impact BIO#3: Project Construction Effects on Special-Status Bird Habitat.<br>Impact BIO#4: Project Construction Effects on Special-Status Fish Habitat.<br>Impact BIO#6: Project Construction Effects on Special-Status Mammal Habitat.<br>Impact BIO#7: Project Construction Effects on Special-Status Reptile Habitat.<br>Impact BIO#8: Project Construction Effects on State and Federally Jurisdictional Aquatic Resources.<br>Impact BIO#9: Project Construction Effects on Fish and Wildlife Resources Protected by Fish and Game Code Section 1600 et seq.<br>Impact BIO#10: Project Construction Effects on Federally Designated Critical Habitat.<br>Impact BIO#11: Project Construction Effects on Significant Ecological Areas. |
| BIO-MM#47 | Prepare and Implement a CMP for Impacts on Aquatic Resources | The Authority will prepare and implement a CMP that identifies mitigation to address temporary and permanent loss, including functions and services, of aquatic resources as defined as WOTUS under the CWA and/or waters of the state under the Porter-Cologne Act and/or | Pre-construction/ Construction/Post-construction | Design/final design/surveying/ compensatory mitigation/reporting | Yearly or as established by regulatory compliance agencies | Authority/ Contractor/Project Biologist | Authority/ Contractor/Project Biologist | Prepare and implement CMP for temporary and permanent impact on aquatic resources/report findings | Condition of construction contract/condition of regulatory permits | Impact BIO#2: Project Construction Effects on Special-Status Amphibian Habitat.<br>Impact BIO#4: Project Construction Effects on Special-Status Fish Habitat.<br>Impact BIO#5: Project Construction Effects on Special-Status Invertebrate Habitat.<br>Impact BIO#6: Project Construction Effects |

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| | | regulated under CFGC section 1600 et seq. The compensatory mitigation will meet state and federal policies on no net loss of functions and services of wetlands. To the extent feasible, compensatory mitigation will be provided within CDFW Region 5 and within Los Angeles County. Compensatory mitigation may involve the restoration, establishment, enhancement, and/or preservation of aquatic resources through1 or more of the following methods:<br>• Purchase of credits from an agency-approved mitigation bank<br>• Preservation of aquatic resources through acquisition of property<br>• Establishment, restoration, or enhancement of aquatic resources<br>• In-lieu fee contribution determined through consultation with the applicable regulatory agencies<br>The following ratios will be used for compensatory mitigation for aquatic resources unless a higher ratio is required pursuant to regulatory authorizations issued under Section 404 of the CWA and/or the Porter-Cologne Act and/or CFGC section 1600 et seq:<br>• Vernal pools: 2:1<br>• Seasonal wetlands: between 1.1:1 and 1.5:1 based on impact type, function and services lost<br>• 1:1 off-site for permanent impacts<br>• 1:1 on site and 0.1:1 to 0.5:1 off-site for temporary impacts<br>For mitigation involving establishment, restoration, enhancement, or preservation of aquatic resources by the Authority, the CMP will contain the following information:<br>• Objectives—A description of the resource types and amounts that will be provided, the type of compensation (i.e., restoration, establishment, enhancement, and/or preservation), and the manner in which the resource functions of the compensatory mitigation project will address the needs of the watershed or ecoregion.<br>• Site selection—A description of the factors considered during the long-term | | | | | | | | on Special-Status Mammal Habitat.<br>Impact BIO#7: Project Construction Effects on Special-Status Reptile Habitat.<br>Impact BIO#8: Project Construction Effects on State and Federally Jurisdictional Aquatic Resources.<br>Impact BIO#9: Project Construction Effects on Fish and Wildlife Resources Protected by Fish and Game Code Section 1600 et seq.<br>Impact BIO#10: Project Construction Effects on Federally Designated Critical Habitat.<br>Impact BIO#11: Project Construction Effects on Significant Ecological Areas. |

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| | | sustainability of the resource.<br>• Adaptive management plan—A management strategy to address changes in site conditions or other components of the compensatory mitigation project.<br>• Financial assurances—A description of financial assurances that will be provided to ensure that the compensatory mitigation will be successful.<br>In circumstances where the Authority intends to fulfill compensatory mitigation obligations by securing credits from approved conservation and mitigation banks or in-lieu fee programs, the CMP need only include the name of the specific conservation and mitigation bank or in-lieu fee program to be used and the method for calculating credits. | | | | | | | |
| BIO-MM#50 | Implement Measures to Minimize Impacts During Off-Site Habitat Restoration, or Enhancement, or Creation on Mitigation Sites | Prior to ground-disturbing activities associated with habitat restoration, enhancement, and/or creation actions at a mitigation site, the Authority will conduct a site assessment of the work area to identify biological and aquatic resources, including vegetation communities, landcover types, and the distribution of special-status plants and wildlife.<br>Based on the results of the site assessment, the Authority will obtain any necessary regulatory authorizations prior to conducting habitat restoration, enhancement, and/or creation activities, including authorization under FESA or CESA, CFGC Section 1600 et seq., the CWA, and the Porter-Cologne Act.<br>The Authority will implement the following measures to avoid or minimize impacts on species habitat and aquatic biological resources during habitat restoration, enhancement, or creation activities:<br>• BIO-IAMF#3: Prepare WEAP Training Materials and Conduct Construction Period WEAP Training<br>• BIO-IAMF#6: Establish Monofilament Restrictions<br>• BIO-IAMF#7: Prevent Entrapment in Construction Materials and Excavations<br>• BIO-IAMF#8: Delineate Equipment Staging Areas and Traffic Routes | Pre-construction/ Construction/Post-Construction | Design/final design/surveying/compensatory mitigation/reporting | Yearly or as established by regulatory compliance agencies | Authority/ Contractor/Project Biologist | Authority/ Contractor/Project Biologist | Implement measure to avoid and minimize impacts during off-site habitat restoration, enhancement, and creation/report findings | Condition of construction contract/condition of regulatory permits | Impact BIO#1: Project Construction Effects on Habitat for Special-Status Plants and Plant Communities.<br>Impact BIO#2: Project Construction Effects on Special-Status Amphibian Habitat.<br>Impact BIO#3: Project Construction Effects on Special-Status Bird Habitat.<br>Impact BIO#4: Project Construction Effects on Special-Status Fish Habitat.<br>Impact BIO#5: Project Construction Effects on Special-Status Invertebrate Habitat.<br>Impact BIO#6: Project Construction Effects on Special-Status Mammal Habitat.<br>Impact BIO#7: Project Construction Effects on Special-Status Reptile Habitat.<br>Impact BIO#8: Project Construction Effects on State and Federally Jurisdictional Aquatic Resources.<br>Impact BIO#9: Project Construction Effects on Fish and Wildlife Resources Protected by Fish and Game Code Section 1600 et seq.<br>Impact BIO#10: Project Construction Effects on Federally Designated Critical Habitat.<br>Impact BIO#11: Project Construction Effects on Significant Ecological Areas.<br>Impact BIO#12: Project Construction Effects on Protected |

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| | | • BIO-IAMF#9: Dispose of Construction Spoils and Waste<br>• BIO-IAMF#10: Clean Construction Equipment<br>• BIO-IAMF#11: Maintain Construction Sites<br>• BIO-MM#14: Conduct Preconstruction Surveys and Delineate Active Nest Buffers Exclusion Areas for Breeding Birds<br>• BIO-MM#15: Conduct Preconstruction Surveys and Monitoring for Non-Special-Status Raptors<br>• BIO-MM#32: Restore Temporary Riparian Habitat Impacts<br>• BIO-MM#33: Restore Aquatic Resources Subject to Temporary Impacts<br>• BIO-MM#55: Prepare and Implement a Weed Control Plan<br>• BIO-MM#58: Establish Environmentally Sensitive Areas and Nondisturbance Zones<br>• BIO-MM#60: Limit Vehicle Traffic and Construction Site Speeds<br>• BIO-MM#63: Work Stoppage | | | | | | | | |
| BIO-MM#52 | Conduct California Glossy Snake, California Legless Lizard, Coast Patch-Nosed Snake, Coastal Rosy Boa, Coastal Whiptail, Blainville's Horned Lizard, San Bernardino Ringneck, San Bernardino Mountain Kingsnake, South Coast Garter Snake, Two-Striped Garter Snake, and Western Pond Turtle Monitoring, and Implement Avoidance and Minimization Measures | Prior to ground-disturbing activities, the Project Biologist shall conduct a clearance survey in suitable habitat within the work area for California glossy snake, California legless lizard, coast patch-nosed snake, coastal rosy boa, coastal whiptail, Blainville's horned lizard, San Bernardino ringneck, San Bernardino mountain kingsnake, south coast garter snake, two-striped garter snake, and western pond turtle. The Project Biologist may establish wildlife exclusion fencing to keep the species from entering the work area. If California glossy snake, California legless lizard, coast patch-nosed snake, coastal rosy boa, coastal whiptail, Blainville's horned lizard, San Bernardino ringneck, San Bernardino mountain kingsnake, south coast garter snake, two-striped garter snake, and western pond turtle is observed during construction, measures will be taken to avoid the | Pre-construction/ Construction | Surveying/Monitoring/Reporting | Weekly or as established by regulatory compliance agencies | Authority/ Contractor/Project Biologist | Authority/ Contractor/Project Biologist | Pre-construction surveys for nesting Swainson's hawks, California Glossy Snake, California Legless Lizard, Coast Patch-Nosed Snake, Coastal Rosy Boa, Coastal Whiptail, Blainville's Horned Lizard, San Bernardino Ringneck, San Bernardino Mountain Kingsnake, South Coast Garter Snake, Two-Striped Garter Snake, and Western Pond Turtle /monitor active nests/report | Condition of construction contract/condition of regulatory permits | Impact BIO#7: Project Construction Effects on Special-Status Reptile Habitat. |

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| | | individual(s), and the species will be allowed to leave of its own volition or be relocated outside of the work area by the Project Biologist. Clearance surveys will be conducted daily unless the Project Biologist determines that the surveys are no longer necessary. | | | | | | findings | | |
| BIO-MM#53 | Prepare and Implement a CMP for Species and Species Habitat | The Authority will prepare and implement a CMP that sets out the compensatory mitigation that will be provided to offset permanent and temporary impacts on federal and state-listed species and their habitat, fish and wildlife resources regulated under the CFGC, and certain other special-status species. The compensatory mitigation outlined in the CMP will be proportional to associated impacts. The CMP will include the following:<br>• A description of the species and habitat types for which compensatory mitigation is being provided<br>• A description of the methods used to identify and evaluate mitigation options. Where compensatory mitigation is identified as the preferred approach, mitigation ratios for federal and state-listed species and their habitat will ultimately be determined pursuant to regulatory authorizations issued under FESA and CESA. Mitigation options will include1 or more of the following:<br>○ Purchase of mitigation credits from an agency-approved mitigation bank.<br>○ Protection of habitat through acquisition of fee-title or conservation easement and funding for long-term management of the habitat. To the extent feasible, compensatory mitigation will be provided within CDFW Region 5 and within Los Angeles County.<br>○ Title to lands acquired in fee-title will be transferred to CDFW, and conservation easements will be held by an entity approved in writing by the applicable regulatory agency. In circumstances where the Authority protects habitat through a conservation easement, the terms of the conservation easement will be subject to | Pre-construction/ Construction/Post-construction | Surveying/Monitoring/Reporting | Weekly or as established by regulatory compliance agencies | Authority/ Contractor/Project Biologist | Authority/ Contractor/Project Biologist | Prepare CMP for temporary and permanent impacts on special-status species and their habitat | Condition of construction contract/condition of regulatory permits | Impact BIO#1: Project Construction Effects on Habitat for Special-Status Plants and Plant Communities.<br>Impact BIO#2: Project Construction Effects on Special-Status Amphibian Habitat.<br>Impact BIO#3: Project Construction Effects on Special-Status Bird Habitat.<br>Impact BIO#4: Project Construction Effects on Special-Status Fish Habitat.<br>Impact BIO#5: Project Construction Effects on Special-Status Invertebrate Habitat.<br>Impact BIO#6: Project Construction Effects on Special-Status Mammal Habitat.<br>Impact BIO#7: Project Construction Effects on Special-Status Reptile Habitat.<br>Impact BIO#9: Project Construction Effects on Fish and Wildlife Resources Protected by Fish and Game Code Section 1600 et seq.<br>Impact BIO#10: Project Construction Effects on Federally Designated Critical Habitat.<br>Impact BIO#11: Project Construction Effects on Significant Ecological Areas.<br>Impact BIO#14: Project Operation Effects on Habitat for Special-Status Species Individuals and Communities. |

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| | | approval of the applicable regulatory agencies, and the conservation easement will identify applicable regulatory agencies as third-party beneficiaries with a right of access to the easement areas.<br>○ Payment to an existing in-lieu fee program.<br>A summary of the estimated direct permanent and temporary impacts on species and species habitat. A description of the process that will be used to confirm impacts. Actual impacts on species and habitat could differ from estimates. Should this occur, adjustments will be made to the compensatory mitigation that will be provided to ensure that mitigation remains commensurate with impacts. Adjustments to impact estimates and compensatory mitigation will occur in any of the following circumstances: Impacts on species (typically measured as habitat loss) are reduced or increased as a result of changes in project design<br>Preconstruction site assessments indicate that habitat features are absent (e.g., because of errors in land cover mapping or land cover conversion)<br>The habitat is determined to be unoccupied based on negative species surveys. Impacts initially categorized as permanent qualify as temporary impacts<br>• An overview of the strategy for mitigating effects on species. The overview will include the ratios to be applied to determine mitigation levels and the resulting mitigation totals<br>• A description of habitat restoration or enhancement projects, if any, that will contribute to compensatory mitigation commitments<br>• A description of the success criteria that will be used to evaluate the performance of habitat restoration or enhancement projects, and a description of the types of monitoring that will be used to verify that such criteria have been met<br>• A description of the management actions that will be used to maintain the habitat on the mitigation sites, and | | | | | | | | |

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| | | the funding mechanisms for long-term management<br>• A description of adaptive management approaches, if applicable, that will be used in the management of species habitat<br>• A description of financial assurances that will be provided to demonstrate that the funding to implement mitigation is assured. | | | | | | | | |
| BIO-MM#54 | Prepare and Implement an Annual Vegetation Control Plan | Prior to the operation and maintenance of the HSR, the Authority, with approval by USFS for activities on USFS land, will prepare an annual vegetation control plan to address vegetation removal for the purpose of maintaining clear areas around facilities, reducing the risk of fire, and controlling invasive weeds during the operational phase. The Authority will generally follow the procedures established in Chapter C2 of the Caltrans Maintenance Manual to manage vegetation on Authority property (California Department of Transportation [Caltrans] 2010). Vegetation will be controlled by chemical, thermal, biological, cultural, mechanical, structural, and manual methods. The vegetation control plan will be updated each winter and completed in time to be implemented no later than April 1 of each year. The annual update to the vegetation control plan will include a section addressing issues encountered during the prior year and changes to be incorporated into the vegetation control plan. The plan will describe site-specific vegetation control methods, as outlined below:<br>▪ Mowing program consistent with section 1415 of the FAST Act.<br>▪ Other non-chemical vegetation control.<br>▪ Other chemical pest control methods (e.g., insects, snail, rodent).<br>▪ Special consideration shall be given to the possible chemical contamination of surface and groundwater.<br>▪ Buffer zones of up to 20 feet or greater shall be maintained from surface water (oceans, bays, lakes, rivers, streams, creeks, and canals) or drainage ditches (when water is flowing) when applying any pre-emergent herbicide.<br>▪ Buffers of 5 feet or greater shall be maintained from surface water when | Pre-construction/ Construction/Post-construction | Design/final design/compensatory mitigation/reporting | Yearly or as established by regulatory compliance agencies | Authority/ Contractor/ Project Biologist | Authority/ Contractor/ Project Biologist | Prepare and implement vegetation control plan to address for vegetation removal for the purpose of maintaining clear areas/report findings | Condition of construction contract/condition of regulatory permits | Impact BIO#1: Project Construction Effects on Habitat for Special-Status Plants and Plant Communities.<br>Impact BIO#14: Project Operation Effects on Habitat for Special-Status Species Individuals and Communities. |

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| | | applying post-emergent herbicides.<br>▪ Special consideration shall be given to areas determined under BIO-MM#94 to be occupied monarch butterfly overwintering groves (generally mid-September to mid-March) and occupied host plants (e.g., milkweed)/breeding areas (mid-March to mid-September). If pesticides are used, applications shall be done mid-March to mid-September, when possible. Use of pesticides within 1 mile of occupied overwintering areas shall be avoided or minimized, with the distance of pesticide use from these occupied areas to be reduced as determined by a qualified Project Biologist, as appropriate, based on weather conditions, topography, and potential for off-site drift.<br>▪ Relative to the monarch butterfly, whenever possible, the following shall be applicable: targeted application herbicide methods shall be used; large-scale broadcast applications shall be avoided; precautions shall be taken to limit off-site movement of herbicides (e.g., drift from wind and discharge from surface water flows); neonicotinoids or other systemic insecticides, including coated seeds, shall not be used any time of the year in monarch butterfly habitat due to their ecosystem persistence, systemic nature, and toxicity; and soil fumigants shall not be used.<br><br>Only Caltrans-approved herbicides may be used in the vegetation control program. Pesticide application will be conducted in accordance with all requirements of the California Department of Pesticide Regulation and County Agricultural Commissioners by certified pesticide applicators. Noxious/invasive weeds will be treated where requested by County Agricultural Commissioners. The appropriate chemical formulations will be used for vegetation management. Glyphosate Roundup will only be used in the uplands and outside of watercourses and riparian areas. Glyphosate Rodeo will be used for aquatic weed control. The Authority will cooperate in area-wide efforts to control of noxious/invasive weeds if such programs have been established by local agencies. | | | | | | | |

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| BIO-MM#55 | Prepare and Implement a Weed Control Plan | Prior to any ground-disturbing activity during the construction phase, the project biologist will develop a WCP, subject to review and approval by the Authority. The purpose of the WCP is to establish approaches to minimize and avoid the spread of invasive weeds during ground-disturbing activities during construction and operation and maintenance (O&M).<br>The WCP will include, at a minimum, the following:<br>• A requirement to delineate ESAs in the field prior to weed control activities.<br>• A schedule for weed surveys to be conducted in coordination with the BRMP<br>• Success criteria for invasive weed control. The success criteria will be linked to the BRMP standards for on-site work during ground-disturbing activities. In particular, the criteria will establish limits on the introduction and spread of invasive species, as defined by the California Invasive Plant Council, to less than or equal to the pre-disturbance conditions in the area temporarily affected by ground-disturbing activities. If invasive species cover is found to exceed pre-disturbance conditions by greater than 10 percent or is 10 percent greater than levels at a similar, nearby reference site, a control effort will be implemented. If the target, or other success criteria identified in the WCP, has not been met by the end of the WCP monitoring and implementation period, the Authority will continue the monitoring and control efforts, and remedial actions will be identified and implemented until the success criteria are met.<br>• Provisions to ensure consistency between the WCP and the RRP, including verification that the RRP includes measures to minimize the risk of the spread and/or establishment of invasive species and reflects the same revegetation performance standards as the WCP.<br>• Identification of weed control treatments, including permitted herbicides and manual and mechanical removal methods.<br>• Time frames for weed control treatment for each plant species.<br>• Identification of fire prevention | Pre-construction/ Construction/Post-construction | Prepare plan/reporting | Yearly or as established by regulatory compliance agencies | Authority/ Contractor/ Project Biologist | Authority/ Contractor/ Project Biologist | Prepare and implement WCP minimize and avoid the spread of invasive weeds/report findings | Condition of construction contract/condition of regulatory permits | Impact BIO#1: Project Construction Effects on Habitat for Special-Status Plants and Plant Communities.<br>Impact BIO#2: Project Construction Effects on Special-Status Amphibian Habitat.<br>Impact BIO#3: Project Construction Effects on Special-Status Bird Habitat.<br>Impact BIO#4: Project Construction Effects on Special-Status Fish Habitat.<br>Impact BIO#5: Project Construction Effects on Special-Status Invertebrate Habitat.<br>Impact BIO#6: Project Construction Effects on Special-Status Mammal Habitat.<br>Impact BIO#7: Project Construction Effects on Special-Status Reptile Habitat.<br>Impact BIO#8: Project Construction Effects on State and Federally Jurisdictional Aquatic Resources.<br>Impact BIO#9: Project Construction Effects on Fish and Wildlife Resources Protected by Fish and Game Code Section 1600 et seq.<br>Impact BIO#12: Project Construction Effects on Protected<br>Impact BIO#14: Project Operation Effects on Habitat for Special-Status Species Individuals and Communities. |

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| | | measures.<br>• Require use of the appropriate chemical formulations for vegetation management. Glyphosate Roundup will only be used in the uplands and outside of watercourses and riparian areas. Glyphosate Rodeo will be used for aquatic weed control.<br>Use of herbicides shall consider occupied monarch butterfly habitat, with special consideration of occupied host plants (e.g., milkweed) consistent with provisions set forth in the Annual Vegetation Control Plan and RRP. | | | | | | | | |
| BIO-MM#56 | Conduct Monitoring of Construction Activities | During any initial ground-disturbing activity, the Project Biologist will be present in the work area to verify compliance with avoidance and minimization measures, to establish ESAs, and install wildlife exclusion fencing and construction exclusionary fencing. Following completion of initial ground-disturbing activities, the Project Biologist will visit the project construction site(s) once per week or once every 2 weeks, depending on the Project Biologist's assessment of the level of disturbance, to verify compliance with mitigation measures. | Construction | Monitoring/ Reporting | Weekly or as established by regulatory compliance agencies | Authority/ Contractor/ Project Biologist | Authority/ Contractor/ Project Biologist | Project biologist will be present in work area to verify compliance with avoidance and minimization measures | Condition of construction contract/condition of regulatory permits | Impact BIO#1: Project Construction Effects on Habitat for Special-Status Plants and Plant Communities<br>Impact BIO#2: Project Construction Effects on Special-Status Amphibian Habitat.<br>Impact BIO#3: Project Construction Effects on Special-Status Bird Habitat.<br>Impact BIO#4: Project Construction Effects on Special-Status Fish Habitat.<br>Impact BIO#5: Project Construction Effects on Special-Status Invertebrate Habitat.<br>Impact BIO#6: Project Construction Effects on Special-Status Mammal Habitat.<br>Impact BIO#7: Project Construction Effects on Special-Status Reptile Habitat.<br>Impact BIO#8: Project Construction Effects on State and Federally Jurisdictional Aquatic Resources.<br>Impact BIO#9: Project Construction Effects on Fish and Wildlife Resources Protected by Fish and Game Code Section 1600 et seq.<br>Impact BIO#12: Project Construction Effects on Protected Trees. |
| BIO-MM#58 | Establish Environmentally Sensitive Areas and Nondisturbance Zones | Prior to any ground-disturbing activity in a work area, the Project Biologist will use flagging to mark ESAs that support special-status species or aquatic resources and are subject to seasonal restrictions or other avoidance and minimization measures. The Project Biologist will also direct the installation of wildlife exclusion fencing to prevent special-status wildlife species from entering work areas. The wildlife exclusion fencing will have exit doors to allow animals that may be inside an enclosed area to leave the area. The Project Biologist will also direct the installation of construction | Pre-construction/ Construction | Identify and establish ESAs, WEF, and construction exclusionary fencing/ | Weekly or as established by regulatory compliance agencies | Authority/ Contractor/ Project Biologist | Authority/ Contractor/ Project Biologist | Demarcate ESAs and no-work areas | Condition of construction contract/condition of regulatory permits | Impact BIO#1: Project Construction Effects on Habitat for Special-Status Plants and Plant Communities.<br>Impact BIO#2: Project Construction Effects on Special-Status Amphibian Habitat.<br>Impact BIO#3: Project Construction Effects on Special-Status Bird Habitat.<br>Impact BIO#4: Project Construction Effects on Special-Status Fish Habitat.<br>Impact BIO#5: Project Construction Effects on Special-Status Invertebrate Habitat.<br>Impact BIO#6: Project Construction Effects on Special-Status Mammal Habitat. |

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| | | exclusionary fencing at the boundary of the work area, as appropriate, to avoid and minimize impacts on special-status species or aquatic resources outside of the work area during the construction period. The ESAs, wildlife exclusion fencing, and construction exclusionary fencing will be delineated by the Project Biologist based on the results of habitat mapping or modeling and any preconstruction surveys, and in coordination with the Authority. The ESA, wildlife exclusion fencing, and construction exclusionary fencing will be regularly inspected and maintained by the Project Biologist.<br>The ESA, wildlife exclusion fencing, and construction exclusionary fencing locations will be identified and depicted on an exclusion fencing exhibit. The purpose of the ESAs and wildlife exclusion fencing will be explained at WEAP training and the locations of the ESA and wildlife exclusion fencing areas will be noted during worker tailgate sessions. | | | | | | | | Impact BIO#7: Project Construction Effects on Special-Status Reptile Habitat.<br>Impact BIO#8: Project Construction Effects on State and Federally Jurisdictional Aquatic Resources.<br>Impact BIO#9: Project Construction Effects on Fish and Wildlife Resources Protected by Fish and Game Code Section 1600 et seq.<br>Impact BIO#12: Project Construction Effects on Protected<br>Impact BIO#13: Project Effects on Wildlife Movement Corridors. |
| BIO-MM#60 | Limit Vehicle Traffic and Construction Site Speeds | Prior to any ground-disturbing activities, the Project Biologist will ensure that appropriate measures have been instituted to restrict project vehicle traffic within the construction footprint to established roads, construction areas, and other permissible areas. The Project Biologist will establish vehicle speed limits of no more than 15 miles per hour for unimproved access roads and for temporary and permanent construction areas within the construction footprint. The Project Biologist will also direct that access routes be flagged and marked and that measures be adopted to prevent off-road vehicle traffic. | Pre-construction/ Construction | Monitoring/ Reporting | Weekly or as established by regulatory compliance agencies | Authority/ Contractor/ Project Biologist | Authority/ Contractor/ Project Biologist | Establish and demarcate vehicle access routes and speed limits/report findings | Condition of construction contract/condition of regulatory permits | Impact BIO#2: Project Construction Effects on Special-Status Amphibian Habitat.<br>Impact BIO#3: Project Construction Effects on Special-Status Bird Habitat.<br>Impact BIO#5: Project Construction Effects on Special-Status Invertebrate Habitat.<br>Impact BIO#6: Project Construction Effects on Special-Status Mammal Habitat.<br>Impact BIO#7: Project Construction Effects on Special-Status Reptile Habitat.<br>Impact BIO#13: Project Effects on Wildlife Movement Corridors. |
| BIO-MM#61 | Establish and Implement a Compliance Reporting Program | The Project Biologist will prepare monthly and annual reports documenting compliance with all IAMFs, mitigation measures, and requirements set forth in regulatory agency authorizations. The Authority will review and approve all compliance reports prior to submittal to the regulatory agencies. Reports will be prepared in compliance with the content requirements outlined in the regulatory agency authorizations.<br>Pre-activity survey reports will be submitted within 15 days of completing the surveys and will include:<br>• Location(s) of where pre-activity | Pre-construction/ Construction | Monitoring/ Reporting | Monthly and annually | Authority/ Contractor/ Project Biologist | Authority/ Contractor/ Project Biologist | Establish and implement compliance reporting program/report findings | Condition of construction contract/condition of regulatory permits | Impact BIO#1: Project Construction Effects on Habitat for Special-Status Plants and Plant Communities.<br>Impact BIO#2: Project Construction Effects on Special-Status Amphibian Habitat.<br>Impact BIO#3: Project Construction Effects on Special-Status Bird Habitat.<br>Impact BIO#4: Project Construction Effects on Special-Status Fish Habitat.<br>Impact BIO#5: Project Construction Effects on Special-Status Invertebrate Habitat.<br>Impact BIO#6: Project Construction |

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| | | surveys were completed, including latitude and longitude, Assessor Parcel Number, and HSR parcel number<br>• Written description of the surveyed area. A figure of each surveyed location will be provided that depicts the surveyed area and survey buffers over an aerial image<br>• Date, time, and weather conditions observed at each location<br>• Personnel who conducted the pre-activity surveys<br>• Verification of the accuracy of the Authority's habitat mapping at each location, provided in writing and on a figure<br>• Observations made during the survey, including the type and locations (written and GIS) of any sensitive resources detected<br>• Identification of relevant measures from the BRMP to be implemented as a result of the survey observations<br>Daily Compliance Reports will be submitted to the Authority via Environmental Mitigation Management and Assessment or similar submittal method within 24 hours of each monitoring day. Noncompliance events will be reported to the Authority the day of the occurrence. Daily Compliance Reports will include:<br>• Date, time, and weather conditions observed at each location where monitoring occurred<br>• Personnel who conducted compliance monitoring<br>• Project activities monitored, including construction equipment in use<br>• Compliance conditions implemented successfully<br>• Noncompliance events observed<br>Daily compliance reports will also be included in the Monthly Compliance Reports, which will be submitted to the Authority by the tenth of each month and will include:<br>• Summary of construction activities and locations during the reporting month, including any noncompliance events and their resolution, work stoppages, and take of threatened or endangered | | | | | | | | Effects on Special-Status Mammal Habitat.<br>Impact BIO#7: Project Construction Effects on Special-Status Reptile Habitat. |

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| | | species.<br>• Summary of anticipated project activities and work areas for the upcoming month.<br>• Tracking of impacts on suitable habitats for each threatened and endangered species identified in USFWS and CDFW authorizations, including:<br>  ○ An accounting of the number of acres of habitats for which the Authority provides compensatory mitigation that has been disturbed during the reporting month.<br>  ○ An accounting of the cumulative total number of acres of threatened and endangered species habitat that has been disturbed during the project period.<br>• Up-to-date GIS layers, associated metadata, and photo documentation used to track acreages disturbed.<br>• Copies of all pre-activity survey reports, daily compliance reports, and noncompliance/work stoppage reports for the reporting month.<br>Annual Reports will be submitted to the Authority by the January 20 and will include:<br>• Summary of all Monthly Compliance Reports for the reporting year.<br>• A general description of the status of the Palmdale to Burbank Project Section, including projected completion dates.<br>• All available information about project-related incidental take of threatened and endangered species.<br>• Information about other project impacts on the threatened and endangered species.<br>• A summary of findings from preconstruction surveys (e.g., number of times a threatened or endangered species or a den, burrow, or nest was encountered; location; whether avoidance was achieved; if not, what other measures were implemented).<br>• Written description of disturbances to threatened and endangered species habitat within work areas, both for the preceding 12 months and in total since issuance of regulatory authorizations by USFWS and CDFW, and updated maps of all land disturbances and updated maps of identified habitat features suitable for threatened and endangered species within | | | | | | | | |

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| | | the RSA.<br>In addition to the compliance reporting requirements outlined above, the following items will be provided for compliance documentation purposes:<br>• If agency personnel visit the construction footprint in accordance with BIO-IAMF#2, the Project Biologist will prepare a memorandum within1 day of the visit that memorializes the issues raised during the field meeting. This memorandum will be submitted to the Authority via Environmental Mitigation Management and Assessment. Any issues regarding regulatory compliance raised by agency personnel will be reported to the Authority and the contractor.<br>• Compliance reporting will be submitted to the Authority via Environmental Mitigation Management and Assessment in accordance with the report schedule. The Project Biologist will prepare and submit compliance reports that document the following:<br>○ Implementation and performance of the RRP described in BIO-MM#6<br>○ Summary of progress made regarding the implementation of the WCP described in BIO-MM#55<br>○ Compliance with work window restrictions described in BIO-IAMF#10<br>○ Compliance with BIO-MM#58: Establish Environmentally Sensitive Areas and Nondisturbance Zones and Install Wildlife Exclusion Fencing<br>○ Compliance with BIO-IAMF#6: Establish Monofilament Restrictions<br>○ Compliance with BIO-IAMF#7: Prevent Entrapment in Construction Materials and Excavations<br>○ Compliance with BIO-IAMF#8: Delineate Equipment Staging Areas<br>○ Compliance with BIO-IAMF#10: Clean Construction Equipment<br>○ Compliance with BIO-MM#60: Limit Vehicle Traffic and Construction Site Speed<br>○ Compliance with BIO-IAMF#12: Design the Project to be Bird Safe<br>○ Compliance with BIO-IAMF#9: | | | | | | | | |

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| | | Dispose of Construction Spoils and Waste<br>○ BMP field manual implementation and any recommended changes to construction site housekeeping practices outlined in BIO-IAMF#11: Maintain Construction Sites<br>• Work stoppages and measures taken under BIO-MM#63: Work Stoppage will be documented in a memorandum prepared by the Project Biologist and submitted to the Authority within 2 business days of the work stoppage. | | | | | | | | |
| BIO-MM#62 | Prepare Plan for Dewatering and Water Diversions | Prior to initiating any construction activity that occurs within open or flowing water, the Authority will prepare a dewatering plan, which will be subject to review and approval by the applicable regulatory agencies. The plan will incorporate measures to minimize turbidity and siltation. The Project Biologist will monitor the dewatering and/or water diversion sites, including collection of water quality data, as applicable. Prior to the dewatering or diverting of water from a site, the Project Biologist shall conduct pre-activity surveys to determine the presence or absence of special-status species within the affected waterbody. In the event that special-status species are detected during pre-activity surveys, the Project Biologist will relocate the species (unless the species is fully protected under state law), consistent with any regulatory authorizations applicable to the species.<br>A Fish Salvage and Relocation Plan shall be prepared as part of the project dewatering plan and will be submitted to CDFW and USFWS for review and approval. Fish species will be excluded from dewatering areas using 1/8-inch block nets, or other physical barriers. Any fish found within the project work area after block nets have been installed will be salvaged and relocated to an area outside the work area and out of harm's way, such as upstream to reduce the chance of re-netting or to another water body, depending on species and location, consistent with regulatory requirements. Salvage and relocation methods will be outlined in the Fish Salvage and Relocation Plan and will be performed using commonly approved and safe methods, such as daily net monitoring with all trapped fish relocated | Pre-construction/ Construction | Design/Final design/Monitoring/ Reporting | Weekly or as established by regulatory compliance agencies | Authority/ Contractor/ Project Biologist | Authority/ Contractor/ Project Biologist | Prepare and implement dewatering and waste diversion plan/report findings | Condition of construction contract/condition of regulatory permits | Impact BIO#2: Project Construction Effects on Special-Status Amphibian Habitat.<br>Impact BIO#4: Project Construction Effects on Special-Status Fish Habitat.<br>Impact BIO#6: Project Construction Effects on Special-Status Mammal Habitat.<br>Impact BIO#7: Project Construction Effects on Special-Status Reptile Habitat.<br>Impact BIO#8: Project Construction Effects on State and Federally Jurisdictional Aquatic Resources.<br>Impact BIO#9: Project Construction Effects on Fish and Wildlife Resources Protected by Fish and Game Code Section 1600 et seq. |

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| | | upstream or to other water bodies to reduce re-trapping. If relocation is required, fish will be relocated using transport tanks with oxygen delivery designed to reduce stress. The Authority shall continue to consult with resource agencies during final design and construction of the project to ensure an approved approach to fish salvage and relocation. | | | | | | | | |
| BIO-MM#63 | Work Stoppage | In the event that any special-status wildlife species is found in a work area, the Project Biologist will have the authority to halt work to prevent death or injury of the species. Any such work stoppage will be limited to the area necessary to protect the species. Work may be resumed once the Project Biologist determines that the individuals of the species have moved out of harm's way, or the Project Biologist has relocated them out of the work area (relocation not applicable to fully protected species).<br>Any such work stoppages and the measures taken to facilitate the removal of the species, if any, will be documented in a memorandum prepared by the Project Biologist and submitted to the Authority within 2 business days of the work stoppage. | Construction | Monitoring/ Reporting | Weekly or as established by regulatory compliance agencies | Authority/ Contractor/ Project Biologist | Authority/ Contractor/ Project Biologist | Halt work to relocate special- status wildlife species (if possible)/report findings | Condition of construction contract/condition of regulatory permits | Impact BIO#2: Project Construction Effects on Special-Status Amphibian Habitat.<br>Impact BIO#3: Project Construction Effects on Special-Status Bird Habitat.<br>Impact BIO#4: Project Construction Effects on Special-Status Fish Habitat.<br><br>Impact BIO#5: Project Construction Effects on Special-Status Invertebrate Habitat.<br>Impact BIO#6: Project Construction Effects on Special-Status Mammal Habitat.<br>Impact BIO#7: Project Construction Effects on Special-Status Reptile Habitat. |
| BIO-MM#64 | Establish Wildlife Crossings | The Authority will create two dedicated wildlife crossings across the alignment to accommodate wildlife movement under permanently fenced infrastructure at the following locations. One dedicated wildlife crossing will be constructed south of the California Aqueduct and the other will be constructed east of Una Lake. Approximate locations are noted below in this measure. Prior to final construction design, the Project Biologist shall confirm appropriate placement and dimensions of wildlife crossings.<br>• SR14A Build Alternative<br>• Near East Barrel Springs Road (east of Una Lake)<br>• South of the Soledad Siphon (south of the California Aqueduct)<br>• E1A Build Alternative<br>• Near East Barrel Springs Road (east of Una Lake)<br>• E1 Build Alternative<br>• At milepost 5.5, south of the California Aqueduct | Pre-construction/ Construction | Design/final design/monitoring/reporting | Prior to construction | Authority/ Contractor/ Project Biologist | Authority/ Contractor/ Project Biologist | Establish wildlife crossings/report findings | Condition of construction contract/condition of regulatory permits | Impact BIO#13: Project Effects on Wildlife Movement Corridors. |

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| | | • E2A Build Alternative<br>• Near East Barrel Springs Road (east of Una Lake)<br>• South of the Soledad Siphon (south of the California Aqueduct)<br>• E2 Build Alternative<br>• At milepost 5.5, south of the California Aqueduct<br>For terrestrial wildlife, crossings will conform to the minimum spacing and dimensions discussed in the Palmdale to Burbank Project Section: Wildlife Corridor Assessment Report (Authority 2019c) unless different dimensions are specified in authorizations issued under FESA or CESA. All wildlife crossings would include the following features: native earthen bottom, unobstructed entrances, and openness factor of at least 0.41 and line-of-sight.<br>To the extent feasible, all wildlife crossings created specifically for terrestrial species will include the following features and design considerations:<br>• Ledges or tunnels incorporated into the design to facilitate safe passage of small mammals.<br>• Year-round absence of water for a portion of the width of the crossing (i.e., no flowing water).<br>• Slight grade at approaches to prevent flooding.<br>• Limited open space between crossing and cover/habitat.<br>• Separation from human use areas (e.g., trails, multi-use undercrossings).<br>• Avoidance of artificial light at approaches to wildlife crossings.<br>• Undercrossings intended to be used by large mammals (i.e., mule deer) within the mule deer species range will have a 10-foot-tall concrete arch to accommodate the mammals' larger stature.<br>• Any culvert intended to function as an undercrossing for carnivores and small animals will be no smaller than a 6-foot-wide arch culvert for lengths up to 200 feet, or an 8-foot-wide arch culvert for lengths up to 300 feet. The substrate will be natural soil of the | | | | | | | | |

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| | | surrounding area, and the grade would not exceed 2 percent. Culverts longer than 200 feet will not be considered wildlife crossing structures. If any portion of the bottom of the wildlife undercrossing is likely to be inundated longer than 24 hours at least once per year, the structure would have a dry ledge. Ledges or tunnels and cover features to prevent predation will also be incorporated into the design to facilitate safe passage of small wildlife. The structure will be straight enough that a mammal entering the culvert can see the other end of the culvert.<br>• Slope within the crossing structure will be consistent with the natural (preconstruction) grade (optimally less than 2 percent). Slopes that follow natural grades greater than 2 percent are acceptable in bridged undercrossings (viaducts).<br>In addition, the Authority will incorporate features to accommodate wildlife movement into the design of bridges and culverts that are replaced or modified as part of project construction, wherever feasible. The Project Biologist review of final construction design for consistency with placement and dimensions of wildlife crossings will be verified in a memorandum provided to the Authority.<br>Such features will include the Authority's commitment to build noise barriers to enhance the effectiveness of wildlife crossings and minimize the risk of mammals' exposure to HSR train noise. Structures will also be designed to be integrated into the visual environment. The structures will be constructed to be completed before HSR train operations begin. [If accurate noise measurements cannot be obtained before train operations, construction of the structures will be commenced no later than 3 years after the start of HSR train operations, after consideration of analysis from adaptive monitoring and management.]<br>The noise/visual barriers will be sited to minimize the risk of deterrence on dedicated wildlife crossings important to wildlife.<br>The extent that noise barriers will extend beyond the wildlife crossing junction shall | | | | | | | | |

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| | | be determined by noise measurement analysis undertaken during the design phase of the wildlife crossings or during the adaptive monitoring and management phase. Barriers shall extend to a distance such that train noise measurements at the wildlife crossings do not exceed 90 dBA. If, at the time of noise measurement, existing or adjacent noise unrelated to HSR trains already exceed 90 dBA, then the Authority may consider these factors in determining the effectiveness of constructing barriers. Length-of-barrier specifications are intended to ensure that the barrier creates a zone of minimized noise, extending several hundred feet from the alignment, that will serve as an attraction cue for animals using sound to locate the crossing locations. (Refer to 2021 Supplemental Noise Analysis on Terrestrial Wildlife Species for the San Jose to Merced Project Section, citing Manci, K. M., D. N. Gladwin, R. Villella, and M. G. Cavendish. 1988. Effects of Aircraft Noise and Sonic Booms on Domestic Animals and Wildlife: A Literature Synthesis. U.S. Fish and Wildlife Service National Ecology Research Center, Fort Collins, CO.). The Authority will consult with CDFW, USFWS, the owner(s) of private properties where noise/visual barriers will be placed, and appropriate local wildlife movement stakeholders as part of final design of noise barriers.<br>Finally, to ensure the effectiveness of the wildlife crossing structures and complementary noise attenuation features, the Authority will monitor and adaptively manage the dedicated wildlife crossings. Monitoring will entail using camera stations or other remote-sensing equipment to document use and passage rates. Monitoring will start no less than 2 years following construction (to allow time for habituation), and total monitoring will not exceed 5 years following construction. Adaptive management may include modifications to design features, such as installation of sound barriers and changes to cover and substrate; use of new technologies to attract animals to the crossing, or other measures that may be determined to be feasible in the future. | | | | | | | |
| BIO-MM#65 | Conduct Preconstruction Surveys and | At least1 year prior to the start of any ground-disturbing activities and construction, the Project Biologist shall | Pre-construction/ Construction | Surveying/monitoring/reporting | Prior to ground-disturbing activities or as established | Authority/ Contractor/ Project Biologist | Authority/ Contractor/ Project Biologist | Pre-construction nesting surveys for eagles/report | Condition of construction contract/condition | Impact BIO#3: Project Construction Effects on Special-Status Bird Habitat. |

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| | Monitoring for Bald and Golden Eagles | conduct nesting season surveys for eagles. Surveys for bald and golden eagle nests will be conducted within 4 miles of any construction areas supporting suitable nesting habitat and important eagle roost sites and foraging areas. Surveys will be conducted in accordance with the USFWS Interim Golden Eagle Inventory and Monitoring Protocols (USFWS 2010), and CDFW's Bald Eagle Breeding Survey Instructions (CDFW 2017b), or current guidance. A nesting territory or inventoried habitat will be considered unoccupied by golden eagles only after completing at least two full surveys in a single breeding season. Prior to initial construction activities, the Project Biologist shall conduct a preconstruction sweep of the Palmdale to Burbank Project Section site for golden eagle use. | | | by regulatory compliance agencies | | | findings | of regulatory permits | |
| BIO-MM#66 | Implement Avoidance Measures for Active Eagle Nests | Prior to the start of any ground-disturbing activity, if an occupied nest is detected within 4 miles of the work areas, the Authority shall implement a 1-mile line-of-sight and 0.5-mile no-line-of-sight exclusion zone (i.e., no-work buffer) and a vertical exclusion zone of no less than 0.5 mile during the breeding season (January 1 through August 31) to ensure that construction activities do not result in injury or disturbance to eagles.<br>Construction activities will not be permitted within the no-work buffer. The no-work buffer will be maintained and nests will be monitored throughout the breeding season or until the young have fledged and are no longer dependent on the nest or parental care that includes nest use for survival.<br>Factors to be considered for determining buffer size will include: the presence of natural buffers provided by vegetation or topography, nest height, locations of foraging territory, and baseline levels of noise and human activity.<br>Eagle nest no-work buffers may be reduced or removed if monitoring reveals the nest to be inactive as determined by the Project Biologist. An inactive eagle nest is1 that is "no longer being used by eagles, as determined by the continuing absence of any adult, egg, or dependent young at the nest for at least 10 consecutive days prior to, and including, the present" (USFWS 2016). Monitoring to demonstrate inactivity | Pre-construction/ Construction | Surveying/ Monitoring/ Reporting | Weekly or as established by regulatory compliance agencies | Authority/ Contractor/ Project Biologist | Authority/ Contractor/ Project Biologist | Implement and maintain no line of-sight no-work buffer during the breeding season/report findings | Condition of construction contract/condition of regulatory permits | Impact BIO#3: Project Construction Effects on Special-Status Bird Habitat. |

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| | | of eagle nests will follow observational procedures described by Pagel et al. (2010).<br>In bald and golden eagle nesting territories, the Project Biologist will examine debris piles and determine whether there is a potential to attract prey species. If the Project Biologist determines that debris piles may attract prey species and pose a danger to eagles, the debris piles will be removed. This mitigation measure is anticipated to be effective because it would restrict construction activities in areas within 0.5 mile of active golden eagle nests and provides specific measures for keeping the work area free of materials that would attract or harm the golden eagle. Implementation of this measure would not trigger secondary environmental impacts because it would not change the scope, scale, or location of construction activities beyond those described in the Final EIR/EIS. | | | | | | | | |
| BIO-MM#67 | Provide Compensatory Mitigation for Loss of Eagle Nests | If preconstruction surveys identify active eagle nests in the permanent impact area, the Authority, in consultation with USFWS and CDFW, shall develop a plan to minimize nest impacts, or for relocation or replacement plan for the affected nest(s), as permitted. The plan will describe if there is no practicable alternative to avoid impacts to nests, how impacts will be minimized, and/or why nest removal will be required in order to enable project construction. Any impact minimization measures, or relocation or replacement of eagle nests will be in accordance with the Bald and Golden Eagle Protection Act (BGEPA) and CFGC, and will be subject to the following minimum requirements:<br>• Impacts to active golden eagle nests will be avoided.<br>• Active bald eagle nests and/or inactive golden eagle nests will be relocated, or a suitable nest will be provided, within the same territory as a viable nesting option for the affected eagle pair.<br>• Post-construction monitoring to confirm continued nesting within the affected nesting territory will occur for a minimum of 3 years.<br>• In the event relocated eagles fail to resume nesting or establish a new nest away from the impact area, adaptive compensatory mitigation mechanisms | Pre-construction/ Construction/Post-construction | Design/final design/surveying/monitoring/compensatory mitigation/reporting | Weekly or as established by regulatory compliance agencies | Authority/ Contractor/ Project Biologist | Authority/ Contractor/ Project Biologist | Compensatory mitigation that replaces eagle nests/report findings | Condition of construction contract/condition of regulatory permits | Impact BIO#3: Project Construction Effects on Special-Status Bird Habitat. |

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| | | outlined in the permit obtained from USFWS for nest relocation will be implemented. Adaptive compensatory mitigation mechanisms may include conservation banking, in-lieu fees, and other third-party mitigation projects or arrangements in the event of unsuccessful nest relocation. | | | | | | | | |
| BIO-MM#68 | Avoid Impacts on White-tailed Kite | If construction activities are scheduled to occur between February 1 and August 31, the Project Biologist shall conduct surveys for white-tailed kite. Surveys will cover a minimum of a 0.5-mile radius around the construction area. If nesting white-tailed kites are detected, the Project Biologist will establish a 0.25-mile no-work buffer unless the Project Biologist determines that smaller buffers would be sufficient to avoid impacts. Buffers will be maintained until the Project Biologist has determined that the young have fledged and are no longer reliant on the nest or parental care that includes nest use for survival. Should a no-work buffer reduction be needed, it will be implemented only when in coordination with CDFW. | Pre-construction/ Construction | Surveying/ Monitoring | Weekly or as established by regulatory compliance agencies | Authority/ Contractor/ Project Biologist | Authority/ Contractor/ Project Biologist | Pre-construction surveys for white-tailed kite/establish no-disturbance buffer/report findings | Condition of construction contract/condition of regulatory permits | Impact BIO#3: Project Construction Effects on Special-Status Bird Habitat. |
| BIO-MM#69 | Conduct Surveys and Implement Avoidance Measures for Active Tricolored Blackbird Nest Colonies | Prior to initiation of construction at any location within 300 feet of suitable nesting habitat, the Project Biologist with experience surveying for and observing tricolored blackbird will conduct preconstruction surveys to establish use of nesting habitat by tricolored blackbird colonies, where access allows, during the nesting season (March 15 through July 31).<br>If construction is initiated near suitable habitat during the nesting season, three surveys will be conducted within 15 days prior to construction, with1 of the surveys within 5 days prior to the start of construction. If active tricolored blackbird nesting colonies are identified, construction activities will be avoided within 300 feet of the nesting colonies during the breeding season (March 15 through July 31) to the extent practicable and consistent with the CDFW's Staff Guidance Regarding Avoidance of Impacts on Tricolored Blackbird Breeding Colonies on Agricultural Fields (2015).<br>The 300-foot minimum no-work buffer shall remain in place until the breeding season has ended or until a qualified biologist has determined that nesting has ceased, the birds have fledged, and are no longer | Pre-construction/ Construction | Surveying/ Monitoring/ | Weekly or as established by regulatory compliance agencies | Authority/ Contractor/ Project Biologist | Authority/ Contractor/ Project Biologist | Pre-construction surveys for white-tailed kite/establish no-disturbance buffer/report findings | Condition of construction contract/condition of regulatory permits | Impact BIO#3: Project Construction Effects on Special-Status Bird Habitat. |

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| | | reliant on the colony or parental care for survival. The Project Biologist shall reassess the nesting colony on a reoccurring basis to determine the extent of the breeding colony within 10 days of project initiation. The Project Biologist shall immediately modify the 300-foot no-work buffer to capture the entire colony if the extent increases.<br>In the event that a tricolored blackbird or nesting colony is detected during surveys, the Authority shall consult with CDFW to discuss how to implement the project and avoid take, or if avoidance is not feasible, to acquire an ITP, pursuant to CFGC section 2081(b), prior to any ground-disturbing activities. | | | | | | | | |
| BIO-MM#70 | Provide Compensatory Mitigation for Impacts on Tricolored Blackbird Habitat | The Authority will provide compensatory mitigation to offset impacts on tricolored blackbird habitat. Compensatory mitigation will replace permanent loss of habitat with habitat that is commensurate with the type (nesting, roosting, and foraging) and amount of habitat lost. Suitable tricolored blackbird nesting habitat will be permanently protected or restored and managed at a ratio of 3:1 (protected or restored: affected) at a location subject to CDFW approval, and in close proximity to the nearest breeding colony observed within the past 15 years, if possible. Suitable breeding season foraging habitat will be protected and managed at a ratio of 1:1 (protected: affected) at a location subject to CDFW approval. Suitable roosting habitat will be protected or restored at a ratio of 1:1 (protected: affected) if not occupied, and a ratio of 2:1 (protected: affected) if occupied by tricolored blackbirds. Compensatory mitigation will be provided using1 or more of the methods described in the CMP. | Pre-construction/ Construction/Post-construction | Design/ Compensatory mitigation/Reporting | Weekly or as established by regulatory compliance agencies | Authority/ Contractor/ Project Biologist | Authority/ Contractor/ Project Biologist | Mitigate permanent tricolored blackbird habitat impacts through compensatory mitigation/report findings | Condition of construction contract/condition of regulatory permits | Impact BIO#3: Project Construction Effects on Special-Status Bird Habitat. |
| BIO-MM#71 | Implement California Condor Avoidance Measures During Helicopter Use | Prior to construction-related uses of helicopters, the Project Biologist will coordinate with USFWS and/or CDFW to establish that no California condors are present in the area. If California condors are observed in the area where helicopters will operate, including the helicopter's flight pattern from its origination, during construction use, and the return flight, helicopter use will not be permitted until the Project Biologist has determined that the California condors have left the area. This mitigation measure is anticipated to be | Pre-construction/ Construction | Monitoring/ Reporting | Prior to construction-related uses of helicopters | Authority/ Contractor/ Project Biologist | Authority/ Contractor/ Project Biologist | Coordinate with USFWS prior to construction-related uses of helicopters/ensure no California condor in helicopter use area/report findings | Condition of construction contract/condition of regulatory permits | Impact BIO#3: Project Construction Effects on Special-Status Bird Habitat. |

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| | | effective because it would restrict construction-related helicopter use wherever California condors are present; condor presence is easily detected by observation and routine electronic tracking. Implementation of this measure would not trigger secondary environmental impacts because it would not change the scope, scale, or location of construction activities beyond those that have been described in the Final EIR/EIS. | | | | | | | | |
| BIO-MM#72 | Implement Avoidance of Nighttime Light Disturbance for California Condor | Nighttime light disturbance will be minimized in and adjacent to suitable habitat where California condor may be present. In the event that nighttime lighting is required, it will be focused, shielded, and directed away from adjacent suitable habitat including nighttime roost areas. During nighttime construction, the Project Biologist will be on site to determine whether the lighting poses a risk or otherwise disturbs or harms condors. In the event the Project Biologist observes disturbance to condor during nighttime work, the lighting shall be reduced, or additional shielding shall be provided until no further disturbance to condor is observed. If reduced lighting or additional shielding does not alleviate disturbance to condor, lighting shall be shut off and nighttime work shall be discontinued until condor are no longer present.<br>This mitigation measure is anticipated to be effective because it would require focused, shielded, and directed nighttime light to avoid disturbances to roosting California condors and requires a Project Biologist be on site during nighttime construction. Implementation of this measure would not trigger secondary environmental impacts because it would not change the scope, scale, or location of construction activities beyond those that have been described in the Final EIR/EIS. | Construction | Monitoring/ Reporting | Weekly or as established by regulatory compliance agencies | Authority/ Contractor/ Project Biologist | Authority/ Contractor/ Project Biologist | Nighttime lighting shall be focused, shielded, and directed away from adjacent suitable California condor habitat/report findings | Condition of construction contract/condition of regulatory permits | Impact BIO#3: Project Construction Effects on Special-Status Bird Habitat. |
| BIO-MM#73 | Implement Removal of Carrion that may Attract Condors and Eagles | During operation and within California condor foraging areas, automated security monitoring and track inspections will be used to detect fence failures and any presence of carrion within the right-of-way that could be an attractant to condors and eagles. Dead and injured wildlife found in the right-of-way will be removed during construction and during operations when the train is not in operation. The automated security monitoring will occur on a continuous basis and the manual track | Operation | Monitoring/ Reporting | As needed or as established by regulatory compliance agencies | Authority/ Contractor/ Project Biologist | Authority/ Contractor/ Project Biologist | Automated security monitoring/remove carrion from right-of-way/report findings | Condition of construction contract/condition of regulatory permits | Impact BIO#14: Project Operation Effects on Habitat for Special-Status Species Individuals and Communities. |

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| | | inspections and carrion removal will occur monthly or more frequently based on automated security alerts and observation reports from HSR operations and maintenance workers (BIO-IAMF#4). | | | | | | | | |
| BIO-MM#74 | Implement Bird Nest and Avian Special-Status Species Avoidance Measures for Helicopter-Based Construction Activities | For construction activities involving the use of a helicopter, the buffer for nesting birds will be 200 feet horizontal and 150 feet vertical. Buffers will be measured from the location of the nest. If a nest is located on a tower or a tree, the vertical buffer begins from the nest location. For raptors that are not state or federal special-status raptors the default buffer is 300 feet. | Pre-construction/ Construction | Monitoring/ Reporting | Prior to completion of construction activities | Authority/ Contractor/ Project Biologist | Authority/ Contractor/ Project Biologist | Maintain helicopter buffer for nesting birds/report findings | Condition of construction contract/condition of regulatory permits | Impact BIO#3: Project Construction Effects on Special-Status Bird Habitat. |
| BIO-MM#76 | Implement Wildlife Rescue Measures | During construction, maintenance, and operation if an injured or trapped wildlife species, including but not limited to birds and raptors, is observed, the Project Biologist shall be notified immediately to determine whether it is appropriate to release or take the wildlife species to the nearest CDFW permitted rehabilitation center. The Project Biologist will follow all relevant guidelines for federal and state-listed species. If an injured or trapped bird is incidentally observed during maintenance or construction, personnel will notify the Project Biologist immediately to determine whether it is appropriate to release or take the bird to the nearest CDFW permitted rehabilitation center. | Construction/Post-construction /Operation | Monitoring/ Reporting | Weekly or as established by regulatory compliance agencies | Authority/ Contractor/ Project Biologist | Authority/ Contractor/ Project Biologist | Notify CDFW of injured or trapped wildlife species/report findings | Condition of construction contract/condition of regulatory permits | Impact BIO#2: Project Construction Effects on Special-Status Amphibian Habitat.<br>Impact BIO#3: Project Construction Effects on Special-Status Bird Habitat.<br>Impact BIO#4: Project Construction Effects on Special-Status Fish Habitat.<br>Impact BIO#6: Project Construction Effects on Special-Status Mammal Habitat.<br>Impact BIO#7: Project Construction Effects on Special-Status Reptile Habitat.<br>Impact BIO#14: Project Operation Effects on Habitat for Special-Status Species Individuals and Communities. |
| BIO-MM#77 | Implement Wildlife Height Requirements for Enhanced Security Fencing | Prior to final construction design the Project Biologist shall review the fencing plans to confirm that security fencing design will prevent access into the right-of-way and tracks by mountain lion. Security fencing height will be increased to a minimum of 10 feet in mountain lion-suitable habitat as identified in the Palmdale to Burbank Project Section: Wildlife Corridor Assessment Report (Authority 2019c) and determined by the Project Biologist. If the fence is placed on a slope, the fence height will be adjusted (increased) to ensure that mountain lion and mule deer cannot jump from an upslope position over the fence; fence height on slopes will be determined by Project Biologist. During the fencing plan review the Project Biologist will evaluate the fence design for the purpose of avoiding harm, injury, entanglement, or entrapment of wildlife species. Prior to operation, the Project Biologist will field inspect the fencing along any portion where increased height was determined to be necessary | Pre-construction/ Construction | Design/Final reporting | Weekly or as established by regulatory compliance agencies | Authority/ Contractor/ Project Biologist | Authority/ Contractor/ Project Biologist | Review and implement fencing plans to prevent access into right-of way and tracks by mountain lion/report findings | Condition of construction contract/condition of regulatory permits | Impact BIO#13: Project Effects on Wildlife Movement Corridors. |

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| | | during the plan review. Fencing plan review and field inspection shall be documented in a memorandum from the Project Biologist and provided to the Authority. | | | | | | | | |
| BIO-MM#78 | Install Wildlife Jump-outs | Prior to final construction design the Project Biologist shall review the fencing plans for placement of wildlife jump-outs. In areas with documented ungulate or other large mammal movement, where terrain or project design (e.g., at-grade crossings) could allow these large animals to enter the ROW, features to reduce access (e.g., taller fencing or wildlife barriers at crossings) or features to allow large animals to escape from the fenced right-of-way (e.g., wildlife jump-outs or escape ramps) will be incorporated into the Palmdale to Burbank Project Section at these locations. Specific locations of these features will be based on the behavior of target species (e.g., mule deer, mountain lion, black bear), adjacent habitat and terrain, and other design constraints as determined by the Project Biologist and Project Engineer. Prior to operation, the Project Biologist will field inspect the fencing for appropriate placement of jump-outs as determined to be necessary during the plan review. Fencing plan review and field inspection shall be documented in a memorandum from the Project Biologist and provided to the Authority. | Pre-construction/ Construction | Design/Final design/Monitoring/ Reporting | Weekly or as established by regulatory compliance agencies | Authority/ Contractor/ Project Biologist | Authority/ Contractor/ Project Biologist | Review the fencing plans for placement of wildlife jump-outs/report findings | Condition of construction contract/condition of regulatory permits | Impact BIO#3: Project Construction Effects on Special-Status Bird Habitat.<br>Impact BIO#13: Project Effects on Wildlife Movement Corridors. |
| BIO-MM#79 | Conduct Surveys for Coastal California Gnatcatcher | To the extent feasible, construction activities that include vegetation removal, earthmoving, or use of heavy construction equipment and that are within 300 feet of suitable coastal California gnatcatcher habitat shall take place between September 1 and February 14, outside of the nesting season. Where construction activities will occur within 300 feet of coastal California gnatcatcher habitat during the nesting season (February 15–August 31), the Project Biologist will conduct protocol surveys to determine whether there are any active coastal California gnatcatcher nests within 300 feet of the Palmdale to Burbank Project Section. The surveys shall be conducted in accordance with the daily timing and weather requirements of the USFWS Coastal California Gnatcatcher (*Polioptila californica californica*) Presence/Absence Survey Guideline (February 1997). From March 15 through June 30, a minimum of six surveys shall be | Pre-construction/ Construction | Monitoring/ Reporting | Weekly or as established by regulatory compliance agencies | Authority/ Contractor/ Project Biologist | Authority/ Contractor/ Project Biologist | Pre-construction surveys for Coastal California Gnatcatcher | Condition of construction contract/condition of regulatory permits | Impact BIO#3: Project Construction Effects on Special-Status Bird Habitat. |

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| | | conducted at least1 week apart. From July 1 through March 14, a minimum of nine surveys shall be conducted at least 2 weeks apart. The biologist will then conduct bi-monthly surveys (every 2 weeks) while construction activities occur within 300 feet of suitable nesting habitat during the nesting season. If a coastal California gnatcatcher nest is discovered within 300 feet of construction activities, construction activities within 300 feet of the nest will be suspended until the Project Biologist determines that the nest is no longer active. If establishment of a 300-foot buffer is not feasible, a reduced buffer could be implemented following coordination with USFWS should existing conditions warrant a reduced buffer. | | | | | | | |
| BIO-MM#80 | Conduct Surveys for Least Bell's Vireo | To the extent feasible, construction activities that include vegetation removal, earthmoving, or use of heavy construction equipment that occur within 300 feet of suitable least Bell's vireo habitat shall occur between September 16 and March 14, outside of the nesting season. Where construction activities will occur within 300 feet of least Bell's vireo habitat during the nesting season (March 15–September 15), the Project Biologist shall conduct protocol surveys to determine whether there are any active least Bell's vireo nests within 300 feet of the Palmdale to Burbank Project Section. The surveys shall be conducted in accordance with the daily timing and weather requirements of the USFWS Least Bell's Vireo Survey Guidelines, January 2001 (USFWS 2001). From April 10 through July 31, a minimum of eight surveys shall be conducted. The biologist will then conduct bi-monthly surveys (every 2 weeks) while construction activities occur within 300 feet of suitable nesting habitat during the nesting season. If a least Bell's vireo nest is discovered within 300 feet of construction activities, suspension of construction activities within 300 feet of the nest will occur until the Project Biologist determines that the nest is no longer active. If establishment of a 300-foot buffer is not feasible, a reduced buffer could be implemented following consultation with USFWS, should existing conditions warrant a reduced buffer. | Pre-construction | Monitoring/ Reporting | Weekly or as established by regulatory compliance agencies | Authority/ Contractor/ Project Biologist | Authority/ Contractor/ Project Biologist | Protocol surveys of Least Bell's Vireo habitat/establish, and maintain no-work buffer/report findings | Condition of construction contract/condition of regulatory permits | Impact BIO#3: Project Construction Effects on Special-Status Bird Habitat. |
| BIO-MM#81 | Conduct Surveys for Southwestern Willow | To the extent feasible, construction activities that include vegetation removal, | Pre-construction/ Construction | Monitoring/ Reporting | Weekly or as established by | Authority/ Contractor/ Project | Authority/ Contractor/ Project | Protocol surveys of Southwestern | Condition of construction | Impact BIO#3: Project Construction Effects on Special-Status Bird Habitat. |

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| | Flycatcher | earthmoving, or use of heavy construction equipment that occur within 300 feet of suitable southwestern willow flycatcher habitat shall occur between September 16 and March 14, outside of the nesting season. Where construction activities will occur within 300 feet of southwestern willow flycatcher habitat, during the nesting season (March 15–September 15), the Project Biologist shall conduct protocol surveys to determine whether there are any active southwestern willow flycatcher nests within 300 feet of the Palmdale to Burbank Project Section. The surveys will be conducted in accordance with the daily timing and weather requirements of U.S. Geological Survey's A Natural History Summary and Survey Protocol for the southwestern Willow Flycatcher, 2010: a minimum of1 survey between May 15 and May 31, a minimum of1 survey between June 1 and June 24, a minimum of1 survey between June 24 and July 17, and additional follow-up surveys at sites where territorial southwestern willow flycatchers are verified or suspected. The biologist will then conduct bi-monthly surveys (every 2 weeks) while construction activities occur within 300 feet of suitable nesting habitat during the nesting season. If a southwestern willow flycatcher nest is discovered within 300 feet of construction activities, suspension of construction activities within 300 feet of the nest will occur until the Project Biologist determines that the nest is no longer active. If establishment of a 300-foot buffer is not feasible, a reduced buffer could be implemented following consultation with USFWS, should existing conditions warrant a reduced buffer. | | | regulatory compliance agencies | Biologist | Biologist | Willow Flycatcher habitat/establish, and maintain no-work buffer/report findings | contract/condition of regulatory permits | |
| BIO-MM#82 | Conduct Surveys for Western Yellow-billed Cuckoo | To the extent feasible, construction activities that include vegetation removal, earthmoving, or use of heavy construction equipment that occur within 300 feet of suitable western yellow-billed cuckoo habitat shall occur between September 16 and May 14, outside of the nesting season. Where construction activities will occur within 300 feet of western yellow-billed cuckoo habitat, during the nesting season (May 15–September 15), the Project Biologist shall conduct protocol surveys to determine whether there are any active western yellow-billed cuckoo nests within | Pre-construction/ Construction | Monitoring/ Reporting | Weekly or as established by regulatory compliance agencies | Authority/ Contractor/ Project Biologist | Authority/ Contractor/ Project Biologist | Protocol surveys of Western Yellow-billed Cuckoo habitat/establish, and maintain no-work buffer/report findings | Condition of construction contract/condition of regulatory permits | Impact BIO#3: Project Construction Effects on Special-Status Bird Habitat. |

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| | | 300 feet of the Palmdale to Burbank Project Section. The surveys would be conducted in accordance with the daily timing and weather requirements of A Natural History Summary and Survey Protocol for the Western Distinct Population Segment of the Yellow-billed Cuckoo (USFWS 2016): a minimum of1 survey from June 15 to July 1 and from July 1 to July 31, and a minimum of two surveys from July 31 to August 15. A minimum of 12 days and a maximum of 15 days between surveys are required. The biologist would then conduct bi-monthly surveys (every 2 weeks) while construction activities occur within 300 feet of suitable nesting habitat during the nesting season. If a western yellow-billed cuckoo nest is discovered within 300 feet of construction activities, suspension of construction activities within 300 feet of the nest would occur until the Project Biologist determines that the nest is no longer active. A reduced buffer could be implemented following consultation with USFWS and CDFW, should existing conditions warrant a reduced buffer. | | | | | | | | |
| BIO-MM#83 | Measures Intended to Reduce, Avoid, and Minimize Effects on Animal Movement | The Authority recognizes the following measures to minimize rail-kill and facilitate animal movement across rail lines:<br>• Fencing and berms will be used to direct animals toward crossing structures and should avoid blocking entrances to crossing structures. Fencing under viaducts or above tunnel areas should be avoided. Additional evaluation will be required if fencing is required that would restrict wildlife movement under viaducts, above tunnels, or at wildlife crossings to determine appropriate mitigation measures.<br>• Fencing alongside at-grade sections will be designed to exclude wildlife from accessing the rail line, including species that could jump over a fence, such as mountain lion, or species like desert tortoise that could burrow under a fence.<br>• Disturbed areas outside of the fence, including fill slopes along at-grade sections, and the ground below viaducts, will be revegetated with native plants.<br>• Vegetative cover appropriate to the local area will be planted near | Construction/Post-construction | Design/Final design | As established by regulatory compliance agencies | Authority/ Contractor/ Project Biologist | Authority/ Contractor/ Project Biologist | Measures will be implemented to minimize rail-kill and facilitate animal movement across rail lines | Contract requirements and specifications | Impact BIO#13: Project Effects on Wildlife Movement Corridors. |

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| | | entrances to identified wildlife crossing structures to give animals protective cover. Per FRA regulations, vegetation will not be planted inside the HSR fence.<br>• Crossing structures and fences will be regularly inspected and maintained to keep the openings of wildlife crossing structures free of debris or sediment. Any damaged "funnel fencing" will be repaired, and any "hanging lip" created by scouring water flows will be remedied in time to prevent degradation of the structure's functionality. | | | | | | | | |
| BIO-MM#84 | Implement Worker Environmental Awareness Program for Unarmored Three-spine Stickleback | Prior to initiation of construction activities in locations where unarmored three-spine stickleback may be present, implement BIO-IAMF#3: Prepare Training Materials and Conduct Construction Period WEAP Training; prior to Operation and Maintenance activities implement BIO-IAMF#4: Operation and Maintenance Period Worker Environmental Awareness Program Training.<br>WEAP training will include site-specific information developed for the restriction of access to the wetted channel of the Santa Clara River, including restrictions on the introduction and handling of concrete or other contaminants, and debris and vegetation disposal.<br>Training will include the repercussions to unarmored three-spine stickleback resulting from contaminants and debris, and access to wetted channel. | Pre-construction | Training program/Reporting | Annual (training)/Monthly (reporting) | Authority/ Contractor | Authority/ Contractor | Prepare a WEAP and implement training for the Unarmored Three-spine Stickleback | WEAP | Impact BIO#4: Project Construction Effects on Special-Status Fish Habitat. Impact BIO#14: Project Operation Effects on Habitat for Special-Status Species Individuals and Communities. |
| BIO-MM#85 | Establish Construction Zones and Environmentally Sensitive Areas for Unarmored Three-spine Stickleback and its Habitat | During temporary and permanent bridge construction, the Authority will implement BIO-IAMF#8: Delineate Equipment Staging Areas and Traffic Routes and BIO-MM#58, Establish Environmentally Sensitive Areas and Nondisturbance Zones, to ensure no work takes place where unarmored three-spine stickleback may be affected. Additional measures include:<br>• Prior to the commencement of construction activities, a qualified biologist will survey the proposed work locations to confirm that the construction zone is outside the wetted channel of the river, that the proposed vibratory pile installation locations are located outside of the 25-year flood zone to the extent feasible, and away | Construction | Establish construction zones | Ongoing during construction | Authority/ Contactor | Authority/ Contactor | Establish Environmentally Sensitive Areas and Nondisturbance Zones to protect unarmored three-spine stickleback | Contract requirements and specifications | Impact BIO#4: Project Construction Effects on Special-Status Fish Habitat. |

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| | | from the wetted channel, and that no work takes place where unarmored three-spine stickleback may be affected.<br>• The Project Biologist will be present during all construction and maintenance activities upstream or downstream of the bridge crossing to prevent activities, personnel, and debris from contacting or disturbing the wetted channel of the Santa Clara River.<br>• No construction activities or personnel will occur within 10 feet of or near the edge of the wetted channel that would have potential to destabilize the low flow channel bank. Permanent structures associated with bridge construction will remain outside of the 25-year flood zone and all construction activities associated with bridge construction will be remain a minimum of 10 feet away from wetted channel.<br>• Prior to ground-disturbing activities, a public barrier fence, in the form of low-impact material (e.g., high visibility flagging, chain-link fencing, or similar low-impact material), to the extent feasible and ESA fencing (BIO-MM#58) will be installed between the bridge construction work zone and the ESA area of the wetted channel of the Santa Clara River to prevent access to the wetted channel. The ESA will be installed a minimum of 10 feet from the wetted channel and the public barrier fence approximately 10 feet from the ESA to the extent practicable. | | | | | | | |
| BIO-MM#86 | Santa Clara River Construction and Maintenance Activity Weather-Related and Seasonal Work Restrictions | **Weather-Related Work Restrictions**<br>Prior to scheduling any bridge or bank stabilization concrete pours for construction or maintenance, a clear weather window, defined for this project as a less than 40 percent chance or less of 0.10 inch or greater of precipitation in the next 48 hours as forecasted by National Oceanic and Atmospheric Administration, will be required. If a bridge or bank stabilization-related concrete pour is in progress and an un-forecasted rain event occurs, bridge or bank stabilization-related concrete pours will be suspended.<br>Prior to and during any storm event, a monitor will inspect work sites to ensure sites are secure so that flooding does not | Pre-construction/ Construction | Establish work-zone restrictions | Ongoing during construction | Authority/ Contractor | Authority/ Contractor | Establish requirements and restrictions to protect the Santa Clara River from impacts related-construction activities | Contract requirements and specifications | Impact BIO#4: Project Construction Effects on Special-Status Fish Habitat. Impact BIO#14: Project Operation Effects on Habitat for Special-Status Species Individuals and Communities. |

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| | | cause damage to tarps or plug diversion drains or allow construction materials, such as uncured concrete, and debris to flow into the river.<br>**Seasonal Work Restrictions**<br>All permanent bridge pier and structure construction in the Santa Clara River riverbed will be completed during the dry season, defined as June 1 through November 1, and all work will completely avoid the wetted channel during construction and maintenance.<br>All measures implemented during bridge construction will be implemented to avoid accidental contact, spills, or falling debris into the wetted channel. During operations, if the wetted portion of the Santa Clara River shifts in location (for example, in response to a flood event that alters the wetted channel alignment), all maintenance and repair activities will continue to occur outside of the wetted channel. | | | | | | | |
| BIO-MM#87 | Prepare and Implement Spill Prevention and Containment Measures | All fuels and components with hazardous materials or wastes will be handled in accordance with applicable regulations, the SWPPP prepared for HYD-IAMF#3 and HYD-IAMF#4, and the Construction Management Plan prepared for HMW-IAMF#6. These materials will be kept in segregated, secured, and/or secondary containment facilities, as necessary.<br>During concrete pours of the permanent bridge piles and bridge decks or other structures, spill containment will be installed and maintained to prevent uncured concrete releases to the wetted channel of the Santa Clara River or any other natural watercourse. Spill containment may include installation of K-rail barriers at the perimeter of work areas, between work areas and the wetted channel and/or underslung tarps to intercept all potential uncured concrete flows to the Santa Clara River or any other natural watercourse.<br>During bridge construction, no continuous dewatering or drawdown within the shafts will occur. Casing water, if any, will be extracted and disposed at a legal disposal site in an upland location. No other construction dewatering associated with installation of the Santa Clara River crossing or other natural watercourse crossing bridges will occur within the work areas. | Pre-construction/ Construction | Design/Final design | Ongoing during construction | Authority/ Contractor | Authority/ Contractor | Implement spill prevention and containment measures | Contract requirements and specifications | Impact BIO#4: Project Construction Effects on Special-Status Fish Habitat. |

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| | | To ensure that water quality is not being affected by bridge and bank stabilization-related concrete pouring activities, the Authority will monitor the water quality at points, upstream, downstream, and immediately adjacent to the construction work zone daily during concrete pouring operations. Key parameters to be monitored are pH and turbidity. | | | | | | | | |
| BIO-MM#88 | Implement Construction or Maintenance Activity Debris Prevention Measures | Prior to initiation of construction or maintenance activities on any bridge over a natural water course (e.g., Santa Clara River, Big Tujunga Wash), an underslung tarp, debris platform or equivalent barrier extending at least 10 feet beyond the width of the wetted channel will be deployed beneath the bridge deck to prevent the inadvertent discharge of equipment, chemicals, or debris into the wetted channel. This buffer distance may be updated based on the results of the hydroacoustic analysis described in BIO-MM#89.<br>The Authority will inspect and maintain tarps, debris platform or equivalent barrier to ensure catchments are functioning appropriately. | Pre-construction/ Construction | Design | Prior to initiation of construction or maintenance activities | Authority/ Contractor | Authority/ Contractor | Implementing barriers beneath any bridge over a natural water course for protection | Contract requirements and specifications | Impact BIO#4: Project Construction Effects on Special-Status Fish Habitat.<br>Impact BIO#14: Project Operation Effects on Habitat for Special-Status Species Individuals and Communities. |
| BIO-MM#89 | Implement Construction Measures for Unarmored Three-spine Stickleback Avoidance | During the installation of piles and piers for the bridge, vibratory or oscillating pile driving methods will be used in the Santa Clara River riverbed, outside of the wetted channel, in order to avoid effects to unarmored three-spine stickleback. A hydroacoustic analysis would be prepared prior to installation of piles and piers to avoid hydroacoustic impacts of vibratory or oscillating pile driving methods. Piles and footings associated with temporary structures required to construct the bridge will be installed and removed only by vibratory methods. Piles and footings will be installed and removed at least 10 feet away from the wetted channel at the time of installation or removal. The hydroacoustic study will also confirm if a 10-foot buffer distance is adequate to avoid effects to unarmored three-spine stickleback. This buffer distance may be updated based on the results of the hydroacoustic analysis.<br>Construction activities in areas susceptible to winter flood flows will be conducted from May 1 through November 30, when winter flood flows do not occur in the Santa Clara River. Other construction activities in areas | Construction | Design | Weekly or as established by regulatory compliance agencies | Authority/ Contractor | Authority/ Contractor | Implement construction measures for unarmored three-spine stickleback | Contract requirements and specifications | Impact BIO#4: Project Construction Effects on Special-Status Fish Habitat. |

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| | | not at risk of flood flows may be constructed year-round.<br>Vegetation management will be limited to trimming existing riparian vegetation outside the wetted channel. Woody debris generated by vegetation management activities will be prevented from contacting the wetted channel, either by hand or by deploying physical restraints or netting. | | | | | | | | |
| BIO-MM#90 | Prepare a Construction Groundwater Dewatering Plan | The Authority will prepare a Construction Groundwater Dewatering Plan for areas in close proximity to stream flow to ensure that any dewatering is conducted in a manner that does not affect river flow. Dewatering will be implemented in a manner that: (1) does not create temporary wetted channel habitat suitable for unarmored three-spine stickleback; (2) does not diminish existing river flow, and therefore does not result in stranding of unarmored three-spine stickleback or other fish; and (3) does not introduce pollutants to surface waters.<br>The plan will include, but not be limited to:<br>• No direct removal of surface water from or to the Santa Clara River or activities that may result in stranding of unarmored three-spine stickleback.<br>• Groundwater discharges will be directed to appropriate legal disposal sites in an upland area that cannot flow into the Santa Clara River or other drainages along the Palmdale to Burbank Project Section alignment to avoid changing the river's flow and water quality.<br>• The Authority will monitor daily surface water elevations upstream, adjacent to, and downstream of the extraction points, to assess any critical flow regimes susceptible to excessive draw down before, during, and after groundwater dewatering activities.<br>• The biological monitor will have the authority to halt dewatering activities if water levels decrease in the wetted portion of the Santa Clara River where unarmored three-spine stickleback are present. | Pre-construction/ Construction | Final design/ Monitoring/ Reporting | Weekly | Authority/ Contractor | Authority/ Contractor | Prepare Construction Groundwater Dewatering Plan for areas in close proximity to stream flow | Contract requirements and specifications | Impact BIO#4: Project Construction Effects on Special-Status Fish Habitat. |
| BIO-MM#92 | Implement Avoidance Measures During Operations and Maintenance for the Santa Clara River | All maintenance of project facilities on the Santa Clara River and other drainages along the Palmdale to Burbank Project Section alignment will adhere to timing and work area restrictions, specifically:<br>• No maintenance activities or personnel | Construction/Post-construction | Monitoring/ Reporting | Weekly or as established by regulatory compliance agencies | Authority/ Contractor | Authority/ Contractor | Implement timing and work area restrictions for all maintenance of project facilities on the Santa Clara | Contract requirements and specifications | Impact BIO#14: Project Operation Effects on Habitat for Special-Status Species Individuals and Communities. |

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| | | will occur within 10 feet of or near the edge of the wetted channel. This buffer distance may be updated based on the results of the hydroacoustic analysis described in BIO-MM#89.<br>• Maintenance activities will not take place in the wetted channel of the Santa Clara River or other drainages along the Palmdale to Burbank Project Section alignment.<br>• Repair, or replacement of bridge structures requiring access to the 25-year flood zone of the riverbed will be restricted to the period from June 1 to September 30, except in the case of an emergency.<br>Any dewatering necessary during maintenance activities will not create a risk of fish stranding, either through draw down (zone of influence) or by flow discharge creating temporary habitat suitable for federally listed fish, nor will it involve direct removal of surface water from, or discharge to, the wetted channel of the Santa Clara River or other drainages along the Palmdale to Burbank Project Section alignment.<br>Maintenance activities will implement additional conservation measures, BIO-MM#84 through BIO-MM#90, as applicable to the activity. | | | | | | River and other drainages along the Project Section alignment | | |
| BIO-MM#93 | Adaptive Management Plan for Groundwater Effects on Species and Habitat | To avoid, minimize and mitigate for impacts on seeps, springs, streams, riparian vegetation, and special-status plant and wildlife species, the Authority will prepare and implement an AMMP prior to, during, and after tunnel construction to implement the requirements described under HYD-MM#4 and as described below concerning biological resources.<br>The purpose of the AMMP relative to biological resources is to monitor groundwater-dependent biological resources within the tunnel construction RSA to detect and remediate adverse effects on habitat function in a timely manner. Implementation of the AMMP will provide information and data to identify hydrological and biological effects that may arise during tunnel construction, if any, and trigger actions to offset any such impacts. The AMMP will include the following components, at a minimum, to avoid or minimize and address impacts on habitat | Pre-construction/ Construction/Cost-construction | Prepare Plan/Reporting/ Monitoring | Monthly | Authority/ Contractor | Authority/ Contractor/ Project Biologist | Prepare and implement an AMMP prior to, during, and after tunnel construction | Condition of construction contract/condition of regulatory permits | Impact BIO#1: Project Construction Effects on Habitat for Special-Status Plants and Plant Communities.<br>Impact BIO#2: Project Construction Effects on Special-Status Amphibian Habitat.<br>Impact BIO#3: Project Construction Effects on Special-Status Bird Habitat.<br>Impact BIO#4: Project Construction Effects on Special-Status Fish Habitat.<br>Impact BIO#6: Project Construction Effects on Special-Status Mammal Habitat.<br>Impact BIO#7: Project Construction Effects on Special-Status Reptile Habitat.<br>Impact BIO#8: Project Construction Effects on State and Federally Jurisdictional Aquatic Resources.<br>Impact BIO#9: Project Construction Effects on Fish and Wildlife Resources Protected by Fish and Game Code |

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| | | for special-status species, and aquatic resources:<br>**Baseline inventory—**The Authority will establish baseline hydrologic conditions within the tunnel construction RSA. Baseline surveys will characterize potential aquatic resources, including but not limited to mapping of wetland and riparian vegetation; hydroperiod (the duration of inundation); flow rates; area of feature; and the potential for special-status plant and fish and wildlife species to occur.<br>**Construction monitoring—**The Authority will designate monitoring locations and methodologies for monitoring water levels, vegetation cover, and special-status species habitat most likely to be affected by tunnel construction. The Authority will monitor representative locations during periods when effects are most likely to occur. If effects (e.g., lowering water levels resulting in reduced habitat) are observed, the Authority will implement contingency plans that expand monitoring beyond the representative locations and increase monitoring frequency to capture the extent of effects on groundwater-dependent biological resources.<br>**Supplemental water—**The Authority will prepare contingency plans to provide supplemental water as necessary to support riparian/aquatic vegetation, wildlife breeding cycles, aquatic wildlife, or protected tree health within the area of predicted effects determined through modeling or monitoring to be potentially affected by groundwater lowering. Any supplemental water used will be sourced locally, to the extent feasible, and will be free of toxins, harmful bacteria or harmful bacterial load, and invasive species. Seasonal variation as documented during the preconstruction baseline monitoring will be considered in establishing the amount of supplemental water. For all features, supplemental water will provide minimum flows and periods of inundation to match baseline conditions. The periods of supplemental water, in general, will likely be in periods of baseflow, which occurs in late spring, summer, and early fall outside of rain periods. For breeding habitats, the Authority will, at a minimum, supplement breeding habitat where necessary to maintain adequate depths for completion of | | | | | | | | Section 1600 et seq. |

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| | | the reproduction cycle (defined as the time by which juveniles are viable and mobile such that they can feasibly leave the breeding location).<br>However, where breeding habitat is perennial or long-seasonal, then supplemental water will be provided as necessary to maintain the entire wetted period as determined through baseline monitoring. For nonbreeding movement and foraging habitat in creeks and streams, water will be provided to maintain seasonal flow similar to baseline conditions. Water will be provided as needed to sustain habitat conditions up to the point of baseline conditions until the qualified biologist determines it is appropriate to cease its provision. If supplemental water is provided from wells, the effects on water supply and habitat features will be managed to avoid and minimize potential disruption by the selection of well location, depth, flow rate, and the use of alternative supplies.<br>**Contingency plan for supplemental water in areas outside of predicted area of effect**—The Authority will establish contingency procedures to provide supplemental water to springs, seeps, and streams to support riparian/aquatic vegetation, wildlife breeding cycles, and aquatic wildlife outside the area of predicted effects, if warranted by monitoring.<br>**Temporary relocation**—The Authority will relocate aquatic species where unavoidable drying of aquatic breeding habitat would occur and maintaining the habitat with supplemental water is not feasible. The Authority will relocate these species, as allowed by USFWS and CDFW. If holding facilities are used, the Authority will return affected wildlife to affected aquatic areas after recovery of baseline hydrologic conditions.<br>**Post-construction monitoring**—After construction, the Authority will monitor water levels and aquatic resource conditions of affected features twice annually (spring and summer) for at least 5 years or as determined through consultation with USFWS and CDFW. As long as groundwater levels are demonstrated to be recovering, monitoring will continue until baseline conditions return or 10 years, whichever is longer. In the event that | | | | | | | | |

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| | | supplementary water is not successful at restoring aquatic resources to baseline conditions in the post-construction period and off-site compensation is triggered, then monitoring may be waived for certain features if it is determined that there is no further utility for monitoring the specific feature.<br>**Post-construction riparian or wetland restoration**—The Authority will restore any lost riparian or wetland vegetation that is not recovering on its own within 1 year of construction and is determined to be the result of tunnel construction through comparison to baseline conditions. Subject to landowner approval, such restoration will occur on site, or at a suitable location nearby if not feasible on site. The Authority will implement restoration of riparian or wetland restoration, as applicable, as defined in mitigation measures BIO-MM#47 and BIO-MM#53.<br>**Compensatory mitigation**—If the Authority determines through direct monitoring or data interpretation that substantial disruption (i.e., loss of 0.5 acre or greater) to habitat supporting special-status species has likely occurred during or after construction and that habitat restoration efforts did not achieve success criteria or that restoration was determined unfeasible, the Authority will provide compensatory mitigation to offset the loss of habitat pursuant to BIO-MM#47 and BIO-MM#53. | | | | | | | | |
| BIO-MM#94 | Avoid Direct Impacts on Monarch Butterfly Host Plant | Prior to ground-disturbing activities, a qualified Project Biologist shall survey for monarch butterfly within suitable habitat. The qualified Project Biologist shall also assess potential overwintering habitat (i.e., identify primary roosting trees and other structural components or flora integral to maintaining microclimate conditions) and delineate overwintering habitat following the Xerces Management Guidelines for Monarch Butterfly Overwintering Habitat (Xerces Society 2017).<br>Subsequently, prior to and during the overwintering period (generally mid-September to mid-March), the qualified Project Biologist shall conduct multiple surveys for overwintering monarchs where overwintering habitat has been identified. If overwintering monarchs are present, the Project Biologist shall establish a 100-foot | Pre-construction/ Construction | Surveying/Monitoring/Reporting | Monthly or as established by regulatory compliance agencies | Authority/ Contractor/ Project Biologist | Authority/ Contractor/ Project Biologist | Pre-construction survey for any monarch butterfly within suitable habitat and maintain exclusion buffer/report findings | Condition of construction contract/condition of regulatory permits | Impact BIO#5: Project Construction Effects on Special-Status Invertebrate Habitat. |

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| | | exclusion buffer from all identified overwintering monarchs. Project activities within this exclusion buffer may only start after all overwintering monarchs have departed the overwintering site as determined by the qualified Project Biologist. The Project will follow overwintering habitat management recommendations as provided in the Western Monarch Butterfly Conservation Recommendations (USFWS 2021b).<br>During the breeding and larval foraging periods (generally mid-March to mid-September), and prior to any ground-disturbing activities, the Project Biologist shall survey for larval host plants, including native milkweed species, within suitable habitat areas. If host plants are found, the qualified Project Biologist shall conduct focused surveys for adult monarch butterflies during the peak of the flight period to determine presence/absence. If monarch butterflies are observed in suitable habitat, the Project Biologist shall establish a 50-foot exclusion buffer from all identified host plants to ensure that construction personnel avoid these areas. Project activities within this exclusion buffer may only start after all monarchs have departed as determined by the qualified Project Biologist. | | | | | | | | |
| BIO-MM#95 | Provide Compensatory Mitigation for Impacts on Monarch Butterfly Habitat | The Authority shall provide compensatory mitigation at a minimum of 1:1 ratio for impacts to occupied overwintering, breeding, and/or foraging habitat to offset impacts to monarch butterfly populations. Compensatory mitigation options shall include1 or more of the following:<br>• Purchase of credits from an agency-approved conservation bank<br>• Acquisition in fee title of USFWS-approved property<br>• Establishment of a conservation easement over a property with replacement functions and values. Development of an agreement with an appropriate endowment in coordination with a long-term management entity and/or<br>• Payment into an in-lieu fee program.<br>Mitigation for monarch butterfly shall prioritize areas with any future designated | Pre-construction/ Construction | Design/final design/coordination | Monthly or as established by regulatory compliance agencies | Authority/ Contractor/ Project Biologist | Authority/ Contractor/ Project Biologist | Compensate for impacts to Monarch Butterfly | Condition of design-build contract | Impact BIO#5: Project Construction Effects on Special-Status Invertebrate Habitat. |

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| | | critical habitat (if/when the monarch is listed and critical habitat is designated), and with existing monarch butterfly populations and suitable milkweed populations to support breeding. The secondary priority shall be to create suitable habitat in other areas, if feasible (i.e., establish self-sustaining milkweed populations). The ultimate mitigation option, or a combination of options, shall be determined in coordination with USFWS, and may include additional actions to guide management of habitats (e.g., grazing, weed control), monitor populations, and identify methods to establish or re-establish populations, as required. | | | | | | | | |
| BIO-MM#96 | Conduct Preconstruction Surveys and Implement Avoidance and Minimization Measures for Mountain Lion Dens | Prior to any ground-disturbing activity, regardless of the time of year, the Project Biologist will conduct preconstruction surveys for known or potential mountain lion dens within suitable habitat located within the work area and within 600 meters of the work area. These surveys will be conducted no less than 14 days and no more than 30 days prior to the start of ground-disturbing activities in a work area. Known and potential mountain lion den types will be defined as follows:<br>• Known den. Any existing natural den or human-made structure that is used or has been used at any time in the past by a mountain lion. Evidence of use may include historical records; past or current radio telemetry or tracking study data; mountain lion sign, such as tracks, scat, and/or prey remains; or other reasonable proof that a given den is being or has been used by a mountain lion.<br>• Potential den. Any thick vegetation, boulder piles, rocky outcrops, or undercut cliffs within the species' range for which available evidence is insufficient to conclude that it is being used or has been used by a mountain lion. Potential dens will include the following characteristics: (1) refuge from predators (coyotes, golden eagles, other mountain lions) or (2) shielding of the litter from heavy rain and hot sun.<br>The Project Biologist will use location-specific survey methods to identify known and potential dens. The survey method will consider topography, vegetation density, | Pre-construction | Monitoring/ Reporting | Weekly | Authority/ Contractor/ Project Biologist | Authority/ Project Biologist | Preconstruction surveys for known or potential mountain lion dens within suitable habitat located within the work area | Condition of construction contract/condition of regulatory permits | Impact BIO#6: Project Construction Effects on Special-Status Mammal Habitat. |

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| | | safety, and other factors. Surveys will be conducted by a qualified biologist (i.e., a biologist with demonstrated experience in mountain lion biology, identification, and survey techniques) and may involve the establishment of camera stations, scent stations, pedestrian surveys (looking for tracks, caches, etc.), or other appropriate methods. Survey methods used will be designed to avoid the disturbance of known or potential dens to the extent feasible<br>If known or potential mountain lion dens are identified or observed during preconstruction surveys, mountain lion dens will be assumed to have kittens present until the Project Biologist can document that they are not present and/or that the den is not being used. A nondisturbance buffer of at least 1,970 feet will be established around the known or potential den until the Project Biologist can document and confirm that the den is not occupied. If the den is determined to be occupied, the 600-meter nondisturbance buffer will be maintained until the den is confirmed abandoned by the Project Biologist. The 600-meter nondisturbance buffer shall remain in place for 2 months after the initial survey and a re-survey at that time shall be conducted by the Project Biologist to determine if the female has abandoned the den and relocated the kittens. The Authority shall consult with CDFW on detection of an active den. Construction may proceed if the Project Biologist determines that a reduced buffer could be implemented because of topography or other factors, or that the den is not being used by mountain lions. | | | | | | | | |
| BIO-MM#97 | Provide Compensatory Mitigation for Impacts on Mountain Lion Habitat | The Authority will provide compensatory mitigation for impacts on mountain lion-suitable habitat through the preservation of suitable habitat that is acceptable to CDFW. Habitat will be replaced at a minimum ratio of 2:1 for permanent impacts on breeding/foraging habitat and high-priority foraging and dispersal habitat (CRC, MCH, SGB, CSC, COW, DSW, DSC, AGS, JUN, VRI, LAC), and at a ratio of 1:1 for low-priority foraging and dispersal habitat (BAR, DOR/VIN), unless a higher ratio is required by regulatory authorizations issued under CESA. Compensatory mitigation will be provided using1 or more of the methods described in BIO-MM#53: Prepare and Implement a Compensatory Mitigation Plan | Pre-construction/ Construction/Post-construction | Design/Final design/ Compensatory mitigation/ Reporting | Monthly or as established by regulatory compliance agencies | Authority/ Contractor/ Project Biologist | Authority/ Contractor/ Project Biologist | Compensatory mitigation for impacts on mountain lion-suitable habitat. | Condition of construction contract/condition of regulatory permits | Impact BIO#6: Project Construction Effects on Special-Status Mammal Habitat. |

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| | | for Species and Species Habitat and would, where feasible and acceptable to CDFW, contribute to preserving important lands for movement. | | | | | | | | |
| BIO-MM#98 | Minimize Permanent Intermittent Impacts on Aerial Species Wildlife Movement | To address the permanent intermittent impact of operations on aerial wildlife movement from train strike and entrapment, the Authority will implement an array of deterrent and diversion features for avian species. These features include the following, which are specified in detail in the Wildlife Corridor Assessment Report (Authority 2019c):<br>• Install pigeon wire or other features to discourage birds from perching on the overhead catenary system (OCS) throughout the project<br>• In selected areas, place flight barriers such as fencing, pole barriers or a tubular screen (Life Impacto Cero 2015) to the height of the OCS to avoid birds flying into the rail alignment and being struck by the train in the following locations:<br>  • SR14A Build Alternative in the vicinity of Una Lake<br>• poles (e.g., avoid the use of tubular poles or cap openings in all poles)<br>• Design aerial structures and tunnel portals to discourage bats from roosting in expansion joints, light tunnel entrances, or other crevices. | Design/pre-construction/ Construction/ Post-construction | Design | As established by regulatory compliance agencies | Authority/ Contractor | Authority/ Contractor | Implement deterrent and diversion features to Project to minimize impacts to aviation species | Condition of construction contract/condition of regulatory permits | Impact BIO#14: Project Operation Effects on Habitat for Special-Status Species Individuals and Communities. |
| BIO-MM#99 | Implement Lighting Minimization Measures During Construction | The Authority will avoid conducting ground-disturbing activities within known wildlife habitat during nighttime hours, to the extent feasible. If nighttime work is necessary, the Authority will minimize impacts on adjacent habitat by:<br>• Conducting nightwork only within the boundaries of previously disturbed, cleared and grubbed areas<br>• Shielding and directing nighttime lighting to avoid illuminating wildlife habitat, including movement corridors<br>• Using the minimum lighting levels approved by Occupational Safety and Health Administration (29 C.F.R. 1926.56) for general construction (i.e., 5 foot-candles or 54 lux)<br>• Minimizing the direction of construction vehicle headlights toward off-site locations and use low beams or turn off headlights when safety considerations permit | Construction | Construction practices/Reporting | As needed | Authority/ Contractor | Authority/ Contractor | Avoid nighttime work to the extent feasible; minimize impacts to wildlife when night work is required. | Condition of construction contract/condition of regulatory permits | Impact BIO#6: Project Construction Effects on Special-Status Mammal Habitat. |

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| | | • Minimizing the duration of lighting by using remote monitoring systems or other methods to ensure security of the construction site during hours it is not in use. | | | | | | | | |
| BIO-MM#100 | Implement Lighting Minimization Measures for Operations | To address the permanent and intermittent impacts from lighting, the Authority will implement measures to minimize the intensity and duration of operational lighting of permanent facilities (e.g., traction power facilities, radio sites, and maintenance facilities), as well as intermittent train lighting as follows:<br>• Outdoor lighting at operational facilities will be consistent with minimum Occupational Safety and Health Administration requirements established by 29 C.F.R. 1926.56 when the facilities are in use. To the extent feasible, the Authority will minimize the duration of lighting at operational facilities by using methods other than lighting (e.g., remote monitoring systems) to ensure security of facilities during nighttime hours they are not in use;.<br>• Nighttime lighting will have shields or cowls (or other device to limit lighting) installed to direct the light downward to reduce the standard luminous intensity distribution curve to contain the light to the boundaries of the project site to the extent practicable.<br>• Train headlights will use the minimum standard allowed by the FRA under 49 C.F.R. 229.125 (a single headlight of at least 200,000 candelas) within non-tunnel portions of the project section. | Post-construction | Reporting | Prior to the commencement of operations | Contractor/Local districts | Contractor | Implement measures to minimize the intensity and duration of operational lighting of permanent facilities and intermittent train lighting | Reporting contract/requirements/specifications | Impact BIO#14: Project Operation Effects on Habitat for Special-Status Species Individuals and Communities. |
| BIO-MM#101 | Minimize Permanent, Intermittent Noise Impacts on Special-Status Bird Habitat | To address the permanent, intermittent impact of noise on suitable special-status bird habitat, the Authority will build sound barriers to minimize or avoid such impacts in locations where suitable special-status bird habitat would be exposed to 65 A-weighted decibels of permanent intermittent noise impact outside the fenced right-of-way. Sound barriers will be designed with the goal of minimizing exposure to noise produced by HSR trains by providing a 10 A-weighted decibel attenuation of sound generated by HSR operations, as measured 50 feet from the noise barrier. Typically this level of sound attenuation may require a 10- to 17-foot-tall sound barrier. The sound barriers will be constructed before HSR | Post-construction | Reporting | Prior to the commencement of operations | Authority/ Contractor | Authority/ Contractor | Construct sound barriers to minimize or avoid intermittent impact of noise on suitable special-status bird habitat | Reporting contract/requirements/specifications | Impact BIO#13: Project Effects on Wildlife Movement Corridors.<br>Impact BIO#14: Project Operation Effects on Habitat for Special-Status Species Individuals and Communities.<br>Impact PK#3: Changes to Park, Recreation, and Open Space Resource Character. |

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| | | train operations begin. The location, length and height of the barriers will be determined based on detailed noise modeling for areas of suitable special-status bird habitat, and measurement of existing conditions so that the noise-attenuating effects of topography and other existing features can be accounted for during the final design phase. | | | | | | | | |
| BIO-MM#102 | Conduct Surveys and Implement Avoidance Measures for Crotch Bumble Bee | Surveys for Crotch bumble bee (*Bombus crotchii*) shall be conducted by qualified Project Biologists in suitable habitat (identified by species habitat suitability modeling) within 1 year prior to the start of construction. Surveys shall be conducted during 4 evenly spaced sampling periods during the flight season (March–September) (Thorp et al. 1983). For each of the 4 sampling events, the Project Biologist shall survey suitable habitat within the project footprint and a 100-foot buffer surrounding the project footprint (where access is allowed), using non-lethal netting methods for 1 person-hour per 3 acres of the highest quality habitat or until 150 bumble bees are sighted, whichever comes first. If initial sampling of a given habitat area indicates that the habitat suitability is of low quality or nonexistent, no further sampling of that area shall be required. General guidelines and best practices for bumble bee surveys shall follow USFWS' Survey Protocols for the Rusty Patched Bumble Bee (*Bombus affinis*) (USFWS 2019), consistent with other bumble bee survey protocols used by The Xerces Society (Hatfield et al. 2020). If surveys conducted within 1 year prior to construction identify occupied Crotch bumble bee habitat within the project footprint or the 100-foot buffer, including within inactive small mammal burrows and thatched/bunch grasses, additional preconstruction surveys of such habitat for active bee nest colonies and associated floral resources (i.e., flowering vegetation on which bees from the colony are observed foraging) within 7 days prior to scheduled disturbance between March and September. The purpose of this preconstruction survey would be to identify active nest colonies and associated floral resources within and adjacent to construction activities to determine areas of avoidance, and if needed, additional actions to address potential impact to Crotch bumble bees. The Project Biologist shall | Pre-construction/ Construction | Surveying/ Monitoring/ Reporting | Weekly or as established by regulatory compliance agencies | Authority/ Contractor/ Project Biologist | Authority/ Contractor/ Project Biologist | Pre-construction surveys of Crotch bumblebee habitat/ establish, and maintain no-work buffer/report findings | Condition of construction contract/condition of regulatory permits | Impact BIO#5: Project Construction Effects on Special-Status Invertebrate Habitat. |

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| | | establish, monitor, and maintain exclusive-work buffers around nest colonies and floral resources identified during preconstruction surveys. The size and configuration of the exclusion buffer would be based on best professional judgment of the qualified Project Biologist. At a minimum, the buffer shall provide at least 50 feet of clearance around nest entrances and maintain disturbance-free airspace between the nest and nearby floral resources. Construction activities shall not occur within the exclusion buffers until the colony is no longer active (i.e., no bees are seen flying in or out of the nest for 3 consecutive days, indicating the colony has completed its nesting season and the next season's queen has dispersed from the colony). | | | | | | | |
| BIO-MM#103 | Provide Compensatory Mitigation for Impacts on Crotch Bumble Bee Habitat | If take or adverse impacts to Crotch bumble bee cannot be avoided during construction or operation of the project, the Authority shall obtain appropriate take authorization from CDFW pursuant to CFGC section 2081 subdivision (b). The Authority shall provide compensatory mitigation for impacts on occupied habitat/floral resources for Crotch bumble bee (confirmed through surveys as described in BIO-MM#102) at a replacement ratio of no less than 1:1, unless a higher ratio is required pursuant to an authorization issued under the California Endangered Species Act. Compensatory mitigation may be implemented through purchase of CDFW-approved bank credits (if available), through preservation of habitat in perpetuity, including suitable habitat currently preserved by the Authority, or through replacement of floral resources as close to their original location as is feasible. Specific to the replacement option, if active Crotch bumble bee nests are identified and floral resources cannot be replaced within 200 meters (approximately 656 feet) of their original location, floral resources shall be planted in the most centrally available location relative to identified nests, no more than 1.5 kilometers (approximately 0.93 mile) from any identified nest. Replaced floral resources may be split into multiple patches to meet distance requirements for multiple nests. These floral resources shall be maintained in perpetuity and replanted/managed as needed to ensure the replacement habitat is preserved. The final mitigation option, or a combination of | Post-construction/ Operation | Design/Final design/ Compensatory mitigation/ Reporting | Monthly or as established by regulatory compliance agencies | Authority/ Contractor/ Project Biologist | Authority/ Contractor/ Project Biologist | Compensate for impacts to habitat for Crotch bumblebee/report findings | Condition of construction contract/condition of regulatory permits | Impact BIO#5: Project Construction Effects on Special-Status Invertebrate Habitat. |

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| | | options, will be determined in coordination with CDFW. | | | | | | | | |
| BIO-MM#104 | Implement Scour Avoidance Features Around Bridge Piers | Scour and cavity (i.e., depression) formation around the base of bridge piers will be avoided through implementation of design features that prevent erosion by dissipating the energy of the water flowing around the base of piers. The following structural designs will be considered and implemented according to the best design considerations, constructability, and environmental protections at the time of construction of the project:<br>• Vegetated riprap: Biotechnical methods can be used alongside rock or other inert materials to resist hydraulic forces, stabilize the stream system and prevent scour. Such methods can include the use of brush layering and poles, grass and ground cover, willow bundles, or other vegetated features that can resist hydraulic forces, increase geotechnical stability, and prevent soil loss behind the structures. Vegetation can thrive where riprap is constructed to encourage ongoing vegetative growth, and can also function to enhance riparian habitat while also protecting stream banks and bridge piers.<br>• Collars: Collars are metal or concrete structures that are placed around the base of the bridge pier to prevent the erosion of the soil around it. The collars can be designed to create turbulence in the flowing water, which helps to prevent scour.<br>• Varying the bridge pier shape: Design the piers with a cross section hydraulically favorable to the water flow to reduce the generation of the turbulent regime and consequently of the vortices that originate the scour.<br>• Orientation of the bridge piers in a manner that follows the water flow lines, to minimize the bridge's obstruction to flow. This method typically involves minimizing the angle between approach flow and major horizontal axes of pier faces.<br>Scour prevention features will be designed in such a way that no gaps, cracks, crevices, or spaces exist in the feature that might experience micro-scour of otherwise retain water that could strand unarmored | Post-construction | Design/final design | Monthly or as established by regulatory compliance agencies | Authority/ Contractor/ | Authority/ Contractor/ | Implement design features that prevent erosion by dissipating the energy of the water flowing around the base of piers | Condition of construction contract/condition of regulatory permits | Impact BIO#4: Project Construction Effects on Special-Status Fish Habitat. |

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| | | three-spine stickleback as flows recede. Scour prevention features will be solid in structure and will be developed within the existing design footprint of the bridge structures. No additional permanent impact footprint would be required for the scour prevention features. | | | | | | | | |
| BIO-MM#105 | BIO-MM#105: Wildlife Movement Working Group on Existing Wildlife Movement Barriers | In recognition of the shared interest of the Authority, federal and state agencies, and multiple non-governmental stakeholders to reduce currently existing barriers to wildlife movement such as SR 14 in the Palmdale to Burbank Project Section, the Authority shall convene a wildlife movement working group (WMWG) with Caltrans and the California Department of Fish and Wildlife (CDFW). Subject to agreement by all WMWG members, this group could be expanded, in later phases, to include representatives from appropriate federal, state, and regional agencies as well as interested non-governmental organization (NGO) stakeholders and state agencies.<br>The first order of work of the WMWG will be development of a charter outlining roles and responsibilities, goals and objectives, and processes to guide the operation of the group. Additionally, as a part of its initial phase, the working group will also seek input from any other interested national, local, or regional stakeholders with an expertise or interest in wildlife movement. The Authority's CEO shall convene and kick-off the WMWG no later than 1 year from issuance of a Record of Decision for the Palmdale to Burbank Project Section. The WMWG may be convened earlier, with consensus from all WMWG members. The Authority will convene the WMWG no less than three times a year.<br>The purpose of the WMWG is to complete a wildlife connectivity study to identify high-use wildlife areas in the Palmdale to Burbank Project Section that can be targeted as potential wildlife connectivity projects and evaluated for feasibility and species benefits, with the goal of prioritizing and selecting biologically and cost-effective projects that facilitate wildlife movement in the Palmdale to Burbank Project Section.<br>In conjunction with working group members, the Authority would contribute its technical expertise, including dedicating staff time, | Design/Pre-construction | Develop WMWG charter; complete wildlife connectivity study | As established by WMWG members | Authority | Authority | Convene WMWG; develop charter, complete study, use study to prioritize cost-effective projects that facilitate wildlife movement in the Palmdale to Burbank Project Section | Authority to provide schedule of initial meeting with agencies and invitations; WMWG member consideration of expanding group, scheduling/invitations to additional appropriate agencies, NGOs; lead development of charter; contribute to wildlife connectivity study | Impact BIO #13: Project Effects on Wildlife Movement Corridors. |

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| | | towards seeking and securing state and federal funding for the formation of the WMWG. In addition, the Authority shall also financially contribute to the funding of any mutually agreed wildlife connectivity study in an amount equal to the contributions of other WMWG members, subject to SB 198, which requires evaluation by the Office of the Inspector General and notification to the Legislature of any proposed Authority contribution (funding or oversight personnel). Authority contributions cannot be made until the Authority has met the requirements of SB 198, and until the Authority receives authorization to use funding in Southern California project sections.<br>The WMWG's charter shall conclude at a time mutually agreed by the WMWG members. | | | | | | | | |
| **Hydrology and Water Resources** | | | | | | | | | | |
| HWR-MM#1 | HWR-MM#1: Minimize Construction-period Water Quality Impacts Associated with Tunnel Construction | Prior to construction start, the Authority will establish the baseline groundwater condition in existing private water wells within the tunnel construction RSA by collecting samples for analytical laboratory testing. These initial samples shall be collected quarterly for at least1 year before construction start to account for any seasonal variation in groundwater chemistry. During tunnel construction, the samples shall be collected on a monthly to quarterly basis, depending on the tunnel construction schedule. The frequency of sample collection and the number of sampled wells shall be determined by the Authority before construction start and after consultation with property owners whose wells are within the RSA. Before and during construction, all respective water well owners shall be offered the opportunity to be present while samples are collected from their private water wells. Split samples will be collected by the Authority from identified private water wells and submitted to laboratories for analysis of regulated constituents including Title 22 metals (i.e., mercury, antimony, arsenic, barium, beryllium, cadmium, total chromium, cobalt, copper, iron, lead, manganese, molybdenum, nickel, selenium, silver, thallium, vanadium, and zinc) and any secondary geochemical parameters (i.e., | Pre-construction/ Construction | Monitoring/ Reporting | Prior to construction/ Monthly during construction | Authority/ Contractor | Authority | During construction, monitor and test private water wells within the tunnel construction RSA for contamination and implement a plan to avoid or minimize risk from any groundwater quality changes in consultation with RWQCB. | Condition of construction contract/condition of regulatory permits | Impact HWR#2: Construction Activities Required for the Build Alternatives. |

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| | | pH, total hardness, calcium, magnesium, sodium, potassium, total alkalinity, hydroxide, carbonate, bicarbonate, chloride, sulfate, nitrate as nitrogen [N], fluoride, and nitrite as N) that the Authority determines to be appropriate after consultation with affected well owners. Split sampling consists of a single sample that is divided into two separate sub-samples for laboratory testing to determine the precision of laboratory results.<br>If during tunnel construction, changes to the referenced constituents are detected and those changes exceed normal variations observed during baseline conditions, the Authority would notify the Regional Water Quality Control Board (RWQCB) of the detected changes and seek the RWQCB's approval for a plan to avoid or minimize the risk that changes to the groundwater would exceed applicable state and federal water quality standards in the existing private water wells. Avoidance or mitigation measures that may be undertaken could include: groundwater barriers designed and monitored to prevent further mobilization of changes, groundwater monitoring and treatment procedures to assess the extent of changes and potential causes. Before construction start, the Authority will consult with private well owners and the RWQCB on its proposed monitoring plan as well as any proposed measures to be taken in the event changes are detected during monitoring. The Authority's plan will include measures to ensure that changes, if they occur, will not exceed applicable federal and state water quality standards. | | | | | | | | |
| HWR-MM#2 | Minimize Impacts Associated with Construction in Floodplains Due to Permanent Structures Located within the SFHAs During Construction | The Authority will implement the following measures to reduce impacts on SFHAs:<br>• Restore the floodplain to its prior operation in instances where floodplains would be affected by construction within 1 year of completing construction at each affected location. This would include grading to restore preconstruction contours and revegetation with appropriate native species.<br>• Avoid placement of facilities in the floodplain or raise the ground with fill above the base flood elevation to the extent practicable. | Construction/Post-construction | Design/final design/restoration | After construction closeout | Authority/ Contractor | Authority | Implement measures to reduce potential impacts to SFHAs | Condition of construction contract | Impact HWR#3: Changes in Flood Risks Associated with Temporary Construction Activities and Permanent Structures Required for the Build Alternatives. |

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| | | • Use construction methods and facilities to avoid or minimize potential encroachments onto surface water resources. | | | | | | | | |
| HWR-MM#3 | Compensation for Impacts on Hansen Spreading Grounds | For the Refined SR14, SR14A, E1, E1A Build Alternatives the reduction in the area and capacity of the Hansen Spreading Grounds would be mitigated as listed below or by an equally effective option to compensate for loss in recharge area and capacity.<br>The Authority would provide replacement groundwater recharge areas to compensate for the HSR footprint within the Hansen Spreading Grounds and to ensure no net loss in recharge area or capacity. New recharge areas would be placed in the vicinity of existing recharge ponds. | Pre-construction/ Construction/Post-construction | Compensatory mitigation | Prior to operations | Authority | Authority | Provide replacement groundwater recharge areas in the vicinity of the Hansen Spreading Grounds to compensate for the Project footprint | Condition of construction contract | Impact HWR#4: Changes in Groundwater Recharge Associated with Temporary Construction Activities and Permanent Structures Required for the Build Alternatives. |
| HWR-MM#4 | Implement a Water Resources Adaptive Management and Monitoring Plan Including Compensatory Mitigation Measures as Necessary | The Authority will implement an AMMP to detect adverse changes in surface and subsurface conditions within the ANF that could occur during and after construction of the HSR tunnels including the construction of associated adits. The actions described in this mitigation measure would provide for timely detection of hydrological changes and, if necessary, appropriate remediation. Monitoring would ensure the effectiveness of the measures and determine if additional action would be required. Additionally, monitoring activities would continue for a period of 10 years after completion of the Palmdale to Burbank Project Section. If impacts persist after this period, monitoring would continue, as necessary. Overall, the purpose of the AMMP is to:<br>• Establish baseline groundwater and surface water hydrologic conditions within the tunnel construction RSA with data collection and in situ monitoring devices.<br>• Develop a monitoring program to detect real-time changes in groundwater and surface water conditions during and after construction through comparisons to baseline conditions and evaluation of paired reference sites.<br>• Establish numeric triggers, such as groundwater flow rate into the tunnel and groundwater levels, which would indicate that certain adaptive management measures are required to | Pre-construction/ Construction/Post-construction | Prepare Plan/Reporting | Quarterly and annually | Authority/ Contractor | Authority | Implement Adaptive Management and Monitoring Plan | Condition of construction contract | Impact HWR#4: Changes in Groundwater Recharge Associated with Temporary Construction Activities and Permanent Structures Required for the Build Alternatives.<br>Impact HWR#5: Changes in Hydrogeologic Conditions Associated with Tunnel Construction Beneath the ANF which May Affect Surface and Subsurface Water Resources. |

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| | | avoid or reduce impacts on groundwater and surface water resources during construction. Adaptive management measures may include providing supplemental water to affected surface water resources and other feasible measures to substantially maintain surface water resource conditions during and after construction, such as stream flows documented during preconstruction, to avoid or minimize desiccation of known springs and streams and disruptions to private water supplies. Groundwater losses that are unaccounted for could create a loss of available groundwater to the surrounding habitat, springs, or domestic wells. Collection of data regarding tunnel outflows and groundwater levels would be collected daily.<br>• Generate quarterly and annual reports to keep state and federal resource agencies apprised of groundwater and surface water conditions before, during, and after construction.<br>***Baseline Inventory and Monitoring of Groundwater and Surface Water Resources***<br>The Authority will establish baseline hydrologic conditions in the tunnel construction RSA through data collection and monitoring. The baseline inventory would include surveys and maps that identify the surface water resources in the RSA. Baseline surveys would generate information sufficient to characterize potential surface water and groundwater resources in the RSA.<br>***Construction Monitoring***<br>The Authority will designate locations in the tunnel construction RSA for monitoring springs, streams, and wells. The purpose of this monitoring is to capture nearly real-time changes in groundwater conditions (e.g., flow, pressure readings) that might be related to tunneling activities. Monitoring data collected during construction would be compared to baseline data collected during preconstruction monitoring and with paired reference sites that would not be affected by groundwater drawdown. The monitoring plan would include a schedule for monitoring activities that reflects periods | | | | | | | | |

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| | | when effects are most likely to occur at specific locations (e.g., when tunneling is nearing Moderate and High Risk Areas). The monitoring plan would account for a potential delay between groundwater drawdown associated with tunneling and the appearance of surface water effects. After construction, a substantial baseline monitoring system would be conducted to evaluate the recovery of water resources through datasets, and results would be compared to construction and preconstruction data to identify hydrogeological changes. The monitoring plan would include monitoring of inflow into the tunnels and would be quantified through use of 3-D surface and groundwater modeling programs to help predict rates of recovery for water resources affected during construction.<br>***Post-Construction Monitoring***<br>After construction, additional monitoring activities would be conducted to evaluate the recovery of water resources. The post-construction monitoring program would be modified to focus on areas where construction monitoring documented water resource effects caused by tunnel construction. The post-construction monitoring would continue for 10 years, or longer if required, until such time that conditions are comparable to the range of baseline conditions that existed before construction. Over time, groundwater resources would recover from losses sustained during construction through recharge by natural precipitation. Such recharge may take months to years after the tunnel lining system is installed (Berg 2012).<br>***Response Actions***<br>**Springs and Streams Impacts**<br>The Authority will prepare contingency plans to provide supplemental water as necessary to support springs and streams determined through modeling and monitoring to be adversely affected by groundwater reductions. Seasonal variation as documented during the preconstruction baseline monitoring would be considered in establishing the amount of supplemental water sufficient to offset the impact. For all features, supplemental water would provide minimum flows and periods of inundation to | | | | | | | | |

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| | | match baseline conditions. The periods in which supplemental water would be provided, in general, would likely reflect the period in which baseflows occur, which is late spring, summer, and early fall outside of rain periods, but could vary between different types of springs and streams. The measures to address impacts on riparian/aquatic vegetation, wildlife breeding cycles, aquatic wildlife, or protected tree health are provided in Mitigation Measure BIO-MM#93 in Section 3.7, Biological and Aquatic Resources.<br>**Adaptive Management Triggers**<br>The AMMP includes quantitative triggers that signal the onset of effects on surface water resources and groundwater levels and compel the implementation of adaptive management measures. The triggers include water pressure/level readings measured in piezometers established along the project alignment and flow rates of springs and streams falling below baseline conditions.<br>**Adaptive Management Measures**<br>Supplemental water would be supplied to affected springs or streams to approximate baseline levels until groundwater recharged naturally. The actual method of distribution of supplemental water would vary according to site-specific characteristics. For example, at some locations, a drip irrigation system may be more appropriate, whereas at other locations, it may be more appropriate to simply discharge water directly to a creek bed. At the specific site, water would be discharged at a point within the creek, or more broadly distributed, according to the site characteristics. See Section 3.6, Public Utilities and Energy, for discussion of the potential sources of water for construction purposes. Those sources would also be relied on to provide supplemental water for affected seeps, springs, or streams.<br>Well Impacts<br>The AMMP includes quantitative triggers that signal the onset of effects on surface water resources and groundwater levels and compel the implementation of adaptive management measures. If a well is discovered to be affected by tunnel construction, the well would be evaluated to determine the best approach to address the effect. Actions could include modifying the | | | | | | | | |

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| | | well equipment, such as by lowering the pump in the well, cleaning the pump, or providing a larger pump. Other additional actions may include providing potable water supplementation until water levels recover in the water supply well. See Section 3.6, Public Utilities and Energy, for discussion of the potential sources of water for construction purposes. Those sources would also be relied on for potable water supplementation. | | | | | | | | |
| **Geology, Soils, Seismicity, and Paleontological Resources** | | | | | | | | | | |
| GEO-MM#1 | Temporary and permanent soil stabilization at disposal sites | The contractor and/or Authority shall develop a restoration plan or temporary soil stabilization plan (interim reclamation plan) for spoil disposal sites. This plan would ensure that these locations are not left with exposed soils that would be vulnerable to wind and water erosion. Each restoration plan would address the final grade and elevation, temporary or permanent ground cover, stormwater and erosion control best management practices, expected future land use, and maintenance and inspection requirements. A restoration plan for the Vulcan Mine will be drafted if Vulcan Mine is to be used for spoils retention. The restoration plan or temporary soil stabilization plan would be prepared prior to spoils being deposited within the disposal sites. | Pre-construction | Prepare Plan | Prior to the initiation of construction activities | Authority/ Contractor | Authority/ Contactor | Prepare restoration plan or temporary soil stabilization plan | Condition of construction contract | Impact GSSP#4: Construction Could Expose Erodible Soils During Construction. |
| GEO-MM#2 | Inundation and slope failure minimization at spoil disposal sites | Prior to commencing construction activities, the construction contractor shall develop an evacuation plan for areas where grading, building, or disposal activities would occur underground or below grade. This plan would consider accident conditions including flood inundation and slope failure. If required, the contractor will obtain adequate Federal Emergency Management Agency flood rate insurance for activities occurring within a floodplain or dam inundation zone. The Authority will notify dam owners or managing agencies where new fill material could displace floodwaters from a seismically induced failure of the Palmdale, Pacoima, or Hansen dams. The volume of fill within the dam inundation zone should be provided to dam owners and managing agencies to allow for necessary revisions to dam inundation zone maps. | Pre-construction | Prepare Plan, obtain insurance if needed, notify dam owners | Prior to the initiation of construction activities | Authority/ Contractor | Authority/ Contractor | Prepare evacuation plan; if needed, obtain adequate Federal Emergency Management Agency flood rate insurance; and notify dam owners of Palmdale, Pacoima, or Hansen dams | Condition of construction contract | Impact GSSP#10: Inundation Related to Seismically Induced Dam Failure Could Endanger People or Structures During Construction.<br>Impact GSSP#13: Mine Conditions Could Pose Hazards During Construction. |

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| Hazardous Materials and Wastes | | | | | | | | | | |
| HMW-MM#1 | Limit handling of extremely hazardous materials near educational facilities. | Prior to construction, the contractor shall prepare a memorandum regarding construction BMPs for hazardous materials for the Authority's approval. The memorandum shall confirm that the contractor will not, within 0.25 mile of a school, use, handle or store any extremely hazardous substance (as defined in Cal. Public Res. Code Section 21151.4) or a mixture containing extremely hazardous substances in a quantity equal to or greater than the State threshold specified pursuant to subdivision (j) of Section 25532 of the Health and Safety Code. Prior to construction, signage shall be installed to delimit work areas within 0.25 mile of a school, informing contractors not to bring extremely hazardous substances into the area. The contractor shall be required to monitor use of extremely hazardous substances. The memorandum required by this measure shall be submitted to the Authority prior to construction involving an extremely hazardous substance.<br>During operations, no extremely hazardous substances or a mixture of extremely hazardous substances would be used in a quantity equal to or greater than the state threshold quantity (Health and Safety Code Section 25532) within 0.25 mile of a school. An operations plan shall be created by the Authority and coordinated with the educational facilities to document compliance. Additionally, ongoing monitoring during construction shall take place in compliance with Cal. Public Res. Code Section 21151.4. | Pre-construction/ Construction/Post-construction | Reporting/ Monitoring | Memorandum approved 30 days prior to start of construction; during construction, submit weekly reports or reporting requirements as established by the approved memorandum | Authority/ Contractor/ | Contractor | Hazardous materials memorandum | Hazardous materials memorandum and operation plan | Impact HMW#3: Potential for Handling Hazardous Materials or Waste Within 0.25 mile of an Educational Facility during Construction.<br>Impact HMW#8: Potential for Handling Hazardous Materials or Waste Within 0.25 mile of and Educational Facility during Operations |
| **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 | During the first 3 years of operation and maintenance, the Authority shall monitor response of local fire, rescue, and emergency service providers to incidents at stations and provide a fair share of cost of service for 5 years. Monitoring shall begin 1 year prior to planned opening of an HSR station. Service levels consist of the monthly volume of calls for fire and police protection, as well as county-, city- or fire protection–funded emergency medical technician or ambulance calls that occur in the station site service areas. | Post-construction | Monitor emergency response/Fair Share of Services Agreement | Annually | Authority | Authority | Monitoring of emergency response service levels beginning1 year before station opening and during station operation to determine baseline service demands, Fair share agreement | Authority to fund the Authority's fair share of services through fair share services agreement | Impact S&S#3: Permanent Interference with Emergency Response<br>Impact S&S#4: Interference with Emergency Response from Train Accidents and Increased Activity at Stations and Facilities. |

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| | | Prior to operation of the stations for HSR service, the Authority would 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 maintenance service areas (as established during the monitoring period). The fair share shall be based on projected passenger use for the first year of operations, with a growth factor for the first 5 years of operation. This cost-sharing agreement would include provisions for ongoing monitoring and future negotiated amendments as the stations expand or passenger use increases. Such amendments would be made on a regular basis for the first 5 years of station operation, as provided for in the agreement. To ensure that services are made available, fair share cost of service funds would not constitute the sole funding mechanism, although they may be used to fund capital improvements or fixtures (a police substation, additional fire vehicles, on-site defibrillators, etc.) necessary to service delivery.<br>After the first 5 years of operation, the Authority would 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 would consider the volume of ridership, past record and trends in service demand at the stations and maintenance sites, new local revenues derived from station area development, and services that the Authority may be providing at the station. | | | | | | | |
| **Socioeconomics and Communities** | | | | | | | | | | |
| SO-MM#1 | Implement measures to reduce impacts associated with the division of residential neighborhoods | Prior to construction (in residential areas) the Authority will minimize impacts in residential areas by conducting special outreach to affected homeowners and residents to understand their special relocation needs fully. The Authority will make efforts to locate suitable replacement properties that are comparable to those currently occupied by these residents, including constructing suitable replacement facilities if necessary.<br>In cases where residents wish to remain in the immediate vicinity, the Authority will take measures to purchase vacant land or | Pre-construction/ Construction/Post-construction | Coordination/ Reporting | Annual | Authority | Authority | Authority to provide compensatory mitigation The Authority will meet with affected residents and property owners and design appropriate measures to minimize impacts | Condition of construction contract | Impact SOCIO#2: Permanent Disruption to Community Cohesion or Division of Established Communities from Construction<br>Impact LU#3: Permanent Alterations to Existing and Planned Land Uses from Construction of the Build Alternatives. |

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| | | 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 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 noise barriers and landscaping, and potential uses for nonagricultural remnant parcels that could benefit the community in the long term). The Authority will document implementation of this measure through annual reporting. | | | | | | | | |
| SO-MM#2 | Implement measures to reduce impacts associated with the division of communities | Prior to construction (in mixed-use communities) the Authority will minimize impacts in the existing communities through a program of outreach to homeowners, residents, landowners, business owners, community organizations, and local officials in affected neighborhoods. The objective will be to maintain community cohesion and avoid physical deterioration. The Authority will evaluate the community's modified access, including the effectiveness of providing overcrossings or undercrossings of the HSR track to allow continued use of community facilities and connectivity. This includes the design of overcrossings or undercrossings to allow multimodal passage.<br>The Authority will also conduct community workshops about the future use of the areas beneath the rail guideway, where these areas would exist. These meetings will provide the community an opportunity to identify design and use options that could strengthen community cohesion and be consistent with the existing community character.<br>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 community's needs. | Pre-construction/ Construction/Post-construction | Reporting/Monitoring | Annually | Authority | Authority | Implement outreach programs and community workshops for impacted communities, implement identified measures | Condition of construction contract | Impact SOCIO#2: Permanent Disruption to Community Cohesion or Division of Established Communities from Construction.<br>Impact LU#3: Permanent Alterations to Existing and Planned Land Uses from Construction of the Build Alternatives. |

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| | | The Authority will present information at the workshops giving the community options for the future use of the area beneath or above the rail guideway and provide an opportunity for individuals to provide feedback and propose solutions. For example, if safety considerations prohibit such uses as bike paths or community gardens, alternatives, such as sculpture gardens or managed landscaping, could be considered. The Authority will consider comments and feedback in planning for the sites.<br>On gathering feedback from the community, the Authority will use the input and define solutions. The Authority will report the decisions at a public workshop and in a written report made available to the public.<br>The Authority will be responsible for implementing the measures to reduce impacts through project design and through the long-term management of the measures. 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 consistent 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 corridor improvements and how these costs will be paid will be determined during consultations with the affected jurisdictions or community organizations. Furthermore, the parties or entities (e.g., the Authority, local government, park or recreation district, nonprofit organization) responsible for ongoing maintenance of these community areas will be determined. The Authority will document compliance with this measure through annual reporting. | | | | | | | | |
| SO-MM#3 | Implement measures to reduce impacts associated with the relocation of important community facilities | Prior to construction, the Authority will minimize impacts resulting from the acquisition, displacement, and/or relocation of key community facilities.<br>The Authority will consult with the appropriate parties before land acquisition to assess potential opportunities to reconfigure land use and buildings and/or relocate affected facilities, as necessary, to minimize the disruption of facility activities | Pre-construction/ Construction | Reporting/ Monitoring | Annually | Authority | Authority | Consult with appropriate parties before property acquisition/ implement outreach programs and community workshops for impacted communities | Condition of construction contract | Impact LU#3: Permanent Alterations to Existing and Planned Land Uses from Construction of the Build Alternatives. |

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| | | and services and to provide for relocation that allows the community currently being served to continue to use these services.<br>The Authority will continue to implement a comprehensive non-English-speaking language outreach program as land acquisition begins. This program will facilitate the identification of approaches that will maintain continuity of operation and allow space and access for the types of services currently provided and planned for these facilities. To avoid disruption to these community amenities, the Authority will provide for reconfiguring land uses or buildings, or relocation of community facilities prior to demolishing existing structures. The Authority will document compliance with this measure through annual reporting. | | | | | | | | |
| **Station Planning, Land Use, and Development** | | | | | | | | | | |
| LU-MM#1 | California HSR System Station Area Development General Principles and Guidelines | Prior to station construction, the Authority shall document how Station Area Planning Agreements have been implemented with each station city. The California HSR System Station Area Development General Principles and Guidelines (February 3, 2011) describe the intended outcomes by the Authority for station cities. Upon review of each station city's plans, the Authority will determine if mitigation strategies (including consultant assistance) are necessary to assist station cities with implementation of station area plans to implement TOD strategies and value capture at and around the station. Station Area Planning documentation reports shall be produced to document mitigation measure compliance. | Pre-construction | Reporting | Prior to station construction | Authority | Authority | Authority will document how Station Area Planning Agreements have been implemented with each station city | Condition of construction contract | Impact LU#3: Permanent Alterations to Existing and Planned Land Uses from Construction of the Build Alternatives. |
| **Agricultural Farmland and Forest Land** | | | | | | | | | | |
| AG-MM#1 | Design Utility Corridors to Avoid Agricultural Lands | The Authority will design and build electrical utility corridors to avoid placing structures on agricultural lands. This will entail coordination with the farm owners to ensure that electrical utilities are placed on poles with powerlines that span agricultural land uses, within the identified project footprint, so that no agricultural land would be converted to a nonagricultural use either directly or indirectly. Electrical utility lines are generally spaced from 125 to 300 feet apart and can often span over 1,000 feet between towers. Therefore, the electrical utility line could span the parcel of farmland for at least a length of approximately 250 | Pre-construction/ Construction | Design/final design | Prior to construction | Authority/ Contractor | Authority/ Contractor | Authority will design and build electrical utility corridors to avoid placing structures on agricultural land. | Condition of construction contract | Impact AG#2: Permanent Conversion of Agricultural Land to Nonagricultural Land<br>Impact SOCIO#14: Permanent Effects on Agricultural Operations from Project Operations. |

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| | | feet without requiring conversion of farmland for the relocation of electrical towers. Utility easements would not affect existing agricultural operations and activities. | | | | | | | | |
| **Parks, Recreation, and Open Space** | | | | | | | | | | |
| PR-MM#1 | Temporary Restricted Access to Park Facilities during Construction | Prior to construction (ground-disturbing activities affecting trails), the contractor would prepare a technical memorandum documenting how connections to the unaffected trail portions and nearby roadways would be maintained during construction. The contractor would provide alternative access via a temporary detour of the trail using existing roadways or other public rights-of-way. The contractor would provide detour signage and lighting and would provide that the alternative routes meet public safety requirements. The technical memorandum would be submitted to the Authority for review and approval. | Design/Pre-construction | Technical memorandum | Prior to construction | Authority/ Contractor | Authority | Technical memorandum documenting measures taken to restrict park access | Condition of construction contract | Impact PK#2: Construction-Related Access, Noise, Vibration, Air Quality, and Visual Changes to Parks, Recreation, and Open Space Resources. |
| PR-MM#2 | Providing Park Access | Prior to construction (ground-disturbing activities affecting park access) the contractor shall prepare a technical memorandum documenting how the contractor would ensure that connections to the unaffected park portions or nearby roadways are maintained after construction. If a proposed linear park closure restricts connectivity, the contractor would provide permanent multimodal access using existing roadways or other public rights-of-way. The technical memorandum shall be submitted to the Authority for review and approval. | Pre-construction/Construction/ Post-construction/Operation | Technical memorandum | Prior to construction | Authority/ Contractor | Authority | Technical memorandum prior to construction | Condition of construction contract | Impact PK#2: Construction-Related Access, Noise, Vibration, Air Quality, and Visual Changes to Parks, Recreation, and Open Space Resources. |
| PR-MM#3 | Implement Standard Safety Measures | During construction, contractors would follow standard safety procedures to protect motorized and non-motorized traffic and maintain access to and from recreation resources. The following features would be provided, where feasible:<br>• Minimize closures to 3 days or less<br>• Coordinate construction noticing and detours with park operations and surrounding community where applicable (see also TRA-MM#C-1 and SS-IAMF#1)<br>• Provide detour signage and lighting to ensure that detour routes meet all public safety requirements (see also TRA-MM#C-1 and SS-IAMF#1)<br>• Install brightly colored fencing | Construction | Implement during construction | Weekly or at another appropriate interval | Contractor | Contractor | Follow standard safety procedures and implement safety features. | Condition of construction contract | Impact PK#2: Construction-Related Access, Noise, Vibration, Air Quality, and Visual Changes to Parks, Recreation, and Open Space Resources. |

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| | | • Install signage indicating closures and construction areas (see also TRA-MM#C-1 and SS-IAMF#1)<br>• Use overhead safety coverings or screens<br>• Provide safe detours of pedestrian and motorized traffic around construction areas<br>• If a proposed park closure restricts connectivity, provide alternative pedestrian and bicycle access via existing roadways or other public rights-of-way<br>• Maintain interrupted trail connectivity and park access over or around the HSR system when the Palmdale to Burbank Project Section is completed | | | | | | | | |
| PR-MM#4 | Develop and Implement a Trail Facilities Plan | Trail Facilities Plan—During final design, the Authority's project engineer would require the design-build contractor to develop a trail facilities plan addressing the short-term project impacts on existing trails within the construction limits of the Palmdale to Burbank Project Section. That plan would address:<br>• Identifying trails that would be closed temporarily and detoured during construction<br>• Preparing a public awareness and notification plan<br>• Temporarily closing portions of the following trails if the proposed extensions are operational at the time of project construction:<br>• Palmdale Hills Trail (Proposed Extension)<br>• Vasquez Loop Trail (Proposed Extension)<br>• Littlerock Trail (Proposed Extension)<br>• Acton Community Trail (Proposed Extension)<br>• Darrell Readmond Trail (Proposed Extension)<br>• Santa Clara River Trail (Proposed Extension)<br>• Rim of the Valley Trail (Proposed Extension)<br>• Developing and implementing detours for temporarily closed portions of trails | Pre-construction/ Construction/Post-construction | Prepare plan/implement plan | Prior to the initiation of construction; after restoration of trail access | Authority/ Contractor | Authority/ Contractor | Prepare Trail Facilities Plan; document restoration of access and connectivity | Condition of construction contract | Impact PK#2: Construction-Related Access, Noise, Vibration, Air Quality, and Visual Changes to Parks, Recreation, and Open Space Resources. |

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| | | • Phasing of temporary trail closures to allow for effective detours to maintain connectivity of these facilities around the construction areas<br>• Coordinating trail closures and detours with local jurisdictions having authority over those facilities<br>• Establishing criteria for identifying detour routes and facilities<br>• Providing informational signage for closures and detours<br>• Requiring compliance with Americans with Disabilities Act access during construction<br>• Maintaining signage for closures and detours throughout the closure period and replacing lost or damaged signage<br>• Restoring trails to their original or better condition at the completion of project construction<br>Temporary Closures of Trails—Prior to temporary closures of trails, the Authority's project engineer will require the design-build contractor to coordinate with the directors of the appropriate jurisdictions' public works and/or parks departments, or their representatives, to review the location of and need for each temporary trail closure. The Authority's project engineer would require the design-build contractor to develop detours for each closure in consultation with the public works and/or parks department directors or their representatives. Prior to and during construction activities that would require the temporary closure of a trail, the Authority's project engineer would require the design-build contractor to comply with and implement the procedures in the trail facilities plan, described above, for the affected trails.<br>Signage for Trail Detours and Closures—The Authority's project engineer would require the design-build contractor to develop detour signs, in consultation with the appropriate jurisdiction's public works and/or parks departments, notifying trail and bike lane users of the upcoming temporary facility closure and directing trail users to the temporary detour routes with estimated timeframes. Appropriate directional and informational signage would be provided by the Palmdale to Burbank Project Section | | | | | | | | |

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| | | design-build contractor prior to each closure and in a location to ensure that trail users would not have to backtrack to get to the detour routes.<br>Contact Information at Trail Detours—The Authority's project engineer would require the design-build contractor to provide detour signage that includes contact information for the Authority's project engineer and the design-build contractor, and that informs trail users to contact the Authority's project engineer and/or the design-build contractor with questions or concerns regarding upcoming or active temporary trail closures.<br>Restoration of Impacted Trail Segments—The Authority's project engineer would require the design-build contractor to return trail segments closed temporarily during construction to their original, or better, condition after completion of construction, prior to their return to the control of the applicable public works or parks department. After project construction, the Authority's project engineer would require the design-build contractor to document that access to and connectivity of the affected trails was restored.<br>Compliance with the Trails Facilities Plan—Compliance with the trails' facilities plan would be documented in the environmental commitments record with text, photographs, maps, and correspondence, as appropriate. | | | | | | | | |
| PR-MM#5 | Modifications to Recreational Uses | In the event a temporary impact area requires the temporary use of land at a park, recreation resource, or school play area that is used for recreation purposes, the Authority's project engineer would consult with the property owner/operator on two components: (1) whether the property owner/operator wants those recreation uses replaced temporarily or permanently elsewhere on the property; and (2) if temporary or permanent replacement of those recreation uses is desired, on modifications that could be made to the remaining recreation area on the property to temporarily or permanently replace the recreation uses displaced by the temporary impact area. Modifications to recreation areas outside the limits of a temporary impact area would be implemented prior to fencing and use of the temporary impact area. | Pre-construction/ Construction | Plan for temporary impact area | Prior to fencing and use of temporary impact area | Authority/ Contractor | Authority | Authority will consult with property owner/operator of any temporarily acquired land at a park, school, or open space. | Condition of construction contract | Impact PK#2: Construction-Related Access, Noise, Vibration, Air Quality, and Visual Changes to Parks, Recreation, and Open Space Resources. |

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| PR-MM#6 | Return of Land Used by Temporary Impact Areas to the Property Owners | The Authority's project engineer would require the design-build contractor to return the land use for each temporary impact area to the owner in its original or better condition when construction in an area has been completed and the temporary impact area is no longer needed. The Authority's project engineer would require the design-build contractor to coordinate the restoration of the affected land with the property owner and the project engineer. | Post-construction | Restoration of temporarily impacted land | Following use of an area for temporary impact area | Authority/ Contactor | Authority/ Contractor | Authority to turn land use for each temporary impact area back to the owner in same or better condition. | Condition of construction contract | Impact PK#1: Acquisition of Parks, Recreation, and Open Space Resources. |
| PR-MM#7 | Permanent Easement from Parks, Recreation Resources, and/or Trails | If a permanent easement (for the facility and facility maintenance access) is required across a park, recreation resource, and/or trail, the Authority would compensate for the loss of the park, recreation resource, and/or trail in accordance with the Uniform Act and the California Park Preservation Act. For resources whose acquisition are subject to the Act, the California Park Preservation Act requires that the compensation or land, or both, for the taking of the parkland and facilities be equal to1 of the following:<br>• The cost of acquiring substitute parkland of comparable characteristics, substantially equal size, and condition<br>• Substitute parkland of comparable characteristics, substantially equal size, and condition<br>• Any combination of substitute parkland and compensation in an amount sufficient to provide substitute parkland of comparable characteristics, substantially equal size, and condition<br>The Authority would consult with the property owner from whom the Authority requires that permanent easement of property regarding the specific conditions of acquisition, use of, and compensation for, or replacement or enhancement of, the park or recreation resource within the easement area, consistent with any applicable requirements of the California Park Preservation Act. | Pre-construction | Final design/ Consultation | Prior to obtaining permanent easement | Authority | Authority | Compensation to property owners for loss of recreation from permanent easement | Required by Uniform Act and California Park Preservation Act | Impact PK#1: Acquisition of Parks, Recreation, and Open Space Resources<br>Impact PK#3: Changes to Park, Recreation, and Open Space Resource Character. |
| PR-MM#8 | Permanent Changes to Access to Parks, Recreation Resources, and/or Trails | If permanent changes to vehicular, bicycle, or pedestrian access to a park or recreation resource are required, the Authority would ensure that connections to the unaffected park portions or nearby roadways would be maintained. If a proposed closure restricts connectivity to a park or recreation resource, the Authority would provide | Pre-construction | Final design/consultation | Prior to beginning construction and closure of any park or recreation resource | Authority | Authority | Authority would implement measures to ensure that connections to the unaffected park portions or nearby roadways would be maintained | Condition of construction contract | Impact PK#1: Acquisition of Parks, Recreation, and Open Space Resources<br>Impact PK#2: Construction-Related Access, Noise, Vibration, Air Quality, and Visual Changes to Parks, Recreation, and Open Space Resources. |

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| | | alternative access to ensure the park or recreation resource remains accessible prior to beginning construction and the closure of any park or recreation resource. The Authority would consult with the property owner regarding the specific conditions of the changes to access and compensation for, or replacement or enhancement of, the access driveways or parking areas at the recreation resource. | | | | | | | | Impact PK#3: Changes to Park, Recreation, and Open Space Resource Character.<br>Impact PK#4: Increased or Decreased Use of Parks, Recreation, and Open Space Resources. |
| PR-MM#9 | Permanent Acquisition of Public Property from Land and/or Trails Planned for Public Recreational Use | For planned recreation resources, final design of the HSR Build Alternatives would continue minimize right-of-way impacts at planned parks, bike paths, and recreation resources. The Authority would continue work with the relevant jurisdictions on the establishment of appropriate compensation and relocation/realignment of a resource or additional property to accommodate the displaced planned park and recreational uses as a result the HSR system. Mitigation may include preparing a plan for designing planned recreation uses to be consistent with the HSR facility, or compensation for the loss of the land in accordance with PR-MM #7, to ensure that there would be no net loss of park, recreation, or open space resources. | Pre-construction | Design/Final design | Prior to construction | Authority | Authority | Continue to minimize right-of-way impacts at planned parks; ensure that there would be no net loss of park, recreation, or open space resources | Condition of construction contract | Impact PK#1: Acquisition of Parks, Recreation, and Open Space Resources.<br>Impact PK#3: Changes to Park, Recreation, and Open Space Resource Character. |
| **Aesthetics and Visual Quality** | | | | | | | | | | |
| AVQ-MM#1 | Minimize Visual Disruption from Construction Activities | Prior to construction (any ground-disturbing activity), the contractor will prepare a technical memorandum identifying how the Palmdale to Burbank Project Section would minimize construction-related visual/aesthetic disruption and include the following activities:<br>• Minimize pre-construction clearing to that necessary for construction.<br>• Limit the removal of buildings to those that would obstruct project components.<br>• When possible, preserve existing vegetation, particularly vegetation along the edge of construction areas that may help screen views.<br>• After construction, regrade areas disturbed by construction, staging, and storage to original contours and revegetate with plant material in compliance with local jurisdictional requirements. If no local jurisdictional requirements exist, replace removed vegetation at a 1:1 replacement ratio | Pre-construction | Reporting/ Monitoring | Prior to construction | Contractor | Contractor | Implement a variety of control measures during design and construction to minimize visual/aesthetic disruption; technical memorandum prior to construction | Contract requirements/ specifications | Impact AVQ#1: Temporary Construction Impacts on Existing Visual Quality.<br>Impact AVQ#3: Temporary Construction Impacts on Scenic Vistas and Drives. |

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| | | for shrubs and small trees, and a 2:1 replacement ratio for mature trees. For example, if the contractor removes 10 mature trees in an area, replant 20 younger trees that, within 5 to 15 years (depending on the growth rates of the trees), would be of a height and spread to provide visual screening similar to the visual screening provided by the trees that were removed for construction. Replaced shrubs would be minimum 5-gallon containers and replaced trees will be minimum 24-inch box and minimum 8 feet in height.<br>• To the extent feasible, do not locate CSAs within the immediate foreground distance (0 to 500 feet) of existing residential neighborhoods, recreational areas, or other land uses that would include highly sensitive viewers. Where such siting would be unavoidable, screen staging sites from viewers using appropriate solid screening materials such as temporary fencing and walls. The contractor will paint over or remove any graffiti or visual defacement of temporary fencing and walls within 5 business days of it occurring.<br>The technical memorandum would be submitted to the Authority for review and approval. | | | | | | | | |
| AVQ-MM#2 | Minimize Light Disturbance during Construction | Prior to construction (any ground-disturbing activity requiring nighttime construction), the contractor will prepare a technical memorandum verifying how they will shield nighttime construction lighting and direct it downward in such a manner to minimize light that falls outside the construction site boundaries. The technical memorandum will be submitted to the Authority for review and approval. | Pre-construction | Reporting/ Monitoring | Monthly | Contractor | Contractor | Technical memorandum on shielding nighttime construction lighting | Contract requirements/ specifications | Impact AVQ#2: Temporary Construction Impacts from Light and Glare. |
| AVQ-MM#3 | Incorporate Design Aesthetic Preferences into Final Design and Construction of Non-Station Structures | Prior to construction (any ground-disturbing activity), the contractor shall work with the Authority and local jurisdictions to incorporate the Authority-approved aesthetic preferences for non-station structures into final design and construction. Refer to Aesthetic Review Process for Non-Stations Structures (Authority 2013). A technical memorandum will be submitted to the Authority to document compliance. | Pre-construction/Design | Reporting/ Monitoring | Final Design | Contractor and Authority | Contractor and Authority | Work with Authority and local jurisdictions to incorporate aesthetic preferences for non-station structures | Contract requirements/ specifications | Impact AVQ#4: Permanent Construction Impacts on Visual Quality. |

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| AVQ-MM#4 | Provide Vegetation Screening Along At-Grade and Elevated Guideways Adjacent to Residential Areas | Prior to operation and maintenance of HSR, the contractor shall plant trees (minimum 24-inch box and 8 feet in height) along the edges of the HSR rights-of-way in locations adjacent to residential areas to visually screen the elevated guideway and the residential area. The species of trees to be installed will be selected based on their mature size and shape, growth rate, hardiness, and drought tolerance. No species on the Invasive Species Council of California's list (ISCC 2010) would be planted. On maturity, the crowns of trees used would be tall enough to partially, or fully, screen views of the elevated guideway from adjacent at-grade areas. On maturity, trees would allow ground-level views under the crowns (with pruning if necessary) and will not interfere with the 15-foot clearance requirement for the guideway. The trees will be maintained. Irrigation systems would be installed within the tree planting areas.<br>The contractor will prepare a technical memorandum within 90 days of completing any construction section or segment documenting the species of trees that were incorporated into the edges of the HSR right-of-way adjacent to residential uses. The technical memorandum will be submitted to the Authority to document compliance. | Construction/Post-construction | Reporting | Prior to operation within 90 days of completing any construction section or segment | Contractor and Authority | Contractor | Prior to operation, plant trees for screening along the edge of HSR rights-of-way adjacent to residential areas; report within 90 days of completing any construction section or segment documenting the species of trees that were incorporated into design | Contract requirements/ specifications; landscaping, and maintenance will be provided by the Contractor for its scope of work until completion of the work at which time the Authority shall assume responsibility for landscaping or assign the responsibility to other third parties. | Impact AVQ#4: Permanent Construction Impacts on Visual Quality. |
| AVQ-MM#5 | Replant Unused Portions of Land Acquired for the HSR | Prior to operations and maintenance, the contractor will plant vegetation within land acquired for the Palmdale to Burbank Project Section (e.g., shifting roadways) that is not used for the HSR or related supporting infrastructure, or other higher or better use. Plantings will allow adequate space between the vegetation and the HSR alignment and catenary lines. All street trees and other visually important vegetation removed in these areas during construction would be replaced with similar vegetation that, on maturity, would be similar in size and character to the removed vegetation. Replaced shrubs would be minimum 5-gallon containers and trees will be minimum 24-inch box and 8 feet in height. The Authority will provide for continuous maintenance with appropriate irrigation systems. The contractor will install the irrigation system within the planting areas. No species listed on the Invasive | Post-construction/ Pre-operations | Reporting | Prior to operation and maintenance; monthly reporting | Authority | Authority | Plant vegetation and provide appropriate irrigation prior to operation and maintenance; monthly reporting | Authority to implement appropriate maintenance plan | Impact AVQ#4: Permanent Construction Impacts on Visual Quality. |

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| | | Species Council of California's list of invasive species would be planted. | | | | | | | | |
| AVQ-MM#6 | Screen Traction Power Supply Stations and Radio Communication Towers | Within 90 days of completing station construction, the contractor will screen from public view the TPSSs (located at approximately 30-mile intervals along the HSR guideway), including radio towers where required, through the use of landscaping or solid walls or fences. This screening will consist of context-appropriate landscaping of a type and scale that does not draw attention to the station or feature. Plant species will be selected based on their mature size and shape, growth rate, hardiness, and drought tolerance. No species on the Invasive Species Council of California's list will be planted. The landscaping will be continuously maintained, and appropriate irrigation systems will be installed within the landscaped areas. Walls would be constructed of cinderblock, 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.<br>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.<br>The contractor will prepare a technical memorandum documenting how the requirements in this measure were implemented. The technical memorandum will be submitted to the Authority to document compliance. | Construction/Post-construction | Reporting | Annually | Contractor | Contractor | A Traction Power Substations (TPPS) shall be screened. | Contract requirements/ specifications | Impact AVQ#4: Permanent Construction Impacts on Visual Quality. |
| **Cultural Resources** | | | | | | | | | | |
| CUL-MM#1 | Mitigate adverse effects to archaeological and built-environment resources identified during phased identification and comply with the stipulations regarding the treatment of archaeological and historic built resources in the PA and MOA | Once parcels are accessible and surveys have been completed, including consultation as stipulated in the MOA, additional archaeological and built-environment resources may be identified. For newly identified eligible properties that would be adversely affected, the following process will be followed, which is presented in detail in the BETP and ATP:<br>• The Authority will consult with the MOA signatories and concurring parties to determine the preferred treatment of the properties/resources and appropriate mitigation measures. | Pre-construction/ Construction | Reporting | Weekly | Contractor/ Authority | Contractor/ Authority | Pre-construction surveys and construction/weekly reporting or as dictated by the ATP, BETP, and the MOA | PA | Impact CUL#1: Effects on Known Archaeological Resources Caused by Construction Activities.<br>Impact CUL#2: Effects on Unknown Archaeological Resources Caused by Construction Activities.<br>Impact CUL#3: Effects on Human Remains Discovered during Construction Activities. |

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| | | • 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 Section 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 Section 15126.4(b)(3)(C).<br>• Should data recovery be necessary, the contractor's Principal Investigator (PI), in consultation with the MOA signatories and consulting parties, would prepare a data recovery plan for approval from the Authority and in consultation with the MOA signatories. On approval, the contractor's PI will implement the plan.<br>• For archaeological resources, the Authority shall also determine if the resource is a unique archaeological site under CEQA. If the resource is not a historical resource but is an archaeological site, the resource shall be treated as required in Cal. Public Res. Code Section 21083.2 by following protection, data recovery, and other appropriate steps outlined in the ATP. The review and approval requirements for these documents is outlined in the ATP.<br>• For historic built resources, the contractor's PI will amend the BETP to include the treatment and mitigation measures identified by the Authority in consultation with the MOA signatories and concurring parties. The contractor's PI will implement the treatment and mitigation measures accordingly. | | | | | | | | |
| CUL-MM#2 | Halt work in the event of an archaeological discovery, and comply with the PA, MOA, ATP, and all state and federal laws, as applicable | During construction (i.e., ground-disturbing activities, including cleaning and grubbing) should there be an unanticipated discovery, the contractor shall follow the procedures for unanticipated discoveries as stipulated in the PA, MOA, and associated ATP. The procedures must also be consistent with the following: the SOI's Standards and Guidelines for Archaeology and Historic Preservation (48 Fed. Reg. 44716-42), as amended by the National Park Service, and | Construction | Reporting | During construction | Contractor/ Authority | Contractor | Daily logs during active monitoring | ATP/MOA | Impact CUL#2: Effects on Unknown Archaeological Resources Caused by Construction Activities.<br>Impact CUL#3: Effects on Human Remains Discovered during Construction Activities. |

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| | | Guidelines for the Implementation of CEQA, as amended. Should the discovery include human remains, the contractor and the Authority shall comply with federal and state regulations and guidelines regarding the treatment of human remains, including relevant sections of the Native American Graves Protection and Repatriation Act (3l(d)); California Health and Safety Code, Section 8010 et seq.; and Cal. Public Res. Code Section 5097.98; and consult with the NAHC, tribal groups, and the SHPO.<br>In the event of an unanticipated archaeological discovery, the contractor will cease work in the immediate vicinity of the find, based on the direction of the archaeological monitor or the apparent location of cultural resources if no monitor is present. If no qualified archaeologist is present, no work can commence until it is approved by the qualified archaeologist in accordance with the MOA, ATP, and monitoring plan. The contractor's qualified archaeologist will assess the potential significance of the find and make recommendations for further evaluation and treatment as necessary. These steps may include evaluation for the CRHR and NRHP, and necessary treatment to resolve significant impacts if the resource is a historical resource or historic property. If, after documentation is reviewed by the Authority, and they determine it is a historic property and the SHPO concurs that the resource is eligible for the NRHP, or the Authority determines it is eligible for the CRHR, preservation in place shall be considered by the Authority in the order of priority provided in CEQA Guidelines Section 15126.4(b)(3) and in consultation with the signatories and consulting parties to the MOA. If data recovery is the only feasible mitigation, then the contractor's qualified PI shall prepare a data recovery plan as required under CEQA Guidelines Section 15126.4(b)(3)(C), the MOA, and ATP, for the Authority's approval.<br>The contractor shall notify the Authority, who shall notify the CSLC, if the find is a cultural resource on or in the submerged lands of California and consequently under the jurisdiction of the CSLC. The Authority will comply with all applicable rules and regulations promulgated by CSLC with | | | | | | | | |

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| | | respect to cultural resources in submerged lands.<br>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 NAHC to identify the most likely descendant (MLD). The MLD shall be empowered to reinter the remains with appropriate dignity. If the MLD fails to make a recommendation, the remains shall be reinterred in a location not subject to further disturbance and the location shall be recorded with the NAHC and relevant Information Center of the California Historical Resources Information System.<br>If human remains are part of an archaeological site, the Authority and contractor shall, in consultation with the MLD and other consulting parties, consider preservation in place as the first option, in the order of priority called for in CEQA Guidelines Section 15126.4(b)(3).<br>In consultation with the relevant Native American tribes, the Authority may conduct scientific analysis on the human remains if called for under a data recovery plan and amenable to all consulting parties. The Authority will work with the MLD to satisfy the requirements of Cal. Public Res. Code Section 5097.98. Performance tracking of this mitigation measure would be based on successful implementation and acceptance of the documentation by the SHPO and appropriate consulting parties. | | | | | | | |
| CUL-MM#3 | Implement other mitigation for effects to precontact archaeological sites | Palmdale to Burbank Project Section, the Authority's ability to fully identify and evaluate archaeological resources within the archaeological APE has, correspondingly, also been limited. Thus, most of the archaeological APE has not been subject to archaeological field inventories. As pedestrian field surveys are a necessary component of the archaeological resource identification and evaluation effort, the commitment to complete the field surveys, prior to ground-disturbing activities associated with the project, is codified in the MOA that has | Pre-construction | Pre-construction surveys | Prior to ground-disturbing activities | Authority | Authority | Conduct archaeological surveys prior to ground-disturbing activities | ATP/MOA | Impact CUL#1: Effects on Known Archaeological Resources Caused by Construction Activities.<br>Impact CUL#2: Effects on Unknown Archaeological Resources Caused by Construction Activities.<br>Impact CUL#3: Effects on Human Remains Discovered during Construction Activities. |

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| | | been completed as a condition of this Final EIR/EIS (Authority 2019h).<br>Access to previously inaccessible properties to complete the archaeological resource identification effort is expected to be available after the ROD, during the design-build phase of the Palmdale to Burbank Project Section. However, due to the design constraints associated with constructing a high-speed train, the ability to shift the alignment to avoid newly identified archaeological resources at this late phase of the project delivery process is substantially limited or unlikely because the alignment is already established. As such, impacts/effects on as-of-yet-unidentified significant archaeological resources as a result of the Palmdale to Burbank Project Section are anticipated; however, the nature and quantity of such effects remains unknown until completion of the archaeological field identification and evaluation effort, and after all ground-disturbing construction activities are complete.<br>Protocols for the identification, evaluation, treatment, and data recovery mitigation of yet-to-be-identified archaeological resources are addressed in the MOA and ATP. Efforts to develop meaningful mitigation measures for effects on as-of-yet-unidentified Native American archaeological resources that cannot be avoided would be negotiated with the tribal consulting parties. Measures that are negotiated among the MOA signatories and tribal consulting parties will be the responsibility of the Authority to implement. | | | | | | | | |
| CUL-MM#4 | Minimize adverse effects to archaeological resources through BMPs | The Authority-prepared MOA and ATP may identify archaeological sites and resources that may be protected-in-place through implementation of BMPs for standard practice maintenance and utility connections to reduce ground disturbance activities (i.e., aboveground utility lines and overhead electrical connections). | Pre-construction | Reporting | Monthly or as needed | Authority | Authority | MPA and ATP may identify protected archaeological sites and resources | ATP/MOA/BMPs | Impact CUL#1: Effects on Known Archaeological Resources Caused by Construction Activities. |
| CUL-MM#5 | Minimize adverse effects to Blum Ranch through consultation with SHPO | In the event the E1, E1A, E2 or E2A Build Alternatives are selected, prior to construction, the Authority will be required to consult with the SHPO and the owner of Blum Ranch to develop protection measures to minimize effects on the visual integrity of the Blum Ranch viewshed. The alternative design measures would modify | Pre-construction | Design/Ffinal design | Prior to construction activities | Authority | Authority | Development of protection measures for Blum Ranch | Contract requirements and specifications | Impact CUL#4: Effects to Historic Built Resources Caused by Construction Activities. |

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| | | the color and design of the HSR structure and portal visible from the historic resources. Implementation of such visual modifications would minimize the contrast between the HSR structure and its surroundings within Aliso Canyon, and thus, the visual impact on Blum Ranch. | | | | | | | | |
| CUL-MM#6 | Construction Protocols for the Preservation of Eagle and Last Chance Mine Road | To preserve the integrity of the roadway and facilitate its restoration to pre-construction conditions, the road would be covered with geofabric before laying asphalt. Furthermore, asphalt would be removed following construction of the project. | Construction/Post-construction | Roadway covering with geofabric material | Prior to construction activities/Prior to asphalt covering/Post-construction | Contactor | Contactor | Preserve Eagle and Last Chance Mine Road | Contract requirements and specifications | Impact CUL#4: Effects to Historic Built Resources Caused by Construction Activities. |
| **Environmental Justice** | | | | | | | | | | |
| EJ-MM#1 | Pre-Construction EJ Community Review and Authority EJ Ombudsman Approval of final Construction-Phase Noise Mitigation and Monitoring Measures Program | The Authority's contractor will be required to submit its proposed and draft construction Noise Monitoring Program (required by N&V-MM#1) to the Authority and the Authority's EJ ombudsman (as this position is defined in EJ-IAMF#1). On the Authority and the Authority's EJ ombudsman's approval, the Authority's contractor will be required to ensure the draft Noise Monitoring Program (Program) is posted on the Authority's website. The posted, draft Program shall include all the Contractor's proposed construction noise mitigations and its proposed Noise Monitoring Program and shall be provided for community review and input in advance of construction start for community comment. The draft Program shall be posted no later than the advance period determined by the Authority's EJ ombudsman.<br><br>Additionally, concurrent with the posting of the proposed draft Program on the Authority's website, the Authority's contractor shall distribute, for public review and comment, a copy of the draft Program to all community, neighborhood, and environmental justice organizations and affected individuals identified by the Authority's EJ ombudsman.<br><br>Prior to determining (1) the advance periods for public posting of the Contractor's draft noise mitigations and monitoring program, (2) the noise monitoring locations, and (3) the outreach required by the Contractor for the draft program, the Authority's EJ ombudsman shall conduct direct outreach activities to solicit input from affected | Pre-construction | Plan implementation | Prior to final design | Authority/ Ombudsman | Authority | Ensure that the Contractor's final Noise Monitoring Program considers substantive concerns from affected communities experiencing potentially disproportionately high and adverse construction noise. | Condition of design- build contract. | Noise and Vibration |

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| | | communities on their preferences in these three topic areas. Such outreach shall include, at minimum, affected neighborhoods in Pacoima, Sun Valley and any other community that the Authority determines may be affected by potentially disproportionately high and adverse construction noise, absent mitigation.<br><br>• The Contractor's EJ liaison (as this position is defined in EJ-IAMF#1) and the Authority's EJ ombudsman shall review all public comments received by any posted comment deadline. The Contractor's EJ liaison shall propose to the Authority EJ ombudsman revisions to the draft Program to address substantive comments and concerns received from potentially affected communities. The Authority EJ ombudsman shall make the final determination as to the sufficiency of the revised, draft Program in addressing comments received from affected communities. That final determination shall include the EJ ombudsman's decision on all noise monitoring locations in the Program. The Contractor's EJ Liaison may not finalize or implement the Program (required under N&V-MM#1) until written approval from the Authority EJ ombudsman is received. | | | | | | | | |
| EJ-MM#2 | Pre-Construction Environmental Justice Air Quality Emissions Analysis and Mandatory Community Input on Potential Emissions Reductions and Reduction Exposure Measures | Through a letter agreement between the SCAQMD and the Authority for AQ-MM#1, the Authority committed to submitting an updated construction-phase air quality emissions estimate to the SCAQMD, after the Authority's receipt of funding for construction of this project section. Additionally, the Authority has committed to best available technology measures and best practices to reduce emissions from project construction. AQ-MM#3 sets goals for the Authority construction contractor's use of Zero Emission (ZE) and/or Near Zero Emission (NZE) Vehicles and off-road equipment (a minimum goal of 10%).<br>To ensure that the Authority avoids disproportionate and adverse air quality effects on environmental justice | Preconstruction | Final Design | Prior to construction activities | Authority | Authority | Prepare an updated construction-phase air quality emissions estimate and an environmental justice air quality analysis for any emissions exceedances. | Condition of design- build contract | Air Quality and Global Climate Change |

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| | | communities, the Authority commits as follows.<br>Although the Authority's air quality emissions estimates in this EIR/EIS are conservative and do not model the Authority's commitment to using latest technologies, the Authority has committed to implement best available technology measures and best practices to reduce emissions from project construction. AQ-MM#3 sets goals for the Authority construction contractor's use of Zero Emission (ZE) and/or Near Zero Emission (NZE) Vehicles and off-road equipment (a minimum goal of 10%).<br>Through a letter agreement between the SCAQMD and the Authority for AQ-MM#1, the Authority committed to submitting an updated construction-phase air quality emissions estimate to the SCAQMD, after the Authority's receipt of funding for construction of this project section.<br>If the Authority's updated estimate submitted to the SCAQMD presents exceedances of CAAQs or NAAQs standards, then the Authority shall concurrently prepare and publicly circulate an environmental justice air quality analysis of those emissions exceedances. The environmental justice analysis shall assess whether project section emissions exceedances may disproportionately and adversely affect minority and/or low-income communities and shall also propose all feasible measures to reduce and mitigate any exceedances. The Contractor's EJ Liaison (as this position is defined in EJ-IAMF#1) shall ensure that the draft environmental justice air quality analysis is distributed to potentially affected communities for review and comment. Organizations receiving the draft analysis shall include the Los Angeles Unified School District and all schools, organizations and individuals identified by the Authority EJ ombusdsman.<br>The draft environmental justice air quality analysis shall:<br>• Attach a copy of the letter agreement between the South Coast Air Quality Management District and the Authority's revised emissions estimates submitted to SCAQMD, | | | | | | | | |

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| | | • Specifically identify the proposed on-road, off-road, and other construction equipment technology proposed to be used, state whether such technology represents the best available technology, and if no, explain why the best available technology is not feasible,<br>• State what percentage of the Contractor's total on-road and off-road construction vehicles and equipment are zero emissions, and<br>• If zero emissions technology or best available technology is not proposed at percentages that meet AV-MM#3 goals, the Authority's draft environmental justice air quality analysis shall disclose this fact and shall propose additional feasible emissions reductions measures and/or exposure reduction measures for communities affected by the exceedances.<br>The draft environmental justice air quality analysis shall be circulated for a minimum 30-day public review period.<br>The Contractor's EJ Liaison shall review all timely-submitted public comments and shall propose revisions to its proposed emissions reductions and/or exposure reduction measures, vehicles and/or equipment to address concerns. The Contractor's EJ Liaison shall revise the draft environmental justice air quality analysis accordingly and submit the final environmental justice air quality analysis to the Authority's EJ ombudsman.<br>The Authority's EJ ombudsman shall make the final determination as to the adequacy of the Contractor's revisions and as to the adequacy of the revised environmental justice air quality analysis and any additional measures proposed by the Contractor to reduce emissions. The Authority's EJ ombudsman may, in their discretion, require additional public review of the Contractor's proposed revisions. The Authority's Contractor may not begin construction on a job site until written approval from the Authority's EJ ombudsman is received as to the adequacy | | | | | | | | |

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| | | of the environmental justice air quality analysis and proposed measures to reduce emissions or to reduce exposure to emissions.<br>. | | | | | | | | |
| OMM #1 | Construction Jobs and Opportunities, Training and Workforce Development | The Authority's Regional Workforce Development Board and EJ ombudsman (defined in EJ-IAMF#1) shall develop a Construction Pre-Apprentice Training Program to provide pre-apprenticeship classes and hands-on construction training to EJ communities with potential disproportionately high and adverse effects. The program shall also include special recruitment and project construction job set-aside programs to offset any impacts to jobs associated with business displacements within those EJ communities. The program(s) shall be developed with feedback, input and suggestions made by the EJ communities during community roundtables held by the EJ ombudsman. The Authority shall involve Pacoima Beautiful as part of this program to consider support of its Workforce Development and Economic Opportunities Plan, administered through Los Angeles City College, in cooperation with the Building Trades Council, Plumbers, Cement Masons, Iron Workers, Teamsters, Sheet Metals Workers, Pipefitters, Electricians and Operating Engineers Building Trades Unions. Further, the Authority shall periodically distribute an updated Jobs Fact Sheet and provide press releases that report achieved construction job creation milestones resulting from dispatching workers to build the high-speed rail system. This Jobs Fact Sheet would include the most recent information regarding the National Targeted Hiring Initiative and the total number of minority and/or low-income workers. | Pre-construction | Program development/coordination | Prior to construction | Authority | Authority | Coordinate with local agencies to develop a special training program for disproportionately affected EJ communities. | Condition of design-built contract | Socioeconomic Impacts. effects described in Chapter 5, Environmental Justice, Table 5-25. |
| OMM #2 | Community Connectivity Enhancements and Workshop | The Contractor's EJ liaison shall work with the Authority EJ ombudsman to hold community roundtables in neighborhoods identified in Chapter 5, Environmental Justice (Table 5-25) of the Final EIR/EIS, to seek input on locally desired pedestrian connectivity enhancements prior to the development of 60% Design Plans. Feasible enhancements shall be considered by the Authority (e.g., sidewalk continuity improvements, tree planting, bulb- | Pre-construction | Community outreach/Monitoring / Design | Quarterly | Authority ombudsman /Contractor liaison | Authority ombudsman /Contractor liaison | Conduct community roundtables for input on project designs at 60%. | Community outreach | Socioeconomic Impacts. effects described in Chapter 5, Environmental Justice, Table 5-25. |

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| | | outs/corner extensions, high visibility crosswalks, reflective/high visibility stop signs, lighting, decorative crosswalks, or pedestrian crosswalk motion sensors) for implementation and incorporated into project plans. | | | | | | | | |
| OMM #3 | Safety and Montague Street Improvements | For the SR14A Build Alternative, the Contractor's EJ liaison shall work with the Authority EJ ombudsman to hold community roundtables to seek input on locally desired safety improvements at Montague Street (in Pacoima) and in all neighborhoods identified in Chapter 5 (Table 5-25) of the Final EIR/EIS for this Offsetting Mitigation Measure, prior to the development 60% Design Plans. Feasible safety improvements shall be considered by the Authority (e.g., traffic calming such as speed humps/tables, tree planting, sidewalk continuity improvements, bulb-outs/corner extensions, painted crosswalks, reflective/highly visible stop signs, reduced speed limits) for incorporation into project plans, acknowledging limited right-of-way space of approximately 40 feet from curb to curb. | Pre-construction | Community outreach/Monitoring / Design | As needed | Authority ombudsman /Contractor liaison | Authority ombudsman /Contractor liaison | Conduct community roundtables for input on project designs at 60%. | Community outreach | Socioeconomic Impacts. effects described in Chapter 5, Environmental Justice, Table 5-25. |
| OMM #4 | Intermediate Window (SR14-W2), Conveyor Belt Usage Requirements and School Coordination | The Pacoima and Sun Valley Construction Safety Transportation Management Plan (CSTMP) subsections and Transportation Construction Management Plan (TCMP; per TR-MM#12), shall address all project components within a ½-mile radius of Broadus Elementary School and Roscoe Elementary School, emergency vehicle access, temporary road closures, spoils hauling routes, circulation and intermodal connections for travel during the duration of construction. During plan development, the Contractor's EJ liaison shall coordinate with the Authority EJ ombudsman to conduct outreach, hold community roundtables, and seek feedback from LAUSD (with regards to Broadus Elementary School and Roscoe Elementary School) and the communities identified in Table 5-25 of Chapter 5 of the Final EIR/EIS (e.g. Pacoima and Sun Valley communities).<br>The Contractor's EJ liaison shall provide a copy of the draft CSTMP and TCMP to the Authority's EJ ombudsman and then shall provide a copy of these draft plans to communities (listed in Table 5-25) for their review and input in advance of implementing the Plans. The Authority's EJ ombudsman shall determine minimum | Pre-construction/construction | Coordination/Monitoring/Reporting | As needed community outreach; quarterly monitoring and reporting | Authority ombudsman /Contractor liaison | Authority ombudsman /Contractor liaison | Community review of draft CSTMP and TCMP and implement measures to construct conveyor belt | Community outreach | Socioeconomic Impacts. effects described in Chapter 5, Environmental Justice, Table 5-25. |

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| | | advance periods, individuals/organizations receiving the draft, and the community input that must be included in the Authority Contractor's final plans.<br>The Contractor's EJ liaison shall provide written confirmation of compliance with the Authority EJ Ombudsman's instructions at least1 1week before the Contractor implements the Plans. Within 1-week of the close of each quarterly reporting cycle, the Contractor's EJ liaison shall provide the Authority's EJ ombudsman with reports documenting compliance with CSTMP and TCMP requirements and implementation activities.<br>For any construction hauling (including spoils hauling) or construction water truck deliveries within a ½ mile radius surrounding Broadus Elementary or Roscoe Elementary schools, the Contractor shall include the following measures in the CSTMP or the TCMP after seeking the aforementioned feedback from LAUSD through the EJ ombudsman.<br>• Crossing guards and flagging<br>• Up to 5 daily week-day hours of non-operation, immediately before and immediately after school hours as indicated by LAUSD (typically 8:00am to 2:24 pm – Mon, Wed, Thurs, Fri; 8:00am to 1:24 pm – Tues)<br>• Mandatory designated construction vehicle/truck route(s) used during school drop-off/pickup and peak hours<br>• Intersection restrictions on construction hauling and construction water trucks during school hours. For Broadus Elementary, construction traffic restrictions shall be in place at the intersections of Bromont Avenue/Filmore Street and Dronfield Avenue/Montford Street. For Roscoe Elementary, construction traffic restrictions shall be in place at the intersection of Stratham Street/Riverton Avenue. The LAUSD shall have authority to change these intersection restrictions, during the required local roads' encroachment permit process approval of the necessary local road encroachment permit.<br>• The tunnel south of Broadus Elementary School shall be excavated | | | | | | | | |

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| | | from south to north to allow for conveyor belt transportation of appropriate spoils directly to Boulevard Mine. If the tunnel north of the school is excavated from south to north and concurrent with the tunnel to the south, appropriate spoils from the northerly excavation shall be stockpiled during peak school traffic hours identified by LAUSD, in construction staging/laydown areas adjacent to the intermediate window (IW), prior to truck transportation occurring outside of the peak school traffic hours. Conveyor belt transportation of all appropriate soils from the tunnel north of the school shall occur during all construction hours, immediately after the tunnel south of the school has been excavated. These requirements for the tunnel north of the school shall be in effect only in the event of contractor selection of IW SR14-W2.<br>• Depending on phasing and direction of drilling near Roscoe Elementary School, the trench near Portal 11 shall be considered as a temporary stockpile location for appropriate spoils prior to transportation. For drilling, both north and south of Portal 11, the Contractor shall primarily use Boulevard Mine as a disposal site, accessed through Portal 10.<br>Prior to the commencement of each subsequent construction phase, the Contractor's EJ liaison shall seek additional input from LAUSD schools in EJ communities (as identified in Table 5-25 of Chapter 5 of the Final EIR/EIS), through the Authority EJ ombudsman. The CSTMP shall be reviewed by the Authority EJ ombudsman and then subsequently by LAUSD for each of the phases of construction (discussed in TR-IAMF#2) and LAUSD may request updates or refinements to the CSTMP for the next construction phase. | | | | | | | |
| **Regional Growth** | | | | | | | | | | |
| There are no mitigation measures required. | | | | | | | | | | |

Notes"

[1] Additional details regarding the listed Transportation Mitigation Measures are included in ages 3.2-117 through 3.2-121 of the Final EIR/EIS.

[2] References to Berg,2012 are listed on page 12-32 of the Final EIR/EIS.

| Mitigation Measure | Title | Mitigation Text | Phase | Implementation Action | Reporting Schedule | Implementing Party | Reporting Party | Implementation Text | Implementation Mechanism | Impact # and Impact Text |
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|---|---|
| ADA | American Disabilities Act |
| APE | area of potential effects |
| ATP | Archaeological Treatment Plan |
| Authority | California High-Speed Rail Authority |
| AVAQMD | Antelope Valley Air Quality Management District |
| AVEK | Antelope Valley-East Kern Water Agency |
| BETP | built environment treatment plan |
| BMP | best management practice |
| BRMP | Biological Resources Management Plan |
| C.F.R. | Code of Federal Regulations |
| Cal. Public Res. Code | California Public Resources Code Caltrans California Department of Transportation |
| CDFW | California Department of Fish and Wildlife |
| CEQA | California Environmental Quality Act |
| CESA | California Endangered Species Act |
| CFGC | California Fish and Game Code |
| CHRIS | California Historical Resources Information System |
| CMP | Construction Management Plan |
| CRHR | California Register of Historical Resources |
| CWA | Clean Water Act |
| dB | decibels |
| dBA | A-weighted decibels |
| EMI | electromagnetic interference |
| EMF | electromagnetic field |
| FESA | Federal Endangered Species Act |
| HSR | High-Speed Rail |
| IAMF | impact avoidance and minimization feature |
| LADWP | Los Angeles Department of Water and Power |
| LAUSD | Los Angeles Unified School District |
| Leq | equivalent sound level |
| LOS | level-of-service |
| MBTA | Migratory Bird Treaty Act |
| Metro | Los Angeles County Metropolitan Transportation Authority |
| MOA | memorandum of agreement |
| MOU | memorandum of understanding |
| MRI | magnetic resonance imaging |
| NEPA | National Environmental Policy Act |
| NRHP | National Register of Historic Places |
| NZE | Near Zero Emission |
| PA | Programmatic Agreement |
| RF | radio frequency |
| ROD | records of decision |
| RWQCB | Regional Water Quality Control Board |
| SCAQMD | South Coast Air Quality Management District |
| SHPO | State Historic Preservation Officer |
| SR | State Route |
| SWP | State Water Project |
| TPSS | Traction Power Substations |
| UAS | Unoccupied Aircraft System |
| US-101 | U.S. Route 101 |
| USEPA | U.S. Environmental Protection Agency |
| USFWS | U.S. Fish and Wildlife Service |
| VOC | Volatile Organic Compounds |
| WOTUS | Waters of the United Stated |
| ZE | Zero Emission |
| ZEV | Zero Emission Vehicle |

**Table 3-2 Palmdale to Burbank Project Section Impact Avoidance and Minimization Features**

| IAMF | Title | IAMF Text | Phase | Implementation | Reporting Schedule | Implementing Party | Reporting Party | Implementation Text | Implementation | Impact # and Impact Text |
|---|---|---|---|---|---|---|---|---|---|---|
| **Transportation** | | | | | | | | | | |
| TR-IAMF#1 | Protection of Public Roadways during Construction | Prior to Construction, the Contractor shall provide a photographic survey documenting the condition of the public roadways along truck routes providing access to the proposed project site. The photographic survey shall be submitted for approval to the agency responsible for road maintenance and the Authority. The Contractor shall be responsible for the repair of any structural damage to public roadways caused by HSR construction or construction access, returning any damaged sections to the equivalent of their original pre-HSR construction structural condition or better. The Contractor shall survey the condition of the public roadways along truck routes providing access to the proposed project site after construction is complete. The Contractor shall complete a before- and after-survey report and submit it to the Authority for review, indicating the location and extent of any damage. | Pre-construction/Post-construction | Survey/Reporting | Immediately prior to and immediately following construction, and during construction as needed. | Authority/ Contractor | Contractor | Provide a photographic survey | Condition of construction contract | Impact TRA#1: Spoils Hauling Effects on Roadway Segments.<br>Impact TRA#7: Project Construction Effects on Vehicles, Pedestrians, Bicyclists, and Transit. |
| TR-IAMF#2 | Construction Transportation Plan | The design-build contractor shall prepare a detailed construction transportation plan (CTP) for the purpose of minimizing the impact of construction and construction traffic on adjoining and nearby roadways in close consultation with the local jurisdiction having authority over the site. Before finalizing the CTP, the Contractor shall provide a draft of the CTP to Los Angeles Unified School District, Acton-Agua Dulce Unified School District, and any other potentially affected public school districts upon their request, for their review and comment. The Authority must review and approve the CTP before the Contractor commences 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, if any. The CTP 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 a minimum, the following elements:<br>• Temporary signage to alert drivers and pedestrians to the construction zone.<br>• Flag persons or other methods of traffic control.<br>• Traffic speed limitations in the construction zone. | Design/Construction | Prepare plan/Reporting Consult with local city, county, transit agencies, and any key stakeholders identified by the Authority on the draft CTP. Such consultation shall be undertaken prior to seeking Authority review and approval of the CTP. Comments from consulted entities on the CTP will be included in any draft CTP submitted for Authority approval. | At incorporation or completion of design/implementation during construction | Authority/ Contractor | Contractor | Prepare and implement CTP | Condition of construction contract | Impact TRA#1: Spoils Hauling Effects on Roadway Segments.<br>Impact TRA#2: Spoils Hauling Effects on Intersections.<br>Impact TRA#4: Spoils Hauling Effects on Freeway Segments.<br>Impact TRA#5: Spoils Hauling Effects on Transit Services.<br>Impact TRA#7: Project Construction Effects on Vehicles, Pedestrians, Bicyclists, and Transit.<br>Impact PK#2: Construction-Related Access, Noise, Vibration, Air Quality, and Visual Changes to Parks, Recreation, and Open Space Resources |

| IAMF | Title | IAMF Text | Phase | Implementation Action | Reporting Schedule | Implementing Party | Reporting Party | Implementation Text | Implementation Mechanism | Impact # and Impact Text |
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| | | • Temporary road closures and provisions for alternative access during the closure.<br>• Detour provisions for temporary road closures—alternating one-way traffic will be considered as an alternative to temporary closures where practicable and where it will result in better traffic flow than will a detour.<br>• Identified routes for construction traffic.<br>• Provisions for safe pedestrian and bicycle passage or convenient detour.<br>• Provisions to minimize access disruption to residents, businesses, customers, delivery vehicles, and buses to the extent practicable—where road closures are required during construction, limit to the hours that are least disruptive to access for the adjacent land uses.<br>• Provisions for farm equipment access.<br>• Provisions for 24-hour access by emergency vehicles.<br>• Safe vehicular and pedestrian access to local businesses and residences during construction. The plan will provide for scheduled transit access where construction will 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 safe and convenient location away from where construction is occurring in close coordination with the transit operator. Adequate measures will be taken to separate students and parents walking to and from the temporary bus stop from the construction zone.<br>• Advance notification to the local school district of construction activities and rigorously maintained traffic control at all school bus loading zones, to provide for the safety of schoolchildren. Review existing or planned Safe Routes to Schools with school districts and emergency responders to incorporate roadway modifications that maintain existing traffic patterns and fulfill response route and access needs during project construction and HSR operations.<br>• Identification and assessment of the potential safety risks of project construction to children, especially in areas where the project is located near homes, schools, day care centers, and parks.<br>• Promotion of child safety within and near the project area. For example, crossing guards could be provided in areas where construction | | | | | | | | |

| IAMF | Title | IAMF Text | Phase | Implementation Action | Reporting Schedule | Implementing Party | Reporting Party | Implementation Text | Implementation Mechanism | Impact # and Impact Text |
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| | | activities are located near schools, day care centers, and parks.<br>CTPs will consider and account for the potential for overlapping construction projects. | | | | | | | | |
| TR-IAMF#3 | Off-Street Parking for Construction-Related Vehicles | The Contractor shall identify adequate off-street parking for all construction-related vehicles throughout the construction period to minimize impacts to public on-street parking areas. If adequate parking cannot be provided on the construction sites, the Contractor shall designate a remote parking area and arrange for the use a shuttle bus to transfer construction workers to/from the job site. This measure shall be addressed in the CTP. | Design/Construction | Prepare plan | Prior to construction | Authority/ Contractor | Contractor | Prepare CTP/Identify adequate off-street parking for all construction- related vehicles | Condition of construction contract | Impact TRA#7: Project Construction Effects on Vehicles, Pedestrians, Bicyclists, and Transit. |
| TR-IAMF#4 | Maintenance of Pedestrian Access | The Contractor shall prepare specific construction management plans to address maintenance of pedestrian access during the construction period. Actions that limit pedestrian access will include, but not be limited to, sidewalk closures, bridge closures, crosswalk closures or pedestrian rerouting at intersections, placement of construction-related material within pedestrian pathways or sidewalks, and other actions that may affect the mobility or safety of pedestrians during the construction period. If sidewalks are maintained along the construction site frontage, provide covered walkways and fencing. The plan objective shall be to maintain pedestrian access where feasible (i.e., meeting design, safety, Americans with Disabilities Act (ADA) requirements). This measure shall be addressed in the CTP. | Design/Construction | Prepare plan | Prior to construction | Authority/ Contractor | Contractor | Prepare CMPs that address maintenance of pedestrian access | Condition of construction contract | Impact TRA#7: Project Construction Effects on Vehicles, Pedestrians, Bicyclists, and Transit. |
| TR-IAMF#5 | Maintenance of Bicycle Access | The Contractor shall prepare specific construction management plans to address maintenance of bicycle access during the construction period. Actions that limit bicycle access will include, but not be limited to, bike lane closures or narrowing, closure or narrowing of streets that are designated bike routes, bridge closures, placement of construction-related materials within designated bike lanes or along bike routes, and other actions that may affect the mobility or safety of bicyclists during the construction period. Maintain bicycle access where feasible (i.e., meeting design, safety, ADA requirements). This measure shall be addressed in the CTP. | Design/Construction | Prepare plan | Prior to construction | Authority/ Contractor | Contractor | Prepare CMPs that address maintenance of bicycle access | Condition of construction contract | Impact TRA#6: Spoils Hauling Effects on Non-Motorized Modes.<br>Impact TRA#7: Project Construction Effects on Vehicles, Pedestrians, Bicyclists, and Transit. |
| TR-IAMF#6 | Restriction on Construction Hours | The Contractor shall limit construction material deliveries between 7 a.m. and 9 a.m. and between 4 p.m. and 6 p.m. on weekdays to minimize impacts to traffic on roadways. The contractor shall limit the number of construction employees arriving or departing the site between the hours of 7 a.m. and 8:30 a.m. and 4:30 p.m. and 6 p.m. Areas where these restrictions will be implemented will be determined as part of the CTP. Based on Authority | Construction | CTP to be prepared prior to construction followed by reporting | Prior to construction/Weekly | Authority/ Contractor | Contractor | Prepare CTP/Limit construction materials deliveries and employee arrival and departures | Condition of construction contract | Impact TRA#6: Spoils Hauling Effects on Non-Motorized Modes.<br>Impact TRA#7: Project Construction Effects on Vehicles, Pedestrians, Bicyclists, and Transit. |

| IAMF | Title | IAMF Text | Phase | Implementation Action | Reporting Schedule | Implementing Party | Reporting Party | Implementation Text | Implementation Mechanism | Impact # and Impact Text |
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| | | review of the CTP the restricted hours maybe altered due to local travel patterns. | | | | | | | | |
| TR-IAMF#7 | Construction Truck Routes | The Contractor shall deliver all construction-related equipment and materials on the appropriate truck routes and shall prohibit heavy-construction vehicles from using alternative routes to get to the site. Truck routes will be established away from schools, day care centers, and residences, or along routes with the least impact if the Authority determines those areas are unavoidable. This measure shall be addressed in the CTP. | Construction | CTP to be prepared prior to construction followed by reporting. | Prior to construction/Weekly | Authority/ Contractor | Contractor | Prepare CTP/Establish truck routes | Condition of construction contract | Impact TRA#1: Spoils Hauling Effects on Roadway Segments.<br>Impact TRA#2: Spoils Hauling Effects on Intersections.<br>Impact TRA#5: Spoils Hauling Effects on Transit Services.<br>Impact TRA#7: Project Construction Effects on Vehicles, Pedestrians, Bicyclists, and Transit.<br>Impact TRA#8: Project Construction Effects on Roadway Segments. |
| TR-IAMF#8 | Construction during Special Events | The Contractor shall provide a mechanism to prevent roadway construction activities from reducing roadway capacity during major athletic events or other special events that substantially (10 percent or more) increase traffic on roadways affected by project construction. Mechanisms include the presence of police officers directing traffic, special-event parking, use of within-the-curb parking, or shoulder lanes for through-traffic and traffic cones. This measure shall be addressed in the CTP. | Design/Construction | CTP to be prepared prior to construction followed by reporting | Prior to construction/Weekly | Authority/ Contractor | Contractor | Prepare CTP/Event coordination | Condition of construction contract | Impact TRA#1: Spoils Hauling Effects on Roadway Segments. |
| TR-IAMF#9 | Protection of Freight and Passenger Rail during Construction | The Contractor shall repair any structural damage to freight or public railways that may occur during the construction period and return any damaged sections to their original structural condition. If necessary, during construction, a “shoofly” track will be constructed to allow existing train lines to bypass any areas closed for construction activities. Upon completion, tracks will be opened and repaired; or new mainline track will be constructed, and the “shoofly” will be removed. Contractor repair responsibility will be included in the design/build contract. | Construction | CTP to be prepared prior to construction followed by reporting | Weekly | Authority/ Contractor | Contractor | Repair structural damage to freight or public railways | Condition of construction contract | Impact TRA#11: Project Construction Effects on Rail and Transit Services. |
| TR-IAMF#11 | Maintenance of Transit Access | The Contractor shall prepare specific construction management plans to address maintenance of transit access during the construction period. Actions that limit transit access will include, but not be limited to, roadway lane closures or narrowing, closure or narrowing of streets that are designated transit routes, bus stop closures, bridge closures, placement of construction-related materials within designated transit lanes, bus stop or layover zones or along transit routes, and other actions that may affect the mobility or safety of bus transit during the construction period. Maintain transit access where | Construction | CTP to be prepared prior to construction followed by reporting | Prior to construction/Weekly | Authority/ Contractor | Contractor | Prepare CMPs to address maintenance of transit access | Condition of construction contract | Impact TRA#7: Project Construction Effects on Vehicles, Pedestrians, Bicyclists, and Transit. |

| IAMF | Title | IAMF Text | Phase | Implementation Action | Reporting Schedule | Implementing Party | Reporting Party | Implementation Text | Implementation Mechanism | Impact # and Impact Text |
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| | | feasible (i.e., meeting design, safety, ADA requirements). This measure shall be addressed in the CTP. | | | | | | | | |
| TR-IAMF#12 | Pedestrian and Bicycle Safety | Prior to construction, the Contractor shall provide a technical memorandum describing how pedestrian and bicycle accessibility will be provided and supported across the HSR corridor, to and from stations and on station property. Priority of safety for pedestrians and bicycles and vulnerable populations over motor vehicle access will be done in a way so as to encourage maximum potential access from non-motorized modes. Local access programs, such as Safe Routes to Schools, shall be maintained or enhanced. Access to community facilities for vulnerable populations shall be maintained or enhanced. | Pre-construction | Prepare technical memorandum | Prior to construction | Authority/ Contractor | Contractor | Preparation of a pedestrian and bicycle accessibility technical memorandum | Condition of construction contract | Impact TRA#7: Project Construction Effects on Vehicles, Pedestrians, Bicyclists, and Transit. |
| **Air Quality and Global Climate Change** | | | | | | | | | | |
| AQ-IAMF#1 | Fugitive Dust Emissions | During construction, the Contractor shall employ the following measures to minimize and control fugitive dust emissions. The Contractor shall prepare a fugitive dust control plan for each distinct construction segment. At a minimum, the plan shall describe how each measure will be employed and identify an individual responsible for ensuring implementation. At a minimum, the plan shall address the following components unless alternative measures are approved by the applicable air quality management district. Before finalizing the plan, the Contractor shall provide a draft of the plan to Los Angeles Unified School District, Acton-Agua Dulce Unified School District, and any other potentially affected public school districts upon their request, for their review and comment.<br>• Cover all vehicle loads transported on public roads to limit visible dust emissions and maintain at least 6 inches of freeboard space from the top of the container or truck bed.<br>• Clean all trucks and equipment before exiting the construction site using an appropriate cleaning station that does not allow runoff to leave the site or mud to be carried on tires off the site.<br>• Water exposed surfaces and unpaved roads at a minimum three times daily with adequate volume to result in wetting of the top 1 inch of soil but avoiding overland flow. Rain events may result in adequate wetting of top 1 inch of soil thereby alleviating the need to manually apply water.<br>• Limit vehicle travel speed on unpaved roads to 15 miles per hour (mph). | Construction | Prepare plan/Reporting | Weekly | Authority/ Contractor | Contractor | Prepare a fugitive dust control plan | Condition of construction contract | Impact PK#2: Construction-Related Access, Noise, Vibration, Air Quality, and Visual Changes to Parks, Recreation, and Open Space Resources. |

| IAMF | Title | IAMF Text | Phase | Implementation Action | Reporting Schedule | Implementing Party | Reporting Party | Implementation Text | Implementation Mechanism | Impact # and Impact Text |
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| | | • Suspend any dust-generating activities when instantaneous wind speed exceeds 25 mph.<br>• Stabilize all disturbed areas, including storage piles that are not being used on a daily basis for construction purposes, by using water, a chemical stabilizer/suppressant, hydro mulch or by covering with a tarp or other suitable cover or vegetative ground cover, to control fugitive dust emissions effectively. In areas adjacent to organic farms, the Authority will use non-chemical means of dust suppression.<br>• Stabilize all on-site unpaved roads and off-site unpaved access roads, using water or a chemical stabilizer/suppressant, to effectively control fugitive dust emissions. In areas adjacent to organic farms, the Authority will use non-chemical means of dust suppression.<br>• Carry out watering or presoaking for all land clearing, grubbing, scraping, excavation, land leveling, grading, cut and fill, and demolition activities.<br>• For buildings up to 6 stories in height, wet all exterior surfaces of buildings during demolition.<br>• Limit or expeditiously remove the accumulation of mud or dirt from adjacent public streets at a minimum of once daily, using a vacuum-type sweeper.<br>After the addition of materials to or the removal of materials from surface or outdoor storage piles, apply sufficient water or a chemical stabilizer/ suppressant. | | | | | | | | |
| AQ-IAMF#2 | Selection of Coatings | During construction, the Contractor shall use:<br>• Low-volatile organic compound (VOC) paint that contains less than 10 percent of VOC contents (VOC, 10%).<br>• Super-compliant or Clean Air paint that has a lower VOC content than that required by SCAQMD Rule 1113 and Antelope Valley Air Quality Management District (AVAQMD) Rule 1113 when available. If not available, the Contractor shall document lack of availability, recommend alternative measure(s) to comply with SCAQMD Rule 1113 and AVAQMD Rule 1113 or disclose absence of measure(s) for full compliance and obtain concurrence from the Authority. | Construction | Low-VOC paint use | Monthly | Authority/ Contractor | Contractor | Use of low-VOC paint during construction | Condition of construction contract | Impact AQ#3: Compliance with Air Quality Plans during Construction. |
| AQ-IAMF#3 | Renewable Diesel | During construction, the Contractor will use renewable diesel fuel to minimize and control exhaust emissions from all heavy-duty diesel-fueled construction diesel equipment and on-road diesel trucks. Renewable diesel must meet the most recent ASTM D975 specification for Ultra Low Sulfur Diesel and have a carbon intensity no greater than 50% of | Construction | Renewable diesel fuel use | Monthly | Authority/ Contractor | Contractor | Use of renewable diesel fuel during construction | Contract requirements and specifications | Impact AQ#2: Regional Air Quality Impacts during Construction.<br>Impact AQ#3: Compliance with Air Quality Plans during Construction. |

| IAMF | Title | IAMF Text | Phase | Implementation Action | Reporting Schedule | Implementing Party | Reporting Party | Implementation Text | Implementation Mechanism | Impact # and Impact Text |
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| | | diesel with the lowest carbon intensity among petroleum fuels sold in California. The Contractor will provide the Authority with monthly and annual reports, through the EMMA system, of renewable diesel purchase records and equipment and vehicle fuel consumption. Exemptions to use traditional diesel can be made where renewable diesel is not available from suppliers within 200 miles of the project site. The construction contract must identify the quantity of traditional diesel purchased and fully document the availability and price of renewable diesel to meet project demand. | | | | | | | | Impact AQ#5: Localized Construction Effects. |
| AQ-IAMF#4 | Reduce Criteria Exhaust Emissions from Construction Equipment | Prior to issuance of construction contracts, the Authority will incorporate the following construction equipment exhaust emissions requirements into the contract specifications:<br>1. All heavy-duty off-road construction diesel equipment used during the construction phase will meet Tier 4 Final engine requirements.<br>2. Small diesel generators (less than 30 horsepower) should be avoided whenever feasible.<br>3. A copy of each unit's certified tier specification and any required CARB or air pollution control district operating permit will be made available to the Authority at the time of mobilization of each piece of equipment.<br>4. 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.<br>5. The contractor will provide the Authority with monthly reports of equipment operating hours (through the EMMA system) and annual reports documenting compliance. | Pre-construction | Contract specifications | Prior to construction | Authority | Authority | Exhaust emissions requirements incorporated into contract specifications | Contract requirements and specifications | Impact AQ#2: Regional Air Quality Impacts during Construction.<br>Impact AQ#3: Compliance with Air Quality Plans during Construction.<br>Impact AQ#4: Health Risks Assessment for Construction-Period Emissions.<br>Impact AQ#5: Localized Construction Effects. |
| AQ-IAMF#5 | Reduce Criteria Exhaust Emissions from On-Road Construction Equipment | Prior to issuance of construction contracts, the Authority will incorporate the following material-hauling truck fleet mix requirements into the contract specifications:<br>1. All on-road trucks used to haul construction materials, including fill, ballast, rail ties, and steel, will consist of an average fleet mix of equipment model year 2020 or newer, but no less than the average fleet mix for the current calendar year as set forth in the CARB's EMFAC 2017 database.<br>2. The contractor will provide documentation to the Authority of efforts to secure such a fleet mix.<br>3. The contractor will keep a written record of equipment usage during project construction for each piece of equipment and provide the Authority with monthly reports of VMT (through | Pre-construction | Contract specifications | Prior to construction | Authority | Authority | Material-hauling truck fleet mix requirements incorporated into contract specifications | Contract requirements and specifications | Impact AQ#2: Regional Air Quality Impacts during Construction.<br>Impact AQ#3: Compliance with Air Quality Plans during Construction.<br>Impact AQ#5: Localized Construction Effects. |

| IAMF | Title | IAMF Text | Phase | Implementation Action | Reporting Schedule | Implementing Party | Reporting Party | Implementation Text | Implementation Mechanism | Impact # and Impact Text |
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| | | EMMA) and annual reports documenting compliance. | | | | | | | | |
| AQ-IAMF#6 | Reduce the Potential Impact of Concrete Batch Plants | Prior to construction of any concrete batch plant, the contractor will provide the Authority with a technical memorandum documenting consistency with the Authority's concrete batch plant siting criteria and utilization of typical control measures. Concrete batch plants will be sited at least 1,000 feet from sensitive receptors, including places such as daycare centers, hospitals, senior care facilities, residences, parks, and other areas where people may congregate. The concrete batch plant will implement typical control measures to reduce fugitive dust such as water sprays, enclosures, hoods, curtains, shrouds, movable and telescoping chutes, central dust collection systems, and other suitable technology, to reduce emissions to be equivalent to the United States Environmental Protection Agency AP-42 controlled emission factors for concrete batch plants. The contractor will provide to the Authority documentation that each batch plant meets this standard during operation. | Construction | Prepare plan/Reporting | Prior to construction of concrete batch plants | Authority/ Contractor | Contractor | Preparation of a concrete batch plant technical memorandum | Contract requirements and specifications | Impact AQ#2: Regional Air Quality Impacts during Construction.<br>Impact AQ#3: Compliance with Air Quality Plans during Construction.<br>Impact AQ#4: Health Risks Assessment for Construction-Period Emissions.<br>Impact AQ#5: Localized Construction Effects. |
| **Noise and Vibration** | | | | | | | | | | |
| NV-IAMF#1 | Noise and Vibration | Prior to Construction, the Contractor shall prepare and submit to the Authority a noise and vibration technical memorandum documenting how the FTA and FRA guidelines for minimizing construction noise and vibration impacts will be employed when work is being conducted within 1,000 feet of sensitive receptors. Typical construction practices contained in the FTA and FRA guidelines for minimizing construction noise and vibration impacts include the following:<br>• Construct noise barriers, such as temporary walls or piles on excavated material, between noisy activities and noise-sensitive resources.<br>• Route truck traffic away from residential streets, when possible.<br>• Construct walled enclosures around especially noisy activities or around clusters or noise equipment.<br>• Combine noisy operations so that they occur in the same period.<br>• Phase demolition, earthmoving, and ground impacting operations so as not to occur in the same time period.<br>Avoid impact pile driving where possible in vibration-sensitive areas. | Pre-construction/ Construction | Prepare technical memorandum/Compliance reporting | Monthly | Authority/ Contractor | Contractor | Prepare a construction noise and vibration technical memorandum | Condition of construction contract | Impact N&V#1: Construction Noise Impacts on Sensitive Receivers.<br>Impact N&V#2: Spoils Haul Route Noise Impacts on Sensitive Receivers.<br>Impact N&V#3: Construction Vibration Impacts on Sensitive Receivers.<br>Impact PK#2: Construction-Related Access, Noise, Vibration, Air Quality, and Visual Changes to Parks, Recreation, and Open Space Resources. |

| IAMF | Title | IAMF Text | Phase | Implementation Action | Reporting Schedule | Implementing Party | Reporting Party | Implementation Text | Implementation Mechanism | Impact # and Impact Text |
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| **Electromagnetic Fields and Electromagnetic Interference** | | | | | | | | | | |
| EMI/EMF-IAMF#1 | Preventing Interference with Adjacent Railroads | TM 3.00.10. Implementation Stage Electromagnetic Compatibility Program Plan (ISEP) requires coordination with adjacent railroads. During Project Design the Contractor will work with the engineering departments of railroads that operate parallel the HSR to apply standard design practices to prevent interference with the electronic equipment operated by these railroads. Prior to Operation and Maintenance of each operating segment, the Contractor shall certify through issuance of a technical memorandum to the Authority that design provisions to prevent interference have been established and have been determined to be effective prior to the activation of potentially interfering systems of the HSR.<br>The contractor will work with the railroad engineering departments where these railways parallel the HSR to apply the standard design practices to prevent interference with the electronic equipment operated by these railroads. Design provisions to prevent interference will be put in place and determined to be adequately effective by a qualified electrical engineering professional prior to the HSR activation of potentially interfering systems. The HSR Design Criteria Manual (DCM) Chapter 26 summarizes the applicable electromagnetic interference/electromagnetic field (EMI/EMF) design standards that the Authority will use for the project. | Design/Construction | Prepare technical memorandum/Compliance reporting | Monthly | Authority/ Contractor | Contractor/ Authority | Prepare technical memorandum | Condition of construction contract | Impact EMI/EMF#8: EMI Effects on Schools<br>Impact EMI/EMF#11: Effects on Adjacent Existing Rail Lines. |
| EMI/EMF-IAMF#2 | Controlling 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. The HSR project shall adhere to international guidelines and comply with applicable federal and state laws and regulations. The HSR project design will follow TM 300.10, ISEP, the CHSR DCM Chapter 26, which provides detailed electromagnetic compatibility (EMC) design criteria for the HSR systems and equipment, and the HSR DCM Chapter 22, which addresses grounding requirements for third-party metallic structures, including fences and pipelines, which are parallel and adjacent to the CHSTS right-of-way. These documents describe the design practices to avoid EMI and to provide for HSR operational safety. Some measures of the ISEP include:<br>• 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 | Design/Construction | Prepare technical memorandum/Compliance reporting | Monthly | Authority/ Contractor | Contractor/ Authority | Prepare EMF/EMI interference technical memorandum | Condition of construction contract | Impact EMI/EMF#1: Temporary Impacts from Use of Heavy Construction Equipment.<br>Impact EMI/EMF#3: Temporary Impacts from Operation of Electrical Equipment.<br>Impact EMI/EMF#5: People with Implanted Medical Devices and Exposure to EMF.<br>Impact EMI/EMF#8: EMI Effects on Schools.<br>Impact EMI/EMF#9: Potential for Corrosion of Underground Pipelines, Cables, and Adjoining Rail.<br>Impact EMI/EMF#10: Potential for Nuisance Shocks. |

| IAMF | Title | IAMF Text | Phase | Implementation Action | Reporting Schedule | Implementing Party | Reporting Party | Implementation Text | Implementation Mechanism | Impact # and Impact Text |
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| | | into bid specifications used to procure radio systems.<br>• Pipelines and other linear metallic objects that are not sufficiently grounded through the direct contact with earth will 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 will be implemented.<br>HSR standard corrosion protection measures will be implemented to eliminate risk of substantial corrosion of nearby metal objects. | | | | | | | | Impact EMI/EMF#12: Effects Related to Adjacent Airports. |
| **Public Utilities and Energy** | | | | | | | | | | |
| PUE-IAMF#1 | Design Measures | The HSR project design incorporates utilities and design elements that minimize electricity consumption (e.g., using regenerative braking, energy-saving equipment on rolling stock and at station facilities, implementing energy-saving measures during construction, and automatic train operations to maximize energy efficiency during operations). Thus, the project will not overburden utility services. The design elements are included in the design-build contract. Additionally, the Authority has adopted a sustainability policy that establishes project design and construction requirements that avoid and minimize impacts. | Design/Construction | Reporting | At incorporation or completion of design/monthly reporting (during construction) | Authority/ Contractor | Contractor | Incorporate utilities and design elements that minimize electrical consumption into design | Condition of construction contract | Impact PUE#6: Temporary Energy Consumption during Construction.<br>Impact PUE#11: Permanent Operations Energy Demand. |
| PUE-IAMF#2 | Irrigation Facility Relocation | Where relocating an irrigation facility is necessary, the Contractor will verify the new facility is operational prior to disconnecting the original facility, where feasible. Irrigation facility relocation preferences are included in the design-build contract and reduce unnecessary impacts to continued operation of irrigation facilities. The Contractor shall document all relocations in a memorandum for Authority review and approval. | Design/Pre-construction | Reporting | Monthly | Authority/ Contractor | Contractor | Verify new irrigation facilities are operational prior to disconnecting original facility | Condition of construction contract | Impact PUE#1: Planned Temporary Interruption of Utility Services. |
| PUE-IAMF#3 | Public Notifications | 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 will be published no less than 7 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 60 days in advance of the work for verification that appropriate messaging and notification are to be provided. | Pre-construction/ Construction | Public notification | Monthly | Authority/ Contractor | Contractor | Public notification of utility service interruptions 60 days in advance of work for verification | Pre-construction/ Construction | Impact PUE#1: Planned Temporary Interruption of Utility Services. |

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| PUE-IAMF#4 | Utilities and Energy | 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. It will include upgrades of existing power lines to connect the HSR system to existing utility substations. The technical memorandum shall be provided to the Authority for review and approval. | Design/Pre-construction | Prepare a technical memorandum | At incorporation or completion of design/monthly reporting (during construction) | Authority/ Contractor | Contractor | Prepare service provider coordination technical memorandum | Condition of construction contract | Impact PUE#1: Planned Temporary Interruption of Utility Services.<br>Impact PUE#2: Accidental Disruption of Utility Systems. |
| **Biological and Aquatic Resources** | | | | | | | | | | |
| BIO-IAMF#1 | Designate Project Biologist, Designated Biologists, Species-Specific Biological Monitors and General Biological Monitors | At least 15 business days prior to commencement of any ground-disturbing activity, including but not limited to geotechnical investigations, utility realignments, creation of staging areas, or initial clearing and grubbing, the Authority will submit the name(s) and qualifications of Project Biologists, Designated Biologists, Species-Specific Biological Monitors, and General Biological Monitors retained to conduct biological resource monitoring activities and implement avoidance and minimization measures. No ground-disturbing activity will begin until the Authority has received written approval from the U.S. Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NMFS), where applicable, and the CDFW that the biologists and monitors have been approved to conduct the specified work. The Project Biologist is responsible for ensuring the timely implementation of the biological avoidance and minimization measures as outlined in the Biological Resources Management Plan (BRMP), and for guiding and directing the work of the Designated Biologists and Biological Monitors. Designated Biologists will be responsible for directly overseeing and reporting the implementation of general and species-specific conservation measures. In some instances, Designated Biologists will only be approved for specific species, in which case they will only be authorized to conduct surveys and implement measures for the species for which they have been approved. Species-Specific Biological Monitors will be responsible for implementation of species-specific measures for the species for which they have been approved and will report directly to a Designated Biologist. General Biological Monitors will report directly to a Designated Biologist or to the Project Biologist. General Biological Monitors will be responsible for conducting Worker Environmental Awareness Program (WEAP) training, implementing general conservation measures, conducting general compliance monitoring, and reporting on compliance monitoring activities. The term Project Biologist is used in these IAMFs to mean the Project Biologist, Designated Biologists, Species-Specific Biological Monitors, and General Biological Monitors, as appropriate. When the Authority is specified as | Pre-construction | Compliance reporting | 15-days prior to ground disturbance | Authority | Authority | Submit names of biologists and monitors to regulatory agencies | Condition of construction contract | Impact BIO#1: Project Construction Effects on Habitat for Special-Status Plants and Plant Communities.<br>Impact BIO#2: Project Construction Effects on Special-Status Amphibian Habitat.<br>Impact BIO#3: Project Construction Effects on Special-Status Bird Habitat.<br>Impact BIO#4: Project Construction Effects on Special-Status Fish Habitat.<br>Impact BIO#5: Project Construction Effects on Special-Status Invertebrate Habitat.<br>Impact BIO#6: Project Construction Effects on Special-Status Mammal Habitat.<br>Impact BIO#7: Project Construction Effects on Special-Status Reptile Habitat.<br>Impact BIO#8: Project Construction Effects on State and Federally Jurisdictional Aquatic Resources.<br>Impact BIO#9: Project Construction Effects on Fish and Wildlife Resources Protected by Fish and Game Code Section 1600 et seq.<br>Impact BIO#10: Project Construction Effects on Federally Designated Critical Habitat. |

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| | | implementing an IAMF, it is assumed that the Authority, or its contractor or agent, is implementing the IAMF under the supervision of biologists and biological monitors, as appropriate. | | | | | | | | Impact BIO#11: Project Construction Effects on Significant Ecological Areas.<br>Impact BIO#12: Project Construction Effects on Protected Trees.<br>Impact BIO#13: Project Effects on Wildlife Movement Corridors.<br>Operations Impacts<br>Impact BIO#14: Project Operation Effects on Habitat for Special-Status Species Individuals and Communities.<br>Impact BIO#15: Indirect Effects on Federal and State Protected Aquatic Resources from Project Operation.<br>Impact BIO#16: Indirect Effects on Fish and Wildlife Resources Protected by Fish and Game Code Section 1600 et seq.<br>Impact BIO#17: Project Operation Effects on Designated Critical Habitat.<br>Impact BIO#18: Indirect Effects on Significant Ecological Areas from Project Operation. |
| BIO-IAMF#2 | Facilitate Agency Access | Throughout the construction period, the Authority will allow access by the USFWS, NMFS, U.S. Army Corps of Engineers, CDFW, USFS, and State Water Resources Control Board (SWRCB) to the project site. Because of safety concerns, all visitors will check in with the Authority's resident engineer prior to entering the project footprint. In the event that agency personnel visit the project footprint, the Project Biologist will prepare a memorandum within 3 business days after the visit documenting the issues raised during the field meeting. The Project Biologist will report any issues regarding regulatory compliance raised by agency personnel to the Authority. | Construction | Compliance reporting | 3 days after regulatory agency site visit | Contractor | Contractor | Prepare memorandum documenting agency site visit | Condition of construction contract | Impact BIO#1: Project Construction Effects on Habitat for Special-Status Plants and Plant Communities.<br>Impact BIO#2: Project Construction Effects on Special-Status Amphibian Habitat.<br>Impact BIO#3: Project Construction Effects on Special-Status Bird Habitat.<br>Impact BIO#4: Project Construction Effects on Special-Status Fish Habitat.<br>Impact BIO#5: Project Construction Effects on Special-Status Invertebrate Habitat.<br>Impact BIO#6: Project Construction Effects on |

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| | | | | | | | | | | Special-Status Mammal Habitat.<br>Impact BIO#7: Project Construction Effects on Special-Status Reptile Habitat. |
| BIO-IAMF#3 | Prepare WEAP Training Materials and Conduct Construction Period WEAP Training | Prior to any ground-disturbing activity, the Project Biologist will prepare a Worker Environmental Awareness Program (WEAP) for the purpose of training construction crews to recognize and identify sensitive biological resources that may be encountered in the vicinity of the project footprint. The WEAP training materials will be submitted to the Authority for review and approval. A video of the WEAP training prepared and presented by the Project Biologist and approved by the Authority may be used if the Project Biologist is not available to present the training in person.<br>At a minimum, WEAP training materials will include the following information: key provisions of the federal Endangered Species Act (federal ESA), the California Endangered Species Act (CESA), the BGEPA, the Migratory Bird Treaty Act (MBTA), California Fish and Game Code 1600, Porter-Cologne Water Quality Control Act (Porter-Cologne), and the Clean Water Act (CWA); the consequences and penalties for violation or noncompliance with these laws and regulations and project authorizations; identification and characteristics of special-status plants, special-status wildlife, jurisdictional waters, and special-status plant communities and explanations about their ecological value; hazardous substance spill prevention and containment measures; the contact person in the event of the discovery of a dead or injured wildlife species; and review of avoidance, minimization, and mitigation measures.<br>The Project Biologist will present WEAP training to all construction personnel before they work in the project footprint. As part of the WEAP training, construction timing in relation to species' habitat and life-stage requirements will be detailed and discussed on project maps, which will show areas of planned minimization and avoidance measures. Crews will be informed during the WEAP training that, except when necessary, as determined in consultation with the Project Biologist, travel within the project footprint is restricted to established roadbeds, which include all pre-existing and project-constructed unimproved and improved roads. A fact sheet conveying this information will be prepared by the Project Biologist for distribution to the construction crews and to others who enter the | Pre-construction | Training program/Reporting | Annual (training)/Monthly (reporting) | Contractor/ Authority | Contractor/ Authority | Prepare WEAP/Annual (training)/monthly (reporting) | WEAP | Impact BIO#1: Project Construction Effects on Habitat for Special-Status Plants and Plant Communities.<br>Impact BIO#2: Project Construction Effects on Special-Status Amphibian Habitat.<br>Impact BIO#3: Project Construction Effects on Special-Status Bird Habitat.<br>Impact BIO#4: Project Construction Effects on Special-Status Fish Habitat.<br>Impact BIO#5: Project Construction Effects on Special-Status Invertebrate Habitat.<br>Impact BIO#6: Project Construction Effects on Special-Status Mammal Habitat.<br>Impact BIO#7: Project Construction Effects on Special-Status Reptile Habitat.<br>Impact BIO#8: Project Construction Effects on State and Federally Jurisdictional Aquatic Resources.<br>Impact BIO#9: Project Construction Effects on Fish and Wildlife Resources Protected by Fish and Game Code Section 1600 et seq.<br>Impact BIO#10: Project Construction Effects on Federally Designated Critical Habitat.<br>Impact BIO#11: Project Construction Effects on Significant Ecological Areas. |

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| | | project footprint. Fact sheet information will be duplicated in a wallet-sized format and will be provided in other languages as necessary to accommodate non-English speaking workers. All construction staff will attend the WEAP training prior to beginning work on-site and will attend the WEAP training on an annual basis thereafter.<br>Upon completion of the WEAP training, each member of the construction crew will sign a form stating that they attended the training, understood the information presented, and agreed to comply with the requirements set out in the WEAP training. The Project Biologist will submit the signed WEAP training forms to the Authority on a monthly basis. On an annual basis, the Authority will certify that WEAP training had been provided to all construction personnel. On a monthly basis, the Project Biologist will provide updates relevant to the training to construction personnel during the daily safety ("tailgate") meeting. | | | | | | | | Impact BIO#12: Project Construction Effects on Protected Trees.<br>Impact BIO#13: Project Effects on Wildlife Movement Corridors. |
| BIO-IAMF#4 | Conduct Operation and Maintenance Period WEAP Training | Prior to initiating operation and maintenance (O&M) activities, O&M personnel will attend a WEAP training session arranged by the Authority.<br>At a minimum, O&M WEAP training materials will include the following information: key provisions of the ESA, CESA, the BGEPA, the MBTA, Porter-Cologne, and the CWA; the consequences and penalties for violation or noncompliance with these laws and regulations and project authorizations; identification and characteristics of special-status plants, special-status wildlife, jurisdictional waters, and special-status plant communities and explanations about their ecological value; hazardous substance spill prevention and containment measures; and the contact person in the event of the discovery of a dead or injured wildlife species. The training will include an overview of provisions of the biological resources management plan, annual vegetation, and management plan, weed control plan and security fencing and wildlife exclusion fencing maintenance plans pertinent to O&M activities. A fact sheet prepared by the Authority environmental compliance staff will be prepared for distribution to the O&M employees. The training will be provided by the Authority environmental compliance staff. The training sessions will be provided to employees prior to their involvement in any O&M activity and will be repeated for all O&M employees on an annual basis. Upon completion of the WEAP training, O&M employees will, in writing, verify their attendance at the training sessions and confirm their willingness to comply with the requirements set out in those sessions. | Post-construction | Training program/Reporting | Annual | Contractor/ Authority | Contractor/ Authority | WEAP Training/Annual reporting | WEAP | Impact BIO#14: Project Operation Effects on Habitat for Special-Status Species Individuals and Communities.<br>Impact BIO#15: Indirect Effects on Federal and State Protected Aquatic Resources from Project Operation.<br>Impact BIO#16: Indirect Effects on Fish and Wildlife Resources Protected by Fish and Game Code Section 1600 et seq.<br>Impact BIO#17: Project Operation Effects on Designated Critical Habitat.<br>Impact BIO#18: Indirect Effects on Significant Ecological Areas from Project Operation.<br>Impact BIO#19: Project Operation Effects on Protected Trees. |

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| BIO-IAMF#5 | Prepare and Implement a Biological Resources Management Plan | Prior to any ground-disturbing activity, the Project Biologist will prepare the BRMP, which will include a compilation of the biological resources avoidance and minimization measures applicable to the HSR section. All project environmental plans, such as the Restoration and Revegetation Plan (RPP) and Weed Control Plan, which shall be made available to USFS for review and approval where it applies to USFS lands, will be included as appendices to the BRMP. The BRMP is intended to serve as a comprehensive document that sets out the range of avoidance and minimization measures to support the appropriate and timely implementation of those measures. The implementation of these measures will be tracked through final design, construction, and operation phases. The BRMP will contain, but not be limited to, the following information:<br>• A master schedule that shows construction of the project, pre-construction surveys, and establishment of buffers and exclusions zones to protect sensitive biological resources.<br>• Specific measures for the protection of special-status species.<br>• 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.<br>• Identification of agency-approved Project Biologist(s) and Biological Monitor(s), including those responsible for notification and report of injury or death of federally or State-listed species.<br>• Measures to preserve topsoil and control erosion.<br>• Design of protective fencing around Environmentally Sensitive Areas and the construction staging areas.<br>• Locations of trees to be protected as wildlife habitat (roosting sites) and locations for planting replacement trees.<br>• 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.<br>• 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. | Pre-construction | Prepare plan | Prior to any ground-disturbing activity | Contractor | Contractor | Prepare BRMP | USFS; USFWS, USACE, SWRCB, and CDFW permits | Impact BIO#1: Project Construction Effects on Habitat for Special-Status Plants and Plant Communities.<br>Impact BIO#2: Project Construction Effects on Special-Status Amphibian Habitat.<br>Impact BIO#3: Project Construction Effects on Special-Status Bird Habitat.<br>Impact BIO#4: Project Construction Effects on Special-Status Fish Habitat.<br>Impact BIO#5: Project Construction Effects on Special-Status Invertebrate Habitat.<br>Impact BIO#6: Project Construction Effects on Special-Status Mammal Habitat.<br>Impact BIO#7: Project Construction Effects on Special-Status Reptile Habitat.<br>Impact BIO#8: Project Construction Effects on State and Federally Jurisdictional Aquatic Resources.<br>Impact BIO#9: Project Construction Effects on Fish and Wildlife Resources Protected by Fish and Game Code Section 1600 et seq.<br>Impact BIO#10: Project Construction Effects on Federally Designated Critical Habitat.<br>Impact BIO#11: Project Construction Effects on Significant Ecological Areas.<br>Impact BIO#12: Project Construction Effects on Protected Trees. |

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| | | • Provisions for biological monitoring during ground-disturbing activities to confirm compliance and success of protective measures. The monitoring will: (1) identify specific locations of wildlife habitat and sensitive species to be monitored; (2) identify the frequency of monitoring and the monitoring methods (for each habitat and sensitive species to be monitored); (3) list required qualifications of biological monitor(s); (4) identify the reporting requirements; and (5) provide an accounting of impacts to special-status species habitat compared to pre-construction impact estimates.<br>The BRMP will be submitted to the Authority and USFS, where applicable, for review and approval prior to any ground-disturbing activity. | | | | | | | | |
| BIO-IAMF#6 | Establish Monofilament Restrictions | Prior to any ground-disturbing activity, the Project Biologist will verify that plastic monofilament netting (erosion control matting) or similar material is not being used as part of erosion control activities. The Project Biologist will identify acceptable material for such use, including: geomembranes, coconut coir matting, tackified hydroseeding compounds, and rice straw wattles (e.g., Earthsaver wattles: biodegradable, photodegradable, burlap). Within developed or urban areas, the Project Biologist may allow exceptions to the restrictions on the type of erosion control material if the Project Biologist determines that the construction area is of sufficient distance from natural areas to ensure the avoidance of potential impacts to wildlife. | Pre-construction | Compliance reporting | Prior to any ground-disturbing activity/Monthly | Contractor | Authority/ Contractor | Monthly reporting | Condition of construction contract | Impact BIO#2: Project Construction Effects on Special-Status Amphibian Habitat. |
| BIO-IAMF#7 | Prevent Entrapment in Construction Materials and Excavations | At the end of each workday during construction, the Authority will cover all excavated, steep-sided holes or trenches more than 8 inches deep and that have sidewalls steeper than 1:1 (45 degree) slope with plywood or similar materials, or provide a minimum of 1escape ramp per 100 feet of trenching (with slopes no greater than 3:1) constructed of earth fill or wooden planks. The Project Biologist will thoroughly inspect holes and trenches for trapped animals at the start and end of each workday.<br>The Authority will screen, cover, or elevate at least 1 foot above ground, all construction pipe, culverts, or similar structures with a diameter of 3 inches or greater that are stored overnight within the project footprint. These pipes, culverts, and similar structures will be inspected by the Project Biologist for wildlife before such material is moved, buried, or capped. | Construction | Monitoring/Compliance reporting | Daily monitoring/Monthly reporting | Authority/ Contractor | Contractor | Daily monitoring/monthly reporting | Condition of construction contract | Impact BIO#2: Project Construction Effects on Special-Status Amphibian Habitat. |
| BIO-IAMF#8 | Delineate Equipment Staging Areas | Prior to any ground-disturbing activity, the Authority will establish staging areas for construction equipment in areas that minimize effects to sensitive biological resources, including habitat for special- | Pre-construction | Compliance reporting | Prior to any ground-disturbing activity/Monthly | Authority/ Contractor | Contractor | Monthly reporting | Condition of construction contract | Impact BIO#1: Project Construction Effects on Habitat for Special-Status |

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| | and Traffic Routes | status species, seasonal wetlands, and wildlife movement corridors. Staging areas (including any temporary material storage areas) will be located in areas that will be occupied by permanent facilities, where practicable. Equipment staging areas will be identified on final project construction plans. The Authority will flag and mark access routes to ensure that vehicle traffic within the project footprint is restricted to established roads, construction areas and other designated areas. | | | | | | | | Plants and Plant Communities.<br>Impact BIO#2: Project Construction Effects on Special-Status Amphibian Habitat. |
| BIO-IAMF#9 | Dispose of Construction Spoils and Waste | During ground-disturbing activities, the Authority may temporarily store excavated materials produced by construction activities in areas at or near construction sites within the project footprint. Where practicable, the Authority will return excavated soil to its original location to be used as backfill. Any excavated waste materials unsuitable for treatment and reuse will be disposed at an off-site location, in conformance with applicable State and federal laws. If a site is already identified as needing restoration post-disturbance, efforts should be made to remove and store the topsoil in a manner that would allow for it to be replaced as part of site restoration. | Construction | Compliance reporting | Monthly | Authority | Contractor | Monthly reporting | Condition of construction contract | Impact BIO#1: Project Construction Effects on Habitat for Special-Status Plants and Plant Communities.<br>Impact BIO#2: Project Construction Effects on Special-Status Amphibian Habitat. |
| BIO-IAMF#10 | Clean Construction Equipment | Prior to any ground-disturbing activity, the Authority will ensure that all equipment entering the work area is free of mud and plant materials. The Authority will establish vehicle cleaning locations designed to isolate and contain organic materials and minimize opportunities for weeds and invasive species to move in and out of the project footprint. Cleaning may be done by washing with water, blowing with compressed air, brushing, or other hand cleaning. The cleaning areas will be located so as to avoid impacts to surface waters and appropriate Stormwater Pollution Prevention Plan (SWPPP) best management practices (BMPs) will be implemented so as to further control any potential for the spread of weeds or other invasive species. Cleaning stations will be inspected regularly (at least monthly). | Pre-construction | Compliance reporting | Prior to any ground-disturbing activity, monthly reporting | Authority/ Contractor | Contractor | Monthly reporting | Condition of construction contract | Impact BIO#1: Project Construction Effects on Habitat for Special-Status Plants and Plant Communities.<br>Impact BIO#2: Project Construction Effects on Special-Status Amphibian Habitat. |
| BIO-IAMF#11 | Maintain Construction Sites | Prior to any ground-disturbing activity, the Authority will prepare a construction site BMP field manual. The manual will contain standard construction site housekeeping practices required to be implemented by construction personnel. The manual will identify BMPs for the following topics: temporary soil stabilization, temporary sediment control, wind erosion control, non-storm water management, waste management and materials control, rodenticide use, and other general construction site cleanliness measures. The BMP field manual shall be reviewed and approved by USFS if the activities occur within USFS lands. | Pre-construction | Reporting | Prior to any ground-disturbing activity, annual reporting | Authority/ Contractor | Authority | Monthly reporting | Condition of construction contract | Impact BIO#2: Project Construction Effects on Special-Status Amphibian Habitat.<br>Impact BIO#3: Project Construction Effects on Special-Status Bird Habitat.<br>Impact BIO#4: Project Construction Effects on Special-Status Fish Habitat.<br>Impact BIO#5: Project Construction Effects on Special-Status Invertebrate Habitat. |

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| | | All construction personnel will receive training on BMP field manual implementation prior to working within the project footprint. All personnel will acknowledge, in writing, their understanding of the BMP field manual implementation requirements. The BMP field manual will be updated by January 31st of each year. The Authority will provide, on an annual basis, training updates to all construction personnel. | | | | | | | | Impact BIO#6: Project Construction Effects on Special-Status Mammal Habitat.<br>Impact BIO#7: Project Construction Effects on Special-Status Reptile Habitat.<br>Impact BIO#8: Project Construction Effects on State and Federally Jurisdictional Aquatic Resources.<br>Impact BIO#9: Project Construction Effects on Fish and Wildlife Resources Protected by Fish and Game Code Section 1600 et seq.<br>Impact BIO#12: Project Construction Effects on Protected Trees.<br>Impact BIO#13: Project Effects on Wildlife Movement Corridors. |
| BIO-IAMF#12 | Design the Project to be Bird Safe | Prior to final construction design, the Authority will ensure that the catenary system, masts, and other structures such as fencing, electric lines, communication towers and facilities are designed to be bird and raptor-safe in accordance with the applicable recommendations presented in Suggested Practices for Raptor Protection on Power Lines: The State of the Art in 2006 (APLIC 2006) and Reducing Avian Collisions with Power Lines: State of the Art in 2012 (APLIC 2012). Applicable APLIC recommendations include, but are not limited to:<br>• Ensuring sufficient spacing of phase conductors to prevent bird electrocution.<br>• Configuring lines to reduce vertical spread of lines and/or decreasing the span length if such options are feasible.<br>• Marking lines and fences (e.g., Bird Flight Diverter for fencing and lines) to increase the visibility of lines and reduce the potential for collision. Where fencing is necessary, using bird compatible design standards to increase visibility of fences to prevent collision and entanglement.<br>• Installing perch guards to discourage avian presence on and near project facilities.<br>• Minimizing the use of guywires. Where the use of guywires is unavoidable, demarcating | Pre-construction | Design | Prior to final design | Authority | Authority | Bird and raptor- safe design catenary system, masts, and other structures such as fencing | Condition of construction contract | Impact BIO#10: Project Construction Effects on Federally Designated Critical Habitat.<br>Impact BIO#11: Project Construction Effects on Significant Ecological Areas.<br>Impact BIO#14: Project Operation Effects on Habitat for Special-Status Species Individuals and Communities. |

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| | | guywires using the best available methods to minimize avian strikes (e.g., line markers).<br>• Reusing or co-locating new transmission facilities and other ancillary facilities with existing facilities and disturbed areas to minimize habitat impacts and avoid collision risks.<br>• Structures will be monopole or dual-pole design versus lattice tower design to minimize perching and nesting opportunities. Communication towers will conform to Recommended Best Practices for Communication Tower Design, Siting, Construction, Operation, Maintenance, and Decommissioning (UFWS 2018).<br>• Use of facility lighting that does not attract birds or their prey to project sites. These include using non-steady burning lights (red, dual red and white strobe, strobe-like flashing lights) to meet Federal Aviation Administration requirements, using motion or heat sensors and switches to reduce the time when lights are illuminated, using appropriate shielding to reduce horizontal or skyward illumination, and avoiding the use of high-intensity lights (e.g., sodium vapor, quartz, and halogen). Lighting will not be installed under viaduct and bridge structures in riparian habitat areas.<br>Additional bird operational actions will be required for dry lakes and playas, Audubon Important Bird Areas and documented avian movement corridors. These measures include:<br>• Avoid, to the extent feasible, siting transmission lines across canyons or on ridgelines to prevent bird and raptor collisions.<br>• Install bird flight diverters on all facilities spanning or within 1,000 feet of stream and wash channels, canals, ponds, and any other natural or artificial body of water.<br>• Fencing or other type of flight diverter will be installed on all viaduct structures to encourage birds and raptors to fly over the HSR and avoid flying directly in the path of on-coming trains.<br>• Ensure poles do not have openings that could entrap birds. Measures may include sealing or capping all openings in poles or providing for escape routes (e.g., openings accommodating escape for various species).<br>Design aerial structures (e.g., viaducts and bridges) and tunnel portals to discourage birds and bats from roosting in expansion joints or other crevices. | | | | | | | | |
| **Hydrology and Water Resources** | | | | | | | | | | |

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| HYD-IAMF#1 | Stormwater and Groundwater Management | Prior to Construction, the Contractor shall prepare a storm and groundwater management and treatment plan for review and approval by the Authority. During the detailed design phase, each receiving storm and groundwater system's capacity to accommodate project runoff will be evaluated. As necessary, on-site storm and groundwater 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 the latest version of Authority Technical Memorandum 2.6.5 Hydraulics and Hydrology Guidelines. On-site storm and groundwater 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 techniques will be used to detain runoff on site and to reduce off-site runoff such as constructed wetland systems, biofiltration and bioretention systems, wet ponds, organic mulch layers, planting soil beds, and vegetated systems (biofilters), such as vegetated swales and grass filter strips, will be used where appropriate. | Design | Prepare plan | At incorporation or completion of design | Authority/ Contractor | Contractor | Prepare a stormwater management and treatment plan | Condition of construction contract | Impact HWR#1: Permanent Alteration of Surface Drainage Patterns from Aboveground Temporary Construction Activities and Permanent Structures Required for the Build Alternatives.<br>Impact HWR#3: Changes in Flood Risks Associated with Temporary Construction Activities and Permanent Structures Required for the Build Alternatives. |
| HYD-IAMF#2 | Flood Protection | Prior to Construction, the Contractor shall prepare a flood protection plan for Authority review and approval. The project will be designed both to remain operational during flood events and to minimize increases in 100-year or 200-year flood elevations, as applicable to locale. Design standards will include the following:<br>• Establish track elevation to prevent saturation and infiltration of stormwater into the sub-ballast.<br>• Minimize development within the floodplain, to such an extent that water surface elevation in the floodplain will not increase by more than 1 foot, or as required by state or local agencies, during the 100-year or 200-year flood flow [as applicable to locale]. Avoid placement of facilities in the floodplain or raise the ground with fill above the base-flood elevation.<br>• Design the floodplain crossings to maintain a 100-year floodwater surface elevation of no greater than 1 foot above current levels, or as required by state or local agencies, and project features within the floodway itself will not increase existing 100-year floodwater surface elevations in Federal Emergency Management Agency-designated floodways, or as otherwise | Design | Prepare plan | At incorporation or completion of design | Authority/ Contractor | Contractor | Prepare flood protection plan | Condition of construction contract | Impact HWR#1: Permanent Alteration of Surface Drainage Patterns from Aboveground Temporary Construction Activities and Permanent Structures Required for the Build Alternatives.<br>Impact HWR#3: Changes in Flood Risks Associated with Temporary Construction Activities and Permanent Structures Required for the Build Alternatives. |

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| | | agreed upon with the county floodplains manager.<br>The following design standards will minimize the effects of pier placement on floodplains and floodways:<br>• Design site crossings to be as nearly perpendicular to the channel as feasible to minimize bridge length.<br>• Orient piers to be parallel to the expected high-water flow direction to minimize flow disturbance.<br>• 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.<br>• 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.<br>• Use quarry stone, cobblestone, or their equivalent for erosion control along rivers and streams, complimented with native riparian plantings or other natural stabilization alternatives that will restore and maintain a natural riparian corridor.<br>Place bedding materials under the stone protection at locations where the underlying soils require stabilization as a result of stream-flow velocity. | | | | | | | | |
| HYD-IAMF#3 | Prepare and Implement a Construction Stormwater Pollution Prevention Plan | Prior to Construction (any ground-disturbing activities), the Contractor shall comply with the SWRCB Construction General Permit requiring preparation and implementation of a SWPPP. The Construction SWPPP will propose BMPs to minimize potential short-term increases in sediment transport caused by construction, including erosion control requirements, stormwater management, and channel dewatering for affected stream crossings. These BMPs will include measures to incorporate permeable surfaces into facility design plans where feasible, and how treated stormwater will be retained or detained on site. Other BMPs shall include strategies to manage the amount and quality of overall stormwater runoff. The Construction SWPPP will include measures to address, but are not limited to, the following:<br>• Hydromodification management to verify maintenance of pre-project hydrology by emphasizing on site retention of stormwater runoff using measures such as flow dispersion, infiltration, and evaporation (supplemented by detention where required). Additional flow | Pre-construction/ Construction | Permit compliance | At incorporation or completion of design/during monthly construction report | Authority/ Contractor | Contractor | Prepare Construction SWPPP | Condition of construction contract | Impact HWR#1: Permanent Alteration of Surface Drainage Patterns from Aboveground Temporary Construction Activities and Permanent Structures Required for the Build Alternatives<br>Impact HWR#2: Construction Activities Required for the Build Alternatives.<br>Impact PK#2: Construction-Related Access, Noise, Vibration, Air Quality, and Visual Changes to Parks, Recreation, and Open Space Resources. |

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| | | control measures will be implemented where local regulations or drainage requirements dictate.<br>• Implementing practices to minimize the contact of construction materials, equipment, and maintenance supplies with stormwater.<br>• 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.<br>• Implementing practices to reduce erosion of exposed soil, including soil stabilization, regular watering for dust control, perimeter siltation fences, and sediment catchment basins.<br>• Implementing practices to maintain current water quality, including: siltation fencing, wattle barriers, stabilized construction entrances, grass buffer strips, ponding areas, organic mulch layers, inlet protection, storage tanks and sediment traps to arrest and settle sediment.<br>• Where feasible, avoiding areas that may have substantial erosion risk, including areas with erosive soils and steep slopes.<br>• Using diversion ditches to intercept surface runoff from off site.<br>• Where feasible, limiting construction to dry periods when flows in water bodies are low or absent.<br>• Implementing practices to capture and provide proper off-site disposal of concrete wash water, including isolation of runoff from fresh concrete during curing to prevent it from reaching the local drainage system, and possible treatments (e.g., dry ice).<br>• Developing and implementing a spill prevention and emergency response plan to handle potential fuel and/or hazardous material spills.<br>Implementation of a SWPPP will be performed by the construction contractors as directed by the contractor's Qualified SWPPP Practitioner or designee. As part of that responsibility, the effectiveness of construction BMPs must be monitored before, during and after storm events. Records of these inspections and monitoring results are submitted to the local 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 will have the opportunity to review these documents. | | | | | | | |

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| HYD-IAMF#4 | Prepare and Implement an Industrial Stormwater Pollution Prevention Plan | Prior to Construction of any facility classified as an industrial facility, the Contractor shall comply with existing water quality regulations. The stormwater general permit requires preparation of a SWPPP 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/Construction | Permit compliance | At incorporation or completion of design/during monthly operation report | Authority/ Contractor | Contractor | Prepare industrial SWPPP | Condition of construction contract | Impact HWR#6: Project Operation Effects on Water. |
| HYD-IAMF#5 | Tunnel Boring Machine Design and Features | Certain types of Tunnel Boring Machines (TBMs) can operate in either an open hard rock tunneling mode (open-mode) or a pressurized tunneling mode (closed-mode). TBMs capable of operating in either of these modes are referred to as “hybrid” TBMs. Closed-mode operations will effectively prevent seepage from occurring at the cutterhead area, even under difficult ground conditions. The mode of operation for the proposed TBMs that will be employed will be determined by the specific conditions encountered along the tunnel alignment.<br>The current technology allows TBMs to sustain up to 17 bar of groundwater pressure while boring without additional measures. In areas where pressures can be expected to be higher, additional measures such as pre-grouting will be taken to minimize the water inflow into the tunnel during construction (see HYD-IAMF#7 for details).<br>In circumstances where groundwater pressures are 25 bar or less, a one-pass lining system will be installed in the tunnels constructed behind the passing TBM. In circumstances in which groundwater pressures exceed 25 bar, a two-pass lining system will be installed after the TBM has finalized its operations. A two-pass lining system will also be used in all instances for conventionally mined tunnels. See HYD-IAMF#6 below for more details.<br>The TBMs that will be needed for this project will be required to operate in a closed-mode when needed. The pressurization of the face will be achieved with Slurry or Earth Pressure Balance (EPB) technologies. The precise type of TBMs that will be used for the Build Alternatives cannot be identified at this time, since the selection of a TBM type will depend on a detailed knowledge of the geotechnical and hydrogeological ground conditions that exist along the alignments. Nevertheless, Slurry TBMs are generally more compatible with the high-water pressure conditions that will be encountered under the Build Alternatives.<br>The TBMs will be designed with ports for drilling horizontal probe holes through the TBM cutterhead, and angled probe holes through the TBM shields (see Figure 1). These holes will allow for water pressures and flow rates to be measured ahead of | Design | Design of TBMs | During Project design phase | Authority | Contractor | Design TBMs for the Project | Condition of construction contract | Impact HWR#4: Changes in Groundwater Recharge Associated with Temporary Construction Activities and Permanent Structures Required for the Build Alternatives.<br>Impact HWR#5: Changes in Hydrogeologic Conditions Associated with Tunnel Construction Beneath the ANF which May Affect Surface and Subsurface Water Resources. |

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| | | the TBM. The probe holes, equipped with blow out preventers, will allow for pre-excavation grouting ahead of the TBM to cut-off groundwater inflows into the tunnel. The design and configuration of probe/grout holes will allow for concurrent drilling and grouting of multiple holes ahead of the TBM, and around the entire tunnel perimeter. Such probing and grouting operations are most applicable to a TBM operating in an open mode and will be mandatory in that instance (see HYD-IAMF#7).<br>Two additional TBM features may be required for the construction of these tunnels:<br>• capability for injection of pressurized bentonite to fill the void space between the TBM shield and the rock/soil outside the shield, when working in a closed-mode, and<br>• the use of an automatic tail void grouting system in which grout is injected simultaneously with the TBM advance while operating both in closed-mode and open-mode (see HYD-IAMF#7 “Grouting” section below). | | | | | | | | |
| HYD-IAMF#6 | Tunnel Lining Systems | In circumstances where groundwater pressures are 25 bar or less, a one-pass lining system will be installed in the tunnels constructed using a TBM. The lining system, which will consist of segmental, precast, concrete lining with bolted and gasketed joints, will create a tunnel lining capable of resisting the groundwater pressure with minimal, leakage. A one-pass lining system could potentially be used in higher pressure locations if technological advancements were sufficient to ensure watertight seals under those pressures.<br>The steps to build the first lining will be the following:<br>1. probing ahead of the front of the cutter head to gather data about groundwater and rock conditions,<br>2. if the water pressure is above the TBM design pressure and it cannot work in closed-mode alone, pre-grouting ahead of the TBM through the cutter head and the shield.<br>3. checking with additional bores the effectiveness of the pre-grouting, and drilling of new boreholes and pre-grouting again if required,<br>4. excavate the ground to allow mounting of a new segmental ring, building the first lining typically about 12 m (40 feet length) behind the cutter head and performing the backfill grouting of the gap with a quick-setting grout, | Construction | Install one-pass lining system | Prior to operations | Authority/ Contractor | Authority/Contactor | Design and install one-pass lining system in the tunnels constructed using a TBM | Condition of construction contract | Impact HWR#4: Changes in Groundwater Recharge Associated with Temporary Construction Activities and Permanent Structures Required for the Build Alternatives.<br>Impact HWR#5: Changes in Hydrogeologic Conditions Associated with Tunnel Construction Beneath the ANF which May Affect Surface and Subsurface Water Resources. |

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| | | 5. finally, if leakage is detected through the first lining, punctual check grouting through the cast-in grout ports in the first lining takes place as needed to stop leakage.<br>Even when following the steps above, during construction, some leakage might occur in the area between the cutter head and the first ring of lining segments. This might happen if the pre-grouting treatment fails, and the ground water pressure exceeds the maximum sustained by the TBM shield. In this situation, additional measures will be taken to reduce the permeability of the surrounding ground and therefore, the water inflow. These measures can be:<br>• perform additional grouting through new holes drilled through the shield and the cutter head;<br>• perform ground freezing techniques in case of loose soils with high-permeability.<br>In sections where groundwater pressures are above 25 bar, a second tunnel lining would be installed to ensure water tight tunnels over the long-term. Current gaskets available in the market are nominally rated up to 50 bar; however these gaskets are assumed to withstand only 25 bars in the design (using a safety factor of 2) to account for construction quality defects and the 100-year lifespan of the infrastructure.<br>In order to minimize water leakage into the tunnel for the complete lifespan of the infrastructure, in the segments where ground water pressures are expected to exceed 25 bar, a monolithic second lining will be put in place after the TBM has finalized its operations and all its facilities have been dismantled (approx. 16 months). If any water flow is detected during the construction period after the installation of the first lining and before the second lining deployment, additional check grouting will be implemented as needed.<br>After completion of the second lining, the tunnel will be considered to be dry during the lifespan of the infrastructure. | | | | | | | |
| HYD-IAMF#7 | Grouting | A multi-phase grouting program will be implemented during the construction of the tunnels. A primary objective of the grouting program will be to reduce or prevent potential groundwater flows into the tunnels. The grouting program will be implemented for both TBM constructed and conventionally mined tunnels, although in the case of conventionally mined tunnels only pre-excavation grouting, and check grouting will be used.<br>The groundwater elevations can be obtained from the network of piezometers recommended in the Geotechnical Investigation Plan for the design phase | Construction/Post-construction | Implement grouting program | Monthly | Authority/ Contractor | Contractor | Implement a multi-phase grouting program within the Project tunnels | Condition of construction contract | Impact HWR#4: Changes in Groundwater Recharge Associated with Temporary Construction Activities and Permanent Structures Required for the Build Alternatives.<br>Impact HWR#5: Changes in Hydrogeologic Conditions Associated with Tunnel Construction Beneath the ANF which May Affect |

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| | | of the project. This will allow for development of appropriate grouting methods as well as provide a monitoring program to detect real-time changes of the groundwater elevations during construction.<br><br>To the extent applicable and feasible, the following grouting methods will be used during the construction of the tunnels to avoid and minimize groundwater flows into the tunnels:<br><br>• Pre-excavation grouting— During TBM tunnel construction using the open-mode approach, pre-excavation grouting will be implemented to reduce groundwater flow from the rock/soil mass prior to excavation, and to improve rock/soils conditions for tunneling. Systematic pre-excavation grouting ahead of the TBM will be performed to allow the TBM to advance, and the tunnel lining system to be installed, with minimum impacts to groundwater resources. Grout will be injected through the TBM shield and cutterhead holes. In circumstances where conventional mining methods are used, grout will be injected through drill holes advanced through the tunnel face and around the tunnel perimeter. The overall range of criteria for length and direction of drill holes, number of holes, grout composition and injection pressures will be determined based on a more extensive Geotechnical Baseline Report and the range of conditions anticipated from that report. The field conditions will then be used to select the appropriate application of the pre-excavation grouting technology at each specific location. The pre-grouting will create a zone of treated rock/soil around the tunnel that will be sealed to minimize groundwater inflows. Additional grouting will be implemented radially outward from the tunnel interior to broaden the diameter of the grouted zone surrounding the tunnel, as necessary, to further reduce groundwater flows into the tunnel.<br>• There are many international examples showing that pre-excavation grouting is effective in preventing the flow of water in tunnels during its construction. This technique has existed for more than 60 years and has experienced a rapid development during the last 20 years. Pressure injection has been used up to 1650 feet of water column (50 bar).<br>• A set of target water ingress flow rates should be established for this project prior to construction, based on the detailed studies to be developed in later phases, like ground water models and aquifer studies. Target inflow rates for both the construction and operation phases | | | | | | | | Surface and Subsurface Water Resources. |

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| | | should be defined, as well as differentiating per geologic formations or the different aquifers identified.<br>• Steering (overcut) gap around the body of the shield—During construction, pressurized bentonite will be injected to fill the void space between the TBM shield and the rock/soil outside the shield. The void space will be filled to seal off any potential water leakage from the cutterhead of the TBM back towards the rear of the shield. The capacity to inject pressurized bentonite is a built-in characteristic of a Slurry TBM, but this feature will need to be added to an EPB TBM if that type of TBM were to be selected. After advancing the machine, the void will be filled with the backfill grout placed around the tunnel lining (see below).<br>• Backfill grouting with two-component grout—During construction, backfill grouting will occur simultaneously with the advancement of the TBM. Grout will be injected from the tail of the shield to fill the annular gap between the TBM excavation limits and the segmental lining. The annular gap from the tail of the shield will be filled with a quick-setting grout to prevent water from traveling along the interface between the lining and the rock/soil. The accelerated two-component grout is superior to conventional cement grouts because it provides for complete and reliable backfilling of the annular gap. Moreover, this material hardens very quickly and provides resistance to water flow upon hardening.<br>• Check grouting— After the tunnel lining has been installed and backfilled, check grouting will be injected through grout ports in the tunnel lining where the back filling volume is less than the theoretical volume or there is evidence of groundwater inflow. The ports will be opened to check for voids and groundwater inflows. If any voids were detected, grout will be injected into the annular space under pressure (typically 0.7 to 1.0 bar higher than the static groundwater pressure) between the lining and rock/soil wall to control groundwater flows. The check grouting will be used for both single pass and double pass linings and will further reduce the potential for water to leak through the lining and into the tunnel. | | | | | | | | |
| HYD-IAMF#8 | Private Well Monitoring and Minimizing | **Private Well Monitoring**<br>Prior to tunnel construction, the Authority will identify all private water supply wells within the tunnel | Pre-construction/ Construction | Monitoring/Reporting | Monthly | Authority | Authority | Identify and monitor existing private wells for water quality impacts and replace | Condition of construction contract | Impact HWR#4: Changes in Groundwater Recharge Associated with Temporary Construction Activities and |

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| | Access Disruptions for Private Water Supply Wells Outside of the ANF | alignment outside of the ANF that may be rendered unusable due to tunnel construction. Baseline conditions prior to construction start, including pumping capacity and water quality, will be recorded for each well. Per the Authority's Right-of-Way Manual (see Section 8.07.00.00, Water Wells), if the project's tunneling intersects with a private well, the replacement of an affected private water supply well is among the options that the Authority will consider. Any final measures that the Authority undertakes will be determined only after consultation with the affected property owner.<br>**General Approach for Replacing Private Wells**<br>It is anticipated that any replacement well would be located on the owner's remainder property as close as reasonably possible to the existing well. If replacing a well is not feasible, the Authority will work with the property owner to identify an alternate water source for the affected property, which may include acquiring access to water wells on other properties or connecting to another water source to provide a water supply that is comparable to pre-existing conditions, to the extent feasible.<br>Any replacement wells must be constructed in compliance with applicable regulations, including regulations by the Department of Water Resources (e.g., Bulletins 74-81 and 74-90, as adopted by local agencies), the SWRCB, and the Department of Toxic Substances Control.<br>**Well Replacement**<br>If the Authority determines that a well must be acquired and replacement is appropriate, the Authority will generally cause the original well to be abandoned and will fairly compensate the well owner for the cost of establishing a replacement well or connecting to another water source.<br>Other options that the Authority will consider to replacing an existing well will include: the identification an alternative water source to provide a water supply that is equivalent in quantity and quality to pre-existing conditions for the affected well owner.<br>Under Section 8.07.03.00 of the Authority's Right-of-Way Manual, the Authority's policies and procedures allow for a follow-on monitoring period to ensure that the new well's supply is equivalent to the initial well. If it is not, the Authority's policies and procedures allow for compensation to the well owner to address needs to reach an equivalent water supply.<br>**Compensation to Property Owner**<br>If impacts to water supply wells necessitate acquisition of wells and/or the real property in which they are situated, the acquisition (and compensation for the acquisition) will occur in compliance with the | | | | | | private wells as needed | | Permanent Structures Required for the Build Alternatives. |

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| | | Authority's Right-of-Way Manual, and the Uniform Relocation Assistance and Real Property Acquisition Policies Act. | | | | | | | | |
| **Geology, Soils, Seismicity, and Paleontological Resources** | | | | | | | | | | |
| GEO-IAMF#1 | Geologic Hazards | Prior to construction, the Contractor shall prepare a Construction Management Plan (CMP) addressing how the Contractor will address geologic constraints and minimize or avoid impacts to geologic hazards during construction. The plan will be submitted to the Authority for review and approval. Additionally, the CMP shall include, if deemed necessary, details regarding the automated remote monitoring and define the settlement/deformation thresholds. The CMP will be developed during future project stages. At a minimum, the plan will address the following geological and geotechnical constraints/ resources:<br>a) Groundwater Withdrawal. Controlling the amount of groundwater withdrawal from the project, by re-inject groundwater at specific locations if necessary, or use alternate foundation designs to offset the potential for settlement. This control is important for locations with retained cuts in areas where high groundwater exists, and where existing buildings are located near the depressed track section.<br>b) Unstable Soils and Slope Instability. Employing various methods to mitigate for the risk of ground failure from unstable soils or slope instability. If soft or loose soils are encountered at shallow depths, they can be excavated and replaced with competent soils. To limit the excavation depth, replacement materials can also be strengthened using geosynthetics. Where unsuitable soils are deeper, ground improvement methods, such as stone columns, cement deep-soil-mixing, or jet-grouting, can be used. Alternatively, if sufficient construction time is available, preloading—in combination with prefabricated vertical drains (wicks) and staged construction—can be used to gradually improve the strength of the soil without causing bearing-capacity failures. Unstable slopes or landslide areas should be mitigated through appropriate methods for slope stabilization and landslide remediation. Methods for stabilizing landslides include applications of dewatering, earthwork (mass grading including buttress construction or complete landslide removal), and structural solutions such as retaining walls, tie-back systems, or pile installation<br>c) Subsidence. The Authority addresses subsidence in its design and construction processes. For the initial design, survey monuments were installed to establish a datum and set an initial track profile. | Design/Construction | Prepare plan | At incorporation or completion of design/during monthly construction report | Authority/ Contractor | Contractor | Prepare Construction Management Plan (CMP) | Condition of construction contract | Impact GSSP#1: Ground Subsidence and Ground Settlement Could Endanger People or Structures During Construction.<br>Impact GSSP#2: Karst Terrain Could Endanger People or Structures During Construction.<br>Impact GSSP#3: Landslides Could Endanger People or Structures During Construction.<br>Impact GSSP#4: Construction Could Expose Erodible Soils During Construction.<br>Impact GSSP#5: Expansive, Corrosive, and Collapsible Soils Could Endanger People or Structures During Construction.<br>Impact GSSP#6: Areas of Difficult Excavation Could Potentially Endanger Workers and Facilities.<br>Impact GSSP#7: Fault Rupture and Seismic Ground Shaking Could Endanger People or Structures During Construction.<br>Impact GSSP#8: Liquefaction, Lateral Spreading, and Ground Lurching Could Endanger People or Structures During Construction.<br>Impact GSSP#15: Surface Excavation and Subsurface Tunneling Could Destroy Unique Paleontological Resources.<br>Impact GSSP#16: Effects of Geologic Hazards During Operations.<br>Impact HMW#2: Potential to Encounter PEC Sites with Known and/or Suspected |

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| | | In the construction phase, the design-build (DB) contractors for track bed preparation will conduct topographic surveys for preparation of final design. Because subsidence could have occurred since the original benchmarks (survey monuments) were established, the DB contractor's topographic surveys will be used to help determine whether subsidence has occurred. The updated topographic surveys will also be used to establish the top of rail elevations for final design where the HSR system is outside established floodplain areas and above water surface elevations. Where the HSR system is in floodplain areas susceptible to flooding, consideration is being given to overbuild the height of the rail bed in anticipation of future subsidence.<br>d) Water and Wind Erosion. The Contractor will implement erosion control methods as appropriate from the various erosion control methods documented in the Construction Storm Water Pollution Prevention Plan (SWPPP) (See HYD-IAMF#3), the California Department of Transportation (Caltrans) Construction Manuals, and the construction technical memorandum (see GEO-IAMF#6), and in coordination with other erosion, sediment, stormwater management and fugitive dust control efforts. Water and wind erosion control methods may include, but are not limited to, use of revegetation, stabilizers, mulches, and biodegradable geotextiles.<br>e) Soils with Shrink-Swell Potential. In locations where shrink-swell potential is marginally unacceptable, soil additives will be mixed with existing soil to reduce the shrink-swell potential. Construction specifications will be based upon the decision whether to remove or treat the soil. This decision is based on the soils, specific shrink-swell characteristics, the additional costs for treatment versus excavation and replacement, as well as the long-term performance characteristics of the treated soil.<br>f) Soils with Corrosive Potential. In locations where soils have a potential to be corrosive to steel and concrete, the soils will be removed and buried structures will be designed for corrosive conditions, and corrosion-protected materials will be used in infrastructure.<br>g) Health and Safety Plan. Contractor shall be responsible for developing and implementing a health and safety plan to address geologic hazards. | | | | | | | | Contamination during Construction. |
| GEO-IAMF#2 | Slope Monitoring | During O&M, the Authority shall incorporate slope monitoring by a Registered Engineering Geologist | Operation | Prepare plan/Monitoring | Monthly during operation | Authority/ Contractor | Contractor | Slope monitoring during operation | Condition of construction contract | N/A |

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| | | into the O&M procedures. The procedures shall be implemented at sites identified in the CMP where a potential for long-term instability exists from gravity or seismic loading including but not limited to at-grade sections where slope failure could result in loss of track support, or where slope failure could result in additional earth loading to foundations supporting elevated structures. | | | | | | | | |
| GEO-IAMF#3 | Gas Monitoring | Prior to construction, the Contractor shall prepare a CMP addressing how gas monitoring will be incorporated into construction best management practices. The CMP will be submitted to the Authority for review and approval. Hazards related to potential migration of hazardous gases due to the presence of known oil and gas fields, areas of active or historic landfills, or other subsurface sources can be reduced or eliminated by following strict federal and state Occupational Safety & Health Administration (OSHA/Cal-OSHA) regulatory requirements for excavations, and by consulting with other agencies as appropriate, such as the Department of Conservation (Division of Oil and Gas) and the California Environmental Protection Agency, Department of Toxic Substances Control, regarding known areas of concern.<br>Practices will include using safe and explosion-proof equipment during construction, and testing for gases regularly. Installation of passive or active gas venting systems, gas collection systems, as well as active monitoring systems and alarms will be required in underground construction areas and facilities where subsurface gases are present. Installing gas-detection systems can monitor the effectiveness of these systems. | Design/Construction | Prepare plan/Design | Prior to construction | Authority/ Contractor | Contractor | Preparation of a CMP | Condition of construction contract | Impact GSSP#13: Mine Conditions Could Pose Hazards During Construction.<br>Impact HMW#4: Potential for Facilities Associated with all six Build Alternatives to be Located Adjacent to Landfills. |
| GEO-IAMF#4 | Historic or Abandoned Mines | Prior to construction, the Contractor shall prepare a CMP addressing how historic and abandoned mines will be incorporated into construction best management practices. The CMP will be submitted to the Authority for review and approval. Depending on the properties of an individual mine, mitigations to address historic or abandoned mines could include:<br>• ERCLA Cleanup. Environmental cleanups at sites that are releasing or threatening to release hazardous substances such as heavy metals from acid mine drainage and associated contaminated water and vapors as applicable.<br>• Non-CERCLA Cleanup. Cleanups of nonhazardous substance-related surface disturbance such as revegetation of disturbed areas, stabilization of mine tailings, reconstruction of stream channels and floodplains. | Design/Construction | Prepare plan/Design | Prior to construction | Authority/ Contractor | Contractor | Preparation of a CMP | Condition of design-build contract | Impact GSSP#13: Mine Conditions Could Pose Hazards During Construction.<br>Impact HMW#1: Hazards Due to the Routine Transport, Use, or Disposal of Hazardous Materials during Construction.<br>Impact HMW#2: Potential to Encounter PEC Sites with Known and/or Suspected Contamination during Construction. |

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| | | Safety Mitigation. Mitigation of physical safety hazards such as closure of adits and shafts and removal of dangerous structures. | | | | | | | | |
| GEO-IAMF#5 | Naturally Occurring Hazardous Materials | Prior to construction, the Contractor shall prepare a CMP addressing how the Contractor would minimize or avoid impacts related to hazardous naturally occurring materials (i.e., radon, mercury, and naturally occurring asbestos) during construction. The CMP would be submitted to the Authority for review and approval. The CMP shall include appropriate provisions for handling hazardous minerals, soils, or vapors including, but not limited to, dust control, control of soil erosion and water runoff, vapor control, and testing and proper disposal of excavated material. For operations, the Authority shall prepare and implement an Emergency Response Procedure Plan. In the unlikely event of a major naturally occurring hazardous materials release close to or in the vicinity of the Project, the Authority will develop emergency response procedures in conformance with Federal, State, and local regulations. Procedures for preventing, responding to, and mitigating releases of hazardous materials from non-natural sources are addressed in HMW-IAMF#4. | Design/Construction | Design/Monitoring/Reporting | Prior to construction | Authority/ Contractor | Contractor | Preparation of a CMP | Condition of construction contract | Impact HMW#1: Hazards Due to the Routine Transport, Use, or Disposal of Hazardous Materials during Construction. |
| GEO-IAMF#6 | Ground Rupture Early Warning Systems | Prior to construction, the Contractor shall document how the project design incorporates installation of early warning systems, triggered by strong ground motion association with ground rupture. Known nearly active fault will be monitored. Linear monitoring systems such as time domain reflectometers or similar technology shall be installed along rail lines in the zone of potential ground rupture. These devices emit electronic information that is processed in a centralized location and will be used to temporarily control trains, thus reducing accidents due to fault creep. Damage to infrastructure from fault creep can be mitigated with routine maintenance including minor realignment. | Design/Construction | Design/Monitoring/Reporting | Prior to construction | Authority/ Contractor | Contractor | Preparation of a CMP | Condition of construction contract | Impact GSSP#7: Fault Rupture and Seismic Ground Shaking Could Endanger People or Structures During Construction.<br>Impact GSSP#7: Fault Rupture and Seismic Ground Shaking Could Endanger People or Structures During Construction. |
| GEO-IAMF#7 | Evaluate and Design for Large Seismic Ground Shaking | Prior to construction, the Contractor shall document through preparation of a technical memorandum how all HSR components were evaluated and designed for large seismic ground shaking. Prior to final design, the Contractor will conduct additional seismic studies to establish up-to-date estimation of levels of ground motion. The most current Caltrans seismic design criteria at the time of design will be used in the design of any structures supported in or on the ground. These design procedures and features reduce to the greatest practical extent for potential movements, shear forces, and displacements that result from inertial response of the structure. In critical locations, pendulum base isolators may be used to reduce the levels of inertial forces. New | Design | Design/Studies | Prior to final construction | Contractor/ Authority | Contractor/ Authority | At incorporation or completion of design | Seismic ground shaking design technical memorandum | Impact GSSP#7: Fault Rupture and Seismic Ground Shaking Could Endanger People or Structures During Construction.<br>Impact GSSP#7: Fault Rupture and Seismic Ground Shaking Could Endanger People or Structures During Construction. |

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| | | composite materials may also be used to enhance seismic performance. | | | | | | | | |
| GEO-IAMF#8 | Suspension of Operations During an Earthquake | Prior to O&M activities, the Contractor shall document in a technical memorandum how suspension of operations during or after an earthquake was addressed in project design. Motion-sensing instruments to provide ground motion data and a control system to shut down HSR operations temporarily during or after a potentially damaging earthquake will be incorporated into final design. Monitoring equipment will be installed at select locations where high ground motions could occur. The system will then be inspected for damage due to ground motion and/or ground deformation, and then returned to service when appropriate. | Design/Construction /Operation | Reporting | As needed based on an earthquake event | Contractor/ Authority | Contractor/ Authority | At incorporation or completion of design/during monthly construction reporting | Technical memorandum prepared as needed based on an earthquake event | Impact GSSP#7: Fault Rupture and Seismic Ground Shaking Could Endanger People or Structures During Construction. |
| GEO-IAMF#9 | Subsidence Monitoring | Prior to O&M, the Authority shall develop a stringent track monitoring program. Once tracks are operational, a remote monitoring program will be implemented to monitor the effects of ongoing subsidence. Track inspection systems will provide early warning of reduced track integrity. HSR train sets will be equipped with autonomous equipment for daily track surveys. This specification will be added to HSR train bid packages. If monitoring indicates that track tolerances are not met, trains will operate at reduced speed until track tolerances are restored. In addition, the contractor responsible for wayside maintenance will be required to implement a stringent program for track maintenance. | Design/Operation | Program development | Monthly | Authority | Contractor | Develop a stringent track monitoring program | Condition of design-build contract | Impact GSSP#1: Ground Subsidence and Ground Settlement Could Endanger People or Structures During Construction.<br>Impact GSSP#16: Effects of Geologic Hazards During Operations. |
| GEO-IAMF#10 | Geology and Soils | Prior to construction, the Contractor shall document through issuance of a technical memorandum how the following guidelines and standards have been incorporated into facility design and construction:<br>• 2015 American Association of State Highway and Transportation Officials (AASHTO) Load and Resistance Factor Bridge Design Specifications and the 2015 AASHTO Guide Specifications for Load and Resistance Factor Seismic Bridge Design, or their most recent versions. These documents provide guidance for characterization of soils, as well as methods to be used in the design of bridge foundations and structures, retaining walls, and buried structures. These design specifications will provide minimum specifications for evaluating the seismic response of the soil and structures.<br>• 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 | Design/Construction /Operation | Design/Reporting | At incorporation or completion of design/during monthly construction reporting | Authority/ Contractor | Contractor | Prepare technical memorandum/Implementation of guidelines during design, construction, and operation phases | Condition of construction contract | Impact GSSP#1: Ground Subsidence and Ground Settlement Could Endanger People or Structures During Construction.<br>Impact GSSP#5: Expansive, Corrosive, and Collapsible Soils Could Endanger People or Structures During Construction.<br>Impact GSSP#6: Areas of Difficult Excavation Could Potentially Endanger Workers and Facilities.<br>Impact GSSP#7: Fault Rupture and Seismic Ground Shaking Could Endanger People or Structures During Construction.<br>Impact GSSP#8: Liquefaction, Lateral Spreading, and Ground Lurching Could Endanger |

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| | | designing retaining walls used for retained cuts and retained fills, foundations for elevated structures, and at-grade segments. Some of the documents include guidance on methods of mitigating geologic hazards that are encountered during design.<br>• 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.<br>• California Building Code: The code is based on 2015 International Building Code (IBC). This code contains general building design and construction requirements relating to fire and life safety, structural safety, and access compliance.<br>• IBC and American Society of Civil Engineers (ASCE)-7: These codes and standards provide minimum design loads for buildings and other structures. They will 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.<br>• 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 cantilevers (e.g., soldier pile, secant pile, and tangent pile) and tie-back walls used for retained cuts.<br>• ASTM International has developed standards and guidelines for all types of material testing—from soil compaction testing to concrete—strength testing. The ASTM International standards also include minimum performance requirements for materials. | | | | | | | People or Structures During Construction.<br>Impact GSSP#16: Effects of Geologic Hazards During Operations. |
| GEO-IAMF#11 | Engage a Qualified Paleontologic | Prior to the 90% design milestone for each construction package (CP) within the Project Section, | Design | Contractor will retain paleontological resources specialist | Prior to 90 percent design milestone for each CP | Authority/ Contractor | Contractor | Retain PRS | Condition of construction contract | Impact GSSP#15: Surface Excavation and Subsurface Tunneling Could Destroy |

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| | al Resources Specialist | the Contractor will retain a Paleontological Resources Specialist (PRS) responsible for<br>• Reviewing the final design for the CP,<br>• Developing a detailed Paleontological Resources Monitoring and Mitigation Plan (PRMMP) for the CP, and<br>• The PRS will be responsible for implementing the PRMMP, including development and delivery of WEAP Training, supervision of Paleontological Resource Monitors (PRMs), evaluation and treatment of finds, if any, and preparation o f a final paleontological mitigation report, per the PRMMP and for each CP.<br>Retention of PRS staff will occur in a timely manner, in advance of the 90% design milestone for each CP, such that the PRS is on board and can review the 90% design submittal without delay when it becomes available. If feasible, the same PRS will be responsible for all CPs within a given Project Section.<br>All PRS staff will meet or exceed the qualifications for a Principal Paleontologist as defined in the California Department of Transportation's current Standard Environmental Reference, Chapter 8 (Caltrans 2014). Appointment of PRS staff will be subject to review and approval by the Authority. | | | | | | | | Unique Paleontological Resources. |
| GEO-IAMF#12 | Perform Final Design Review and Triggers Evaluation | For each CP within the Project Section, the responsible PRS will evaluate the 90% design submittal to identify the portions of the CP that will involve work in paleontologically sensitive geologic units (either at the surface or in the subsurface), based on findings of the final Paleontological Resources Technical Report (TR) prepared for the Project Section. Evaluation will consider the location, areal extent, and anticipated depth of ground disturbance, the construction techniques that are planned/proposed, and the geology (i.e., location of geologic units with high paleontological resources) of the CP and vicinity. The evaluation and resulting recommendations will be consistent with guidance in the Society of Vertebrate Paleontology (SVP) Standard Procedures for the Assessment and Mitigation of Adverse Impacts to Paleontological Resources (SVP Impact Mitigation Guidelines Revision Committee 2010), the SVP Conditions of Receivership for Paleontologic Salvage Collections (SVP Conformable Impact Mitigation Guidelines Committee 1996), and relevant guidance from Chapter 8 of the current Caltrans Standard Environmental Reference (Caltrans 2014).<br>The purpose of the Final Design Review and Triggers Evaluation will be to develop specific language detailing the location and duration of paleontological monitoring and other requirements | Design | Reporting | Prior to 90 percent design milestone for each CP | Authority/ Contractor | Contractor | CP reporting | Condition of construction contract | Impact GSSP#15: Surface Excavation and Subsurface Tunneling Could Destroy Unique Paleontological Resources. |

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| | | for paleontological resources applicable to each CP within the Project Section. Paleontological protection requirements identified through the Final Design Review and Triggers Evaluation will be recorded in a concise technical memorandum ("Final Design Review Requirements for Paleontological Resources Protection") which will then be incorporated in full detail into the PRMMP for each CP. Those portions of the CP requiring paleontological monitoring will also be clearly delineated in the project construction documents for each CP. | | | | | | | | |
| GEO-IAMF#13 | Prepare and Implement Paleontological Resources Monitoring and Mitigation Plan (PRMMP) | Following the Final Design Review and Triggers Evaluation for each CP, the PRS will develop a CP-specific PRMMP. For greater efficiency, PRMMPs may be written such that they cover more than1CP, as long as the specific requirements of the IAMF's are satisfied explicitly and in detail for each CP included.<br>The PRMMP for each CP will incorporate the findings of the Design Review and Triggers Evaluation for that CP and will be consistent with the SVP Standard Procedures for the Assessment and Mitigation of Adverse Impacts to Paleontological Resources (SVP Impact Mitigation Guidelines Revision Committee 2010), the SVP Conditions of Receivership for Paleontologic Salvage Collections (SVP Conformable Impact Mitigation Guidelines Committee 1996), and relevant guidance from Chapter 8 of the current Caltrans Standard Environmental Reference (Caltrans 2014). As such, the PRMMP will provide for at least the following:<br>• Implementation of the PRMMP by qualified personnel, including the following positions:<br>  ○ Paleontological Resource Specialist - The PRS will be required to meet or exceed Principal Paleontologist qualifications per Chapter 8 of the current Caltrans Standard Environmental Reference (Caltrans 2014). The Supervising Paleontologist may, but not necessarily, be the PRS who prepares the PRMMP.<br>  ○ Paleontological Resources Monitors - The PRS will be required to meet or exceed Paleontological Monitor qualifications per Chapter 8 of the current Caltrans Standard Environmental Reference (Caltrans 2014).<br>• Development of pre-construction and construction-period coordination procedures and communications protocols.<br>• Evaluation as to whether a pre-construction survey by qualified personnel is warranted for the CP. In general, pre-construction surveys are beneficial if there is a strong possibility that significant paleontological resources (e.g., | Design | Reporting | Each CP | Authority/ Contractor | Contractor | CP reporting | Condition of construction contract | Impact GSSP#15: Surface Excavation and Subsurface Tunneling Could Destroy Unique Paleontological Resources. |

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| | | concentrations of vertebrate fossils) are exposed at the ground surface and will be destroyed during the initial clearing and grubbing phase of earthwork. Such a determination can usually be made during preparation of the paleontological resources TR.<br>• Requirements for paleontological monitoring by qualified PRMs of all ground-disturbance activities known to affect, or potentially affect, highly sensitive geologic units and for ground-disturbance activities affecting other geologic units in any areas where the PRS considers it warranted based on the findings of the paleontological resources TR or any pre-construction surveys. In all areas of the CP subject to monitoring, monitoring will initially be conducted full-time for all ground-disturbance activities. However, the PRMMP may provide for monitoring frequency in any given location to be reduced once approximately 50% of the ground-disturbance activity in completed locations, if the reduction is appropriate based on the implementing PRS's professional judgment in consideration of actual site conditions.<br>• Provisions, if recommended by the PRS for paleontological monitoring of specific construction drilling operations. In general, small diameter (i.e., <18 inches) drilling operations or drilling operations using bucket augers tend to pulverize impacted sediments and any contained fossils and are typically not monitored. The section in the PRMMP addressing monitoring for drilling operations will rely, in part, on the information supplied by the CP design and geotechnical teams but will also take into consideration of the nature, depth, and location of drilling needed, and the anticipated equipment and staging configurations.<br>• Provisions for the content development and delivery of paleontological resources WEAP training.<br>• Provisions for in-progress documentation of monitoring (and, if applicable, salvage/recovery operations) via "construction dailies" or a similar approved means.<br>• Provisions for a "stop work, evaluate, and treat appropriately" response in the event of a known or potential paleontological discovery, including finds in highly sensitive geologic units as well as finds, if any, in geologic units identified as less sensitive, or non-sensitive, for paleontological resources. | | | | | | | | |

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| | | • Provisions for sampling and recovery of unearthed fossils consistent with SVP Standard Procedures (SVP Impact Mitigation Guidelines Revision Committee 2010) and the SVP Conditions of Receivership (SVP Conformable Impact Mitigation Guidelines Committee 1996). Recovery procedures will provide for recovery of both macrofossils and microfossils.<br>• Provisions for acquiring a repository agreement from an approved regional repository for the curation, care, and storage of recovered materials, consistent with the SVP Conditions of Receivership (SVP Conformable Impact Mitigation Guidelines Committee 1996). If more than1repository institution is designated, separate repository agreements must be provided.<br>• Provisions for preparation of a final monitoring and mitigation report that meets the requirements of the Caltrans Standard Environmental Reference Chapter 8 provisions for the Paleontological Monitoring Report and Paleontological Stewardship Summary (Caltrans 2014).<br>Provisions for the preparation, identification, and analysis and curation of fossil specimens and data recovered, consistent with the SVP Conditions of Receivership (SVP Conformable Impact Mitigation Guidelines Committee 1996) and any specific requirements of the designated repository institution(s). | | | | | | | | |
| GEO-IAMF#14 | Provide WEAP Training for Paleontological Resources | Prior to groundbreaking for each CP within the Project Section, the Contractor will provide paleontological resources WEAP training delivered by the PRS. 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. Refresher training will also be made available to management and supervisory personnel and workers as needed, based on the judgment of the PRS.<br>At a minimum, paleontological resources WEAP training will include information on:<br>• The coordination between construction staff and paleontological staff.<br>• The construction and paleontological staff roles and responsibilities in implementing the PRMMP.<br>• The possibility of encountering fossils during construction.<br>• The types of fossils that may be seen and how to recognize them, and | Pre-construction | Training program/Reporting | Prior to groundbreaking for each CP within the Project Section, then annual (training)/Monthly (reporting) | Contractor/ Authority | Contractor/ Authority | WEAP training | Condition of construction contract | Impact GSSP#15: Surface Excavation and Subsurface Tunneling Could Destroy Unique Paleontological Resources. |

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| | | • The proper procedures in the event fossils are encountered, including the requirement to halt work in the vicinity of the find and procedures for notifying responsible parties in the event of a find.<br>Training materials and formats may include, but are not necessarily limited to, in-person training, prerecorded videos, posters, and informational brochures that provide contacts and summarize procedures in the event paleontological resources are encountered. WEAP training contents will be subject to review and approval by the Authority. Paleontological resources WEAP training may be provided concurrently with cultural resources WEAP training.<br>Upon completion of any WEAP training, the Contractor will require workers to sign a form stating that they attended the training and understand and will comply with the information presented. Verification of paleontological resources WEAP training will be provided to the Authority by the Contractor. | | | | | | | | |
| GEO-IAMF#15 | Halt Construction, Evaluate, and Treat if Paleontological Resources Are Found | Consistent with the PRMMP if fossil materials are discovered during construction, regardless of the individual making the discovery, all activity in the immediate vicinity of the discovery will halt and the find will be protected from further disturbance. If the discovery is made by someone other than the PRS or PRM(s), the person who made the discovery will immediately notify construction supervisory personnel, who will in turn notify the PRS. Notification to the PRS will take place promptly (prior to the close of work the same day as the find), and the PRS will evaluate the find and prescribe appropriate treatment as soon as feasible. Work may continue on other portions of the CP while evaluation (and, if needed, treatment) takes place, as long as the find can be adequately protected in the judgment of the PRS.<br>If the PRS determines that treatment (i.e., recovery and documentation of unearthed fossil[s]) is warranted, such treatment, and any required reporting, will proceed consistent with the PRMMP. The Contractor will be responsible for ensuring prompt and accurate implementation, subject to verification by the Authority.<br>The stop work requirement does not apply to drilling operations since drilling typically cannot be suspended in mid-course. However, if finds are made during drilling, the same notification and other follow-up requirements will apply. The PRS will coordinate with construction supervisory and drilling staff regarding the handling of recovered fossils. | Construction | Reporting | Daily logs during active monitoring | Authority/ Contractor | Contractor | Weekly reporting (if resource is identified during construction) | PRMMP, WEAP | Impact GSSP#15: Surface Excavation and Subsurface Tunneling Could Destroy Unique Paleontological Resources. |

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| | | The requirements of this IAMF will be detailed in the PRMMP and presented as part of the paleontological resources WEAP training. | | | | | | | | |
| **Hazardous Materials and Wastes** | | | | | | | | | | |
| HMW-IAMF#1 | Property Acquisition Phase I and Phase II Environmental Site Assessments, Additional Preconstruction Investigations, and Associated Actions to Control Site Contamination | During the right-of-way acquisition phase, Phase I environmental site assessments shall be conducted in accordance with standard ASTM International methodologies to characterize each parcel, including parcels at potential environmental concern sites. Parcels that require a Phase II Environmental Site Assessment (e.g., soil, groundwater, soil vapor subsurface investigations) will be identified using information and data obtained in the Phase I Environmental Site Assessments. Phase II and subsequent investigation may require coordination with federal, state, and local agency officials, as well as other stakeholders. Depending on the arrangement negotiated during property acquisition, potential environmental concern sites with known or suspected contamination may be remediated prior to construction on the site. For sites that are not remediated prior to acquisition, data obtained during the Phase I Environmental Site Assessment will be used to evaluate the need for and the extent of additional investigation. The Phase II Environmental Site Assessment and any additional characterization data collected will be used to inform aspects of detailed project design and actions required during construction and/or operation of the project to protect human health and the environment from contaminants present on the parcels (e.g., targeted removal of contamination, in situ treatment, or soil capping). Project design details for construction at sites subject to cleanup or land use controls will be reviewed and approved by appropriate environmental oversight agencies. Design and other corrective actions required to protect human health and the environment shall be coordinated with appropriate federal, state, and local agency officials and stakeholders (as necessary) and conducted in full compliance with recorded land use restrictions, and applicable state and federal laws and regulations and local ordinances. For construction within the San Fernando Valley Superfund Site Area 1, coordination with stakeholders shall be in accordance with HMW-IAMF#11. Controls necessary to protect workers, the public, and the environment from contamination discovered during the Environmental Site Assessments and pre-construction site investigations shall be identified and required to be implemented during construction in accordance with HMW-IAMF#4. | Pre-construction/ Construction | Reporting | During the right- of-way acquisition phase | Authority/ Contractor | Contractor | Prepare Phase I and II ESAs and additional investigation materials, if needed | Condition of construction contract | Impact HMW#2: Potential to Encounter PEC Sites with Known and/or Suspected Contamination during Construction.<br>Impact HMW#4: Potential for Facilities Associated with all six Build Alternatives to be Located Adjacent to Landfills.<br>Impact HMW#7: Hazards Due to Operation Within Areas of Historical Contamination. |

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| HMW-IAMF#2 | Landfill | Prior to Construction (any ground-disturbing activities), the Contractor shall verify to the Authority through preparation of a technical memorandum that methane protection measures will be implemented for all work within 1,000 feet of a landfill, including development of new structures within 1,000 feet of a landfill, gas-detection systems and personnel training. This will be undertaken pursuant to State of California Title 27, Environmental Protection – Division 2, Solid Waste, and the hazardous materials best management practices plan. | Pre-construction/ Construction | Reporting | Prior to Construction (any ground-disturbing activities) | Authority/ Contractor | Contractor | Monthly record keeping | Contract requirements and specifications | Impact HMW#4: Potential for Facilities Associated with all six Build Alternatives to be Located Adjacent to Landfills. |
| HMW-IAMF#3 | Work and Vapor Barriers | Prior to Construction (any ground-disturbing activities), the Contractor shall verify to the Authority through preparation of a technical memorandum the use of work barriers. Nominal design variances, such as the addition of a plastic barrier beneath the ballast material to limit the potential release of volatile subsurface contaminants, may be implemented in conjunction with site investigation and remediation. Vapor barriers and associated venting systems determined to be necessary to prevent intrusion of hazardous concentrations of volatile compounds into occupied project structures (e.g., stations or tunnels) shall be designed in accordance with standard engineering practices and reviewed and accepted by relevant stakeholders and regulatory agencies. Existing vapor barriers for controlling vapor intrusion at potential environmental concern sites shall be protected during construction, and if damaged, shall be repaired or replaced in accordance with discussions and coordination with relevant stakeholders and regulatory agencies. | Pre-construction/ Construction | Prepare technical memorandum | Prior to Construction (any ground-disturbing activities) | Authority/ Contractor | Contractor | Prepare work barrier technical memorandum | Condition of construction contract | Impact HMW#2: Potential to Encounter PEC Sites with Known and/or Suspected Contamination during Construction.<br>Impact HMW#4: Potential for Facilities Associated with all six Build Alternatives to be Located Adjacent to Landfills.<br>Impact HMW#7: Hazards Due to Operation Within Areas of Historical Contamination. |
| HMW-IAMF#4 | Known, Suspected, and Unanticipated Environmental Contamination | The Authority, or its Design Contractor, prior to completion of 30 percent design, will develop a soil management plan that incorporates information and data regarding known and suspected contamination obtained per HMW-IAMF#1. The plan will include requirements for protection of human health and environmental to be implemented by the Construction Contractor during construction on sites at which contamination is or may be present. The soil management plan will be reviewed and approved by appropriate agencies with oversight responsibilities for sites subject to cleanup or land use controls and will be provided to the Construction Contractor who shall be contractually obligated to meet requirements the plan requirements.<br>Prior to Construction, the Construction Contractor in accordance with the soil management plan, shall prepare a CMP addressing provisions for the disturbance and handling of known, suspected, and unanticipated contamination, and protection of existing remedial systems and contamination controls (e.g., vapor barriers) where construction | Pre-construction | Prepare plan | Prior to completion of 30 percent design | Authority/Design Contractor | Design Contractor, Construction Contractor | Prepare soil management plan/report as needed | Condition of construction contract | Impact HMW#1: Hazards Due to the Routine Transport, Use, or Disposal of Hazardous Materials during Construction.<br>Impact HMW#2: Potential to Encounter PEC Sites with Known and/or Suspected Contamination during Construction.<br>Impact HMW#5: The Construction Footprint Would be in the Vicinity of Oil and Natural Gas Resources or Facilities. |

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| | | may impact or damage such systems and controls. The plan shall require that an environmental professional provide oversight of activities that may result in encountering known or suspected contamination. The CMP shall require the Contractor to develop and implement site-specific health and safety protocols that address site hazards in compliance with Cal OSHA regulations for handling contaminated media; including training of construction workers in hazard recognition and monitoring for hazardous contaminants to which workers may be exposed in areas where contamination is known or suspected based on data obtained under HMW-IAMF#1. Use of field screening equipment shall be specified as appropriate based on data obtained under HMW-IAMF#1 (e.g., for volatile organic vapors). The CMP shall include specifications for controlling releases of contaminants or contaminated media during construction, including dust control, control of soil erosion and contaminated water runoff, vapor control, and testing and proper storage and disposal of excavated material. The CMP shall include an effective monitoring and cleanup program for spills and leaks of any hazardous materials or contaminated media. Requirements for sampling and analysis of media suspected to be contaminated shall be included in the CMP.<br>For work at sites subject to contaminant cleanup, the CMP shall be submitted, as required, to regulatory agencies with oversight authority for the cleanup and to stakeholders. For work at the San Fernando Valley Superfund Site Area 1, consultation with regulatory agencies and stakeholders shall be in accordance with HMW-IAMF#11. The CMP shall include requirements for notification by the Contractor to the Authority, which will notify appropriate stakeholders and agencies, of newly discovered contamination. The Authority will work closely with the stakeholders and regulatory agencies to resolve any such encounters and address necessary cleanup or disposal. Recordkeeping requirements shall be specified in the CMP. For operations in areas with known and suspected contamination, the Authority shall prepare and implement emergency response procedures that address the unlikely potential of a major hazardous materials release close to or in the vicinity of the Project as required by Federal, State, and local regulations. The CMP will be submitted to the Authority for review and approval.<br>Copies of all documentation generated in accordance with the CMP, including monitoring and analytical results, shall be provided to the Authority within 30 days of receipt of analytical results and/or | | | | | | | | |

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| | | encountering of apparent contaminated media (soil, groundwater, or vapor). | | | | | | | | |
| HMW-IAMF#5 | Demolition Plans | Prior to construction that involves demolition, the Contractor shall prepare demolition plans for the safe dismantling and removal of building components and debris. The demolition plans will include a plan for lead and asbestos and polychlorinated biphenyl abatement. The plans shall be submitted to the Project Construction Manager (PCM) on behalf of the Authority for verification that appropriate demolition practices have been followed consistent with federal and state regulations regarding asbestos and lead paint abatement. | Pre-construction/ Construction | Prepare plan/Reporting | Prior to construction that involves demolition | Authority/ Contractor | Contractor | Prepare demolition plans/reporting as needed | Condition of construction contract | Impact HMW#1: Hazards Due to the Routine Transport, Use, or Disposal of Hazardous Materials during Construction. |
| HMW-IAMF#6 | Spill Prevention | Prior to construction (any ground-disturbing activities), the Contractor shall prepare a Construction Management Plan addressing spill prevention. A Spill Prevention, Control, and Countermeasure (SPCC) plan (or Spill Prevention and Response Plan if the total above ground oil storage capacity is less than 1,320 gallons in storage containers greater than or equal to 55-gallons) shall prescribe BMPs to follow to prevent hazardous material releases and cleanup of any hazardous material releases that may occur. The plans will be prepared and submitted to the PCM on behalf of the Authority and shall be implemented during Construction. | Pre-construction/ Construction | Prepare plan/Reporting | Prior to Construction (any ground-disturbing activities)/reporting | Authority/ Contractor | Contractor | Prepare Construction Management Plan/reporting as needed | Condition of construction contract | Impact HMW#1: Hazards Due to the Routine Transport, Use, or Disposal of Hazardous Materials during Construction.<br>Impact HMW#2: Potential to Encounter PEC Sites with Known and/or Suspected Contamination during Construction.<br>Impact HMW#5: The Construction Footprint Would be in the Vicinity of Oil and Natural Gas Resources or Facilities. |
| HMW-IAMF#7 | Storage and Transport of Materials | During construction, the Contractor will comply with applicable state and federal regulations, such as the Resource Conservation and Recovery Act, Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), the Hazardous Materials Release Response Plans and Inventory Law, and the Hazardous Waste Control Law. Prior to Construction the Contractor will provide the Authority with a hazardous materials and waste plan describing responsible parties and procedures for hazardous waste and hazardous materials transport. | Pre-construction/ Construction | Regulation compliance/Reporting | Monthly | Authority/ Contractor | Contractor | Weekly record keeping/monthly reporting | Condition of construction contract | Impact HMW#1: Hazards Due to the Routine Transport, Use, or Disposal of Hazardous Materials during Construction.<br>Impact HMW#2: Potential to Encounter PEC Sites with Known and/or Suspected Contamination during Construction.<br>Impact HMW#5: The Construction Footprint Would be in the Vicinity of Oil and Natural Gas Resources or Facilities. |
| HMW-IAMF#8 | Permit Conditions | During Construction and Operation, the Contractor will comply with the SWRCB Construction Clean Water Act Section 402 General Permit conditions and requirements for transport, labeling, containment, cover, and other BMPs for storage of hazardous materials during Construction and Operation. Prior to Construction and Operation, the Contractor shall provide the Authority with a | Pre-construction/ Construction/ Operation | Reporting | Prior to construction | Authority/ Contractor | Contractor | Prepare hazardous materials and waste plan | Condition of construction contract | Impact HMW#1: Hazards Due to the Routine Transport, Use, or Disposal of Hazardous Materials during Construction.<br>Impact HMW#2: Potential to Encounter PEC Sites with |

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| | | hazardous materials and waste plan describing responsible parties and procedures for hazardous waste and hazardous materials transport, containment, and storage BMPs that will be implemented during Construction and Operation. | | | | | | | | Known and/or Suspected Contamination during Construction.<br>Impact HMW#5: The Construction Footprint Would be in the Vicinity of Oil and Natural Gas Resources or Facilities. |
| HMW-IAMF#9 | Environmental Management System | To the extent feasible, the Authority is committed to identifying, avoiding, and minimizing hazardous substances in the material selection process for construction, operation, and maintenance of the HSR system. The Authority will use an Environmental Management System to describe the process that will be used to evaluate the full inventory of hazardous materials as defined by federal and state law employed on an annual basis and will replace hazardous substances with nonhazardous materials. The Contractor shall implement the material substitution recommendation contained in the annual inventory. | Pre-construction/ Construction | Reporting | Annual | Authority/ Contractor | Contractor | Annual reporting | Condition of construction contract/Environmental Management System | Impact HMW#6: Hazards Due to the Routine Transport, Use, or Disposal of Hazardous Materials during Operation. |
| HMW-IAMF#10 | Hazardous Materials Plans | Prior to Operations and Maintenance activities, the Authority shall prepare hazardous materials monitoring plans. These will be used as a basis source, such as a hazardous materials business plan as defined in Title 19 California Code of Regulations and a SPCC plan. | Post-construction | Prepare plans | Prior to operation | Authority | Authority | Prepare hazardous materials monitoring plans | Condition of construction contract | Impact HMW#6: Hazards Due to the Routine Transport, Use, or Disposal of Hazardous Materials during Operation. |
| HMW-IAMF#11 | Stakeholder Consultation for the San Fernando Valley Superfund Site Area 1 | As design of the Palmdale to Burbank Project Section progresses, more project-specific information will be developed regarding the requisite permitting and project design for the potential replacement of, or modification to, extraction wells and/or other ancillary infrastructure used for municipal water supply and remediation of groundwater within the Burbank and Glendale Operable Units of the Superfund Sites in the San Fernando Valley.<br>As the design progresses, the Authority will coordinate with relevant stakeholders on an ongoing basis to review the permitting requirements as well as the project design and construction methods for proposed modifications to the extraction wells and ancillary infrastructure to ensure that municipal water supplies and the effectiveness of the Superfund Site cleanup remedies are not impaired by construction and operation of the HSR Build Alternative. Relevant stakeholders include the United States Environmental Protection Agency, the California Department of Toxic Substances Control, RWQCB - Los Angeles Region, the California Department of Water Resources, RWQCB Division of Drinking Water, the City of Burbank, the City of Glendale, and Potentially Responsible Parties named in the Second Consent Decree for San Fernando Valley Superfund | During Design | Stakeholder Coordination/ Reporting | Ongoing | Authority | Contractor | Coordination with relevant stakeholders on an ongoing basis to review the permitting requirements as well as the project design and construction methods for proposed modifications to the extraction wells and ancillary infrastructure to ensure that municipal water supplies and the effectiveness of the Superfund Site cleanup remedies are not impaired by construction and operation of the HSR Build Alternative | Coordination with stakeholders to address Superfund Sites | Impact HMW#2: Potential to Encounter PEC Sites with Known and/or Suspected Contamination during Construction.<br>Impact HMW#7: Hazards Due to Operation Within Areas of Historical Contamination. |

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| | | Site, Burbank Operable Unit, Civil Action No. 4527-MRP(tx) (C.D. Cal. June 23, 1998) and the Consent Decree for the San Fernando Valley Superfund Site and the Consent Decree for the Glendale Operable Unit, Civil Action No. 99-00552 MRP (ANx). The purpose of this ongoing stakeholder coordination is to ensure that municipal water supplies and the effectiveness of the Superfund Site cleanup remedies are not impaired by construction and operation of the HSR Build Alternative. The Authority would coordinate with relevant stakeholders on issues such as ensuring system shutdowns occur within normal timeframes, maintaining operating of existing systems while testing new replacement systems, and providing additional groundwater or surface water supplies if needed.<br><br>Depending upon the scope of the potential modifications to the extraction wells and ancillary infrastructure, the Authority shall enter into enforceable agreements with United States Environmental Protection Agency as the agency responsible for the Superfund Program.<br><br>In addition, all extractions of groundwater from the San Fernando groundwater basin (which is part of the Upper Los Angeles River Area) must be reported to the Upper Los Angeles River Area Watermaster. Groundwater extractions from Upper Los Angeles River Area must be reported to the Upper Los Angeles River Area Watermaster, and to the City of Los Angeles (via the Los Angeles Department of Water and Power). | | | | | | | | |
| **Safety and Security** | | | | | | | | | | |
| SS-IAMF#1 | Construction Safety Transportation Management Plan | Prior to construction (any ground-disturbing activity), the Contractor shall prepare for submittal to the Authority a construction safety transportation management plan. The plan will describe the contractor's coordination efforts with local jurisdictions for maintaining emergency vehicle access. The plan will also specify the Contractors procedures for implementing temporary road closures including: access to residences and businesses during construction, lane closures, signage and flag persons, temporary detour provisions, alternative bus and delivery routes, emergency vehicle access, and alternative access locations. The Contractor shall prepare and submit monthly reports to the Authority documenting construction transportation plan implementation activities for compliance monitoring. | Pre-construction | Prepare plan | Prior to construction (any ground-disturbing activity) | Contractor | Contractor | Prepare construction safety transportation management plan | Condition of construction contract | Impact S&S#1: Temporary Interference with Emergency Response Times from Construction Activities.<br>Impact S&S#7: Temporary Exposure to Traffic Hazards.<br>Impact S&S#16: Temporary and Permanent Exposure to Wildfire Hazards.<br>Impact S&S#19: Fire and Wildfire Hazards from Operations and Maintenance. |
| SS-IAMF#2 | Safety and Security | Sixty days after receiving from the Authority a construction notice-to-proceed, the Contractor shall provide the Authority with a technical memorandum | Pre-construction | Prepare plan | 60 days after receiving a construction notice-to-proceed | Authority/ Contractor | Authority/ Contractor | Prepare technical memorandum documenting | Condition of construction contract | Impact S&S#3: Permanent Interference with Emergency Response. |

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| | Management Plan | documenting how the following requirements, plan, programs and guidelines were considered in design, construction and eventual operation to protect the safety and security of construction workers and users of the HSR. The Contractor shall be responsible for implementing all construction-related safety and security plans and the Authority shall be responsible for implementing all safety and security plans related to HSR operation.<br>• Workplace worker safety is generally governed by the Occupational Health and Safety Act of 1970, which established the OSHA. OSHA establishes standards and oversees compliance with workplace safety and reporting of injuries and illnesses of employed workers. In California, OSHA enforcement of workplace requirements is performed by California Occupational Safety and Health Administration (Cal OSHA). Under Cal OSHA regulations, as of July 1, 1991, every employer must establish, implement, and maintain an injury and illness prevention program.<br>• The Authority has adopted a Safety and Security Management Plan to guide the safety and security activities, processes, and responsibilities during design, construction and implementation phases of the project to protect the safety and security of construction workers and the public. A Systems Safety Program Plan (SSPP) and a System Security Plan will be implemented prior to the start of revenue service to guide the safety and security of the operation of the high-speed rail system.<br>• Prior to Construction, the Contractor shall provide the Authority with a Safety and Security Management Plan documenting how they will implement the Authority's safety and security requirements within their project scope.<br>• Implement site-specific health and safety plans and site-specific security plans to establish minimum safety and security guidelines for contractors of, and visitors to, construction projects. Contractors will be required to develop and implement site-specific measures that address regulatory requirements to protect human health and property at construction sites.<br>• Preparation of a Valley Fever action plan that includes: A) information on causes, preventive measures, symptoms, and treatments for Valley Fever to individuals who could potentially be exposed through construction activities (i.e., construction workers, monitors, managers, and support personnel); B) continued outreach and coordination with California Department of | | | | | | compliance with safety requirements, plans, programs, and guidelines | | Impact S&S#4: Interference with Emergency Response from Train Accidents and Increased Activity at Stations and Facilities.<br>Impact S&S#5: Temporary Exposure to Criminal Activity at Construction Sites.<br>Impact S&S#6: Temporary Exposure to Construction Site Hazards.<br>Impact S&S#10: Temporary Exposure to Valley Fever.<br>Impact S&S#11: Temporary Exposure to Risk from High-Risk Facilities.<br>Impact S&S#13: Permanent Exposure to High-Risk Facilities and Fall Hazards.<br>Impact S&S#14: Permanent Criminal and Terrorist Activity.<br>Impact S&S#16: Temporary and Permanent Exposure to Wildfire Hazards.<br>Impact S&S#19: Fire and Wildfire Hazards from Operations and Maintenance. |

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| | | Public Health; C) coordination with county departments of public health to ensure that the above referenced information concerning Valley Fever is readily available to nearby residents, schools, and businesses and to obtain area information about Valley Fever outbreaks and hotspots; and D) provide a qualified person dedicated to overseeing implementation of the Valley Fever prevention measures to encourage a culture of safety of the contractors and subcontractors. The Valley Fever Health and Safety (VFHS) designee shall coordinate with the county Public Health Officer and oversee and manage the implementation of Valley Fever control measures. The VFHS designee is responsible for ensuring the implementation of measures in coordination with the county Public Health Officer. Medical information will be maintained following applicable and appropriate confidentiality protections. The VFHS in coordination with the county Public Health Officer will determine what measures will be added to the requirements for the Safety and Security Management Plan regarding preventive measures to avoid Valley Fever exposure. Measures shall include, but are not limited to the following: A) train workers and supervisors on how to recognize symptoms of illness and ways to minimize exposure, such as washing hands at the end of shifts; B) provide washing facilities nearby for washing at the end of shifts; C) provide vehicles with enclosed, air conditioned cabs and make sure workers keep the windows closed; D) equip heavy equipment cabs with high efficiency particulate air (HEPA) filters; and E) make NIOSH approved respiratory protection with particulate filters as recommended by the CDPH available to workers who request them.<br>• System safety program plans incorporate FRA requirements and are implemented upon FRA approval. FRA's SSPPs requirements will be determined in FRA's new System Safety Regulation (49 C.F.R. 270).<br>• Rail systems must comply with FRA requirements for tracks, equipment, railroad operating rules and practices, passenger safety, emergency response, and passenger equipment safety standards found in 49 C.F.R. Parts 200-299.<br>• The HSR Urban Design Guidelines (Authority 2011) require implementing the principles of crime prevention through environmental design. The contractor shall consider 4 basic principles | | | | | | | | |

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| | | of crime prevention through environmental design during station design and site planning: territoriality (design physical elements that express ownership of the station or site); natural surveillance (arrange physical features to maximize visibility); improved sightlines (provide clear views of surrounding areas); and access control (provide physical guidance for people coming and going from a space). The HSR design includes emergency access to the rail right-of-way, and elevated HSR structure design includes emergency egress points.<br>• Implement fire/life safety and security programs that promote fire and life safety and security in system design, construction, and implementation. The fire and life safety program is coordinated with local emergency response organizations to provide them with an understanding of the rail system, facilities, and operations, and to obtain their input for modifications to emergency response operations and facilities, such as evacuation routes. The Authority will establish fire/life safety and security committees throughout the HSR section.<br>• Implement system security plans that address design features intended to maintain security at the stations within the track right-of-way, at stations, and onboard trains. A dedicated police force will ensure that the security needs of the HSR system are met.<br>• The design standards and guidelines require emergency walkways on both sides of the tracks for both elevated and at-grade sections and the provision of appropriate space as defined by fire and safety codes along at-grade sections of the alignment to allow for emergency response access.<br>Implement standard operating procedures and emergency operating procedures, such as the FRA-mandated Roadway Worker Protection Program to address the day-to-day operation and emergency situations that will maintain the safety of employees, passengers, and the public | | | | | | | | |
| SS-IAMF#3 | Hazard Analyses | The Authority's hazard management program includes the identification of hazards, assessment of associated risk, and application of control measures (mitigation), to reduce the risk to an acceptable level. Hazard assessment includes a preliminary hazard analysis (PHA) and threat and vulnerability assessment (TVA).<br>• The Authority's programmatic PHAs are developed in conformance with the FRA's | Pre-construction/ Construction | Reporting | Monthly | Authority's Safety and Security committees | Authority | Identification of hazards, assessment of risk and application of control measures | Condition of construction contract | Impact S&S#4: Interference with Emergency Response from Train Accidents and Increased Activity at Stations and Facilities.<br>Impact S&S#11: Temporary Exposure to Risk from High-Risk Facilities. |

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| | | Collison Hazard Analysis Guide: Commuter and Intercity Passenger Service (FRA 2007) and the U.S. Department of Defense's System Safety Program Plan (MIL-STD-882) to identify and determine the facility hazards and vulnerabilities so that they can be addressed by—and either eliminated or minimized—the design.<br>• 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 HSR operations to avoid collisions.<br>• During design and construction, the Contractor will conduct site-specific PHA and TVA assessments to apply the programmatic work to their specific project designs.<br>The Authority's safety and security committees will be responsible for implementing the recommendations contained in the hazard analysis during HSR operation. | | | | | | | | Impact S&S#12: Permanent Operational Safety Impacts.<br>Impact S&S#13: Permanent Exposure to High-Risk Facilities and Fall Hazards.<br>Impact S&S#14: Permanent Criminal and Terrorist Activity. |
| SS-IAMF#4 | Oil and Gas Wells | Prior to ground-disturbing activities, the Contractor shall identify and inspect all active and abandoned oil and gas wells within 200 feet of the HSR tracks. Any active wells will be abandoned and relocated by the Contractor in accordance with the California Department of Conservation, Division of Oil, and Gas and Geothermal Resources (DOGGR) standards in coordination with the well owners. In the event that relocated wells do not attain the current production rates of the now-abandoned active wells, the Authority will be responsible for compensating the well owner for lost production. All abandoned wells within 200 feet of the HS tracks will be inspected and re-abandoned, as necessary, in accordance with DOGGR standards and in coordination with the well owner. The Contractor will provide the Authority with documentation that the identification and inspection of the wells has occurred prior to construction. | Pre-construction | Regulatory Compliance/ Reporting | Prior to ground-disturbing activities | Contractor/ Authority | Contractor | Identify and inspect all active and abandoned oil and gas wells and abandon identified active oil wells. | Condition of construction contract | Impact S&S#6: Temporary Exposure to Construction Site Hazards. |
| SS-IAMF#5 | Aviation Safety | To address Federal Aviation Administration (FAA) requirements related to their mandate of ensuring civil aviation safety and to prevent the potential for disruption of airfield and airspace operations at Hollywood Burbank Airport as a result of construction and/or operation of the Palmdale to Burbank Project Section, the Authority and/or its contractor(s) on behalf of the Authority will: | Pre-Construction | Prepare designs, construction plans | Monthly | Authority and/or its contractor | Authority | Compliance with FAA requirements related to aviation safety | Submittal of design and construction plans | Impact S&S#9: Temporary and Permanent Interference with Airport Safety. |

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| | | • Submit designs and/or information to the FAA as required by Code of Federal Regulations, Title 14, Part 77, to ensure design of permanent HSR features within and adjacent to the boundary of Hollywood Burbank Airport do not intrude into imaginary surfaces as defined in 14 C.F.R. section 77.9(b).<br>• Submit construction plans and/or information to the FAA as required by Code of Federal Regulations, Title 14, Part 77, which may include the location of planned HSR construction and construction staging areas within and adjacent to the boundary of the Hollywood Burbank Airport, the types and height of proposed equipment, and planned time/duration of construction, to ensure construction within and adjacent to the boundary of Hollywood Burbank Airport does not intrude into imaginary surfaces as defined in 14 C.F.R. section 77.9(b).<br>• Implement measures required by the FAA to ensure continued safety of air navigation during HSR construction and operation, pursuant to 14 C.F.R. section 77.5(c).<br>• Ensure that the planned HSR facilities do not violate any grant assurances that are imposed at Hollywood Burbank Airport as a condition for obtaining an Airport Improvement Grants from the FAA.<br>If necessary, work with and the Burbank-Glendale-Pasadena Airport Authority to amend the current Airport Layout Plan for any temporary or permanent construction-related facilities required for the HSR project, to be submitted to the FAA for approval. | | | | | | | |
| SS-IAMF#6 | Stakeholder Coordination for the Hollywood Burbank Airport | As design of the Burbank to Los Angeles Project Section progresses, the Authority shall continue to coordinate with the FAA and Burbank-Glendale-Pasadena Airport Authority to avoid conflicts due to overlapping construction schedules and future operations at the Hollywood Burbank Airport. The purpose of this ongoing stakeholder coordination is to ensure that the design, construction, and operation of the HSR Build Alternative takes into consideration the Airport Layout Plan and any future improvements to the Hollywood Burbank Airport identified in SCAG's 2020-2045 Regional Transportation Plan/Sustainable Community Strategy (SCAG 2020) and to ensure that construction and operation of the HSR Build Alternative do not negatively impact these future improvements. | During design | Coordination with the FAA and Burbank-Glendale-Pasadena Airport Authority | Monthly | Authority | Authority | Authority shall continue to coordinate with FAA and Burbank-Glendale-Pasadena Airport Authority to avoid conflicts due to overlapping construction schedules and future operations at the Hollywood Burbank Airport | Stakeholder coordination of construction schedules and future improvements | Impact S&S#9: Temporary and Permanent Interference with Airport Safety. |

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| **Socioeconomics and Communities** | | | | | | | | | | |
| SOCIO-IAMF#1 | Construction Management Plan | Prior to Construction, the Contractor shall prepare a CMP providing measures that minimize impacts on low-income households and minority populations. The plan shall be submitted to the Authority for review and approval. The plan will include actions pertaining to communications, visual protection, air quality, safety controls, noise controls, and traffic controls to minimize impacts on low-income households and minority populations. The plan will verify that 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. | Design/Construction | Prepare plan | Prior to construction | Authority/ Contractor | Contractor | Prepare CMP | Condition of construction contract | Impact SOCIO#1: Temporary Disruption to Community Cohesion or Division of Existing Communities from Construction.<br>Impact SOCIO#11: Temporary Effects on Children's Health and Safety from Construction. |
| SOCIO-IAMF#2 | Compliance with Uniform Relocation Assistance and Real Property Acquisition Policies Act | 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, will apply to all acquisitions of real property or displacements of persons resulting from this federally assisted project. It was created to provide for fair and equitable treatment of all affected persons. Additionally, the Fifth Amendment of the U.S. Constitution provides that private property may not be taken for a public use without payment of "just compensation."<br>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.<br>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.<br>The California Relocation Assistance Act essentially mirrors the Uniform Act and also provides for consistent and fair treatment of property owners. | Design/Construction /Operation | Reporting and meeting with interested parties | Prior to completion of property acquisition/Monthly | Authority | Authority | Comply with Uniform Act/Monthly reporting and record keeping | Compliance with acts, creation of ombudsman office and reporting | Impact SOCIO#1: Temporary Disruption to Community Cohesion or Division of Existing Communities from Construction.<br>Impact SOCIO#3: Permanent Displacement of Community Facilities from Construction.<br>Impact SOCIO#5: Permanent Displacement and Relocation of Sensitive Residential Populations from Construction. |

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| | | However, because the project will receive federal funding, the Uniform Act takes precedence. 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 will 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).<br>More-detailed information about how the Authority plans to comply with the Uniform Act and the California Relocation Assistance Act is provided in the following three detailed relocation assistance documents modeled after Caltrans versions:<br>• Your Rights and Benefits as a Displacee under the Uniform Relocation Assistance Program (Residential)<br>• Your Rights and Benefits as a Displacee under the Uniform Relocation Assistance Program (Mobile Home)<br>• Your Rights and Benefits as a Displaced Business, Farm, or Nonprofit Organization under the Uniform Relocation Assistance Program | | | | | | | | |
| SOCIO-IAMF#3 | Relocation Mitigation Plan | Before any acquisitions occur, the Authority will develop a relocation mitigation plan, in consultation with affected cities and counties and property owners. In addition to establishing a program to minimize the economic disruption related to relocation, the relocation mitigation plan will be written in a style that also enables it to be used as a public-information document.<br>The relocation mitigation plan will be designed to meet the following objectives:<br>• Provide affected property and business owners and tenants a high level of individualized assistance in situations when acquisition is necessary, and the property owner desires to relocate the existing land use.<br>• Coordinate relocation activities with other agencies acquiring property resulting in displacements in the study area to provide for | Design/Construction | Prepare plan | Prior to property acquisitions | Authority | Authority | Develop relocation mitigation plan | Condition of construction contract | Impact SOCIO#3: Permanent Displacement of Community Facilities from Construction.<br>Impact SOCIO#5: Permanent Displacement and Relocation of Sensitive Residential Populations from Construction. |

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| | | all displaced persons and businesses to receive fair and consistent relocation benefits.<br>• Make a best effort to minimize the permanent closure of businesses and nonprofit agencies as a result of property acquisition.<br>• Within the limits established by law and regulation, minimize the economic disruption caused to property owners by relocation.<br>• 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.<br>• Provide those business owners who require complex permitting with regulatory compliance assistance.<br>The relocation mitigation plan will include the following components:<br>• A description of the appraisal, acquisition, and relocation process as well as a description of the activities of the appraisal and relocation specialists.<br>• A means of assigning appraisal and relocation staff to affected property owners, tenants, or other residents on an individual basis.<br>• Individualized assistance to affected property owners, tenants, or other residents in applying for funding, including research to summarize loans, grants, and federal aid available, and research areas for relocation.<br>• 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 will also act to address concerns about the relocation process as it applies to the individual situations of property owners, tenants, and other residents. | | | | | | | | |
| **Station Planning, Land Use and Development** | | | | | | | | | | |
| LU-IAMF#1 | HSR Station Area Development: General Principles and Guidelines | Prior to O&M, the Authority shall prepare a memorandum for each station describing how the Authority's station area development principles and guidelines are applied to achieve the anticipated benefits of station area development. Refer to HSR Station Area Development General Principles and Guidelines, February 3, 2011. | Post-construction | Reporting | Prior to O&M for each station | Authority | Authority | Authority would prepare a technical memorandum for each station | Condition of construction contract | Impact LU#3: Permanent Alterations to Existing and Planned Land Uses from Construction of the Build Alternatives. |
| LU-IAMF#2 | Station Area Planning and Local Agency Coordination | Prior to O&M, the Authority shall prepare a memorandum for each station describing the local agency coordination and station area planning conducted to prepare the station area for HSR | Post-construction | Reporting | Prior to O&M for each station | Authority | Authority | Authority would prepare a technical memorandum for each station | Condition of construction contract | Impact LU#3: Permanent Alterations to Existing and Planned Land Uses from |

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| | | operations. Refer to HSR Station Area Development: General Principles and Guidelines, February 3, 2011. | | | | | | | | Construction of the Build Alternatives. |
| LU-IAMF#3 | Restoration of Land Used Temporarily During Construction | Prior to any ground-disturbing activities at the site of land to be used temporarily during construction, the Contractor shall prepare a restoration plan addressing specific actions, sequence of implementation, parties responsible for implementation and successful achievement of restoration for temporary impacts. Before beginning construction use of land, the Contractor shall submit the restoration plan to the Authority for review and obtain Authority approval. The restoration plan shall include time-stamped photo documentation of the pre-construction conditions of all temporary staging areas. All construction access, mobilization, material laydown, and staging areas will be returned to a condition equal to the pre-construction staging condition. This requirement is included in the design-build construction contract requirements. | Pre-construction | Prepare restoration plan | Prior to construction | Authority/ Contractor | Contractor | Contractor would prepare a restoration plan | Condition of construction contract | Impact LU#1: Temporary Alternations to Existing and Planned Land Uses from Construction Staging Areas. |
| **Agricultural Farmland and Forest Land** | | | | | | | | | | |
| AG-IAMF#1 | Restoration of Important Farmland Used for Temporary Staging Areas | Prior to any ground-disturbing activities at the site of a temporary construction staging area located on Important Farmland, the Contractor shall prepare a restoration plan addressing specific actions, sequence of implementation, parties responsible for implementation and successful achievement of restoration for temporary impacts. Actions shall include removing and stockpiling the top 18 inches of soil for replacement on-site during restoration activities. Before beginning construction use of sites on Important Farmland, the Contractor shall submit the restoration plan to the Authority for review and obtain Authority (and if applicable, the landowner) approval. The restoration plan shall include time-stamped photo documentation of the pre-construction conditions of all temporary staging areas.<br>All construction access, mobilization, material laydown, and staging areas on Important Farmlands will be returned to a condition equal to the pre-construction staging condition. This requirement is included in the design-build construction contract requirements. | Pre-construction | Reporting | Prior to any ground-disturbing activities on Important Farmland | Authority/ Contractor | Contractor | Prepare restoration plan | Condition of construction contract | Impact AG#1: Temporary Use of Agricultural or Forest Land for Construction Staging, Material Laydown, and Access. |
| AG-IAMF#2 | Permit Assistance | Prior to disturbance causing activities affecting any segment of a confined animal facility, 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 will require either relocation of the facility or | Pre-construction | Reporting | Prior to disturbance causing activities affecting any segment of a confined animal facility/Monthly | Authority | Authority | At incorporation or completion of design/monthly reporting during construction | Condition of construction contract | Impact AG#2: Permanent Conversion of Agricultural Land to Nonagricultural Land. |

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| | | amendment of its existing regulatory permits. The Authority will create a permit assistance center for landowners and operators whose operations will be out of compliance with permits because of the HSR. This permit center will focus on helping the permit holders modify or obtain any new permits that are required because of the HSR impacts. | | | | | | | | |
| AG-IAMF#3 | 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, the program will assist the owners of remnant parcels in selling those remnants to adjacent landowners, upon request. The goal of the program is to provide for continued agricultural use on the maximum feasible amount of remnant parcels that otherwise may not be economic to farm. The program 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 regulations.<br>The program will operate for a minimum of 5 years after construction of the section is completed. The Authority shall document implementation of this measure through issuance of a compliance memorandum- after the minimum operation period of 5 years has elapsed. The document shall be filed with Environmental Mitigation Management and Assessment system (EMMA). | Operation | Establish program | Program will operate for a minimum of 5 years after construction of the project section is completed | Authority | Authority | Establish farmland consolidation program | Condition of construction contract | N/A |
| AG-IAMF#4 | Notification to Agricultural Property Owners | Prior to the start of any construction activity adjacent to farmland, the Authority shall provide written notification to agricultural property owners or leaseholders immediately adjacent to the disturbance limits for the HSR project section. The notification is to indicate the intent to begin construction, including an estimated date for the start of construction. In order to provide agricultural property owners or leaseholders sufficient lead time to make any changes to their operations due to project section construction, this notification shall be provided at least 3 months, but no more than 12 months, prior to the start of construction activity. | Pre-construction | Public notification | Monthly | Authority | Authority | Notification to adjacent property owners and leaseholders at least 3 months, but no more than 12 months, prior to the start of construction activity | Condition of construction contract | Impact AG#6: Noise and Vibration Effects on Farm Animals. |
| AG-IAMF#5 | Temporary Livestock and Equipment Crossings | Prior to the start of any construction activity adjacent to any farmland, the Authority shall coordinate with agricultural property owners or leaseholders to provide temporary livestock and equipment crossings to minimize impacts to livestock movement, as well | Pre-construction | Public coordination/Project design | Monthly | Authority | Authority | Coordination with agricultural property owners and leaseholders, design | Condition of construction contract | Impact AG#1: Temporary Use of Agricultural or Forest Land for Construction Staging, Material Laydown, and Access. |

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| | | as routine operations and normal business activities, during project construction. | | | | | | of livestock and equipment crossings | | Impact AG#6: Noise and Vibration Effects on Farm Animals. |
| AG-IAMF#6 | Equipment Crossings | During final design, and in coordination with the property owners of land in use for agricultural operations, the Authority shall finalize the realignments of any affected access roads to provide equipment crossings to minimize impediments to routine agricultural operations and normal business activities that may result from long-term project operation. | Final design | Public coordination | Monthly | Authority | Authority | Coordination with agricultural property owners and leaseholders, design of agricultural access road realignments | Condition of construction contract | Impact AG#1: Temporary Use of Agricultural or Forest Land for Construction Staging, Material Laydown, and Access.<br>Impact AG#2: Permanent Conversion of Agricultural Land to Nonagricultural Land.<br>Impact AG#6: Noise and Vibration Effects on Farm Animals. |
| **Parks, Recreation and Open Space** | | | | | | | | | | |
| PK-IAMF#1 | Parks, Recreation, and Open Space | Prior to Construction, the Contractor shall prepare and submit to the Authority a technical memorandum that identifies project design features to be implemented to minimize impacts on parks, recreation and open space. Typical design measures to avoid or minimize impacts to parks and recreation may include:<br>• Provide safe and attractive access for present travel modes (e.g., motorists, bicyclists, pedestrians—as applicable) to existing park and recreation facilities.<br>• Design guideway, system, and station features in such a way as to enhance the surrounding local communities. Provide easy crossings of the guideway which allows for community use under the guideway or at station areas. | Pre-construction | Reporting | At incorporation or completion of design/monthly reporting during construction | Authority/ Contractor | Contractor | Prepare technical memorandum that documents project design features that minimize impacts on park, recreation, and open space | Condition of construction contract | Impact PK#4: Increased or Decreased Use of Parks, Recreation, and Open Space Resources. |
| **Aesthetics and Visual Quality** | | | | | | | | | | |
| AVQ-IAMF#1 | Aesthetic Options | Prior to construction the Contractor shall document, through issue of a technical memorandum, how the Authority's aesthetic guidelines have been employed to minimize visual impacts. The Authority seeks to balance providing a consistent, project-wide aesthetic with the local context for the numerous high-speed rail non-station structures across the state. Examples of aesthetic options will be provided to local jurisdictions that can be applied to non-standard structures in the high-speed rail system. Refer to Draft Design Opportunities for Local Jurisdictions and Aesthetic Requirements (October 2017). | Pre-construction | Reporting | At incorporation or completion of design | Contractor | Contractor | Prepare aesthetics technical memorandum | Condition of construction contract | N/A |
| AVQ-IAMF#2 | Aesthetic Review Process | Prior to construction, the Contractor shall document that the Authority's aesthetic review process has been followed to guide the development of non-station area structures. Documentation shall be through issuance of a technical memorandum to the Authority. The Authority will identify key non-station | Pre-construction | Reporting | At incorporation or completion of design | Authority/ Contractor | Authority | Prepare aesthetics review process technical memorandum | Condition of construction contract | N/A |

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| | | structures recommended for aesthetic treatment, consult with local jurisdictions on how best to involve the community in the process, solicit input from local jurisdictions on their aesthetic preferences, and evaluate aesthetic preferences for potential cost, schedule and operational impacts. The Authority will also evaluate compatibility with project-wide aesthetic goals, include recommended aesthetic approaches in the construction procurement documents, and work with the contractor and local jurisdictions to review designs and local aesthetic preferences and incorporate them into final design and construction. Refer to Aesthetic Review Process for Non-Stations Structures (Authority 2013), Draft Design Opportunities for Local Jurisdictions and Aesthetic Requirements (October 2017). | | | | | | | | |
| **Cultural Resources** | | | | | | | | | | |
| CUL-IAMF#1 | Geospatial Data Layer and Archaeological Sensitivity Map | Prior to construction (any ground-disturbing activities) and staging of materials and equipment, the Contractor's archaeologist or geoarchaeologist shall prepare a geospatial data layer identifying the locations of all known archaeological resources and built historic resources that require avoidance or protection, and areas of archaeological sensitivity that require monitoring within the area of potential effect (APE). The Contractor's archaeologist, who meets the Secretary of the Interior's Professional Qualifications Standards provided in 36 Code of Federal Regulations (C.F.R.) Part 61, is to use, as appropriate, a combination of the following: known locations of archaeological sites and built historic properties, tribal consultation, landforms, depositional processes, distance to water, mapping provided in the Archaeological Treatment Plan, or historic mapping. This mapping is to be updated as the design progresses if it results in an expansion of the area of ground disturbance/APE, including temporary construction easements and new laydown and access areas. This mapping will be used to develop an archaeological monitoring plan to be prepared by the Contractor's archaeologist, and upon approval by the Authority, implemented by the Contractor's archaeologist. When design is sufficiently advanced, a geospatial data layer will be produced by the Contractor overlaying the locations of all known archaeological resources and built historic resources within the APE, for which avoidance measures are necessary, and all archaeologically sensitive areas, for which monitoring is required. | Design/Pre-construction | Prepare plan | At incorporation or completion of design | Contractor's archaeologist or geoarchaeologist | Authority | Prepare geospatial data layer | Condition of construction contract | Impact CUL#1: Effects on Known Archaeological Resources Caused by Construction Activities.<br>Impact CUL#3: Effects on Human Remains Discovered during Construction Activities. |
| CUL-IAMF#2 | WEAP Training Session | Prior to construction (any ground-disturbing activity) construction contractor personnel who work on site will attend a WEAP training session provided by the Contractor. The WEAP will include cultural resources awareness training performed by the Contractor's | Pre-construction | Training program/Reporting | Annual (training)/monthly (reporting) | Authority/ Contractor | Contractor | WEAP training | WEAP | Impact CUL#1: Effects on Known Archaeological Resources Caused by Construction Activities. |

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| | | archaeologist who meets the Secretary of the Interior's Professional Qualification Standards provided in 36 C.F.R. Part 61. The Contractor will develop instructional materials and a fact sheet for distribution to the construction crews, and submit the materials, as well as qualifications of the personnel providing the training, to the Authority for approval at least 15 days prior to being permitted on-site access. The training will address measures required to avoid or protect built historic resources, educate crews on artifacts and archaeological features they may encounter and the mandatory procedures to follow should potential cultural resources be exposed during construction. Translation services shall be provided by the Contractor for non-English speaking participants. The training sessions shall be given prior to the initiation of any ground disturbance activities and repeated on an annual basis. Additionally, new construction crewmembers shall attend an initial WEAP training session prior to working on site.<br>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 Contractor's archaeologist will submit the signed WEAP training forms to the Mitigation Manager on a monthly basis. On an annual basis, the Contractor will provide the Authority with a letter indicating that regular WEAP training has been implemented and will provide at least1PowerPoint annually of the WEAP training. On a monthly basis, the Contractor's archaeologist will provide updates and synopsis of the training to workers during the daily safety ("tailgate") meeting. Construction crews will be informed during the WEAP training that, to the extent possible, travel within the marked project site will be restricted to established roadbeds. | | | | | | | |
| CUL-IAMF#3 | Pre-construction Cultural Resource Surveys | Prior to construction (any ground-disturbing activities in areas not yet surveyed) and the staging of materials and equipment, the Contractor shall conduct pre-construction cultural resource surveys. Resulting from lack of legal access, much of the construction footprint may not have been surveyed. Once parcels are accessible the Contractor will have archaeologists or architectural historians, as appropriate, who meet the Secretary of the Interior professional qualification standards survey and complete reporting in appropriate document for archaeology and /or built resources, in accordance with documentation requirements stipulated in the Programmatic Agreement (PA). Identified resources shall be evaluated for the National Register of Historic Places (NRHP) and the California Register of Historical Resources (CRHR). The qualified | Pre-construction | Conduct pre-construction surveys; Identify historic and/or cultural resources | Surveys conducted prior to ground disturbance | Authority/ Contractor | Contractor | Cultural resource surveys conducted prior to ground disturbance | Condition of construction contract | Impact CUL#2: Effects on Unknown Archaeological Resources Caused by Construction Activities. |

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| | | archaeologist or architectural historian, as appropriate, will assess the potential to affect to historic properties (NRHP) by applying the effects criteria in 36 C.F.R. Part 800.5(a)(1), and the potential of significant impacts to CRHR by applying the criteria in California Environmental Quality Act Guidelines 15064.5(b). Should the Authority and FRA determine, in consultation with the State Historic Preservation Office (SHPO), that any newly identified historic properties or historical resources would be adversely affected, the Built Environment Treatment Plan or Archaeological Treatment Plan, as appropriate, will be amended, to document mitigation measures agreed upon by the Memorandum of Agreement (MOA) signatories. The schedule of these surveys will be dependent on the timing of obtaining legal access to the properties and may be driven by the need to complete construction-related activities, e.g., geotechnical borings, laydown yards, etc. Prior to beginning surveys, updated records searches may be required by the FRA and Authority, depending on the length of the passage of time, to validate that accurate information was obtained regarding previous inventory and evaluation efforts. The Contractor's archaeologist, in consultation with the Authority, will determine if an updated records search is required. If an updated records search is necessary, the search shall be performed by the Contractor's archaeologist. | | | | | | | | |
| CUL-IAMF#4 | Relocation of Project Features when Possible | Changing the rail alignment to avoid newly discovered sites is likely infeasible; however, access areas and laydown sites may be relocated should their proposed location be found to be on archaeological sites or have the potential to affect historic built resources in the vicinity. The contractor will delineate all avoidance and protection measures for identified archaeological and built resources on construction drawings. | Construction | Relocation of access areas and laydown sites | As needed | Authority/ Contractor | Contractor | Relocation access areas and laydown sites as needed to avoid archaeological or historic built resources | Condition of construction contract | Impact CUL#1: Effects on Known Archaeological Resources Caused by Construction Activities.<br>Impact CUL#3: Effects on Human Remains Discovered during Construction Activities. |
| CUL-IAMF#5 | Archaeological Monitoring Plan and Implementation | Prior to construction the Contractor's professionally qualified archaeologist, as defined in the PA, will prepare a monitoring plan based on the results of geospatial data layer and archaeological sensitivity map. The plan is to be reviewed and approved by the Authority prior to any ground-disturbing activities. During Construction (any ground-disturbing activities) or staging of materials or equipment, the Contractor will be responsible for implementing the monitoring plan and providing archaeological and tribal monitoring of ground-disturbing construction activities with a potential to affect archaeological remains in areas identified as archaeologically sensitive in the Archaeological Treatment Plan. The Contractor shall obtain Authority approval of all persons providing archaeological or tribal monitoring. | Pre-construction/ Construction | Prepare and implement monitoring plan | Prior to construction (prepare plan)/during construction (implement plan) | Authority/ Contractor | Contractor | Prepare archaeological monitoring plan | Condition of construction contract | Impact CUL#1: Effects on Known Archaeological Resources Caused by Construction Activities.<br>Impact CUL#3: Effects on Human Remains Discovered during Construction Activities. |

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| CUL-IAMF#6 | Pre-Construction Conditions Assessment, Plan for Protection of Historic Built Resources, and Repair of Inadvertent Damage | Prior to construction (any ground-disturbing activities that are within 1,000 feet of a historic built property) the Contractor may be required to assess the condition of construction-adjacent historic properties and prepare a Plan for the Protection of Historic Built Resources and Repair of Inadvertent Damage. The MOA and Built Environment Treatment Plan (BETP) will stipulate for which properties the plan is to be prepared. MOA signatories and consulting parties may comment on the adequacy of the assessments. Protection measures will be developed in consultation with the landowner or land-owning agencies as well as the SHPO and the MOA signatories and consulting parties, as required by the PA. As the design progresses, additional properties may be identified by the Authority as requiring this plan. The plan shall record existing conditions in order to (1) establish a baseline against which to compare the property's post-project condition, (2) to identify structural deficiencies that make the property vulnerable to project construction-related damage, such as vibration, and (3) to identify stabilization or other measures required to avoid or minimize inadvertent adverse effects. The plan will be further described in the BETP and be prepared by an interdisciplinary team, including (but not limited to) as appropriate, an architectural historian, architect, photographer, structural engineer, and acoustical engineer. Ambient conditions will be used to identify buildings that are sensitive receptors to construction-related vibration and require vibration monitoring during construction activities. Additional protective measures may be required if the property is vacant during construction.<br>The plan content shall be outlined in the BETP and is to be completed and approved by the Authority, with protective measures implemented before construction begins within 1,000 feet of the subject building. The plan shall describe the protocols for documenting inadvertent damage (should it occur), as well as notification, coordination, and reporting to the SHPO, MOA signatories, and the owner of the historic property. The plan shall direct that inadvertent damage to historic properties shall be repaired in accordance with the Secretary of the Interior's Standards for the Treatment of Historic Properties (U.S. Department of the Interior, 1995). The plan shall be developed in coordination with the Authority and FRA and shall be submitted to the SHPO for review and approval. Protective plans will be required for buildings that will be moved as part of the project mitigation, including stabilization before, during, and after relocation; protection during temporary storage; and relocation to a new site, followed by rehabilitation. | Pre-construction | Conduct assessment and protection plan | Required if within 1,000 feet of historic built property | Contractor/Authority | Contractor/Authority | Assess the condition of construction-adjacent historic properties and prepare a Plan for the Protection of Historic Built Resources and Repair of Inadvertent Damage | MOA/PA/BETP | Impact CUL#4: Effects on Historic Built Resources Caused by Construction Activities. |

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| CUL-IAMF#7 | Built Environment Monitoring Plan | Prior to construction (any ground-disturbing activities within 1,000 feet of a historic property or resource) the Contractor shall prepare a Built Environment Monitoring Plan (BEMP). Draft and final BEMP's will be prepared describing the properties that will require monitoring, the type of activities or resources that will require full-time monitoring or spot checks, the required number of monitors for each construction activity, and the parameters that will influence the level of effort for monitoring. Maximum vibration level thresholds may be established in the Plan for Protection of Historic Resources and Repair of Inadvertent Damage the monitoring of which will be included in this monitoring plan. The BETP will outline the process for corrective action should the protection measures prove ineffective. Consultation procedures will also be defined in the BETP. The Contractor shall develop both the draft and final plans in coordination with the Authority and FRA, and shall be submitted to the SHPO for review and approval. The plan will be implemented prior to any ground-disturbing activities within 1,000 feet of properties identified as requiring monitoring, as specified in the BETP. | Pre-construction | Prepare monitoring plan | Required if within 1,000 feet of historic built property | Contractor/ Authority | Contractor/ Authority | Prepare a BEMP | BETP | N/A |
| CUL-IAMF#8 | Implement Protection and/or Stabilization Measures | Implement the plan described in the Plan for Protection of Historic Resources and Repair of Inadvertent Damage and in the Built Environment Treatment Plan. Such protection measures 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. Temporary stabilization and protection measures will be removed after construction is complete, and the historic properties will be restored to their pre-construction condition. For buildings that will be moved, treatment will include stabilization before, during, and after relocation; protection during temporary storage; and relocation to a new site, followed by rehabilitation. | Pre-construction | Implement protection and/or stabilization measures | Per BETP | Authority/ Contractor | Contractor | Implement historic built resource protection measures per BETP | BETP | Impact CUL#4: Effects on Historic Built Resources Caused by Construction Activities. |
| **Environmental Justice** | | | | | | | | | | |
| EJ-IAMF#1 | Authority EJ Ombudsman and Contractor's EJ Liaison | EJ communities are historically underrepresented, thus requiring special outreach. Prior to final design, the Authority shall create an ombudsman position to address the needs of adversely affected EJ communities, Los Angeles Unified School District's (LAUSD) Broadus Elementary and Roscoe Elementary schools and, upon request, additional private and charter schools. For purposes of all EJ-specific measures (EJ-IAMFs and EJ-MMs), reference to eligible "EJ communities" shall mean | Pre-construction | Outreach and Reporting | Prior to final design | Authority | Authority | Creation of an ombudsman position | Recruitment/Appointments | Transportation<br>Noise and Vibration<br>Socioeconomics and Communities |

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| | | Pacoima and Sun Valley for Refined SR14, SR14A, E1 and E1A alternatives and Lakeview Terrace and Sun Valley for E2 and E2a alternatives. In addition, the students of Project alignment-adjacent schools in the above-defined EJ communities (LAUSD's Broadus Elementary and Roscoe Elementary, and any private/charter schools) are also included in the definition of EJ communities for purposes of these measures. The Authority will also make available resources developed for EJ-IAMFs to any other EJ communities that are identified in Chapter 5 of the EIR/EIS as EJ communities along the alignment, if a specific EJ community so requests. The Authority' final design plans and contract documents shall require the Contractor to establish a full-time EJ liaison to serve as a multilingual single point of contact for the EJ communities. The scope of the Authority's EJ ombudsman and Contractor's EJ liaison responsibilities and duties include those articulated in the other EJ-related IAMFs. These responsibilities include: implementing programs (e.g., the Workforce Development Program, community air quality monitoring), holding community roundtables to obtain ideas for business spotlighting, developing appropriate aesthetic treatments, proposing potential intersection and/or safety improvements, and obtaining community-specific feedback on the following plans not typically reviewed by the general public:<br>• Construction Management Plan (SOCIO-IAMF#1)<br>• Relocation Mitigation Plan (SOCIO-IAMF#3)<br>• Construction Safety Transportation Management Plan (SS-IAMF#1)<br>• Safety and Security Management Plan (SS-IAMF#2)<br>• Transportation Construction Management Plan (TR-MM#12)<br>• Operations Noise and Vibration Technical Memorandum (NV-IAMF#1)<br>The EJ ombudsman and Contractor's EJ liaison shall have stop work authority in the event of safety concerns and may also apply stop work authority for project-related concerns regarding fugitive dust, construction noise and traffic (e.g., noncompliance with designated truck hauling routes and the CTP). Beginning with final design and throughout the construction phase of the project, the Contractor's EJ liaison shall submit reports (quarterly, at minimum) to the ombudsman providing evidence of compliance with all EJ-IAMFs, maintenance of pedestrian access per TR-IAMF#4, communication of relocation | | | | | | | | |

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| | | mitigation plan and relocation ombudsman availability (SOCIO- IAMF#3).<br>During construction, the Contractor's EJ liaison shall provide multilingual notices (e.g., online information, e- blasts, text messaging, voice messaging or mailers) to inform EJ communities (specifically, communities identified in the first paragraph of this IAMF) of the Authority's hotline for reporting community concerns or complaints regarding construction noise and traffic effects and updates. These notices shall be provided 2 weeks in advance of each planned instance of vehicle, pedestrian, bicycle, transit access, and utility service disruption. Notices shall continue, at a minimum, until the EJ communities receive post-construction guidance with details of how to access and ride the HSR system.<br>The EJ liaison's report to the ombudsman shall include all concerns and complaints received from EJ communities and measures taken by the Authority or its Contractors to address those concerns and complaints. The Authority's construction Contractor shall implement all corrective actions communicated by the EJ ombudsman, or their EJ liaison, within a 24-hour period unless written authorization from the EJ ombudsman provides the Contractor with an alternate timeline. The EJ liaison shall also serve as the primary point of contact for LAUSD for schools with construction-related concerns within adversely affected EJ communities (as identified in Table 5-24 and Section 5.5 of the Final EIR/EIS).<br>The Authority shall ensure the point of contact has access to the Authority's contract interpretation and translation services for substantial Limited English Proficiency (LEP) languages in the affected area. Substantial shall be as defined in state LEP law (the Dymally Alatorre Bilingual Services Act). The Authority may also consider contracting with a community organization for substantial LEP communities to assist with outreach. | | | | | | | |
| EJ-IAMF#2 | Business Spotlighting | To minimize any potential access disruptions or inconveniences to businesses within adversely affected EJ communities (as defined in EJ-IAMF#1) during construction activities, the Authority shall provide assistance to those businesses to maintain visibility during construction, such as providing signage and targeted advertising and marketing campaigns, incentives for construction worker patronage (as applicable), and/or Authority-sponsored community events. Business spotlighting will supplement efforts described in TR- MM#12 and includes street vendors permitted by the City of Los Angeles. | Construction | Implement visibility spotlighting measures | Prior to operation | Authority | Authority | Provide assistance to businesses to maintain their visibility | Condition of construction contract | Socioeconomics and Communities. |

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| EJ-IAMF#3 | EJ Community-Inclusive Development of Aesthetic Treatments and Community Cohesion Enhancements | In addition to the requirements in AVQ-IAMF#1 (Aesthetic Options) and AVQ-IAMF#2 (Aesthetic Review Process), the Contractor's EJ liaison shall work with the Authority EJ ombudsman to hold community roundtables to seek input on locally desired aesthetic treatment preferences from the adversely affected EJ communities (as defined in EJ-IAMF#1), possibly developed by local artists.<br>Treatment options may include streetscape, vegetation screening, consideration of a community mural, and/or beautification tree plantings or plant plantings (such as improvements to an existing community garden or establishment of a new community garden location). When applicable, tree plantings shall involve the Pacoima Beautiful Street Tree Planting/Adopt a Tree Program collaboration with the Los Angeles Conservation Corps. As appropriate, reuse of property purchased by the Authority that are within the EJ communities (as defined in EJ-IAMF#1) shall be considered for plant and/or tree plantings. Specific consideration to plantings at Boulevard Mine shall be given to both, fulfill the requirements of this measure and support the EPA Abandoned Mines Land Program and to implement AVQ-MM#5.<br>Upon Authority review for compatibility with the Draft Design Opportunities for Local Jurisdictions and Aesthetic Requirements (October 2017) and approval, the identified locally desired aesthetic treatments shall be included in the final design plans. The Authority's Contractor shall implement the aesthetic treatments in the construction of HSR infrastructure. | Pre-construction/ Construction | Outreach | Prior to operation | Contractor's EJ liaison/ Authority EJ ombudsman | Contractor's EJ liaison/ Authority EJ ombudsman | Conduct community roundtables to seek input on locally desired aesthetic treatment | Condition of construction contract | Aesthetics and Visual Quality. |
| EJ-IAMF#4 | EJ Business Relocation/Displacement Assistance | Pursuant to SOCIO-IAMF#3 Relocation Mitigation Plan, the Authority will develop a relocation mitigation plan. The Plan will include a subsection dedicated to addressing adverse effects to businesses in the EJ communities (as defined in EJ-IAMF#1). This subsection shall include a description of measures taken or proposed to offset the adverse effects of business displacements and relocations in EJ communities, including a description of measures to relocate displaced businesses in proximity to their same community. The Authority shall hold community roundtable meetings to seek and consider input from affected EJ communities prior to finalizing the Authority's Relocation Mitigation Plan. | Pre-construction/Construction | Preparation of Plan | Prior to acquisitions | Authority | Authority | Implement the Relocation Mitigation Plan to address adverse effect on EJ communities | Condition of design-build contract | Socioeconomics and Communities. |
| EJ-IAMF#5 | EJ Community Post-Construction Communication | The Contractor's EJ liaison shall ensure multilingual notices (e.g., online information, e-blasts, text messaging, voice messaging, or mailers) are distributed to EJ communities (as defined in EJ-IAMF#1), providing an estimated operation commencement date. The notices shall include information regarding underground and aboveground | Post-construction | Community outreach | Prior to operations | Contractor's EJ liaison/ Authority EJ ombudsman | Contractor's EJ liaison/ Authority EJ ombudsman | Send out notices of commencement of project operations | Condition of design-build contract | Air Quality and Global Climate Change<br>Noise and Vibration<br>Socioeconomics and Communities. |

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| | | facilities, boarding platforms, ticketing areas, passenger waiting areas, restrooms, pickup/drop-off facilities for private automobiles, transit center for buses and shuttles, and surface parking areas. Notices shall clearly describe various modes of access to the HSR system. If available, the notices shall also specify HSR system ticket costs. | | | | | | | | |
| EJ-IAMF#6 | Non-Regulatory Supplemental and Informational Monitoring | Prior to the start of construction, the Authority shall reference the EPA Air Sensor Toolbox and the SCAQMD Air Quality Sensor Performance Evaluation Center (AQ-SPEC) to propose stationary outdoor air quality sensors and applicable monitoring locations within EJ communities (as identified in EJ-IAMF#1). Data from these air quality sensors could be used for increasing environmental awareness and educating the communities about air quality. The selected sensors will be required, at a minimum, to provide PM2.5 community monitoring. It should be noted that the data from these air quality monitors cannot be used for regulatory purposes; however, they could provide the neighborhoods with greater access to publicly accessible, local air quality data. | Pre-construction | Coordination/monitoring/reporting | Prior to operations | Authority/ Contractor | Authority/ Contractor | Install outdoor air quality sensors within EJ communities | Condition of design-build contract | Air Quality and Global Climate Change. |

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| AASHTO | American Association of State Highway and Transportation Officials | CHSR | California High-Speed Rail | IAMF | impact avoidance and minimization feature | RWQCB | Regional Water Quality Control Board | | |
| ADA | Americans with Disabilities Act | CHSTS | California Safety Test Solutions | IBC | International Building Code | SEM | sequential excavation method | | |
| APE | area of potential effect | CMP | construction management plan | ISEP | Implementation Stage Electromagnetic Compatibility Program Plan | SHPO | State Historic Preservation Office | | |
| AREMA | American Railway Engineering and Maintenance-of-Way Association | CP | construction package | MBTA | Migratory Bird Treaty Act | SOI | Secretary of the Interior | | |
| ASCE | American Society of Civil Engineers | CRHR | California Register of Historical Resources | MOA | Memorandum of Agreement | SPCC | Spill Prevention, Control, and Countermeasure | | |
| ASTM | American Society for Testing and Materials | CTP | construction transportation plan | mph | miles per hour | SSPP | Systems Safety Program Plan | | |
| Authority | California High-Speed Rail Authority | CWA | Clean Water Act | MSE | mechanically stabilized earth | SVP | Society of Vertebrate Paleontology | | |
| BEMP | Built Environment Monitoring Plan | DB | design-build | NCCAB | North Central Coast Air Basin | SWPPP | stormwater pollution prevention plan | | |
| BETP | built environment treatment plan | DCM | Design Criteria Manual | NIOSH | National Institute for Occupational Safety and Health | SWRCB | State Water Resources Control Board | | |
| BGEPA | Bald and Golden Eagle Protection Act | DOGGR | California Department of Conservation, Division of Oil, and Gas and Geothermal Resources | NMFS | National Marine Fisheries Service | TBM | tunnel boring machine | | |
| BMP | best management practice | | | NOA | naturally occurring asbestos | TR | triggers review | | |
| BRMP | biological resources management plan | EMC | electromagnetic compatibility | NRHP | National Register of Historic Places | TVA | threat and vulnerability assessment | | |
| Cal-OSHA | California Occupational Safety and Health Administration | EMF | electromagnetic field | O&M | operations and maintenance | Uniform Act | Uniform Relocation Assistance and Real Property Acquisition Policies Act, as amended | | |
| Caltrans | California Department of Transportation | EMI | electromagnetic interference | OSHA | Occupational Safety and Health Administration | | | | |
| CARB | California Air Resources Board | EMMA | Environmental Mitigation Management and Assessment | PA | Programmatic Agreement | US | United States | | |
| CDFW | California Department of Fish and Wildlife | EPB | Earth Pressure Balance | PCM | Project Construction Manager | USACE | U.S. Army Corps of Engineers | | |
| CDPH | California Department of Public Health | ESA | Endangered Species Act | PHA | preliminary hazard analysis | USEPA | U.S. Environmental Protection Agency | | |
| CDSM | cement deep-soil-mixing | ESA | environmental site assessment | Porter-Cologne | Porter-Cologne Water Quality Control Act | USFWS | U.S. Fish and Wildlife Service | | |
| CEQA | California Environmental Quality Act | FHWA | Federal Highway Administration | PRMMP | paleontological resources monitoring and mitigation plan | VFHS | Valley Fever Health and Safety | | |
| CERCLA | Comprehensive Environmental Response, Compensation, and Liability Act | FRA | Federal Railroad Administration | PRS | paleontological resources specialist | VMT | vehicle miles traveled | | |
| | | FTA | Federal Transit Administration | PSI | pounds per square inch | VOC | volatile organic compound | | |
| CESA | California Endangered Species Act | HEPA | high efficiency particulate air | RCRA | Resource Conservation and Recovery Act | WCP | Weed Control Plan | | |
| C.F.R. | Code of Federal Regulations | HSR | high-speed rail | RPP | restoration and revegetation plan | WEAP | Worker Environmental Awareness Program | | |