FINAL REPORT

COMBINED PALEONTOLOGICAL IDENTIFICATION REPORT AND PALEONTOLOGICAL EVALUATION REPORT INTERSTATE 710 CORRIDOR PROJECT BETWEEN OCEAN BOULEVARD AND STATE ROUTE 60 07-LA-710-PM 5.4/24.5 EA 249900

Prepared for

Metro
Los Angeles County Metropolitan Transportation Authority

Caltrans
California Department of Transportation

June 2017
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FINAL

Combined Paleontological Identification Report and Paleontological Evaluation Report

for

Interstate 710 Corridor Project
Between Ocean Boulevard and State Route 60

County of Los Angeles, California
07-LA-710-PM 5.4/24.5 EA 249900

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June 2017
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SUMMARY OF FINDINGS

The California Department of Transportation (Caltrans), in cooperation with the Los Angeles County Metropolitan Transportation Authority (Metro), the Gateway Cities Council of Governments (Gateway Cities COG), the Southern California Association of Governments (SCAG), the Ports of Los Angeles (POLA) and Long Beach (POLB), and the Interstate 5 Joint Powers Authority (I-5 JPA), proposes to widen Interstate 710 (I-710) from Ocean Blvd. in the City of Long Beach north to State Route 60 (SR-60). Caltrans, Metro, Gateway Cities COG, SCAG, POLA, POLB, and the I-5 JPA are collectively referred to as the I-710 Funding Partners. These agencies are collectively funding the preparation of preliminary engineering and environmental documentation for the I-710 Corridor Project (proposed project) to evaluate improvements along the I-710 Corridor from Ocean Blvd. in the City of Long Beach to SR-60.

The existing I-710 mainline generally consists of eight general purpose (GP) lanes north of Interstate 405 (I-405) and six GP lanes south of I-405. Three alternatives are currently under consideration for the proposed project. These are: Alternative 1, the No Build Alternative; Alternative 5C, which involves modernizing I-710 by increasing the number of GP lanes on the freeway and reconfiguring access points to/from I-710 and its crossing freeways; and Alternative 7, which involves adding a clean-emission freight corridor (two separate truck-only lanes) along I-710, modifying the I-710 alignment, maintaining the same number of GP lanes on I-710, and reconfiguring the access points to/from I-710 and its crossing freeways.

Recommendations from the California Environmental Quality Act (CEQA) and guidelines from Caltrans are consistent with the recommendations of the Society of Vertebrate Paleontology (SVP) and indicate that impacts to nonrenewable paleontological resources must be considered during project design and construction. In order to determine the potential impacts of the proposed project on paleontological resources that may be encountered during project development, the following tasks were conducted: (1) a review of pertinent geological and paleontological literature, (2) fossil locality searches through the Natural History Museum of Los Angeles County (LACM), and (3) field surveys of the Area of Potential Disturbance (APD). The area studied for this proposed project is the APD, which is based on the horizontal and vertical extent of anticipated project activities. The APD includes a 100-foot buffer around all areas of proposed and existing right-of-way, utility relocations, lay-down areas, construction staging, and construction easements.

Based on the aforementioned research, the APD crosses six geologic units with different levels of paleontological sensitivity. Artificial Fill has no paleontological sensitivity, while the Alluvial Fan Deposits; Young Alluvial Fan and Valley Deposits, Undivided; and Young Alluvial Flood Plain Deposits have low paleontological sensitivity from the surface to a depth of 15 feet and high paleontological sensitivity below that mark. The Old Alluvial Fan Deposits, Undivided, and Old Paralic Deposits, Undivided, have high paleontological sensitivity.
The proposed project involves potential excavation that could extend into paleontologically sensitive deposits and impact significant, nonrenewable paleontological resources. To reduce impacts to nonrenewable paleontological resources, this study recommends preparation of a Caltrans Paleontological Mitigation Plan (PMP) concurrently with development of final design plans. This PMP should be synthesized from outlines and guidelines provided by Caltrans and the SVP and specifically tailored to the paleontological resources and geologic units that may be encountered during excavation associated with the proposed project. This study recommends that the section of the PMP describing the excavation monitoring for the proposed project include the following:

- A preconstruction field survey shall be conducted in areas identified as having high paleontological sensitivity after vegetation and paving have been removed, followed by salvage of any observed surface paleontological resources prior to the beginning of additional grading.

- A qualified Principal Paleontologist or representative shall attend the preconstruction meeting. At this meeting, the Principal Paleontologist will explain the likelihood of encountering paleontological resources, what resources may be discovered, and the methods of recovery that will be employed.

- During construction excavation, a qualified vertebrate paleontological monitor shall initially be present on a full-time basis whenever excavation will occur within the sediments that have a high paleontological sensitivity rating and on a spot-check basis in sediments that have a low sensitivity rating. Monitoring may be reduced to a part-time basis if no resources are being discovered in sediments with a high sensitivity rating. (Monitoring reductions, when they occur, will be determined by the qualified Principal Paleontologist in consultation with the Caltrans Resident Engineer [RE].) The monitor shall inspect fresh cuts and/or spoils piles to recover paleontological resources. With the RE’s approval, the monitor shall temporarily divert construction equipment away from the immediate area of the discovery. The monitor shall be equipped to rapidly stabilize and remove fossils to avoid prolonged delays to construction schedules. If large mammal fossils or large concentrations of fossils are encountered, the appropriate equipment may be considered to assist in the removal and/or collection of large fossil materials.

- Localized concentrations of small (or micro-) vertebrates may be found in all native sediments. Therefore, these sediments shall occasionally be spot-screened on site through one-eighth- to one-twentieth-inch mesh screens to determine whether microfossils are present. If microfossils are encountered, sediment samples (up to three cubic yards, or 6,000 pounds) shall be collected and processed through one-twentieth-inch mesh screens to recover additional fossils.

- Recovered specimens shall be prepared to the point of identification and permanent preservation. Preparation includes the sorting of any washed mass samples to recover small invertebrate and vertebrate fossils, the removal of surplus sediment from around
larger specimens to reduce the volume of storage for the repository and storage cost, and the addition of approved chemical hardeners/stabilizers to fragile specimens.

- Specimens shall be identified to the lowest taxonomic level possible and curated into an institutional repository with retrievable storage. The repository institutions usually charge a one-time fee based on volume, so removing surplus sediment is important. The repository institution may be a local museum or university with a curator who can retrieve the specimens on request. Caltrans requires that a draft curation agreement be in place with an approved curation facility prior to the initiation of any paleontological monitoring or mitigation activities.

- Preparation and submittal of the Paleontological Mitigation Report (PMR) documenting completion of the PMP for the Lead Agency (Caltrans).

Implementation of these mitigation measures to avoid or minimize harm will reduce impacts to nonrenewable paleontological resources. More project-specific measures may be developed during preparation of the PMP to further reduce impacts during final project design.
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<tr>
<td>APD</td>
<td>Area of Potential Disturbance</td>
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<tr>
<td>BLM</td>
<td>Bureau of Land Management</td>
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<tr>
<td>BNSF</td>
<td>Burlington Northern Santa Fe Railway</td>
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<tr>
<td>Caltrans</td>
<td>California Department of Transportation</td>
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<tr>
<td>CEQA</td>
<td>California Environmental Quality Act</td>
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<tr>
<td>CFR</td>
<td>Code of Federal Regulations</td>
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<tr>
<td>Corps</td>
<td>United States Army Corps of Engineers</td>
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<tr>
<td>EIR</td>
<td>Environmental Impact Report</td>
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<td>EIS</td>
<td>Environmental Impact Statement</td>
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<tr>
<td>ESA</td>
<td>Environmentally Sensitive Area</td>
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<tr>
<td>FHWA</td>
<td>Federal Highway Administration</td>
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<tr>
<td>FRATIS</td>
<td>Freight Advanced Traveler Information Systems</td>
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<tr>
<td>FTA</td>
<td>Federal Transit Administration</td>
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<tr>
<td>FTIP</td>
<td>Federal Transportation Improvement Program</td>
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<tr>
<td>Gateway Cities COG</td>
<td>Gateway Cities Council of Governments</td>
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<tr>
<td>GP</td>
<td>General purpose</td>
</tr>
<tr>
<td>HOV</td>
<td>High occupancy vehicle</td>
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<tr>
<td>I-5</td>
<td>Interstate 5</td>
</tr>
<tr>
<td>I-105</td>
<td>Interstate 105</td>
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<tr>
<td>I-405</td>
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<tr>
<td>I-710</td>
<td>Interstate 710</td>
</tr>
<tr>
<td>ITS</td>
<td>Intelligent Transportation Systems</td>
</tr>
<tr>
<td>JPA</td>
<td>Joint Powers Authority</td>
</tr>
<tr>
<td>LACM</td>
<td>Natural History Museum of Los Angeles County</td>
</tr>
<tr>
<td>LADWP</td>
<td>Los Angeles County Department of Water and Power</td>
</tr>
<tr>
<td>LAJ</td>
<td>Los Angeles Junction (Railway)</td>
</tr>
<tr>
<td>Metro</td>
<td>Los Angeles County Metropolitan Transportation Authority</td>
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<tr>
<td>NALMA</td>
<td>North American Land Mammal Age</td>
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<tr>
<td>NEPA</td>
<td>National Environmental Policy Act</td>
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<tr>
<td>NNL</td>
<td>National Natural Landmark</td>
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<tr>
<td>NPS</td>
<td>National Park Service</td>
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<tr>
<td>NZE</td>
<td>Near zero emission</td>
</tr>
<tr>
<td>PA/ED</td>
<td>Project Approval/Environmental Document</td>
</tr>
<tr>
<td>PEAR</td>
<td>Preliminary Environmental Analysis Report</td>
</tr>
<tr>
<td>PER</td>
<td>Paleontological Evaluation Report</td>
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<tr>
<td>PIR</td>
<td>Paleontological Identification Report</td>
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<tr>
<td>PMP</td>
<td>Paleontological Mitigation Plan</td>
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<td>PMR</td>
<td>Paleontological Mitigation Report</td>
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<tr>
<td>POLA</td>
<td>Port of Los Angeles</td>
</tr>
<tr>
<td>POLB</td>
<td>Port of Long Beach</td>
</tr>
<tr>
<td>PRC</td>
<td>Public Resources Code</td>
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<tr>
<td>PSS</td>
<td>Paleontological Stewardship Summary</td>
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<tr>
<td>RE</td>
<td>Resident Engineer</td>
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<tr>
<td>RTP/SCS</td>
<td>Regional Transportation Plan/Sustainable Communities Strategy</td>
</tr>
<tr>
<td>SAFETEA-LU</td>
<td>Safe, Accountable, Flexible, and Efficient Transportation Equity Act: A Legacy for Users</td>
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<tr>
<td>SCAG</td>
<td>Southern California Association of Governments</td>
</tr>
<tr>
<td>Abbreviation</td>
<td>Description</td>
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<tr>
<td>SCE</td>
<td>Southern California Edison</td>
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<tr>
<td>SER</td>
<td>Standard Environmental Reference (Caltrans)</td>
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<tr>
<td>SR-60</td>
<td>State Route 60</td>
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<tr>
<td>SR-91</td>
<td>State Route 91</td>
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<tr>
<td>SVP</td>
<td>Society of Vertebrate Paleontology</td>
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<tr>
<td>TDM</td>
<td>Transportation Demand Management</td>
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<tr>
<td>TSM</td>
<td>Transportation Systems Management</td>
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<tr>
<td>UPRR</td>
<td>Union Pacific Railroad</td>
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<tr>
<td>USC</td>
<td>United States Code</td>
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<tr>
<td>USFS</td>
<td>United States Forest Service</td>
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<tr>
<td>USGS</td>
<td>United States Geological Survey</td>
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<tr>
<td>ZE</td>
<td>zero emission</td>
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1.0 INTRODUCTION

The California Department of Transportation (Caltrans), in cooperation with the Los Angeles County Metropolitan Transportation Authority (Metro), the Gateway Cities Council of Governments (Gateway Cities COG), the Southern California Association of Governments (SCAG), the Ports of Los Angeles (POLA) and Long Beach (POLB), and the Interstate 5 Joint Powers Authority (I-5 JPA), proposes to widen Interstate 710 (I-710) from Ocean Boulevard in the City of Long Beach north to State Route 60 (SR-60).

1.1 PROJECT STUDY AREA AND PROJECT OBJECTIVES

The Interstate 710 (I-710) Corridor Project Study Area (Study Area) includes the portion of Route 710 from Ocean Blvd. in Long Beach to State Route 60 (SR-60) in East Los Angeles, a distance of approximately 19 miles (see Figure 1). At the crossing freeways, the Study Area extends up to 1.5 miles east and west of I-710 on Interstate 405 (I-405), State Route 91 (SR-91), Interstate 105 (I-105), and Interstate 5 (I-5). The Study Area traverses portions of the Cities of Bell, Bell Gardens, Carson, Commerce, Compton, Cudahy, Downey, Huntington Park, Lakewood, Long Beach, Los Angeles, Lynwood, Maywood, Paramount, Signal Hill, South Gate, and Vernon, and portions of unincorporated Los Angeles County, all within Los Angeles County, California.

I-710 (also known as the Long Beach Freeway) is a major north/south interstate freeway connecting the City of Long Beach to central Los Angeles. Within the Study Area, the freeway serves as the principal transportation connection for goods movement between multiple facilities. These facilities include the Port of Los Angeles (POLA) and the Port of Long Beach (POLB) (collectively known as the Ports) shipping terminals, the four crossing freeways serving destinations beyond the Study Area, local warehousing along I-710, and intermodal railyards located in the Cities of Commerce and Vernon.

The environmental impacts of the I-710 Corridor Project will be assessed and disclosed in compliance with both the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA). Caltrans is the Lead Agency for CEQA compliance and the lead agency for NEPA compliance pursuant to Section 6005 of the Safe, Accountable, Flexible, and Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) (23 United States Code [USC] 327).

The need for the I-710 Corridor Project is summarized as follows:

- I-710 experiences high heavy-duty truck volumes, resulting in high concentrations of diesel particulate emissions within the I-710 Corridor.
- I-710 experiences accident rates, especially truck-related, that are well above the statewide average for freeways of this type.
At many locations along I-710, the entrance and exit ramps do not meet current design standards and weaving sections within and between interchanges are of insufficient length. These deficiencies correlate with accidents and congestion.

High volumes of both trucks and cars have led to severe traffic congestion throughout most of the day (6:00 a.m. to 7:00 p.m.) on I-710, as well as on the connecting freeways. This is projected to worsen over the next 20 years.

Increases in population, employment, and goods movement between now and 2035 will lead to more traffic demand on I-710 and on the streets and roadways within the I-710 Corridor as a whole.

The purpose of the I-710 Corridor Project is to achieve the following within the I-710 Corridor:

- Improve air quality and public health
- Improve traffic safety
- Provide modern design for the I-710 mainline
- Address projected traffic volumes for the 2035 horizon year
- Address projected growth in population, employment, and activities related to goods movement (based on the Southern California Association of Governments’ (SCAG) population projections and projected container volume increases at the two Ports)

1.2 ALTERNATIVES DESCRIPTION

This section describes the revised alternatives that were developed by a multidisciplinary technical team to achieve the I-710 Corridor Project purpose and subsequently were reviewed and concurred upon by the various advisory committees involved in the I-710 Corridor Project community participation framework. During the scoping process for the 2012 Draft Environmental Impact Report/Environmental Impact Statement (Draft EIR/EIS), Alternatives 2 (Transportation Systems Management/Transportation Demand Management), 3 (Maximum Goods Movement by Rail and Advanced Technology), 4 (Arterial Highway and I-710 Congestion Relief Improvements), and 5B (Widen to Eight General Purpose Lanes Plus Two High-Occupancy Vehicle Lanes) were considered but withdrawn from further environmental study as stand-alone alternatives. However, elements of these alternatives were included in Build Alternatives 5A (Widen to Ten General Purpose Lanes), 6A (Widen to Ten General Purpose Lanes Plus Four-Lane Freight Corridor), 6B (Widen to Ten General Purpose Lanes Plus Four-Lane Zero Emission Freight Corridor), and 6C (Widen to Ten General Purpose Lanes Plus Four-Lane Zero Emission Freight Corridor with Tolling) that were analyzed in the Draft EIR/EIS. Subsequent to public circulation of the Draft EIR/EIS, in response to new information and comments received from the public, a revised set of build alternatives have been developed and are analyzed in the revised technical studies. These alternatives are described below.
1.3 **ALTERNATIVE 1 – NO BUILD ALTERNATIVE**  
Alternative 1 is the future no-build condition, for which the build alternatives proposed for the I-710 Corridor Project will be compared. The No Build Alternative does not include any improvements within the I-710 Corridor Project Study Area other than those projects that are already funded and/or committed to be constructed by or before the planning horizon year of 2035. The projects included in this alternative are based on SCAG’s 2012–2035 Regional Transportation Plan Sustainable Communities Strategy (RTP/SCS) and Federal Transportation Improvement Program (FTIP) project list, including freeway, arterial, and transit improvements within the SCAG region. This alternative also includes current plans and projects related to goods movement to and from the Ports, such as maximum utilization of existing and planned railroad capacity as well as application of advanced technologies and programs to manage transportation systems and travel demand within the I-710 Corridor. Additionally, Alternative 1 assumes an expansion of transit service within the I-710 corridor commensurate with future population and employment growth.

1.4 **ALTERNATIVE 5C – MODERNIZE THE I-710 FREEWAY**  
Alternative 5C proposes increasing the number of general purpose lanes on the freeway and reconfiguring the access points to/from I-710 and its crossing freeways. This alternative will:

- Shift the freeway centerline at several locations to minimize right-of-way impacts.
- Add up to one general purpose through lane in each direction between Anaheim St. and Olympic Blvd. to address capacity deficient segments on the freeway.
- Add two truck bypass lanes in each direction around the I-405 freeway-to-freeway interchange to address safety and operational deficiencies.
- Add a lane buffer in each direction between Pacific Coast Hwy. and Shoreline Dr. to address safety and operational deficiencies.
- Modify freeway-to-freeway interchanges at I-405, SR-91, I-105, and I-5 to address safety, operational, and capacity deficiencies. Modification varies by location and may entail realignment of freeway connectors, adding and/or extending auxiliary lanes to connectors, and modification to the crossing freeways.
  - At the I-405 interchange, modification entails realignment and replacement of eight of the existing eight freeway-to-freeway connectors. Modifications also include the removal of the local interchange at Wardlow Rd. on I-710, the removal of the local interchange at Pacific Pl. on I-405, and modification of the local interchange on I-405 at Santa Fe Ave.
  - At the SR-91 interchange, modification entails realignment and replacement of one of the existing eight freeway-to-freeway connectors and modification to ramp connection points on I-710. These modifications necessitate modification to the local interchange at Artesia Blvd. on I-710, the local interchange at Santa Fe Ave.
Ave. on SR-91, the local interchange at Long Beach Blvd. on SR-91, and the local interchange at Atlantic Ave. on SR-91.

- At the I-105 interchange, modifications entail relocating ramp connection points on I-710.
- At the I-5 interchange, modifications include new collector-distributor roads that service local interchanges at Washington Blvd. and Bandini Blvd. and relocating ramp connection points on I-710.

- Modify local interchanges on I-710 to address safety, operational, and capacity deficiencies. Modification varies by location and may entail realignment of entrance and exit ramps, adding or extending auxiliary lanes to ramps, realignment of the local street crossings, and modification to adjacent intersecting local streets. Local interchange locations include:
  - Shoreline Dr.
  - Anaheim St.
  - Pacific Coast Hwy. / State Route 1
  - Willow St.
  - Del Amo Blvd.
  - Long Beach Blvd.
  - Alondra Blvd.
  - Rosecrans Ave.
  - MLK Jr. Blvd.
  - Imperial Hwy.
  - Firestone Blvd.
  - Florence Ave.
  - Atlantic Blvd. / Bandini Blvd.
  - Washington Blvd.
  - Olympic Blvd.

- Add or modify local crossings of I-710, as follows:
  - Add a local street crossing over I-710 at Southern Ave. in the City of South Gate to address capacity deficiencies.
  - Remove local one-way crossings over I-710 at Shoreline Dr. (eastbound 9th St. to 6th St. and westbound 7th St. to 9th St.) to address safety and operational deficiencies.
On local street crossings, include pedestrian paths, which are comprised of sidewalks, curb ramps, and crosswalks.

On local street crossings, the cross section will have sufficient outside shoulder width to accommodate Class II bikeways.

Add five pedestrian/Class I bikeway crossings over I-710 and one pedestrian/Class I bikeway crossing under I-405.

- Replace, widen, add, and remove roadway or railway grade separation structures to accommodate lane additions, modified freeway realignments, and reconfigured interchanges. Some intersecting roadways and railroad crossings entail realignment of local streets and/or railroads. Railroad crossing locations where modifications are proposed include:
  - Union Pacific Railroad (UP Railroad) San Pedro Subdivision at I-405 in Long Beach
  - UP Railroad San Pedro Subdivision at I-710 in Long Beach
  - UP Railroad San Pedro Subdivision at I-710 in South Gate
  - UP Railroad Patata Industrial Lead at I-710 in South Gate
  - UP Railroad La Habra Subdivision at I-710 in Bell
  - Los Angeles Junction (LAJ) Railway Laguna Line at I-710 in Bell
  - LAJ Railway Laguna Line at I-710 in Vernon
  - BNSF Hobart Yard at I-710 in Commerce/Vernon
  - UP Railroad East Yard at I-710 in Commerce

- Replace, modify, enhance, add and remove storm water conveyance and treatment systems, roadside equipment, maintenance and access features, to accommodate freeway modifications.

- Replace, modify, and relocate critical infrastructure that crosses proposed freeway modifications. Critical infrastructure includes, but is not limited to, flood control facilities and major utilities. Prominent infrastructure crossings include the Los Angeles River, Compton Creek, Southern California Edison (SCE) transmission lines, and Los Angeles County Department of Water and Power (LADWP) transmission lines.

- Incorporate aesthetic enhancements that include thematic surface treatment of structures and paved surfaces, enhanced roadside landscaping, and irrigation consistent with a corridor-wide aesthetic master plan.

In addition to the freeway features described, the alternative includes added transit, new transportation system features and strategies, and programmatic elements, as follows:
A program to address future congestion at selected local arterial intersections to reduce traffic delay and improve operations within the Study Area. The I-710 Corridor Congestion Relief Program will make funding available to local jurisdictions in order to improve deficient intersections under Alternative 1 (No Build) conditions. Eligible intersection projects consist of improvements such as signal phasing/timing adjustments, lane restriping, median modification, and/or spot widening to provide intersection turn lanes. Under this program, eligible projects must comply with Caltrans’ “Complete Streets” guidelines and principles.

Transportation Systems Management/Transportation Demand Management (TSM/TDM) elements including adaptive ramp metering, updated traffic signals, parking restrictions during peak periods, and improved arterial signage for access to I-710.

Intelligent Transportation Systems (ITS) elements including updated fiber-optic communications to interconnect traffic signals along major arterial streets to improve traffic flow. Proposed I-710 ITS elements also incorporate selected components from the Los Angeles/Gateway Freight Technology Program specific to the I-710 Corridor. These include freeway smart corridor strategies that would deploy dedicated short-range communication roadside units alongside I-710 to manage and control traffic in real time based on prevailing conditions, applying operational strategies such as queue warning systems, variable speed limits/speed harmonization, and dynamic corridor ramp metering. Also included are Los Angeles/Gateway Freight Technology Program improvements that would expand in-vehicle freight advanced traveler information systems (FRATIS) to include intermodal trucks, managing truck movements among drayage operators and the marine terminals at the two Ports.

Transit improvements, including increased revenue vehicle service hours for light rail service (Blue Line/Green Line), Los Angeles County Metropolitan Transportation Authority (Metro) Rapid routes, local bus service, and community bus service within the I-710 Corridor.

New express bus/rapid service routes serving key activity centers and transit connections within the I-710 Corridor.

A program that would provide air quality improvements in the I-710 Corridor. The I-710 Corridor Project Zero Emission/Near Zero Emission Truck Deployment Program would provide funding for facilities needed to support zero emission/near zero emission (ZE/NZE) trucks, such as charging and/or refueling stations; as well as funding for ZE/NZE trucks through existing programs (e.g., Measures ONRD-03 and ONRD-04 in the 2012 Air Quality Management Plan) and/or through new programs such as the Gateway Cities Technology Deployment Program currently under development.

A community health and benefit program that would take the form of a grant program structured to provide corridor communities the opportunity to implement projects or outreach activities that would improve air quality and public health related to I-710 travel and goods movement.
Use of best available control technology construction equipment as defined by the California Air Resources Board during project construction.

1.5 **ALTERNATIVE 7 – ADD CLEAN-EMISSION FREIGHT CORRIDOR (TRUCK-ONLY LANES) ALONG I-710**

Alternative 7 proposes adding two separate truck lanes in each direction between Long Beach and Commerce, adjacent to the freeway, approximately 16 miles in length. This principal feature is also referred to as a “Clean-Emission Freight Corridor.” Alternative 7 also includes modifications to the I-710 alignment, maintaining the same number of general purpose lanes on I-710, and reconfiguring the access points to/from I-710 and its crossing freeways. This alternative will:

- Add two controlled-access truck lanes in each direction (the freight corridor), within or adjacent to the I-710 freeway cross section, with termini connections to/from I-710 near Anaheim St. in Long Beach and near Washington Blvd. in Commerce. The freight corridor features include:
  - Restricted use to ZE/NZE trucks. The freight corridor in Alternative 7 is zero emissions/near zero emissions “technology neutral” in that it could accommodate at least one type of ZE/NZE heavy-duty truck that is in commercial mass production before the project completes final design.
  - Freeway access points (freight corridor-to-freeway interchanges) at three locations on I-710 near Anaheim St., near Del Amo Blvd., and near Bandini Blvd. and one location on SR-91 near Cherry Ave.
  - Local access points (freight corridor-to-local street interchanges) at four locations: Pico Ave., Anaheim St., Slauson Ave., and Washington Blvd.
  - Placement of highway structures in a manner that does not preclude the addition of one future freeway general purpose lane in each direction.
- Shift the I-710 centerline at several locations to accommodate the freight corridor and minimize right-of-way impacts.
- Modify freeway-to-freeway interchanges at I-405, SR-91, I-105, and I-5 to address safety, operational, and capacity deficiencies. Reconfiguration will also accommodate the freight corridor and minimize right-of-way impacts. Modification varies by location and may entail realignment of freeway connectors, adding auxiliary lanes to connectors, and modifications to the crossing freeways.
  - At the I-405 interchange, modification entails realignment and replacement of eight of the existing eight freeway-to-freeway connectors. Modifications also include the removal of the local interchange at Wardlow Rd. on I-710, the removal of the local interchange at Pacific Pl. on I-405, and modification of the local interchange on I-405 at Santa Fe Ave.
At the SR-91 interchange, modification entails realignment and replacement of one of the existing eight freeway-to-freeway connectors, reconstruction of three of the connectors, and modification to ramp connection points on I-710. The connector modifications also necessitate modifications to two local interchanges on SR-91 at Long Beach Blvd. and Atlantic Ave.

At the I-105 interchange, modifications entail relocating ramp connection points on I-710.

At the I-5 interchange, modifications include new collector-distributor roads that service local interchanges at Washington Blvd. and Bandini Blvd. and relocating ramp connection points on I-710.

- Reconfigure local interchanges on I-710 to address safety, operational, and capacity deficiencies. Reconfiguration entails realignment of entrance and exit ramps, adding or extending auxiliary lanes to ramps, and realignment of the local street crossings. Reconfiguration will also accommodate the freight corridor and minimize right-of-way impacts. Local interchange locations include:
  
  - Pico Ave.
  - Shoreline Dr.
  - Anaheim St.
  - Pacific Coast Hwy. / State Route 1
  - Willow St.
  - Del Amo Blvd.
  - Long Beach Blvd.
  - Alondra Blvd.
  - Rosecrans Ave.
  - MLK Jr. Blvd.
  - Imperial Hwy.
  - Firestone Blvd.
  - Florence Ave.
  - Atlantic Blvd. / Bandini Blvd.
  - Washington Blvd.
  - Olympic Blvd.

- Include new or modified local crossings, as follows:
  
  - Add a local street crossing over I-710 at Southern Ave. in the City of South Gate to address capacity and operation deficiencies at adjacent local crossings.
- Remove local one-way crossings over I-710 at Shoreline Dr. (eastbound 9th St. to 6th St. and westbound 7th St. to 9th St.) to address safety and operational deficiencies.

- On local street crossings, include pedestrian paths, which are comprised of sidewalks, curb ramps, and crosswalks.

- On local street crossings, the cross section will have sufficient outside shoulder width to accommodate Class II bikeways.

- Add three pedestrian/Class I bikeway crossings over I-710 and one pedestrian/Class I bikeway crossing under I-405.

- Replace, widen, add, and remove roadway or railway grade separation structures to accommodate lane additions, modified freeway realignments, and reconfigured interchanges. Modification will also accommodate the freight corridor and minimize right-of-way impacts. Some intersecting roadways and railroad crossings entail realignment of local streets and/or railroads. Railroad crossing locations where modifications are proposed include:
  - UP Railroad San Pedro Subdivision at I-405 in Long Beach
  - UP Railroad San Pedro Subdivision at I-710 in Long Beach
  - UP Railroad San Pedro Subdivision at I-710 in South Gate
  - UP Railroad Patata Industrial Lead at I-710 in South Gate
  - UP Railroad La Habra Subdivision at I-710 in Bell
  - LAJ Railway Laguna Line at I-710 in Bell
  - LAJ Railway Laguna Line at I-710 in Vernon
  - BNSF Hobart Yard at I-710 in Commerce/Vernon
  - UP Railroad East Yard at I-710 in Commerce

- Replace, modify, add, enhance and remove storm water conveyance and treatment systems, roadside equipment, maintenance and access features, to accommodate freeway modifications.

- Replace, modify, and relocate critical infrastructure that crosses proposed freeway modifications. Critical infrastructure includes, but is not limited to, flood control facilities and major utilities. Prominent infrastructure crossings include the Los Angeles River, Compton Creek, SCE transmission lines, and LADWP transmission lines.

- Incorporate aesthetic enhancements that include thematic surface treatment of structures and paved surfaces, enhanced roadside landscaping, and irrigation consistent with a corridor-wide aesthetic master plan.
In addition to the freeway features described, the alternative includes added transit, new transportation system features and strategies, and programmatic elements, as follows:

- A program to address future congestion at selected local arterial intersections to reduce traffic delay and improve operations within the Study Area. The I-710 Corridor Congestion Relief Program will make funding available to local jurisdictions in order to improve deficient intersections under Alternative 1 (No Build) conditions. Eligible intersection projects consist of improvements such as signal phasing/timing adjustments, lane restriping, median modification, and/or spot widening to provide intersection turn lanes. Under this program, eligible projects must comply with Caltrans’ “Complete Streets” guidelines and principles.

- TSM/TDM elements including adaptive ramp metering, updated traffic signals, parking restrictions during peak periods, and improved arterial signage for access to I-710.

- ITS elements including updated fiber-optic communications to interconnect traffic signals along major arterial streets to improve traffic flow. Proposed I-710 ITS elements also incorporate selected components from the Los Angeles/Gateway Freight Technology Program specific to the I-710 Corridor. These include freeway smart corridor strategies that would deploy dedicated short-range communication roadside units alongside I-710 to manage and control traffic in real time based on prevailing conditions, applying operational strategies such as queue warning systems, variable speed limits/speed harmonization, and dynamic corridor ramp metering. Also included are Los Angeles/Gateway Freight Technology Program improvements that would expand in-vehicle FRATIS to include intermodal trucks, managing truck movements among drayage operators and the marine terminals at the two Ports.

- Transit improvements, including increased revenue vehicle service hours for light rail service (Blue Line/Green Line), Metro Rapid routes, local bus service, and community bus service within the I-710 Corridor.

- New express bus/rapid service routes serving key activity centers and transit connections within the I-710 Corridor.

- A program that would provide air quality improvements in the I-710 Corridor. The I-710 Corridor Project Zero Emission/Near Zero Emission Truck Deployment Program would provide funding for facilities needed to support ZE/NZE trucks, such as charging and/or refueling stations as well as funding for ZE/NZE trucks through existing programs (e.g., Measures ONRD-03 and ONRD-04 in the 2012 Air Quality Management Plan) and/or through new programs such as the Gateway Cities Technology Deployment Program currently under development.

- A community health and benefit program that would take the form of a grant program structured to provide corridor communities the opportunity to implement projects or outreach activities that would improve air quality and public health related to I-710 travel and goods movement.
Use of best available control technology construction equipment as defined by the California Air Resources Board during project construction.

1.6 DESIGN OPTIONS

Design Options are variations to the alternatives, specific to discrete segments of I-710. The locations, objectives, and features are described as follows:

1.6.1 DESIGN OPTIONS 1A AND 1B

The objective of this variation is to reduce impacts to BNSF operations at the Hobart intermodal rail yard. The limits of the design variation extend from the Atlantic Blvd./Bandini Blvd. interchange to the Washington Blvd. interchange, a distance of approximately one mile through the Cities of Bell, Commerce, and Vernon. Design Option 1A applies to Alternative 5C, and Design Option 1B applies to Alternative 7. Differences between the alternative and the variation are described as follows:

- Highway alignments crossing the Hobart Yard are shifted to the east and none encroach beyond the existing State right of way on the west side of the freeway over the rail yard. As such, the shifts apply to proposed freeway, collector-distributor road, and ramp alignments.
- For Design Option 1A, the interchange configuration and local street circulation is the same as Alternative 5C, but the general location of the highway alignments are different. Thus, the right-of-way requirements are also different than Alternative 5C.
- For Design Option 1B, the interchange configuration is the same as Alternative 7, but the local street configuration, highway alignments, and right-of-way requirements are different than Alternative 7.

1.6.2 DESIGN OPTION 2A

The objective of this variation is to restore circulation between Shoreline Dr. and Pacific Coast Hwy., via the freeway. The limits of the design variation extend from the Shoreline Dr. interchange to the Pacific Coast Hwy. interchange, a distance of approximately one mile through the City of Long Beach. Design Option 2A only applies to Alternative 5C. Differences between the alternative and the variation are described as follows:

- Two grade separated ramps are added and provide connections between (1) the northbound Shoreline Dr. entrance ramp to I-710 and the northbound Pacific Coast Hwy. exit ramp from I-710, and (2) the southbound Pacific Coast Hwy. entrance ramp to I-710 and the southbound Shoreline Dr. exit ramp from I-710.
- To accommodate the added ramps, highway alignments are shifted to the west. The shifted alignments include the Shoreline Dr. entrance and exit ramps, the southbound
freeway, the southbound Pacific Coast Hwy. entrance ramp, and the southbound Anaheim St. exit ramp.

- The interchange configuration types, the Shoreline Dr. ramp alignments (Shoemaker Bridge) over the Los Angeles River, and local street configuration are the same as Alternative 5C, but the highway alignments, the ramp termini at Anaheim St. and Pacific Coast Hwy., and the right-of-way requirements are different.

1.6.3 **Design Options 3A and 3B**

The objective of this variation is to further improve safety and operation of the freeway by reducing weaving conflicts. The limits of the design variation extend from the Washington Blvd. interchange to the SR-60 interchange, a distance of approximately two miles through the City of Commerce and the unincorporated area of East Los Angeles. Design Option 3A applies to Alternative 5C, and Design Option 3B applies to Alternative 7. Differences between the alternative and the variation entail reconfiguration of the SR-60, I-5, and Olympic Blvd. interchanges, alteration of freeway and local traffic circulation, and requirements for additional right of way. These differences are the same for both Design Options 3A and 3B and are further described as follows:

- The northbound I-710 to eastbound/westbound SR-60 connector is modified and extended. The point of connection on I-710 is relocated further south near the I-5 freeway crossing.
- The southbound I-710 to southbound I-5 connector is modified and extended. The point of connection is relocated further north, closer to the SR-60 freeway crossing.
- The entrance ramp from Olympic Blvd. to northbound I-710 is removed and is replaced by an entrance ramp from Olympic Blvd. to eastbound/westbound SR-60, via the modified I-710-to-SR-60 connector.
- The exit ramp to Olympic Blvd. from northbound I-710 is modified. The point of connection is removed on I-710 and replaced by a point of connection on the modified I-710-to-SR-60 connector.
- The entrance ramp from Eastern Ave. to southbound I-710 is removed and replaced by an entrance ramp from Whittier Blvd. to the I-5-to-I-710 connector.
- The exit ramp to Olympic Blvd./Whittier Blvd. via Eastern Ave. from southbound I-710 is removed and is replaced by an exit ramp to Whittier Blvd. from the SR-60-to-I-710 connector.

1.6.4 **Option 7ZE**

Option 7ZE provides for the use of the freight corridor exclusively by zero emission trucks, excluding near zero emission trucks. The freight corridor in Option 7ZE is zero emissions “technology neutral” in that it could accommodate at least one type of ZE heavy-duty truck that
is in commercial mass production before the project completes final design. This option is operational in nature and would not represent a difference in the geometric design of Alternative 7.

1.7 PURPOSE OF INVESTIGATION

Significant nonrenewable paleontological resources, including vertebrate fossils and unique or scientifically important invertebrate and plant fossils, are recognized by the Federal government and the State of California. Regulations at both the Federal and State level require that impacts to paleontological resources be avoided, or if they cannot be avoided, mitigated. A summary of the regulations and requirements regarding paleontological resources and their applicability to the proposed project is provided below.

1.7.1 CALTRANS REQUIREMENTS

As portions of this project are within a State highway right-of-way, the project is obligated to follow the guidelines specified in the Caltrans Standard Environmental Reference (SER), specifically the SER Environmental Handbook, Volume 1, Chapter 8 (Caltrans, 2015), which deals with paleontology. The guidelines are designed to address impacts to paleontological resources prior to the beginning of construction. In most cases, three documents are required to be prepared: a Paleontological Investigation Report (PIR), a Paleontological Evaluation Report (PER), and a Paleontological Mitigation Plan (PMP). The PIR and PER are often combined into a single document. The PIR and PER must be prepared prior to completion of the Project Approval/Environmental Document (PA/ED) phase in order to minimize construction delays. The PMP must be developed prior to the beginning of construction.

The purpose of the PIR is to identify whether or not paleontological resources may be present within the proposed project; the purpose of the PER is to evaluate the significance of the resources if it is determined that resources are likely to be present; and the purpose of the PMP is to develop mitigation for significant resources. Occasionally, the PIR/PER will determine that, despite the results of the background research, it is unlikely that the project will encounter significant resources during construction. This may be due to the removal of sensitive sediments as a result of previous construction in the area or to the burying of sensitive sediments with fill deeper than depths that will be encountered during construction related to the project. In these cases, a PMP will not be required, and the reason will be specified in the PIR/PER. At the conclusion of grading, two additional documents may need to be prepared: a Paleontological Mitigation Report (PMR) and a Paleontological Stewardship Summary (PSS).

1.7.2 FEDERAL REGULATIONS

A variety of Federal statutes specifically address paleontological resources. A project must comply with one or more Federal regulations concerning paleontological resources if: (1) the project involves land under the jurisdiction of a Federal agency, (2) a Federal agency has oversight on the project, and/or (3) a permit, license, authorization, or funding from a Federal
agency is required to complete the project. A brief discussion of the Federal regulations that involve paleontological resources and their applicability to this project are included below.

### 1.7.2.1 National Environmental Policy Act of 1969 (42 United States Code 4321–4375)

NEPA established a national policy for the protection, promotion, enhancement, and understanding of the environment and created the Council on Environmental Quality. As part of this act, Section 101(b)(4) (42 USC 4331) seeks to “preserve important historic, cultural, and natural aspects of our natural heritage, and maintain, wherever possible, an environment which supports diversity and variety of individual choice.” NEPA requires that the environmental effects of a proposed Federal project or action be evaluated. Regulations for implementing this evaluation are found in Title 40 of the Code of Federal Regulations (CFR), Sections 1500–1508. Because Federal agencies (i.e., the Federal Highway Administration [FHWA] and the Federal Transit Administration [FTA]) may have oversight on this project, compliance with NEPA regulations is required for the project as a whole.

The applicability of NEPA to paleontological resources depends on whether Section 101(b)(4) is interpreted to include fossils. However, compliance with CEQA regulations and Caltrans guidelines regarding paleontological resources will meet the requirements of NEPA regardless of whether paleontological resources are deemed to be covered under this act.

### 1.7.2.2 Archaeological and Paleontological Salvage (23 USC 305)

As part of the Federal-Aid Highway Act of 1956 (23 USC et seq.), this Federal law authorizes the appropriation and use of Federal funds for paleontological salvage as necessary by the highway department of any state, in compliance with 16 USC 431–433. According to 23 CFR 1.9(a), the use of Federal-aid funds must be in conformity with Federal and State law. Under this statute, mitigation of impacts to paleontological resources during development of this project may be an eligible Federal project cost provided the necessary documentation is submitted to the FHWA.

### 1.7.2.3 The Antiquities Act of 1906 (16 USC 431–433)

This law prohibits appropriating, excavating, injuring, or destroying any object of antiquity situated on Federal land without the permission of the Secretary of the Department of the Government having jurisdiction over the land. Fossils are generally considered “objects of antiquity” by Federal agencies, including the Bureau of Land Management (BLM), the National Park Service (NPS), and the United States Forest Service (USFS). Permits to collect fossils on lands administered by Federal agencies are authorized under this act. Therefore, projects involving Federal lands will require permits for paleontological evaluation and mitigation efforts. No portion of this project crosses lands administered by the Federal government. Therefore, this act is not applicable to this project.
1.7.2.4 **PALEONTOLOGICAL RESOURCES PRESERVATION ACT (16 USC 470AAA ET SEQ.)**
This act prohibits the excavation, removal, or damage of any paleontological resources located on Federal land under the jurisdiction of the Secretaries of the Interior or Agriculture (e.g., BLM, NPS, and USFS). The statute establishes criminal and civil penalties for fossil theft and vandalism on Federal lands. Federal land-managing agencies (e.g., the BLM, USFS, NPS, and United States Army Corps of Engineers [Corps]) may issue paleontological permits for conducting project-related investigations, both inventory and mitigation, on lands under their jurisdiction. No portion of this project crosses lands administered by the Federal government; therefore, this act is not applicable to this project.

1.7.2.5 **NATIONAL NATURAL LANDMARKS PROGRAM (16 USC 461-467)**
The National Natural Landmarks (NNL) Program was established in 1962 and is administered under the Historic Sites Act of 1935 (16 USC 461–467). Implementing regulations were first published in 1980 under 36 CFR Section 1212, and the program was re-designated as 36 CFR 62 in 1981. An NNL is defined as “an area designated by the Secretary of the Interior as being of national significance to the United States because it is an outstanding example(s) of major biological and geological features found within the boundaries of the United States or its Territories or on the Outer Continental Shelf.” National significance describes “an area that is one of the best examples of a biological community or geological feature within a natural region of the United States, including terrestrial communities, landforms, geological features and processes, habitats of native plants and animal species, or fossil evidence of the development of life.” Federal agencies and their agents (e.g., Caltrans) should consider the existence and location of designated NNLs, and of areas found to meet the criteria for national significance, in assessing the effects of their activities on the environment under Section 102(2)(c) of NEPA. Because no portion of this project crosses an NNL, these landmarks do not have to be considered as part of this project.

1.7.2.6 **PALEONTOLOGICAL RESOURCES ON PUBLIC LANDS (43 CFR 8365 ET SEQ.)**
These regulations provide for the protection and preservation of public lands and resources, including paleontological resources. Specifically, 43 CFR 8365.1-5(a)(1) states that on public lands, which are defined as lands under the jurisdiction of the BLM (43 CFR 8365.1), no person shall “willfully deface, disturb, remove, or destroy any personal property, or structures, or any scientific, cultural, archaeological, or historic resource, natural object or area,” which the BLM interprets to include paleontological resources. This regulation does not apply to this project because the project does not involve lands administered by the BLM.

1.7.3 **STATE REGULATIONS**
Under State law, paleontological resources are protected by both CEQA and Public Resources Code (PRC) Section 5097.5.
1.7.3.1 CALIFORNIA ENVIRONMENTAL QUALITY ACT (PRC 21000 ET SEQ.)

The purpose of CEQA is to provide a statewide policy of environmental protection. As part of this protection, State and local agencies are required to analyze, disclose, and, when feasible, mitigate the environmental impacts of, or find alternatives to, proposed projects.

The State CEQA Guidelines (California Code of Regulations [CCR] 15000 et seq.) provide regulations for the implementation of CEQA and include more specific direction on the process of documenting, analyzing, disclosing, and mitigating environmental impacts of a project. To assist in this process, Appendix G of the State CEQA Guidelines provides a sample checklist form that may be used to identify and explain the degree of impact a project will have on a variety of environmental aspects, including paleontological resources (Section V[c]).

As stated in Section 15002(b)(1-3) of the State CEQA Guidelines, CEQA applies to governmental action, including activities that are undertaken by, financed by, or require approval from a governmental agency. Because this project is undertaken by, funded by, and requires approval from governmental agencies, CEQA applies.

1.7.3.2 CALIFORNIA PUBLIC RESOURCES CODE 5097.5

This law protects historic, archaeological, and paleontological resources on public lands within California and establishes criminal and civil penalties for violations. Specifically, California PRC Section 5097.5 states:

“(a) No person shall knowingly and willfully excavate upon, or remove, destroy, injure or deface any historic or prehistoric ruins, burial grounds, archaeological or vertebrate paleontological site, including fossilized footprints, inscriptions made by human agency, or any other archaeological, paleontological or historical feature, situated on public lands, except with the express permission of the public agency having jurisdiction over such lands. Violation of this section is a misdemeanor.

(b) As used in this section, “public lands” means lands owned by, or under the jurisdiction of, the state, or any city, county, district, authority, or public corporation, or any agency thereof.”

Because this project involves public lands as defined in Section 5097.5(b), this regulation applies.

1.7.4 LOCAL REQUIREMENTS

While Caltrans is not required to comply with local ordinances and requirements, it will endeavor to do so to the extent possible. Various cities and counties have passed ordinances and requirements related to paleontological resources within their jurisdictions, generally to provide additional guidance on assessment and treatment measures for projects subject to CEQA.
compliance. Project staff should periodically coordinate with local entities to update their knowledge of local requirements.

General Plans for cities and counties are developed to identify the community’s vision for its collective future and establish the fundamental framework to guide future decision-making about development, resource management, public safety, public services, and general community well-being. General Plans describe how residents will work to retain the natural and aesthetic qualities that make their city unique while at the same time responding to the dynamics of regional growth and meeting changing community needs. General Plans serve as policy guides, balancing these interrelated factors to each city’s community vision. By following Caltrans guidelines and CEQA regulations, the project will meet and/or exceed the paleontological protection guidelines of the cities through which the project passes if those cities have any protections in place.

1.7.4.1 COUNTY OF LOS ANGELES
The County of Los Angeles General Plan sets forth the goals and policies the County uses to manage future growth and land use (Los Angeles County, 2012). The Conservation and Natural Resources Element (Chapter 6) of the County’s General Plan contains the following goal and policies designed to protect paleontological resources within the County:

- **Goal C/NR 14:** Protected historic, cultural, and paleontological resources.
  - **Policy C/NR 14.1:** Mitigate all impacts from new development on or adjacent to historic, cultural, and paleontological resources to the greatest extent feasible.
  - **Policy C/NR 14.2:** Support an inter-jurisdictional collaborative system that protects and enhances the County’s historic, cultural, and paleontological resources.
  - **Policy C/NR 14.5:** Promote public awareness of the County’s historic, cultural, and paleontological resources.
  - **Policy C/NR 14.6:** Ensure proper notification and recovery processes are carried out for development on or near historic, cultural, and paleontological resources.

1.7.4.2 CITY OF BELL
The General Plan for the City of Bell, adopted in October 1996, does not have any goals, policies, or implementation measures related to paleontological resources (City of Bell, 1996).

1.7.4.3 CITY OF BELL GARDENS
The City of Bell Gardens did not have a General Plan available for review online as of November 2015.
1.7.44 CITY OF CARSON
The General Plan for the City of Carson, adopted in September 2006, does not have any goals, policies, or implementation measures related to paleontological resources (City of Carson, 2006).

1.7.45 CITY OF COMMERCE
The City of Commerce 2020 General Plan, adopted in January 2008, outlines policies and programs to guide future planning and development in the City (City of Commerce, 2008). Protection of paleontological resources is discussed in one of the programs included in Section 6.4, Chapter 6: Resource Management Element, of the General Plan. The Cultural Resource Management Program states, “Should archaeological or paleontological resources be encountered during excavation and grading activities, all work would cease until appropriate salvage measures are established”. Under this program, the State CEQA Guidelines should be followed during monitoring, salvage, and preservation activities.

1.7.46 CITY OF COMPTON
The General Plan for the City of Compton, adopted in May 2011, does not have any goals, policies, or implementation measures related to paleontological resources (City of Compton, 2011).

1.7.47 CITY OF CUDAHY
The General Plan for the City of Cudahy, adopted September 15, 2010, does not have any goals, policies, or implementation measures related to paleontological resources (City of Cudahy, 2010).

1.7.48 CITY OF DOWNEY
The General Plan for the City of Downey, adopted in January 2005, does not have any goals, policies, or implementation measures related to paleontological resources (City of Downey, 2005).

1.7.49 CITY OF HUNTINGTON PARK
The General Plan for the City of Huntington Park, adopted in February 1992, does not have any goals, policies, or implementation measures related to paleontological resources (City of Huntington Park, 2005).

1.7.410 CITY OF LAKewood
The City of Lakewood did not have a General Plan available for review online as of November 2015.
1.7.4.11 CITY OF LONG BEACH

The General Plan for the City of Long Beach, adopted in June 2010, does not have any goals, policies, or implementation measures related to paleontological resources (City of Long Beach, 2010).

1.7.4.12 CITY OF LOS ANGELES

The Conservation Element of the City of Los Angeles General Plan, adopted in September 2001, identifies natural and cultural resources within the City and describes objectives, policies, and programs for their protection, preservation, and management (City of Los Angeles, 2001). Chapter II: Resource Conservation and Management, Section 3: Archaeological and Paleontological, discusses protection of paleontological resources and states, in part:

Pursuant to CEQA, if a land development project is within a potentially [scientifically] significant paleontological area, the developer is required to contact a bona fide paleontologist to arrange for assessment of the potential impact and mitigation of potential disruption of or damage to the site. If [scientifically] significant paleontological resources are uncovered during project execution, authorities are to be notified and the designated paleontologist may order excavations stopped, within reasonable time limits, to enable assessment, removal or protection of the resources. (p. II-5)

This section also indicates that the City is responsible for protecting paleontological resources and outlines the following objective, policy, and program regarding paleontological resources (pp. II-5 and II-6):

- **Objective:** Protect the City's archaeological and paleontological resources for historical, cultural, and/or educational purposes.

  - **Policy:** Continue to identify and protect [scientifically] significant archaeological and paleontological sites and/or resources known to exist or that are identified during land development, demolition or property modification activities.

  - **Program:** Permit processing, monitoring, enforcement and periodic revision of regulations and procedures.

1.7.4.13 CITY OF LYNNWOOD

The General Plan for the City of Lynwood, adopted in August 2003, does not have any goals, policies, or implementation measures related to paleontological resources (City of Lynwood, 2003).
1.7.4.14 CITY OF MAYWOOD
The General Plan for the City of Maywood, adopted in December 1989, does not have any goals, policies, or implementation measures related to paleontological resources (City of Maywood, 1989).

1.7.4.15 CITY OF PARAMOUNT
The General Plan for the City of Paramount, adopted in August 2007, does not have any goals, policies, or implementation measures related to paleontological resources (City of Paramount, 2007).

1.7.4.16 CITY OF SIGNAL HILL
The General Plan for the City of Signal Hill, adopted in February 1986, does not have any goals, policies, or implementation measures related to paleontological resources (City of Signal Hill, 1986).

1.7.4.17 CITY OF SOUTH GATE
The City of South Gate General Plan, adopted in May 2009, contains goals, objectives and policies to provide citywide policy guidance on topics such as regional coordination, preservation of the identity of the community, and preservation of existing neighborhood character (City of South Gate, 2009). For paleontological resources, this includes:

- **Goal CD-9**: Preservation and protection of places, buildings, and objects that embody the City’s social, commercial, architectural and agricultural history.
  - **Objective CD 9.1**: Identify and preserve cultural and historic resources.
    - **Policy P.4**: Unique paleontological resources and sites will not be directly or indirectly destroyed or significantly altered.

1.7.4.18 CITY OF VERNON
The General Plan for the City of Vernon, adopted in December 2007, does not have any goals, policies, or implementation measures related to paleontological resources (City of Vernon, 2007).

1.8 SIGNIFICANCE

1.8.1 DEFINITIONS OF SIGNIFICANCE
The SVP (2010) provides the following definitions of significance.

- **Significant Nonrenewable Paleontological Resources** are fossils and fossiliferous deposits, here defined as consisting of identifiable vertebrate fossils, large or small; uncommon invertebrate, plant, and trace fossils; and other data that provide taphonomic,
taxonomic, phylogenetic, paleoecologic, stratigraphic, and/or biochronologic information. Paleontological resources are considered to be older than recorded human history and/or older than the middle Holocene (i.e., older than approximately [4,200 years ago (Walker et al., 2012)]).

According to Caltrans (2015), the significance of a paleontological resource may be stated for a particular fossil species, fossil assemblage, or a rock unit as a whole. There are two generally recognized types of paleontological significance:

- **National**: An NNL-eligible paleontological resource is an area of national significance (as defined under 36 CFR 62) that contains an outstanding example of fossil evidence of the development of life on earth. This is the only codified definition of paleontological significance.

- **Scientific**: Definitions of a scientifically significant paleontological resource can vary by jurisdictional agency and paleontological practitioner.

Generally, scientifically significant paleontological resources are identified sites or geological deposits containing individual fossils or assemblages of fossils that are unique or unusual; are diagnostically or stratigraphically important; and add to the existing body of knowledge in specific areas stratigraphically, taxonomically, or regionally (SVP, 1995). Particularly important are fossils found in situ (undisturbed) in primary context (i.e., fossils that have not been subjected to disturbance subsequent to their burial and fossilization). As such, they aid in stratigraphic correlation, particularly those offering data for the interpretation of tectonic events, geomorphologic evolution, paleoclimatology, the relationships between aquatic and terrestrial species, and evolution in general. Discovery of in situ fossil-bearing deposits is rare for many species, especially vertebrates. Vertebrate fossils are often assigned greater significance than other fossils because they are rarer than other types of fossils. This is primarily due to the fact that the best conditions for fossil preservation include little or no disturbance after death and quick burial in oxygen-depleted, fine-grained sediments. While these conditions often exist in marine settings, they are relatively rare in terrestrial settings. This has ramifications on the amount of scientific study needed to adequately characterize an individual species and therefore affects how relative sensitivities are assigned to formations and rock units.

In their Model Curation Program, Eisentraut and Cooper (2002) developed a useful analysis for judging whether fossils are scientifically significant. Using their analysis method, fossils can be judged scientifically significant if they meet any of the following criteria within the following categories:

- **Taxonomy**: Assemblages that contain rare or unknown taxa, such as defining new (previously unknown to science) species, or that represent a species that is the first or has very limited occurrence within the area or formation.

- **Evolution**: Fossils that represent important stages or links in evolutionary relationships or that fill gaps or enhance underrepresented intervals in the stratigraphic record.
Biostratigraphy: Fossils important for determining or confining relative geologic (stratigraphic) ages or for use in defining regional to interregional stratigraphic associations. These fossils are often known as biostratigraphic markers and represent plants or animals that existed for only a short and restricted period in the geologic past.

Paleoecology: Fossils important for reconstructing ancient organism community structure and interpretation of ancient sedimentary environments. Depending on which fossils are found, much can be learned about the ancient environment, from water depth, temperature, and salinity to what the substrate was like (muddy, sandy, or rocky) and even whether the area was in a high-energy location like a beach or a low-energy location like a bay. Even terrestrial animals can contain information about the ancient environment. For example, an abundance of grazing animals such as horse, bison, and mammoth suggests more of a grassland environment, while an abundance of browsing animals such as deer, mastodon, and camel suggests more of a brushy environment. Preserved parts of plants can also lend insight into what was growing in the area at a particular time. In addition, by studying the ratios of different species to each other's population densities, relationships between predator and prey can be determined.

There is a complex but vital interrelationship among evolution, biostratigraphy, and paleoecology: biostratigraphy (the record of fossil succession and progression) is the expression of evolution (change in populations of organisms through time), which in turn is driven by natural selection pressures exerted by changing environments (paleoecology).

Taphonomy: Fossils that are exceptionally well or unusually/uniquely preserved or are relatively rare in the fossil record. This could include preservation of soft tissues such as hair, skin, or feathers from animals or the leaves/stems of plants that are not commonly fossilized.

1.8.2 SUMMARY OF SIGNIFICANCE

This document uses an abbreviated summary defining the significance of paleontological resources:

All vertebrate fossils that can be related to a stratigraphic context are considered significant, nonrenewable paleontological resources. Invertebrate and plant fossils, as well as other environmental indicators associated with vertebrate fossils, are considered significant. Certain invertebrate and plant fossils that are regionally rare or uncommon, or that help to define stratigraphy, age, or taxonomic relationships, are considered significant.
1.9 **SENSITIVITY**

1.9.1 **DEFINITION OF SENSITIVITY**

Sensitivity is often stated as “potential,” since decisions about how to manage paleontological resources must be based on “potential,” as the actual situation cannot be known until construction excavation for the project is underway. In accordance with the Caltrans SER guidelines for paleontology (Caltrans, 2015), the sensitivity of geologic units that may contain paleontological resources is assessed on the basis of high, low, or no potential for paleontological resources.

- **High Potential:** Rock units which, based on previous studies, contain or are likely to contain significant vertebrate, significant invertebrate, or significant plant fossils. These units include, but are not limited to, sedimentary formations that contain significant nonrenewable paleontological resources anywhere within their geographical extent and sedimentary rock units temporally or lithologically suitable for the preservation of fossils. These units may also include some volcanic and low-grade metamorphic rock units. Fossiliferous deposits with very limited geographic extent or an uncommon origin (e.g., tar pits and caves) are given special consideration and ranked as highly sensitive. High sensitivity includes the potential for containing: (1) abundant vertebrate fossils; (2) a few significant fossils (large or small vertebrate, invertebrate, or plant fossils) that may provide new and significant taxonomic, phylogenetic, ecologic, and/or stratigraphic data; (3) areas that may contain datable organic remains older than Recent, including *Neotoma* (sp.) middens; and/or (4) areas that may contain unique new vertebrate deposits, traces, and/or trackways. Areas with a high potential for containing significant paleontological resources require monitoring and mitigation.

- **Low Potential:** This category includes sedimentary rock units that: (1) are potentially fossiliferous but have not yielded significant fossils in the past; (2) have not yet yielded fossils but possess a potential to contain fossil remains; or (3) contain common and/or widespread invertebrate fossils if the taxonomy, phylogeny, and ecology of the species contained in the rock are well understood. Sedimentary rocks expected to contain vertebrate fossils are not placed in this category because vertebrates are generally rare and found in more localized stratum. Rock units designated as low potential generally do not require monitoring and mitigation. However, as excavation for construction gets underway, it is possible that new and unanticipated paleontological resources may be encountered. If this occurs, a Construction Change Order must be prepared in order to have a qualified Principal Paleontologist evaluate the resource. If the resource is determined to be significant, monitoring and mitigation are required.

- **No Potential:** Rock units of intrusive igneous origin, most extrusive igneous rocks, and moderately to highly metamorphosed rocks are classified as having no potential for containing significant paleontological resources. For projects encountering only these types of rock units, paleontological resources can generally be eliminated as a concern.
when the Preliminary Environmental Analysis Report (PEAR) is prepared and no further action taken.

Given the range of criteria that may be used, paleontological significance assessments should necessarily be based on the recommendations of a professional Principal Paleontologist with expertise in the region under study and the resources found in that region. An evaluation of a particular rock unit’s significance rests on the known importance of specific fossils. This significance is often reflected as a sensitivity ranking relative to other rock units in the same region. Regardless of the format used by a paleontologist to rank formations, the importance of any rock unit must be explicitly stated in terms of the specific fossils known or suspected to be present (and, if the latter, why such fossils are suspected), and why these fossils are of paleontological importance. Some land management agencies may require the use of specific guidelines to assess significance, whereas others may defer to the expertise of local paleontologists and provide little guidance.

If a paleontological resource is determined to be significant, of high sensitivity, or of scientific importance, a mitigation program must be developed and implemented. Mitigation can be initiated prior to and/or during construction. The latter is more common for Caltrans projects. It should be noted that mitigation during construction poses a greater risk of construction delays. Mitigation is an eligible Federal project cost, in accordance with 23 USC 305, only if significance documentation acceptable to the FHWA is submitted. Thus, coordination between Caltrans, FHWA, and all jurisdictional agencies is critical to formally establishing the significance of a resource. Any necessary coordination on Caltrans projects is usually completed and included as part of the PMP.

As a practical matter, no consideration is generally afforded to paleontological sites for which scientific importance cannot be demonstrated. If a paleontological resource assessment results in a determination that the site is insignificant or of low sensitivity, it is recommended that this conclusion be documented in a PER and in the project’s environmental document in order to demonstrate compliance with applicable statutory requirements.

1.9.2 SUMMARY OF SENSITIVITY

This document uses the following abbreviated summary to define paleontological sensitivity and the potential for significant paleontological resources:

A formation or geologic unit has paleontological sensitivity or the potential for significant paleontological resources if it has previously produced, or has lithologies conducive to the preservation of, vertebrate fossils and associated or regionally uncommon invertebrate and plant fossils. All sedimentary rocks and certain extrusive volcanic rocks and mildly metamorphosed rocks are considered to have potential for paleontological resources.
2.0 METHODS

To ensure that research was comprehensive, the proposed project Area of Potential Disturbance (APD) was expanded to include an area up to 100 feet (ft) beyond the footprint of the proposed project. The APD is depicted on the Long Beach, South Gate, and Los Angeles, California 7.5-minute series United States Geological Survey (USGS) topographic maps (see Figure 3). In order to determine the potential impacts of the project on paleontological resources that may be encountered during project development, the following tasks were conducted: (1) a review of pertinent geological and paleontological literature, (2) fossil locality searches through the Natural History Museum of Los Angeles County (LACM), and (3) field surveys of the APD.

2.1 KEY PERSONNEL

Dr. Rieboldt has 14 years of experience in the paleontology and geology fields, having conducted field and laboratory research and worked with natural history collections across the country. She also has extensive experience as a paleontological consultant, monitoring for paleontological resources; overseeing paleontological monitoring programs; writing paleontological resource assessment reports, mitigation plans, and monitoring reports; and identifying and describing fossils.

2.2 LITERATURE REVIEW AND FOSSIL LOCALITY SEARCHES

A paleontological literature review was conducted for the proposed project using published and unpublished reports, paleontological assessments, and paleontological monitoring reports, field notes, published literature, and maps. A fossil locality search was conducted through the LACM in June 2009 during the initial scoping for this project (Appendix A). Because over six years had passed since the fossil locality search was completed and the project has undergone some design changes, a new locality search through the LACM was requested in January 2016, and the results were received in February 2016 (Appendix B).

The purpose of this literature review is to determine which geologic units are present within the APD and whether fossils have been recovered from those or similar geologic units elsewhere in the region. The purpose of the fossil locality searches was to establish the status and extent of previously recorded paleontological resources within and surrounding the APD. With this knowledge, an informed assessment of the potential impacts of the proposed project on paleontological resources could be made, and the types of fossils that might be uncovered during ground-disturbing activities could be determined. Because geologic formations and units may extend over large geographic areas and contain similar lithologies and fossils, the literature review and fossil locality searches include areas well beyond the APD.
2.3 **FIELD SURVEY**

A pedestrian field survey of the APD was conducted by Principal Paleontologist Steven W. Conkling at various times between June 16 and August 21, 2009. Additional survey work to address design refinements was conducted during May 2011 by Mr. Conkling. An additional survey was completed on August 17, 2015, by Associate Ivan Strudwick within SCE rights-of-way associated with this project. During the surveys, bedrock and sediment exposures along the I-710 Corridor were examined to identify exposures of fossiliferous sediments. The purpose of these surveys was to note the sediments and identify any paleontological resources exposed on the surface. The pedestrian survey was limited to areas within proposed project footprint where surficial geological exposures were present. During May 2011 and August 2015, additional work was done to verify that the entire proposed project was included within the APD and to examine the area geology to ensure that no additional fossiliferous geologic units were being encountered through project design refinements.
3.0 RESULTS

3.1 LITERATURE REVIEW

3.1.1 GEOLOGY

The proposed project is located at the northern end of the Peninsular Ranges Geomorphic Province, a 900-mile-long northwest-southeast-trending structural block that extends from the tip of Baja California to the Transverse Ranges and includes the Los Angeles Basin (California Geological Survey, 2002; Norris and Webb, 1976). The total width of the province is approximately 225 miles, with a maximum landbound width of 65 miles (Sharp, 1976). The province contains extensive pre-Cenozoic (more than 66 million years ago [Ma]) igneous and metamorphic rocks covered by Cenozoic (less than 66 Ma) sedimentary deposits (Norris and Webb, 1976).

Specifically, the proposed project runs along the course of the Los Angeles River, crossing the Los Angeles Basin from north to south. The Los Angeles Basin is a broad, almost level alluvial plain with slight hills or mesas rising above the basin floor (Yerkes et al., 1965). It is bounded on the north and northeast by hills and mountains of the Transverse Ranges, on the east by the mountains of the Peninsular Ranges, and on the south and west by the Pacific Ocean. Geologic mapping (Saucedo, et al., 2003; Yerkes and Campbell, 2005) indicates that sediments from the latest Quaternary are mapped within the APD; however, the two maps covering the APD differ slightly (Figure 3). At the northern end of the APD, Yerkes and Campbell (2005) distinguished between Holocene Alluvial Fan Deposits and Holocene to late Pleistocene Alluvial Fan Deposits. However, over the majority of the APD, Saucedo et al. (2003) grouped the alluvial fan deposits of Holocene to late Pleistocene age into the same unit, called Young Alluvial Fan and Valley Deposits, Undivided. Table A lists the geologic units mapped within the APD and their respective ages. These geologic units are described in more detail in the following pages.

3.1.1.1 ARTIFICIAL FILL (AF)

Artificial fill is mapped, or known to exist, throughout the APD. This is consistent with the fact that the proposed project is located in a developed area that has been substantially altered by human activity. Artificial fill consists of sediments that have been removed from one location and transported to another by humans. The transportation distance can range from a few feet to dozens of miles. Composition is dependent on the source. When it is compacted and dense, artificial fill is known as “engineered fill,” but it can be unconsolidated and loosely compacted. Artificial fill will sometimes contain modern debris such as asphalt, wood, bricks, concrete, metal, glass, plastic, and even plant material. Depending on the area, thickness can be less than one foot or several hundred feet.
FIGURE 3
I-710 Corridor Project
Sheet 1 of 2
07-LA-710-PM 5.4/24.5
EA 249900; EFIS 0700000443
Geologic Map

SOURCE: Saucedo, et al. (2003); Yerkes and Campbell (2005)
E:URS0801/GIS_MOD/MXD/Paleo/Geology_SH1.mxd (6/14/2017)
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FIGURE 3
I-710 Corridor Project
07-LA-710- PM 5.4/24.5
EA 249900; EFIS 0700000443
Geologic Map

Area of Potential Disturbance (APD)

Geologic Units
- Af - Artificial Fill
- Qf - Alluvial Fan Deposits
- Qyf - Young Alluvial Fan and Valley Deposits, Undivided
- Qya - Young Alluvial Flood Plain Deposits
- Qof - Old Alluvial Fan Deposits, Undivided
- Qof3 - Old Alluvial Fan Deposits, Unit 3
- Qoa - Old Alluvial Flood Plain Deposits, Undivided
- Qop - Old Paralic Deposits, Undivided

* undivided (a = sandy, s = silty, g = gravel)

SOURCE: Saucedo, et al. (2003); Yerkes and Campbell (2005)

I:\URS0801\GIS MOD\MXD\Paleo\Geology_SH2.mxd (6/14/2017)
Table A: Geologic Units and Ages within the I-710 Corridor APD

<table>
<thead>
<tr>
<th>Geologic Unit</th>
<th>Map Symbol</th>
<th>Epoch</th>
<th>Age (years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Artificial Fill</td>
<td>af</td>
<td>Holocene</td>
<td>Less than 100</td>
</tr>
<tr>
<td>Alluvial Fan Deposits</td>
<td>Qf</td>
<td>Holocene</td>
<td>Less than 11,700</td>
</tr>
<tr>
<td>Young Alluvial Fan and Valley Deposits, Undivided</td>
<td>Qyf, Qyfa, Qyfs</td>
<td>Holocene to late Pleistocene</td>
<td>Less than 126,000</td>
</tr>
<tr>
<td>Young Alluvial Flood Plain Deposits</td>
<td>Qya</td>
<td>Holocene to late Pleistocene</td>
<td>Less than 126,000</td>
</tr>
<tr>
<td>Old Alluvial Fan Deposits, Undivided</td>
<td>Qof</td>
<td>Late to middle Pleistocene</td>
<td>11,700 to 781,000</td>
</tr>
<tr>
<td>Old Paralic Deposits, Undivided</td>
<td>Qop</td>
<td>Late to middle Pleistocene</td>
<td>11,700 to 781,000</td>
</tr>
</tbody>
</table>

1 Map Symbol: a = sandy, s = silty
APD = Area of Potential Disturbance
ft = foot/feet
I-710 = Interstate 710

3.1.1.2 Alluvial Fan Deposits (Qf)
The Alluvial Fan Deposits mapped at the northern end of the APD consist of unconsolidated mixtures of boulders, cobbles, gravel, sand, and silt (Yerkes and Campbell, 2005). They are found in active and recently active alluvial fans, as well as the upstream portions of some connected channels (Yerkes and Campbell, 2005). These deposits accumulated during the Holocene and are less than 11,700 years old (Yerkes and Campbell, 2005); however, they likely overlie older, Pleistocene (11,700–2.588 Ma) deposits at undetermined depths and, as such, may be considered to be equivalent to the deposits of Holocene age within the Young Alluvial Fan and Valley Deposits as mapped by Saucedo et al. (2003) over the majority of the APD.

3.1.1.3 Young Alluvial Fan and Valley Deposits, Undivided (Qyf, Qyfa, Qyfs)
The Young Alluvial Fan and Valley Deposits consist of unconsolidated gravel, sand, and silt with occasional cobbles and boulders near mountain fronts (Saucedo et al., 2003; Yerkes and Campbell, 2005). These sediments were deposited by flooding streams and debris flows coming down from higher elevations and generally form a fan or lobe shape at the base of hills and mountains (Yerkes and Campbell, 2005). In some areas, the surfaces can show slight to moderate soil development (Saucedo et al., 2003; Yerkes and Campbell, 2005). These sediments cover the majority of the APD. The Young Alluvial Fan Deposits, undivided, are Holocene to late Pleistocene in age (less than 126,000 years ago) (Saucedo et al., 2003; Yerkes and Campbell, 2005). In general, the age of these sediments increases with depth; once a depth of approximately 15 ft is reached, the sediments will likely be from the Pleistocene and at least 11,700 years old. The deposits of Holocene age within this geologic unit may be considered equivalent to the Holocene Alluvial Fan Deposits mapped by Yerkes and Campbell (2005) at the northern end of the APD.
3.1.4 **Young Alluvial Flood Plain Deposits (QYA)**

Young Alluvial Flood Plain Deposits are generally found adjacent to stream and river channels and represent deposition by streams and rivers during flood events. They consist of poorly consolidated, poorly sorted, permeable deposits of sand, silt, and clay that accumulated during the Holocene to Late Pleistocene (less than 126,000 years ago) (Saucedo et al., 2003). Within the APD, these deposits are mapped in a small area along SR-91 west of I-710.

3.1.5 **Old Alluvial Fan Deposits, Undivided (QOF)**

The Old Alluvial Fan Deposits, Undivided, are late to middle Pleistocene in age (11,700–781,000 years ago) and consist of unconsolidated silt, sand, and gravel (Yerkes and Campbell, 2005). These sediments were deposited by flooding streams and debris flows coming down from higher elevations and generally form a fan or lobe shape at the base of hills and mountains. In some areas, these deposits are dissected by erosional gullies and have surfaces of moderately to well-developed soils (Yerkes and Campbell, 2005). The Old Alluvial Fan Deposits, Undivided, are found at the northern end of the APD.

3.1.6 **Old Paralic Deposits, Undivided (QOP)**

The late to middle Pleistocene (11,700–781,000 years ago) Old Paralic Deposits, Undivided, are composed of marine and non-marine sediments deposited at or near sea level in environments such as deltas, estuaries, tidal flats, beaches, lagoons, and shallow subtidal shelves. As described by Saucedo et al. (2003), they are mostly poorly sorted, moderately permeable, reddish-brown, interfingered strandline, beach, estuarine, and colluvial deposits. These deposits can be composed of siltstone, sandstone, and conglomerate; however, within the project they are mapped as being primarily silty (Saucedo et al., 2003). The Old Alluvial Deposits, Undivided, are mapped at the southern end of the APD.

3.1.2 **Paleontology**

3.1.2.1 **Artificial Fill**

Artificial fill can contain fossils, but these fossils have been removed from their original location and are thus out of context. They are not considered important for scientific study and have no paleontological sensitivity. It should be noted that these deposits can overlie older sediments that do have the potential to contain paleontological resources (see below).

3.1.2.2 **Alluvial Fan Deposits**

Although Holocene (less than 11,700 years ago) deposits, such as the Alluvial Fan Deposits in the APD, can contain remains of plants and animals, only those from the middle to early Holocene (4,200 to 11,700 years ago; Walker et al., 2012) are considered scientifically important (SVP 2010). Scientifically important fossils from middle to early Holocene deposits are not very common, and the LACM has no records of vertebrate fossil localities from middle to
early Holocene deposits within or surrounding the APD (see Section 3.2 and Appendices A and B).

These Holocene deposits likely overlie older, Pleistocene deposits, which have produced scientifically important fossils elsewhere in the County and the region (Jefferson, 1991a, 1991b; Miller, 1971; Reynolds and Reynolds, 1991; Springer et al., 2009). These older deposits span the end of the Rancholabrean North American Land Mammal Age (NALMA), which dates from 11,000 to 240,000 years ago (Sanders et al., 2009) and was named for the Rancho La Brea fossil site in central Los Angeles. The presence of *Bison* defines the beginning of the Rancholabrean NALMA (Bell et al., 2004), but fossils from this time also include other large and small mammals, reptiles, fish, invertebrates, and plants (Jefferson, 1991a, 1991b; Miller, 1971; Reynolds and Reynolds, 1991; Springer et al., 2009). These older deposits may be encountered at depths as shallow as 15 ft below the surface (see below). As such, these sediments are assigned a low paleontological sensitivity from the surface to depths of 15 ft and a high paleontological sensitivity once a depth of 15 ft is reached.

### 3.1.2.3 Young Alluvial Fan and Valley Deposits, Undivided and Young Alluvial Flood Plain Deposits

The Young Alluvial Fan Deposits, undivided, are Holocene and late Pleistocene in age (less than 126,000 years ago). Although Holocene (less than 11,700 years ago) deposits can contain remains of plants and animals, only those from the middle to early Holocene (4,200 to 11,700 years ago; Walker et al., 2012) are considered scientifically important (SVP 2010). As noted above, scientifically important fossils from middle to early Holocene deposits are not very common, and the LACM has no records of vertebrate fossil localities from Holocene deposits within or surrounding the APD. The older, Pleistocene deposits in this geologic unit have produced scientifically important fossils elsewhere in the County and the region (see discussion above on Alluvial Fan Deposits). Although the exact depth of the Holocene/Pleistocene boundary is not known throughout the APD, based on the depths at which Pleistocene fossils were found near the APD (see discussion of LACM fossil localities in Section 3.2), it is inferred that Pleistocene deposits may be encountered beginning at a depth of approximately 15 ft. Therefore, these deposits are assigned low paleontological sensitivity from the surface to a depth of 15 ft and high paleontological sensitivity below that mark.

### 3.1.2.4 Old Alluvial Fan Deposits, Undivided and Old Paralic Deposits, Undivided

The late to middle Pleistocene Old Alluvial Fan Deposits and Old Paralic Deposits, Undivided, span the latest two NALMAs: the Rancholabrean (11,700 to 240,000 years ago) and the Irvingtonian (240,000 years to approximately 2 Ma) (Martin et al., 2008; Sanders et al., 2009). Fossils are known from similar Rancholabrean and Irvingtonian deposits from excavations for roads, housing developments, and quarries, as well as scientific investigations in the County and the region (Jefferson, 1991a, 1991b; Miller, 1971; Pajak et al., 1996; Reynolds and Reynolds, 1991; Springer et al., 2009). These fossils include mammoths, mastodons, horses, bison, camels, saber-toothed cats, coyotes, deer, and sloths, as well as smaller animals like rodents, rabbits, birds, reptiles, and bony fish (Barrie et al., 1992; Conkling, 1988, 1997;
Jefferson, 1991a, 1991b; Lander, 2000; Miller, 1971; Pajak et al., 1996; Reynolds and Reynolds, 1991; Springer et al., 2009). As such, these deposits are considered to have high paleontological sensitivity.

3.2 Fossil Locality Searches

The LACM notes that most of the APD contains younger Quaternary deposits (i.e., the late Holocene sediments in the Alluvial Fan Deposits; Young Alluvial Fan and Valley Deposits, Undivided; and Young Alluvial Flood Plain Deposits), and the museum has no records of fossil localities in the uppermost layers of these deposits (i.e., those of late Holocene age). However, the museum has records of 34 fossil localities from older Quaternary deposits (i.e., middle Holocene to late Pleistocene sediments below the Alluvial Fan Deposits and within the Young Alluvial Fan and Valley Deposits, Undivided, and Young Alluvial Flood Plain Deposits, as well as the late to middle Pleistocene Old Alluvial Fan Deposits, Undivided, and Old Paralic Deposits, Undivided). These older deposits are mapped at the surface at the northern end of the APD and may be encountered at depth elsewhere in the APD.

As noted above, a total of 34 fossil localities were identified within and near the APD during two fossil locality searches conducted at the LACM in 2009 and 2016. Of the 28 localities identified in the 2009 fossil locality search (Appendix A) and the 20 localities in the 2016 fossil locality search (Appendix B), only 11 are the same. This discrepancy may be due to new localities appearing since the 2009 results were obtained or may be due to slightly different areas being searched and the overall distance from the fossil localities to the APD. However, the results of both fossil locality searches reinforce the fact that numerous fossil localities have been recovered from sediments similar to those within the APD. The results of both fossil locality searches are included in Appendices A and B and summarized below.

The LACM has collections from two vertebrate fossil localities that are present within the boundaries of the current APD. The two localities are LACM 7701–7702, both situated just south of the City of Commerce and north of the Los Angeles River near the intersection of Atlantic Avenue and I-710. These localities contained fossil specimens of threespine stickleback (Gasterosteus aculeatus), salamander (Batrachoseps), lizard (Lacertilia), snake (Colubridae), rabbit (Sylvilagus), pocket mouse (Microtus), harvest mouse (Reithrodontomys), and pocket gopher (Thomomys), at depths ranging from 11 to 34 ft below grade.

Within approximately six miles along the west side of the length of the APD, the LACM has specimens from 19 localities collected from depths of approximately 5 to 30 ft below the surface. These localities include LACM 1157, 1158, 1163, 1165, 1225, 1295, 1344, 1919, 2029, 3260, 3266, 3319, 3365, 3382, 3823, 4129, 4206, 4685, and 6705. Collectively, these localities yielded specimens of pond turtle (Emys), puffin (Mancalla), turkey (Parapavo), ground sloth (Paramylodon sp.), mammoth (Mammuthus), mastodon (Mammut americanum), dire wolf (Canis dirus), coyote (Canis latrans), rabbit (Sylvilagus), squirrel (Sciuridae), ground squirrel
(Spermophilus beecheyi), deer mouse (Microtus), pocket gopher (Thomomys), horse (Equus),
deer (Cervus), pronghorn antelope (Capromeryx minor), camel (Camelidae), and bison (Bison).

To the east, along the length of the APD and within approximately five miles, the LACM has 11
localities recovered from depths of approximately 16 to 100 ft. LACM localities 1005, 1021,
1022, 1144, 3245, 3363, 3550, 6746, 6802, and 6896 collectively produced specimens of
horse (Equus), mammoth (Mammuthus), camel, (Camelops), bison (Bison), sea lion (Zalophus),
whale (Cetacea), birds (Aves), speckled sanddab (Citharichthys stigmaeus), Pacific sanddab
(C. sordidus), California halibut (Paralichthys californicus), English sole (Parophrys vetulus),
slender sole (Lyopsetta exilis), lanternfish (Electriona rissi), bay gobi (Lepidogobius lepidus),
and many species of invertebrates.

The LACM also knows of two fossil localities near the APD from other institutions. The first of
these localities is from the San Bernardino County Museum (SBCM), which has locality SBCM
9.3.2 that produced sloth (Paramylodon), pocket gopher (Thomomys bottae), mammoth
(Mammuthus), horse (Equus), and bison (Bison latifrons). The second locality is from the San
Diego Museum of Natural History (SDMNH), which has locality SDMNH 3246 from the Naval
Fuel Reserve Quarry. This locality produced rabbits (Sylvilagus, Lepus), pocket gopher
(Thomomys), kangaroo rat (Dipodomys), pack rat (Neotoma), cat (Felis), horse (Equus), bison
(Bison), and deer (Odocoileus).

The LACM believes that shallow excavations in the uppermost few feet of the younger
Quaternary Alluvium exposed in portions of the APD are not likely to uncover significant fossil
vertebrate remains. Any excavations in the older sediments below or within the Alluvial Fan
Deposits; Young Alluvial Fan and Valley Deposits, Undivided; Young Alluvial Flood Plain
Deposits; Old Alluvial Fan Deposits; or Old Paralic Deposits, Undivided, may encounter
significant vertebrate fossils. Therefore, the LACM believes that, except for recent Quaternary
Alluvium that is present in the upper several feet across much of the proposed project, the
paleontological sensitivity of the APD is rated high. The LACM believes that any substantial
excavations should be closely monitored to quickly and professionally collect any specimens
without impeding development. Any fossils recovered during construction should be deposited
in a permanent scientific institution for the benefit of current and future generations.

3.3 FIELD SURVEYS

The pedestrian surveys noted that the APD contains sediments that correspond to the geologic
units mapped by Saucedo et al. (2003) and Yerkes and Campbell (2005). In localized areas,
artificial fill has been added and some limited exposures of subsurface bedrock are located
along the portion of the APD south of SR-91. No paleontological resources were identified
during the course of either field survey.

3.4 PROJECT-SPECIFIC PALEONTOLOGICAL SENSITIVITIES
Across the Los Angeles Basin, a veneer of Holocene sediments often overlies older, Pleistocene sediments. This creates a situation where excavation into Holocene surficial sediments with low paleontological sensitivity extends into Pleistocene sediments with high paleontological sensitivity. The majority of the APD is underlain by these Holocene sediments, but the results of the fossil locality searches demonstrate that fossils are relatively common at depth.

The specific paleontological sensitivities for geologic units within the APD are listed in Table B and are based the Paleontological Potential Sensitivity Scale used by Caltrans. Sensitivities (and potential) for Old Alluvial Fan Deposits, Undivided, and Old Paralic Deposits, Undivided, are high based on the presence of significant fossil remains that have been recovered from these units in other areas. It is likely that similar significant resources may be encountered if these units are encountered during excavation associated with the proposed project. Artificial fill is usually assigned a sensitivity of “none.” The Young Alluvial Fan and Valley Deposits, Undivided, have a sensitivity of “low” in the uppermost 15 ft as they are too young to contain paleontological resources. However, once a depth of 15 ft is reached, there is a potential to encounter sediments from the middle Holocene or older, at which point the sensitivity in that area will change to “high.” In addition, there is a potential for both the artificial fill and the Young Alluvial Fan and Valley Deposits, Undivided, to form a thin veneer on top of other sediment that has a high sensitivity.

### Table B: Geologic Units and Potential Paleontological Sensitivity within the I-710 Corridor APD

<table>
<thead>
<tr>
<th>Geologic Unit</th>
<th>Paleontological Potential Sensitivity (Caltrans)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Artificial Fill</td>
<td>None</td>
</tr>
<tr>
<td>Alluvial Fan Deposits</td>
<td>Low: surface to 15 ft; High: below 15 ft</td>
</tr>
<tr>
<td>Young Alluvial Fan and Valley Deposits, Undivided</td>
<td>Low: surface to 15 ft; High: below 15 ft</td>
</tr>
<tr>
<td>Young Alluvial Flood Plain Deposits</td>
<td>Low: surface to 15 ft; High: below 15 ft</td>
</tr>
<tr>
<td>Old Alluvial Fan Deposits, Undivided</td>
<td>High</td>
</tr>
<tr>
<td>Old Paralic Deposits, Undivided</td>
<td>High</td>
</tr>
</tbody>
</table>

APD = Area of Potential Disturbance  
Caltrans = California Department of Transportation  
ft = foot/feet  
I-710 = Interstate 710
4.0 **RECOMMENDATIONS FOR THE PMP**

4.1 **INTRODUCTION**

Caltrans and the SVP both present similar guidelines for adequate mitigation of impacts to significant nonrenewable paleontological resources. Excerpts from individual guidelines follow.

4.1.1 **SOCIETY OF VERTEBRATE PALEONTOLOGY**

Recommended general guidelines for conformable impact mitigation to significant nonrenewable paleontological resources have been published by the SVP (1995 and 2010) along with conditions of receivership that the repository institution can require when receiving fossils recovered from construction projects (SVP, 1996). In areas determined through a records check and field survey to have high potential for significant paleontological resources, an adequate program for mitigating the impact of development should include:

- A preliminary survey and surface salvage of any observed fossils prior to construction;
- Monitoring and salvage during project excavation;
- Screen washing to recover small specimens (if applicable) and specimen preparation to a point of stabilization and identification;
- Identification, cataloging, curation, and storage into a museum or university that has a curator who can retrieve the specimens upon request; and
- A final report of the finds and their significance after all operations are completed.

All phases of mitigation are to be supervised by a professional paleontologist who maintains the necessary paleontological collecting permits and repository agreements. The Lead Agency ensures compliance with the measures developed to mitigate the impacts of excavation during the initial assessment. To ensure compliance from the start of the project, a statement that confirms the site’s potential sensitivity, confirms the repository agreement with an established institution, and indicates the program for impact mitigation should be deposited with the Lead Agency and contractors before work begins. The program will be reviewed and accepted by the Lead Agency’s designated vertebrate paleontologist. If a mitigation program is initiated early in the course of project planning, construction delays due to paleontologic salvage activities can be minimized or avoided.

4.1.2 **CALIFORNIA DEPARTMENT OF TRANSPORTATION**

Caltrans has developed a set of guidelines similar those of the SVP to reduce impacts to paleontological resources. These recommendations start with avoidance of the resource area by the project and continue with recommendations for impact mitigation measures during construction excavation.
4.1.2.1 **AVOIDANCE**

Avoidance of project impacts can be achieved by project redesign so that paleontological resources are completely outside the project’s impact area (e.g., by using a different alignment route that misses the resource or a construction approach that does not entail construction excavation that would impact fossiliferous strata).

4.1.2.2 **CALTRANS PMP**

Since the geology of California is diverse and the nature of the fossils that it contains varies from one outcrop to the next, Caltrans does not provide generic paleontological resource impact mitigation, but instead presents a format for the PMP that can be utilized by the Principal Paleontologist who has been retained to manage paleontological resources during project development. A full list of sections of the PMP is included in Caltrans’ SER Environmental Handbook, Volume 1, Chapter 8 (Caltrans, 2015). Briefly, the PMP sections are:

- **Introduction.** A brief discussion of the goals of the proposed study, of the construction project’s effects, and why mitigation is needed (e.g., compliance with CEQA).
- **Background.** Pertinent information should be provided to demonstrate familiarity with the project area and the types of fossils and rock units under study.
- **Description of the Resource.** A description of the rock units, boundaries of the fossiliferous formations, and locations of exposures in the vicinity of the APD.
- **Proposed Research.** A clear, concise description of why the paleontological resource is significant or has scientific importance, and how the study is expected to address current gaps in the paleontological data.
- **Scope of Work.** The work plan to mitigate project effects, including all fieldwork and laboratory efforts. This may include the following:
  - Procedures for interfacing paleontological and construction personnel should be developed in consultation with the Resident Engineer (RE).
  - Construction monitoring programs should be outlined.
  - Salvage methods should be outlined, from large specimen recovery to collection and processing of microfossils.
  - Recovered specimens should be prepared to a point of identification and stabilized for preservation in conformance with individual repository requirements.
  - All recovered specimens should be cataloged using the format of the proposed curation facility.
  - Not all located fossils need to be recovered. Criteria for the discarding of specific fossil specimens should be made explicit.
- **Decision Thresholds.** How and when fieldwork will achieve the study goals, allowing fieldwork to cease, or any circumstances under which additional effort might be needed to achieve study goals.

- **Schedule.** The schedule for completing the proposed work may appear as text or in graphic form (e.g., a timeline) and include a start date, the duration of fieldwork and laboratory processing, and the time required for report preparation.

- **Justification of Cost Estimate.** Provides narrative support for the cost estimate, including the basis for person-hour estimates, clarification of overhead percentages, and any other costs.

- **Cost Estimate.** Presented as an appendix, this documentation should present a tabular summary of costs for the proposed effort and include all proposed numbers and levels of personnel, time, and costs.

- **Bibliography.** The bibliography should include only those references cited in the plan.

- **Curation.** The curation facility should be identified and a draft curation agreement included. A curation agreement with an approved facility must be in place prior to initiating any paleontological monitoring or mitigation activities.

The plan should be prepared by or under the supervision of a qualified Principal Paleontologist and submitted for review sufficiently in advance of an anticipated start-work date so that all involved agencies have time to comment, the Lead Agency has time to adjust the plan to accommodate such input, and the plan may be resubmitted for all necessary approvals. In the case of Caltrans projects, coordination with other agencies should be accomplished through Caltrans staff rather than consultants directly approaching land management/regulatory agencies. It is imperative that all agencies with jurisdiction over a paleontological site be in agreement as to the level of effort in the mitigation plan, including agreement on the applicability of pertinent laws, regulations, and permit requirements. When properly designed, the PMP serves as a basis for obtaining any necessary permits from other agencies.

Specific interagency issues may include, but are not limited to, health and safety issues; employee access and egress; collection, removal, and stockpiling of fossiliferous sediment; water washing; wet-screen processing of fossiliferous sediment and disposal of muddy wastewater; and use of chemicals (kerosene) to break down specific types of indurated fossiliferous sediment. Agency permits that may be needed for access or to conduct the work of monitoring and salvage should be applied for and obtained in advance of the project.
5.0 CONCLUSION

This study presents a description of the proposed project; a review of regulations, requirements, and guidelines regarding paleontological resources; definitions of paleontological significance and sensitivity; the methods used in this paleontological assessment; and the results of fossil locality searches, field surveys, and reviews of geological and paleontological literature.

The proposed project crosses six geologic units with different levels of paleontological sensitivity. Artificial Fill has no paleontological sensitivity, while the Alluvial Fan Deposits; Young Alluvial Fan and Valley Deposits, Undivided; and Young Alluvial Flood Plain Deposits have low paleontological sensitivity from the surface to a depth of 15 ft and high sensitivity below that mark. The Old Alluvial Fan Deposits, Undivided, and Old Paralic Deposits, Undivided, have high paleontological sensitivity. This study does not anticipate special paleontological situations that would require project redesign to avoid critical localities or strata. However, because there are areas of high paleontological sensitivity within the APD, this study recommends preparation of a Caltrans PMP concurrently with development of final design plans. This PMP should be synthesized from outlines and guidelines provided by Caltrans and the SVP and specifically tailored to the paleontological resources and geologic units that may be encountered during excavation associated with the proposed project.

This study recommends that the section of the PMP describing the excavation monitoring for the proposed project include the following:

- A preconstruction field survey in areas identified as having high paleontological sensitivity after vegetation and paving have been removed, followed by salvage of any observed surface paleontological resources prior to the beginning of additional grading.
- Attendance at the preconstruction meeting by a qualified Principal Paleontologist or representative. At this meeting, the Principal Paleontologist will explain the likelihood for encountering paleontological resources, what resources may be discovered, and the methods of recovery that will be employed.
- During construction excavation, a qualified vertebrate paleontological monitor shall initially be present on a full-time basis whenever excavation will occur within the sediments that have a high paleontological sensitivity rating and on a spot-check basis for excavation in sediments that have a low sensitivity rating. Monitoring may be reduced to a part-time basis if no resources are being discovered in sediments with a high sensitivity rating. (Monitoring reductions, when they occur, will be determined by the qualified Principal Paleontologist in consultation with the Caltrans RE.) The monitor shall inspect fresh cuts and/or spoils piles to recover paleontological resources. Under the direction of the RE, the monitor shall be empowered to temporarily divert construction equipment away from the immediate area of the discovery. The monitor shall be equipped to rapidly stabilize and remove fossils to avoid prolonged delays to
construction schedules. The appropriate equipment may be considered to assist in the removal and/or collection of large fossil materials.

- Localized concentrations of small (or micro-) vertebrates may be found in all native sediments. Therefore, these sediments shall occasionally be spot-screened on site through one-eighth- to one-twentieth-inch mesh screens to determine whether microfossils are present. If microfossils are encountered, sediment samples (up to three cubic yards, or 6,000 pounds) shall be collected and processed through one-twentieth-inch mesh screens to recover additional fossils.

- Recovered specimens shall be prepared to the point of identification and permanent preservation. Preparation includes the sorting of any washed mass samples to recover small invertebrate and vertebrate fossils, the removal of surplus sediment from around larger specimens to reduce the volume of storage for the repository and storage cost, and the addition of approved chemical hardeners/stabilizers to fragile specimens.

- Specimens shall be identified to the lowest taxonomic level possible and curated into an institutional repository with retrievable storage. The repository institutions usually charge a one-time fee based on volume, so removing surplus sediment is important. The repository institution may be a local museum or university with a curator who can retrieve the specimens on request. Caltrans requires that a draft curation agreement be in place with an approved curation facility prior to the initiation of any paleontological monitoring or mitigation activities.

- A PMR documenting completion of the PMP shall be prepared for and submitted to the Lead Agency (Caltrans).

Implementation of these mitigation measures to avoid or minimize harm will reduce impacts to nonrenewable paleontological resources. More project-specific measures may need to be developed during preparation of the PMP to refine these measures during final project design.
6.0 REFERENCES CITED


Corridor, Between Station 756+00 to 1010+00, Orange County, California. Prepared by LSA Associates, Inc. for Sverdrup. LSA Associates, Inc. Project Number SVC501.


Eisentraut, P., and J. Cooper. 2002. Development of a Model Curation Program for Orange County’s Archaeological and Paleontological Collections. Prepared by California State University, Fullerton and submitted to the County of Orange Public Facilities Resources Department/Orange County Harbors, Beaches, and Parks (PFRD/HBP).


APPENDIX A
2009 LOCALITY SEARCH RESULTS
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LSA Associates, Inc.
20 Executive Park, Suite 200
Irvine, California 92614-4731

Attn: Steve Conkling, Cultural & Paleontological Resources Group

re: Paleontological Resources Records Search for the proposed I-710 Corridor Widening Project, LSA Project #URS0801, extending along I-710 from the Port of Long Beach north to State Route 60, Los Angeles County

Dear Steve:

I have thoroughly searched our paleontology collection records for the locality and specimen data for the proposed I-710 Corridor Widening Project, LSA Project #URS0801, extending along I-710 from the Port of Long Beach north to State Route 60, Los Angeles County. We do not have any vertebrate localities that lie directly within the proposed project boundaries, but we do have localities nearby from the same sedimentary deposits that occur in the proposed project area.

Surficial deposits in the proposed project area consist of young Alluvium, fan deposits and older Quaternary Alluvium, derived predominately as fan deposits and older paralic deposits from topographic high areas surrounding the project area. While there are no sediments within the project area that are older than the older Quaternary Alluvium, it is possible that older Pleistocene formations may be encountered during subsurface excavation during project construction.

The closest vertebrate fossil locality from the project is LACM 1144, which is located approximately 2,000 feet east of the I-710 project, that produced a specimen of fossil bison, Bison cf. antiquus. LACM 3550 is located near the purported location of LACM 1144, and produced camel fossils. Approximately 25 other vertebrate localities are located within proximity to the project area for the I-710 project in sediments similar to those present within the project area. LACM 1919, located approximately 4,000 feet west of the project area produced mammoth fossils approximately 10 feet below the existing ground surface. LACM 4129 produced both elephant and camel fossils approximately 3,500 feet west of I-710. LACM 1165 produced a Late Pleistocene fauna approximately 1.75 miles west of I-710. LACM 1163, located within the Port of Long Beach produced Bison fossils approximately 1 mile west of the I-710 project area. LACM 1344, 2.5 miles west of the current project area, produced a small fauna including ground squirrel (Spermophilus beecheyi), mammoth.

"...to inspire wonder, discovery and responsibility for our natural and cultural worlds."
(Mammutthus sp.) and diminutive pronghorn (Capromeryx minor). LACM 6705, located within a berth in Los Angeles Harbor 4,000 feet west of the project, produced the ground sloth Paramylodon during dredging. LACM 2029, located at the Blue Diamond Company, 3.5 miles west of the current project, produced mammoth and bison. LACM 1158, 2.25 miles west of the current project in the Palos Verde Sands, produced a Rancholabrean fauna of horse and bison. LACM 1005, is located in Bixby Park approximately 2 miles east of the southern end of the project, produced mammoth fossils. LACM 4685 also produced mammoth fossils from approximately 4 miles west of the current project area. LACM 1021 [= LACM 1932] (2 miles east of project), LACM 3382 (1.75 miles west), LACM 3823 (4 miles west), LACM 4206 (5 miles west), LACM 1022 (1 mile east), LACM 6746 (3 miles east) and LACM 3660 (2 miles east) each produced a monotypic fauna of mammoth fossils. LACM 1157, from the Consolidated Rock Company 4 miles west of the current project, a mastodon (Mammut americanum) was recovered. LACM 1225 produced by mammoth and horse fossils 5.75 miles west of I-710. LACM 3260 produced fossil bison 1 mile west of the project area, while tapir (Tapirus sp.) and bison were recovered from LACM 1295 3 miles east of the current project. LACM 1295 produced a more diverse Rancholabrean fauna 5.75 miles west of the project are including ground sloth (Paramylodon sp.), pocket gopher, coyote (Canis latrans), dire wolf (Canis diris), horse, deer and bison.

The locality records of LACM also record fossil localities within the project vicinity from two other institutions. The San Bernardino County Museum has a locality (SBCM 9.3.2) that produced sloth (Paramylodon), pocket gopher (Thomomys bottae), mammoth (Mammutthus sp.), horse (Equus lg. sp.), and large bison (Bison latifrons). The San Diego Museum of Natural History records a locality (SDMNH 3246) from the Naval Fuel Reserve Quarry. This SDMNH locality produced rabbits (Sylvilagus and Lepus), pocket gopher, kangaroo rat (Dipodomys sp.), pack rat (Neotoma sp.), cat (Felis sp.), horse, bison and deer (Odocoileus sp.)

Even shallow excavations in the proposed project site area have a good chance of uncovering significant vertebrate fossils in older Quaternary sediments exposed and at depth. Therefore, any substantial excavations in the proposed project area should be closely monitored to quickly and professionally collect any specimens without impeding development. Note that some of the fossils recovered from the Quaternary deposits in the immediate vicinity are very small and can only be detected by screen-washing and picking matrix because they would be missed during typical paleontological monitoring. We recommend that samples from these deposits be collected and processed to determine their suitability for producing vertebrate microfossils. Any fossils recovered during mitigation should be deposited in an accredited and permanent scientific institution for the benefit of current and future generations.
This records search covers only the vertebrate paleontology records of the Natural History Museum of Los Angeles County. It is not intended to be a thorough paleontological survey of the proposed project area covering other institutional records, a literature survey, or any potential on-site survey.

Sincerely,

Samuel A. McLeod, Ph.D.
Vertebrate Paleontology

enclosure: draft invoice
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APPENDIX B
2016 LOCALITY SEARCH RESULTS
LSA Associates, Inc.
20 Executive Park, Suite 200
Irvine, California  92614

Attn: Brooks Smith, Associate, Cultural & Paleontological Resources Group

re: Paleontological Resources Records Check for the proposed Interstate 710 Corridor Project,
LSA Project # URS0801F, Phase 651065, from Ocean Boulevard in Long Beach to State Route 60, Los Angeles County, project area

Dear Brooks:

I have thoroughly searched our paleontology collection records for the locality and specimen data for the proposed Interstate 710 Corridor Project, LSA Project # URS0801F, Phase 651065, from Ocean Boulevard in Long Beach to State Route 60, Los Angeles County, project area as outlined on the portions of the Los Angeles, South Gate, and Long Beach USGS topographic quadrangle maps that you sent to me via e-mail on 25 January 2016. We have two vertebrate fossil localities that lie directly within the proposed project boundaries, and we have other localities nearby from the same sedimentary deposits that occur in the proposed project area, either on the surface or at depth.

In the very northern portion of the proposed project area around the conjunction of the Long Beach Freeway (I-710) and the Pomona Freeway (Highway 60) the surface deposits consist of older Quaternary Alluvium, derived as alluvial fan deposits from the hills to the north. Just east of north of the northern terminus of the proposed project area our vertebrate fossil locality LACM 3363 from these older Quaternary deposits produced specimens of fossil horse, Equus, at unknown depth.
Surface deposits in most of the remainder of the proposed project area consist of younger Quaternary Alluvium, derived as fluvial deposits from the floodplain of the Los Angeles River that currently flows in a concrete channel through or adjacent to the proposed project area. These younger Quaternary deposits typically do not contain significant fossil vertebrates in the uppermost layers, but the underlying older Quaternary deposits found at varying depths may well contain significant vertebrate fossils. We have two vertebrate fossil localities from these deposits that occur within the northern portion of the proposed project area, LACM 7701-7702, in the City of Commerce north of the Los Angeles River near the intersection of Atlantic Avenue and the Long Beach Freeway (I-710), that produced fossil specimens of threespine stickleback, *Gasterosteus aculeatus*, salamander, *Batrachoseps*, lizard, Lacertilia, snake, Colubridae, rabbit, *Sylvilagus*, pocket mouse, *Microtus*, harvest mouse, *Reithrodontomys*, and pocket gopher, *Thomomys*, at 11 to 34 feet below grade.


Beginning around the Dominguez Hills southward there are some exposures of older Quaternary deposits both east and west of the proposed project area. On the northern flank of the Dominguez Hills west of the proposed project area, east of Wilmington Avenue and north of Artesia Boulevard, our vertebrate fossil locality LACM 3382 produced a specimen of fossil mammoth, *Mammuthus*, at a depth of only five feet below the surface. Further southward but still west of the proposed project area, our locality LACM 1919, just west of Wilmington Avenue south of the San Diego Freeway (I-405) and 223rd Street, produced a fossil specimen of mammoth, *Mammuthus*, at about 10 feet below the surface. Just east of locality LACM 1919 but still west of the proposed project area, along both sides of Alameda Street from Carson Street on the north to Sepulveda Boulevard on the south, we have the additional vertebrate fossil localities LACM 1165, 3319 and 4129. From these localities fossil mammoth, *Mammuthus*, was recovered 30 feet below the surface, fossil camel, Camelidae, was found 24 feet down a bore hole and fossil bison, *Bison*, was discovered at unknown depth.

To the east of the proposed project area in the same general vicinity our locality LACM 6802, near Bixby Road between Atlantic Avenue and Orange Avenue, that produced fossil specimens of undetermined vertebrates at a depth of 16 feet below the surface. A little further eastward of the proposed project area along Cover Street between Pixie Avenue and Paramount Boulevard, our vertebrate fossil locality LACM 3660 from these older Quaternary deposits produced a fossil of fossil mammoth, *Mammuthus*, at a depth of 19 feet below the surface. In the Signal Hill area east of the proposed project area and south of the San Diego Freeway we have further older Quaternary localities including LACM 1021-1022 and 3245. Locality LACM 1022, on Spring Street near the intersection with Orange Avenue, produced fossil specimens of
undetermined birds, Aves. Further east along Spring Street near the intersection with Cherry Avenue, our locality LACM 1021 produced fossil specimens of bird, Aves, and mammoth, *Mammuthus*, at unknown depth and locality LACM 3245 produced a rich suite of fossil invertebrates and fish at a depth of 37 feet below the surface, the latter probably from the underlying marine San Pedro Sand. The fossil fish fauna from locality LACM 3245, mostly represented by skull otoliths (ear bones) obtained from screen washing sediment samples, was described by J. E. Fitch and R. D. Reimer in 1967 (Bulletin of the Southern California Academy of Sciences, 66(2):77-91). Fitch and Reimer figured fossil specimens in the LACM collections from locality LACM 3245 for the fish *Citharichthys stigmataeus* (speckled sanddab), *Citharichthys sordidus* (Pacific sanddab), *Paralichthys californicus* (California halibut), *Parophrys vetulus* (English sole), *Lyopsetta exilis* (slender sole), *Electrona rissoi* (lanternfish), and *Lepidogobius lepidus* (bay goby).

East of the very southern portion of the proposed project area, south of Anaheim Street near the intersection of Loma Vista Drive and Crystal Court, our locality LACM 1144, produced fossil specimens of sea lion, *Zalophus*, camel, *Camelops*, and bison, *Bison*, from a depth of less than 48 feet below the surface. Just east of the terminus of the proposed project area, near the intersection of Magnolia Avenue and Ocean Boulevard, our locality LACM 6896 produced a specimen of fossil whale, Cetacea, from pile driving activities at a depth of less than 100 feet.

Shallow excavations in the younger Quaternary Alluvium exposed in all but the northernmost portion of the proposed project area, and very shallow excavations in the older Quaternary Alluvium exposed in the northern-most portion of the proposed project area, may not uncover any significant vertebrate fossils. Deeper excavations in those areas that extend down into the older Quaternary deposits, however, may well encounter significant fossil vertebrate remains. Any substantial excavations in the proposed project area, therefore, should be closely monitored to quickly and professionally collect any specimens without impeding development. Sediment samples should also be collected and processed to determine the small fossil potential in the proposed project area. Any fossils recovered during mitigation should be deposited in an accredited and permanent scientific institution for the benefit of current and future generations.

This records search covers only the vertebrate paleontology records of the Natural History Museum of Los Angeles County. It is not intended to be a thorough paleontological survey of the proposed project area covering other institutional records, a literature survey, or any potential on-site survey.

Sincerely,

Samuel A. McLeod, Ph.D.
Vertebrate Paleontology

enclosure: invoice
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PROFESSIONAL RESPONSIBILITIES

Dr. Rieboldt is a paleontologist at LSA with 15 years of experience in the paleontology and geology fields. Dr. Rieboldt’s field and laboratory experience includes working on research projects throughout California, Nevada, Utah, Colorado, Wyoming, Texas, and Alabama. She has 8 years of experience working with natural history collections in museums in California, Colorado, and Illinois and 7 years of experience as a paleontological consultant in California and Utah, monitoring for paleontological resources, and writing paleontological resource assessment reports and mitigation plans. She also has experience in monitoring the excavation and construction process on multiple subdivision developments and a natural gas pipeline, as well as monitoring drilling and coring operations.

Dr. Rieboldt prepares paleontological assessment reports, mitigation plans, and monitoring reports following the completion of paleontological mitigation monitoring. She provides guidance on the various Federal, State, and local regulations and guidelines regarding paleontological resources as they apply to project around Southern California. She also is responsible for scheduling paleontological monitors on both large- and small-scale projects.

PROJECT EXPERIENCE

State Route 710 North Study
Los Angeles County, California
LSA is leading an environmental team to prepare an Environmental Impact Report/Environmental Impact Statement (EIR/EIS) for the State Route 710 (SR-710) North Study, which spans 23 cities and communities in Los Angeles County. This project, under the direction of the California Department of Transportation (Caltrans) in cooperation with the Los Angeles Metropolitan Transportation Authority (Metro), proposes to improve mobility and relieve congestion between State Route 2 and Interstates 5, 10, 210, and 605 in east/northeast Los Angeles and the San Gabriel Valley. Development of this project involves four alternatives: Freeway Tunnel, Light Rail, Bus Rapid Transit, and Transportation System Management/Transportation Demand Management. Dr. Rieboldt wrote the Paleontological Identification Report (PIR)/Paleontological Evaluation Report (PER) for this project.

Digital 395 Project
San Bernardino, Kern, Inyo, and Mono Counties, California; Douglas and Washoe Counties and Carson City, Nevada
Dr. Rieboldt prepared the Paleontological Resources Monitoring and Mitigation Plan (PRMMP) for the Digital 395 Project, which involved the installation of over 590 miles of fiber-optic line along United States Highway 395 (US-395) on the east side of the Sierra Nevada.
PROFESSIONAL EXPERIENCE

Project Manager, Department of Geological Sciences, California State University, Fullerton, and John D. Cooper Archaeological and Paleontological Center, Santa Ana, California, April 2012–April 2013.


Graduate Student Researcher, Department of Integrative Biology, University of California, Berkeley, January 2004–December 2004.


PROJECT EXPERIENCE (CONTINUED)

Running from Barstow, California, to Reno, Nevada, the project route passed through lands managed by the United States Department of the Interior, Bureau of Land Management; the United States Department of Agriculture, Forest Service; the United States Department of Defense; the States of California and Nevada; and the lands of several Native American tribes. As such, this project was subject to multiple Federal, State, and local regulations and policies regarding paleontological resources.

NBCUniversal Studios G Lot Project
Universal City, Los Angeles County, California
Dr. Rieboldt prepared the Paleontological Resources Monitoring Plan (PRMP) and the Final Mitigation Monitoring Report for the NBCUniversal G Lot Project. For the PRMP, Dr. Rieboldt reviewed the area geology, the applicable City and County mitigation requirements, and the project development plans in order to create an appropriate plan for monitoring excavation activities. This project involved substantial excavation into the middle Miocene (15.97 to 11.62 million years ago) Topanga Group and produced dozens of specimens of fossil leaves and bony fish, as well as a few whale specimens. As part of the mitigation monitoring report, Dr. Rieboldt documented project compliance the applicable requirements and identified and described the fossils recovered. She also coordinated the curation of the recovered fossils into the Natural History Museum of Los Angeles County.

NBCUniversal Studios Universal Hollywood Drive Project
Universal City and Los Angeles, Los Angeles County, California
Dr. Rieboldt prepared the Paleontological Resources Monitoring Plan (PRMP) for the NBCUniversal Studios Universal Hollywood Drive Project, located in the City of Los Angeles and Universal City, which is in unincorporated Los Angeles County. This project involves improving and widening Universal Hollywood Drive and includes excavation into Holocene to Late Pleistocene (less than 126,000 years ago) Young Alluvial Deposits and Middle Miocene (15.97 to 11.62 million years ago) Topanga Group. The PRMP outlines best practices for paleontological monitoring.

Foothill Parkway Westerly Extension Project
City of Corona and unincorporated Riverside County, California
The Foothill Parkway Westerly Extension Project, located in the City of Corona and unincorporated Riverside County, involves construction of approximately 2 miles of roadway with associated structures and connector road improvements to accommodate existing and future traffic demands in that area. The project includes excavation into paleontologically sensitive deposits of Holocene to Pleistocene Alluvial Deposits, the Paleocene Silverado Formation, and the Late Cretaceous Williams and Ladd Formations. Dr. Rieboldt prepared the
PROFESSIONAL EXPERIENCE (CONTINUED)

Collections Assistant, University of California Museum of Paleontology, Berkeley, California, August 1999–December 1999.

PRESENTATIONS


PROJECT EXPERIENCE (CONTINUED)

Paleontological Resources Impact Mitigation Plan for this project, which outlines best practices for paleontological monitoring during project excavation, as well as procedures for preparing, curating, and documenting any recovered fossils.

Pio Pico Energy Center Project
San Diego County, California
Dr. Rieboldt prepared the PRMMP for the Pio Pico Energy Center Project. This project involved the construction of a power plant for three General Electric natural gas-fired combustion turbine generators in an unincorporated area on Otay Mesa in San Diego County. Development of this project will include clearing and grading of the project area, construction of the power plant, and installation of natural gas lines and electricity transmission lines, all within paleontologically sensitive sediments of the Late Oligocene (23.03–28.1 million years ago) Otay Formation. The PRMMP followed all applicable State, County, and California Energy Commission (CEC) requirements and guidelines.

Vernola Marketplace Apartments Project: Phases A and B
Jurupa Valley, California
Dr. Rieboldt prepared the Paleontological Resources Assessment for Phases A and B of the Vernola Marketplace Apartments Project in the City of Jurupa Valley in Riverside County. This project involves the development of 597 multifamily residential units on approximately 25.7 acres of land near the intersection of Interstate 15 and 68th Street. It includes excavation into Holocene through Early Pleistocene deposits, some of which are sensitive for paleontological resources. The paleontological assessment documented the location and nature of the sensitive sediments and made recommendations to ensure project development does not adversely impact those resources.

SR-60/Theodore Street Interchange Project
Moreno Valley, California
LSA is conducting environmental technical studies for air quality and biological, cultural, and paleontological resources for the State Route 60 (SR-60)/Theodore Street Interchange Project in the City of Moreno Valley in Riverside County. The proposed project involves reconstruction of the local interchange at SR-60 and Theodore Street in order to reduce congestion, improve traffic flow, and accommodate forecasted traffic demands in and around Moreno Valley. Project development includes removal and replacement of the Theodore Street bridge over SR-60, auxiliary lanes along SR-60, and new entrance and exit ramps from SR-60 to Theodore Street. Dr. Rieboldt is preparing the PIR/PER for this project.
PRESENTATIONS (CONTINUED)


PROJECT EXPERIENCE (CONTINUED)

San Onofre Nuclear Generating Station Project
San Diego County, California
As part of an on-call contract with Southern California Edison (SCE), Dr. Rieboldt prepared the Paleontological Resources Assessment for the San Onofre Nuclear Generating Station (SONGS) Project, located on the Camp Pendleton Marine Corps Base in San Diego County. This assessment provided a review of the 17 geologic units within the surrounding SONGS facilities and their paleontological sensitivity ratings. Based on the paleontological sensitivities of these 17 geologic units and potential construction methods, the assessment also provided recommendations for mitigating impacts to paleontological resources that may be encountered during development of any future projects at the SONGS facilities.

Central Region Landfills – Frank R. Bowerman Landfill Wetlands Basin, Phase VIIIC, and East Flank Landslide Projects
Orange County, California
Dr. Rieboldt is currently preparing the Final Mitigation Monitoring Report for the Wetlands Basin, Phase VIIIC, and East Flank Landslide Projects. To date, LSA has collected over 100 fossil specimens from these combined projects, and the recovery of these specimens was completed without delay to the project schedule. The most notable specimens collected during the projects so far are several early Miocene (18–20 million years before present) whale fossils and leaves and molluscs from the Cretaceous (72–83 million years before present). As part of the mitigation monitoring report, Dr. Rieboldt is documenting project compliance with the applicable State and County requirements for paleontological resources. She is also identifying and describing the scientific significance of the fossils recovered.

Newport Coastal Coverage Solution Project
Crystal Cove State Park
Orange County, California
The Newport Coastal Coverage Solution Project, located in Crystal Cove State Park in Orange County, involves installation of a building for communications equipment with associated access roads to improve safety communications in that area. The project includes excavation into paleontologically sensitive deposits of the Middle Miocene Topanga Group and possibly Middle to Late Miocene Monterey Formation. Because this project is within the boundaries of a State Park, Dr. Rieboldt obtained the required permit for paleontological field work on State lands and prepared the Paleontological Resources Impact Mitigation Plan (PRIMP), which outlines best practices for paleontological monitoring during project excavation, as well as procedures for preparing, curating, and documenting any recovered fossils.
North County Corridor New State Route 108 Project
Stanislaus County, California
LSA is conducting environmental technical studies for the North County Corridor New State Route 108 (SR-108) Project in Stanislaus County. The proposed project involves relocating the current alignment of SR-108 in order to reduce congestion, improve traffic flow, and accommodate forecasted traffic demands in the northern part of Stanislaus County. LSA prepared the PIR/PER, and at the request of Caltrans, Dr. Rieboldt is preparing a preliminary Paleontological Mitigation Plan (PMP) for this project.

Hidden Canyon Project
Orange County, California
Dr. Rieboldt prepared the Paleontological Mitigation Monitoring Report for the Hidden Canyon Project. LSA has collected specimens of sharks, rays, whales, and mollusks from the Early Miocene to Early Oligocene (15.97–33.9 Ma) Vaqueros Formation. As part of the mitigation monitoring report, Dr. Rieboldt documented project compliance with the applicable State and City of Irvine requirements for paleontological resources. She also identified and described the fossils recovered.

Aldi Distribution Center Project
Moreno Valley, Riverside County, California
Dr. Rieboldt prepared the Final Paleontological Mitigation Monitoring Report for the Aldi Distribution Center Project in Moreno Valley in Riverside County. This project involved excavation into paleontologically sensitive Late Pleistocene deposits and produced specimens of horse (*Equus*), camel (*Hemiauchenia*) and giant ground sloth (*Megalonyx jeffersonii* or *Nothrotheriops shastensis*). For the final report, Dr. Rieboldt identified and described the recovered material and documented project compliance with the applicable State, City, and project-specific requirements for paleontological resources.

City of Menifee On-Call Cultural Resources Studies Peer Review Projects
Menifee, California
LSA is under contract with the City of Menifee in Riverside County to provide on-call peer review of cultural and paleontological resources documents prepared for project compliance with applicable Federal, State, City, and project-specific requirements and guidelines for cultural and paleontological resources. These documents may include field survey reports, assessments, mitigation monitoring programs, and final mitigation reports. Dr. Rieboldt is conducting the peer review of all paleontological documents under this contract.

Ball Road Sanitary Sewer and Storm Drain Improvements Project
Anaheim, California
Dr. Rieboldt prepared the Paleontological Analysis Memorandum for Ball Road Sanitary Sewer and Storm Drain Improvements Project in the City of Anaheim in Orange County. This project involves the replacing and upgrading sewer and storm drain facilities along Ball Road and into Carbon Creek and demolishing an abandoned railroad bridge. It includes excavation into Holocene to Late Pleistocene deposits, some of which are sensitive for paleontological resources. The paleontological analysis documented the location and nature of the sensitive sediments and made recommendations to ensure project development does not adversely impact those resources.
Howland’s Landing Well Project  
Santa Catalina Island, California  
As part of an on-call contract with SCE, Dr. Rieboldt prepared the Paleontological Resources Assessment for the Howland’s Landing Well Project on Santa Catalina Island in Los Angeles County. This emergency project involved drilling exploration wells to determine where fresh water may be reached and then drilling, constructing, and testing the final well, which will provide fresh water for the Howland’s Landing area. The project included excavation into Holocene to Late Pleistocene deposits and metamorphic rocks of the Late Cretaceous Catalina Schist, a part of the Franciscan Formation. Although the Pleistocene sediments that may be present at depth have the potential to contain scientifically important fossils, the excavation methods used for this project would preclude the recovery of paleontological resources. The paleontological assessment documented the location and nature of the sensitive sediments and, based on the excavation methods, recommended that no paleontological mitigation was required for the project.

Sesi Property Landfill Closure Project  
San Diego, California  
Dr. Rieboldt prepared the Paleontological Mitigation Monitoring Report (PMMR) for the Sesi Property Landfill Closure Project. This project involved constructing a monolithic landfill cover with surface drainage facilities and other improvements for closure of landfilled auto-shredder waste on the Sesi property in the City of San Diego, San Diego County. Development of this project involved excavation into the paleontologically sensitive Otay and Lindavista Formations and therefore, required full-time monitoring during ground-disturbing activities in native deposits.

Morse Street Townhomes Project  
Oceanside, California  
Dr. Rieboldt prepared the Paleontological Assessment for the Morse Street Townhomes Project. This project involved the development of 38 townhomes on a 2.3-acre parcel of land near the intersection of Morse Street and the Pacific Coast Highway in the City of Oceanside in San Diego County. Development of this project included clearing and grading to prepare the project area, construction of the various buildings, and installation of utilities.

Stratford Ranch Residential Project  
Perris, California  
Dr. Rieboldt prepared the Paleontological Resources Assessment for the Stratford Ranch Residential Project in the City of Perris in Riverside County. The proposed project includes a new residential community with 400 lots and a 15-acre Stockpile Plan on approximately 80 acres in northeastern Perris. Project development involves clearing and grading to prepare the project area, construction of a new road within the area, and installation of on-site storm drains, new water service, new sewer lines, new electric service, new natural gas lines, and a new telecommunication infrastructure system to serve the proposed residential uses.

34202 Del Obispo Street Project  
Dana Point, California  
LSA conducted environmental technical studies for the 34202 Del Obispo Street Project in the City of Dana Point in Orange County. This mixed-use project involves the development of a residential community, commercial space, and a small amount of parkland/open space. Dr. Rieboldt prepared the Paleontological Resources Assessment for this project.
Spieder Continuing Care Retirement Community Project
San Juan Capistrano, California
Dr. Rieboldt prepared the Paleontological Resources Assessment as one of several environmental technical studies LSA conducted for the Spieder Continuing Care Retirement Community Project in the City of San Juan Capistrano in Orange County. This project involves the development of a Continuing Care Retirement Community designed for residents over the age of 60 years. Development of this project includes the construction of independent living residences, community buildings, and a health care center.

State Route 120/McKinley Avenue Interchange Project
Manteca, California
LSA is conducting environmental technical studies for the State Route 120 (SR-120)/McKinley Avenue Interchange Project in Manteca in San Joaquin County. The proposed project involves the construction of a new interchange at SR-120 and McKinley Avenue in order to reduce congestion, improve traffic flow, and accommodate forecasted traffic demands in and around the City of Manteca. Dr. Rieboldt assisted in the preparation of the PIR/PER and prepared the PMP for this project.

Kaiser Bellflower East Center Demolition Project
Los Angeles County, California
The proposed project involves demolition of the existing Administration Building and East Center Wing of the Kaiser Bellflower Medical Center and remodeling of the exterior and lobby of the West Wing of the Medical Center. Excavation activities associated with this project are anticipated to reach 15–20 feet below ground surface. Dr. Rieboldt wrote the Paleontological Resources Memorandum and the PRIMP for this project.

Vancouver Street Sewer Extension Project
Carlsbad, California
Dr. Rieboldt prepared the PRMMP for the Vancouver Street Sewer Extension Project. This project involved the extension of an existing sewer line from Vancouver Street to Via de Canto through Hidden Canyon Community Park in the City of Carlsbad in San Diego County. Development of this project included traditional excavation, as well as horizontal directional drilling, for the installation of the sewer line segments.

Durfee Avenue Grade Separation Project
Pico Rivera, California
LSA conducted environmental technical studies for the Durfee Avenue Grade Separation Project in the City of Pico Rivera in Los Angeles County. The project proposes to lower Durfee Avenue below the Union Pacific Railroad (UPRR) tracks to improve safety for vehicular, rail, and pedestrian traffic along Durfee Avenue and nearby streets and the railroad right-of-way. Project development includes lowering Durfee Avenue, Walnut Avenue, and Stephens Street; raising the UPRR tracks; and relocating various wet and dry utilities As due diligence for the client, Dr. Rieboldt prepared the paleontological assessment for this project.
State Route 94/State Route 125 Interchange Branch Connector Project
San Diego County, California
LSA conducted cultural and paleontological resources assessments for the State Route 94/State Route 125 (SR-94/SR-125) Interchange Branch Connector Project in San Diego County. The proposed project involves the construction of a freeway-to-freeway connector to allow direct south-to-east movement for the SR-94/SR-125 interchange in order to improve regional circulation and reduce traffic on local streets in the Cities of La Mesa and Lemon Grove, and in the unincorporated community of Spring Valley. Project development includes construction of a freeway connector between southbound SR-125 and eastbound SR-94, auxiliary lanes on those freeways, and new noise barriers and retaining walls, as well as modifications to existing structures. Dr. Rieboldt prepared the PIR/PER for this project.

Surfside Inn Pedestrian Overcrossing Project
Dana Point, California
LSA conducted cultural and paleontological resources assessments for the Surfside Inn Pedestrian Overcrossing Project in the City of Dana Point in Orange County. The proposed project involves replacement and rehabilitation of the pedestrian overcrossing across the Pacific Coast Highway and Metrolink right-of-way from the Capistrano Surfside Inn to Doheny State Beach. Dr. Rieboldt prepared the paleontological resources assessment.

Adelanto Solar Project
San Bernardino County, California
Dr. Rieboldt prepared a paleontological resources analysis report for the Adelanto Solar Project in San Bernardino County. This report included a summary of the geology and potential paleontological resources of the project area, results from a paleontological locality search through the San Bernardino County Museum, and recommendations for mitigating potential impacts to paleontological resources.

North Star Solar Project
Fresno, California
LSA conducted a paleontological resources assessment for the proposed North Star Solar Switching Station and Generation Tie Line (Gen Tie) Project in Fresno County. The purpose of this project is to generate and transmit renewable solar electricity from proven technology at a competitive cost, with low environmental impact, and deliver it to market as soon as possible. The project consists of an approximately 1.5-mile-long gen tie line that will tie into a new 115-kilovolt (kV) Switching Station, which is an expansion of the existing Pacific Gas and Electric (PG&E) Mendota substation. Project construction work will involve location preparation, foundation installation, power pole placement, generation line installation, and erection and connection of the gen tie line and switching station equipment. Dr. Rieboldt prepared the Paleontological Resources Assessment for this project.
PUBLICATIONS

Elrick, M., S. Rieboldt, M. Saltzman, and R.M. McKay

Lipps, J.H., and S.E. Rieboldt

Parham, J.F., and S.E. Rieboldt

SELECTED REPORTS


*Paleontological Resources Assessment for Bayside Covenant Church, Sierra College Boulevard and Cavitt-Stallman Road, City of Roseville, Placer County, California.* Prepared for Bayside Covenant Church. June 2002.


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