2.11 Paleontology

2.11.1 Regulatory Setting

Paleontology is a natural science focused on the study of ancient animal and plant life as it is preserved in the geologic record as fossils.

A number of federal statutes specifically address paleontological resources, their treatment, and funding for mitigation as a part of federally authorized project.

23 United States Code (USC) 1.9(a) requires that the use of federal-aid funds must be in conformity with all federal and state laws.

23 United States Code (USC) 305 authorizes the appropriation and use of federal highway funds for paleontological salvage as necessary by the highway department of any state, in compliance with 16 USC 431-433 above and state law.

Under California law, paleontological resources are protected by the California Environmental Quality Act (CEQA).

2.11.2 Affected Environment

This section is based on the *Paleontological Identification Report and Paleontological Evaluation Report* (February 2017).

A paleontological resource locality search for any known localities within and surrounding the Study Area was completed through the Natural History Museum of Los Angeles County (LACM) in December 2016. Relevant geologic maps and geological and paleontological literature were reviewed. A pedestrian survey of the Study Area was conducted on December 13 and 14, 2016.

The Study Area is within the Peninsular Ranges Geomorphic Province, a large structural block that extends from the Transverse Ranges in the north to the tip of Baja California. Within this larger region, the proposed project is located in the Los Angeles Basin, which is a broad alluvial plain bounded by mountains to the north and east and the Pacific Ocean to the west and south.

Geologic mapping indicates the entire Study Area contains Holocene to late Pleistocene (less than 126,000 years ago) Young Alluvial Fan Deposits. Although not mapped, Artificial Fill was also noted in many portions of the Study Area during the pedestrian survey. Because of its disturbed context, Artificial Fill does not have the potential to contain scientifically significant paleontological resources. The upper 10

feet (ft) of the Young Alluvial Fan Deposits are unlikely to contain scientifically significant paleontological resources because of their young age (likely less than 4,200 years). However, the sediments of the Young Alluvial Fan Deposits below a depth of 10 ft may be old enough to contain scientifically significant paleontological resources.

The results of the locality search through the LACM indicated that the Study Area contains younger Quaternary Alluvium overlying older Quaternary Alluvium (i.e., Young Alluvial Fan Deposits). The LACM has a record of one fossil locality from younger Quaternary sediments similar to those mapped within the Study Area. This locality, LACM 1652, which is located in the City of Anaheim, along Rio Vista Street south of Lincoln Avenue, produced a specimen of sheep (*Ovis*). The closest locality in the older alluvial deposits is LACM 4943, located northwest of the Study Area in the City of Orange, along Fletcher Avenue east of Glassell Avenue. This locality produced a specimen of horse (*Equus*) at a depth of approximately 8–10 ft below the surface. Located in the City of Irvine near the intersection of C Street and 5th Street, LACM 7867 yielded a specimen of pocket gopher (*Thomomys*) at a depth of approximately 25 ft below the surface. Lastly, LACM 7713 produced a specimen of ground sloth (*Myliodontidae*) from an unstated shallow depth near the intersection of State Route 133 (SR-133) and Interstate 405 (I-405).

The pedestrian survey indicated that most of the Study Area is underlain by Artificial Fill. Other sediments observed are consistent with the Young Alluvial Fan Deposits mapped in the Study Area.

2.11.3 Environmental Consequences

2.11.3.1 Temporary Impacts

Build Alternative (Alternative 2A and Alternative 2B [Preferred Alternative])

The construction of the Build Alternative would not result in temporary impacts to paleontological resources because the impacts to those types of resources during construction would be considered permanent as described later in Section 2.11.3.2.

No Build Alternative (Alternative 1)

Under the No Build Alternative, none of the proposed improvements to Interstate 5 (I-5) would be constructed. The No Build Alternative would maintain the existing conditions; therefore, the No Build Alternative would not result in temporary impacts related to paleontological resources as a result of construction activities.

2.11.3.2 Permanent Impacts

Build Alternative (Alternative 2A and Alternative 2B [Preferred Alternative])[1]

The construction of the Build Alternative, including Design Option 3, would require similar ground disturbance, excavation, and modifications to existing freeway and local street facilities and structures. Therefore, the Build Alternative would result in similar potential impacts to paleontological resources. Specifically, if construction requires excavation that extends more than 10 ft below the original ground surface, those activities could result in impacts to paleontological resources.

The new lanes, new shoulders, new and re-established auxiliary lanes, and ramps are expected to require excavation to depths of less than five ft below the original ground surface and would not have the potential to impact paleontological resources. Excavation depths for undercrossings and overcrossings would vary by location and range from less than five ft to more than 100 ft for some cast-in-drilled-hole (CIDH) piles. Similarly, excavation depths for retaining walls and noise barriers would depend on the location and final design. As such, excavation for some of the undercrossings, overcrossings, retaining walls, and noise barriers may extend below a depth of 10 ft and have the potential to impact paleontological resources.

No Build Alternative (Alternative 1)

Under the No Build Alternative, none of the proposed improvements to I-5 would be constructed. The No Build Alternative would maintain the existing conditions; therefore, the No Build Alternative would not result in permanent adverse impacts related to paleontological resources as a result of construction activities.

2.11.4 Avoidance, Minimization, and/or Mitigation Measures

The following Measure PAL-1 provides procedures for the treatment of paleontological resources during project construction:

PAL-1 **Paleontological Mitigation Plan.** A qualified paleontologist shall prepare a Paleontological Mitigation Plan (PMP) following the guidelines in the California Department of Transportation (Caltrans) Standard Environmental Reference (SER), Environmental Handbook, Volume 1, Chapter 8 – Paleontology (June 2016 or more current) and

[1] Alternative 2B without Design Option 3 has been selected as the Preferred Alternative

guidelines developed by the Society of Vertebrate Paleontology (SVP 2010). The PMP shall be prepared concurrently with final design plans during the Plans, Specifications, and Estimates (PS&E) phase.