

## 4.17 PALEONTOLOGICAL RESOURCES

### 4.17.1 Overview

Paleontological resources include fossil remains and their respective fossil sites, associated specimen data and corresponding geologic and geographic site data, and the fossil-bearing rock units which immediately underlie the surface.

Fossils are the remains or indications of once-living organisms and are an important scientific resource because of their use in:

- Documenting the evolution of particular groups of organisms
- Reconstructing the environments in which they lived
- Determining the ages of the fossil-bearing rock units
- Documenting the geologic events that lead to the deposition of the sediments constituting the rock units

Paleontological resources are located in various rock formations found within the proposed Project segments and substation sites in the Mojave Desert and San Gabriel and Chino Valleys. Some Project ground-disturbing activities may have an impact on these resources. Avoidance and impact reduction measures proposed by SCE are included herein and would reduce significant impacts on paleontological resources to a less-than-significant level.

### 4.17.2 Technical Methodology

Qualified specialists reviewed available published and recorded paleontological and geological information and collections, inspected aerial and satellite imagery, and prepared a summary inventory and assessment of importance for paleontological resources likely to occur in each Project segment. The Project description was then reviewed and potential impacts identified and located with respect to the resources inventory. Finally, Applicant Proposed Measures (APMs) were developed to reduce impacts to less than significant levels. Additional detail on these methods is provided below.

To develop a baseline paleontological resource inventory of the proposed Project area, the following tasks were conducted in accordance with Society of Vertebrate Paleontology guidelines (SVP, 1995):

- **Conduct a Stratigraphic Inventory.** Geologic maps and reports covering the surficial geology of the proposed Project area were reviewed by qualified specialists to determine

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the rock units exposed in the proposed Project area, particularly those rock units known to contain fossils, and to delineate their respective areal distributions therein.

- **Conduct a Paleontological Resource Inventory.** Published and unpublished geologic and paleontologic literature was reviewed to document 1) the number and locations of previously recorded fossil sites in and/or near the proposed Project area from each rock unit exposed within the proposed Project area, and 2) the types of fossil remains the rock unit has produced locally. The literature review was supplemented by archival searches conducted at the Department of Vertebrate Paleontology of the Natural History Museum of Los Angeles County to obtain additional information on known fossil sites and remains in and near the proposed Project area.
- **Assess Paleontological Importance.** Fossils identified during the paleontological resource inventory were evaluated in terms of their scientific importance. Fossils are considered scientifically important if they are 1) identifiable, 2) complete, 3) well preserved, 4) age diagnostic, 5) useful in environmental and depositional reconstruction, 6) a type or topotypic specimen, 7) a member of a rare species, 8) a species that is part of a taxonomically diverse assemblage, or 9) a skeletal element different from, or a specimen more complete than, those now available for its respective species. Moreover, the geologic ages of some fossils can be determined also by Carbon-14 and other radiometric dating. Identifiable fossil land mammal remains, for example, are considered scientifically important because of their potential use in providing accurate age determinations and environmental reconstructions for the rock units in which they occur. Furthermore, such remains are comparatively rare in the fossil record.
- **Assess Rock Unit Productivity.** The paleontological productivity of rock units within the proposed Project area was determined based on existing records of the abundance or densities of fossils or fossil sites recorded in the rock unit. Highest potentials were assigned to exposures or occurrences of rock units known to, or are most likely to, yield many complete fossils representing important species in quantities or densities similar to or greater than those previously recorded from the rock unit. Criteria for assessing the paleontological productivity of rock units exposed in the proposed Project area are described below:
  - High potential: rock unit contains comparatively high density of fossil sites and has yielded numerous fossils in Project vicinity, and, therefore, is very likely to contain additional similar remains in proposed Project area.
  - Moderate potential: rock unit contains moderate density of fossil sites and has yielded some fossils in the Project vicinity, and, therefore, is somewhat likely to contain additional remains in proposed Project area.

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- Low potential: rock unit contains no or a very low density of fossil sites and has yielded very few or no fossils in Project vicinity, and, therefore, is not likely to contain any remains in proposed Project area. Such rock units would include those that are very coarse grained (i.e., gravel or conglomerate) or are too young to contain remains old enough to be considered fossilized.
- Undetermined potential: rock unit has limited or no known exposure in proposed Project area but may be present in the shallow subsurface, is poorly studied, contains no known fossil site, and has not yet yielded fossils in proposed Project area and elsewhere. However, in the Project region, the same or a correlative or lithologically similar rock unit contains a sufficient number of recorded fossil sites to suggest that correlative rock units in proposed Project area may have a high potential for containing fossils (note: elsewhere in California, exposures of rock units once thought to have only a low potential for containing fossils subsequently were demonstrated to be highly fossil-bearing as a result of project-related ground-disturbing activities associated with other construction projects).
- No potential: artificial fill and landslide debris, in which any fossil remains would have removed from their original geologic context, and igneous and high-grade metamorphic rock units.
- **Assess Rock Unit Importance.** Using the definitions presented above, the paleontological or scientific importance of a rock unit exposed in the proposed Project area were assessed using the following criteria:
  - High importance: rock unit contains comparatively high density of fossil sites and has yielded numerous identifiable and taxonomically diverse fossil remains in proposed Project area and vicinity, and, therefore, has a comparatively high potential containing additional similar remains in proposed Project area.
  - Moderate importance: rock unit contains recorded fossil sites and has yielded fossils in proposed Project area and vicinity, and, therefore, has a comparatively moderate potential for containing additional similar remains in proposed Project area.
  - Low importance: rock unit contains no or comparatively low density of fossil sites and has yielded very few or no fossils in proposed Project area and vicinity, and, therefore, has only a comparatively low potential for containing any unrecorded fossil site or for yielding any scientifically important fossils in proposed Project area.
  - Undetermined importance: pending further investigation, rock unit for which too few data are available from proposed Project area and vicinity to allow an accurate assessment of its potential for containing any fossil site or for yielding any scientifically important fossil remains in proposed Project area.

- No importance: artificial fill and landslide debris, and igneous and high-grade metamorphic rock units with no potential for containing any unrecorded fossil site or for yielding any scientifically important fossil remains.

### **4.17.3 Regulations, Plans, and Standards**

Fossil remains are a limited, nonrenewable, highly sensitive, scientific resource and are afforded protection under Federal and State legislation (California Office of Historic Preservation, 1983).

#### **4.17.3.1 Federal**

Paleontological resources are addressed by a number of Federal statutes, including the Antiquities Act of 1906, the National Environmental Policy Act of 1969 (NEPA), and the Federal Land Policy and Management Act of 1976 (FLPMA). Both the Antiquities Act and FLPMA apply because the proposed Project area includes Federal lands in the ANF. The ANF, the NEPA lead agency for the Project, would ensure the implementation of the APMs regarding the impact of Project-related construction activities on the paleontological resources on Federal land in the proposed Project area.

Federal statutes that incorporate provisions for the protection of paleontological resources include:

*Antiquities Act of 1906 (P.L. 59-209, 32 Stat. 225): Forbids and establishes criminal sanctions for disturbance of any object of antiquity on Federal land without a permit issued by an authorizing authority.*

*National Environmental Policy Act of 1969 (P.L. 91-190, 83 Stat. 852, 42 USC 4321-4327): Mandates policies to “preserve important historic, cultural and natural aspects of our national heritage” (Section 101.b4).*

#### **4.17.3.2 State**

In California, paleontological resources, particularly with regard to fossil sites, are afforded protection under the following state environmental legislation:

*California Environmental Quality Act of 1970 (Division 13, California Public Resources Code: 21000 et seq.: Requires that a public agency or private interest identify the environmental consequences of its proposed Project on any object or site of significance to the scientific annals of California (Division I, Public Resources Code: 5020.1 [b]).*

*California Public Resources Code, Section 5097.5 (Statute 1965, Chapter 1136, Paragraph 2792): Defines any unauthorized disturbance or removal of a fossil locality or remains on public land as a misdemeanor.*

*California Public Resources Code, Section 30244: Requires reasonable mitigation of adverse environmental impacts that result from development of public land and affect paleontological resources.*

#### **4.17.4 Significance Criteria**

Under CEQA Appendix G(5c), an impact would be considered potentially significant if it would:

- Directly or indirectly destroy a unique paleontological resource or site.

However, few fossil sites would be considered “unique” if the latter term were too narrowly defined (Scott and Springer, 2003). For example, after the first specimen of a Columbian mammoth had been found, the second specimen of this species and its fossil site would not be considered unique, even if the first specimen or the site that produced the first, unique, specimen no longer existed or if the original specimen was a single fragment compared to a complete, but second, fossil skeleton. On the other hand, a fossil site is considered a cultural resource under CEQA (California Public Resources Code section 15064.5) and, according to Scott and Springer (2003), would be considered “historically significant” if it “has yielded, or may be likely to yield, information important to prehistory.”

The following tasks were completed to determine whether rock units in the proposed Project area had the potential to yield scientific information important to paleontology:

- Scientific importance of fossils recorded from each rock unit was assessed.
- Potential paleontological productivity of the rock unit was assessed, based on number or density of fossil sites in the rock unit and the number of fossils produced at fossil sites in the proposed Project area and vicinity.
- Paleontological importance of the rock unit was assessed, based on its documented or potential fossil content in the proposed Project area.

These procedures are described in more detail in Section 4.17.2 Technical Methodology.

#### **4.17.5 Applicant Proposed Measures**

The following APMs were developed to avoid and minimize the potential impacts of project construction on paleontological resources to a less than significant level. The APMs were derived from the guidelines of the SVP and meet the requirements of CEQA. Such measures have been used throughout California and have been demonstrated to be successful in protecting paleontological resources while allowing timely completion of construction.

**APM PALEO-1: Retention of Paleontologist.** Prior to construction, a certified paleontologist would be retained by SCE to supervise monitoring of construction excavations and to produce a PRMP for the proposed Project. Paleontological monitoring would include inspection of exposed rock units and microscopic examination of matrix to determine if fossils are present. The monitor would have authority to temporarily divert grading away from exposed fossils in order to recover the fossil specimens. More specific guidelines for paleontological resource monitoring can be found in the PRMP.

**APM PALEO-2: Conduct a Pre-construction Paleontological Field Survey.** The paleontologist and/or his designated representative will conduct a pre-construction field survey of the Project area underlain by Tertiary rock units and older alluvium. Results of the field inventory and associated recommendations would be incorporated into the PRMP.

**APM PALEO-3: Prepare and Implement a Paleontological Resource Management Plan (PRMP).** This plan would be prepared and implemented under the direction of a qualified paleontologist and would address and incorporate the following APMs:

**APM PALEO-4: Environmental Training.** Training would be provided to construction supervisors and crew with environmental awareness training regarding the protection of paleontological resources and procedures to be implemented in the event fossil remains are encountered by ground-disturbing activities.

**APM PALEO-5: Construction Monitoring.** Ground-disturbing activities would be monitored on a part-time or full-time basis by a paleontological construction monitor only in those parts of the Project area where these activities will disturb previously undisturbed strata in rock units of moderate and high sensitivity. Quaternary Alluvium, colluvium, and Quaternary Landslide Deposits have a low paleontological sensitivity level and would be spot-checked on a periodic basis to insure that older underlying sediments are not being penetrated. Monitoring would not be implemented in areas underlain by younger alluvium unless these activities have reached a depth 5 feet below the present ground surface and fine grained strata are present. Ground-disturbing activities in areas underlain by rock units of low sensitivity would be monitored on a quarter-time basis or spot checked if fine grained strata are present.

**APM PALEO-6: Recovery and Testing.** If fossils are encountered during construction, construction activities would be temporarily diverted from the discovery and the monitor would notify all concerned parties and collect matrix for testing and processing as directed by the Project Paleontologist. In order to expedite removal of fossil-bearing matrix, the monitor may request heavy machinery to assist in moving large quantities of matrix out of the path of construction to designated stockpile areas. Construction would resume at the discovery location once the all necessary matrix was stockpiled, as determined by the paleontological monitor. Testing of stockpiles would consist of screen washing small samples to determine if important fossils are present. If such fossils were present, the additional matrix from the stockpiles would be water screened to ensure recovery of a scientifically significant sample. Samples collected would be limited to a maximum of 6,000 pounds per locality.

**APM PALEO-7: Prepare Monthly Progress Reports.** The Project Paleontologist would document interim results of the construction monitoring program with monthly progress reports. As well, at each fossil locality, field data forms would record the locality, stratigraphic columns would be measured, and appropriate scientific samples submitted for analysis.

**APM PALEO-8: Analysis and Prepare Final Paleontological Resource Recovery Report.** The Project Paleontologist would direct identification, laboratory processing, cataloguing, analysis, and documentation of the fossil collections. When appropriate, and in consultation with SCE, splits of rock or sediment samples would be submitted to commercial laboratories for microfossil, pollen, or radiometric dating analysis. After analysis, the collections would be prepared for curation (see APM PALEO-9, below). A final technical report would be prepared to summarize construction monitoring and present the results of the fossil recovery program. The report would be prepared in accordance with SCE, Society of Vertebrate Paleontology guidelines, and lead agency requirements. The final report would be submitted to SCE, the lead agency, and the curation repository (see below).

**APM PALEO-9: Curation.** Prior to construction, SCE would enter into a formal agreement with a recognized museum repository and would curate the fossil collections, appropriate field and laboratory documentation, and the final Paleontological Resource Recovery Report in a timely manner following construction.

Implementation of the APMs would avoid and minimize all potential impacts to paleontological resources to a less-than-significant level.

**4.17.6 Proposed Project and Alternatives****4.17.6.1 Project-wide Summary**

There are a number of rock units exposed in the proposed Project area that vary in terms of their paleontological importance and productivity. These units are listed in Tables 4.17-1 and 4.17-2 and are summarized below.

**TABLE 4.17-1  
ROCK UNITS BY SEGMENT**

Rock Unit	Segment <sup>1</sup>						
	4	5	6	7	8a-c	10, 10a-b	11
Stream Channel Deposits		X	X	X	X		X
Younger Alluvium	X	X		X	X	X	X
Older Alluvium	X	X	X	X	X	X	X
Anaverde Formation		X					
Fernando Formation				X	X		X
Pico Member				X	X		X
Repetto Member					X		
Sycamore Canyon Formation					X		
Monterey Formation					X		
Yorba Shale Member					X		
Soquel Sandstone Member					X		
La Vida Shale Member					X		
Igneous/Metamorphic Rock Units	X	X	X	X			X

<sup>1</sup> Rock units of Segment 9 are subsumed in this table, and discussed in Section 4.17.6.7.

In ascending stratigraphic order, these rock units include 1) non-fossil-bearing igneous and metamorphic rock units of pre-late Cretaceous age that underlie large portions of the San Gabriel Mountains; 2) the La Vida Shale, Soquel Sandstone, and Yorba Shale Members of the middle and late Miocene, marine Monterey Formation, the late Miocene to early Pliocene marine Sycamore Canyon Formation, the Repetto and Pico Members of the early Pliocene to early Pleistocene, marine Fernando Formation, which underlie the Montebello, Puente, and Chino Hills; 3) the Pliocene Anaverde Formation, which underlies the southern margin of the Mojave Desert; 4) early to late Pleistocene older alluvium, which underlies the margins of the Antelope and San Gabriel Valleys and the major drainages in the San Gabriel Mountains; 5) late Pleistocene to Holocene younger alluvium, which underlies large portions of the Antelope, San Gabriel, and Chino Valleys and the major drainages in the San Gabriel

**TABLE 4.17-2  
IMPORTANCE AND PRODUCTIVITY BY SEGMENT AND ROCK UNIT**

Segments and Sub-segments	Importance-productivity/Rock Units			
	Batholith-igneous/ Metamorphic Rock Units	Tertiary Rock Units	Older Quaternary Rock Units/Alluvium	Younger Quaternary Rock Units/Alluvium
4	None <sup>1</sup>	Not Present <sup>2</sup>	Low/Undetermined <sup>3</sup>	Low/Undetermined <sup>4</sup>
5	None	Not Present	Low-high	Low-moderate
6	None	Not Present	Low	Low
7	None	Moderate-High	Low-high	Low
8A, B, C	Not Present	Moderate-High	Undetermined/High	Low-high
9, Whirlwind Substation	Not Present	Not Present	Low/Undetermined	Low/Undetermined
9, Antelope Substation	Not Present	Not Present	Not Present	Low/Undetermined
9, Vincent Substation	Not Present	Not Present	Low	Not Present
9, Mesa Substation	Not Present	Not Present	Low	Not Present
9, Mira Loma Substation	Not Present	Not Present	Not Present	Low/High
9, Gould Substation	None	Not Present	Not Present	Not Present
10, 10A, B	Not Present	Not Present	Low/Undetermined	Low/Undetermined
11 North	None	Not Present	Low	Low
11 South	None	High	Low/Undetermined	Low/Undetermined

<sup>1</sup> "None" indicates that the rock unit is present but has no important resources.

<sup>2</sup> "Not Present" indicates that the unit is not recorded in segment.

<sup>3</sup> Locally important in areas where rock units are fine grained, and of low importance where coarse grained.

<sup>4</sup> Locally important in areas where rock units are fine grained and at depths greater than 5 feet below present ground surface.

Mountains; and 6) Holocene stream channel deposits, which underlie a large portion of the San Gabriel Valley and the major drainages of the San Gabriel Mountains.

The La Vida Shale, Soquel Sandstone, and Yorba Shale Members of the Monterey Formation, the Sycamore Canyon Formation, and the Repetto and Pico Members of the Fernando Formation have yielded the fossilized remains of middle Miocene to early

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Pleistocene land plants and marine microfossils (foraminifers), algae (sea weed), invertebrates (snails, tusk shells, clams, cephalopods, barnacles, crabs, shrimps, sand dollars, heart urchins), and/or vertebrates (sharks, rays, fishes, turtles, birds, desmostylids, whales) at numerous fossil localities in the Puente and Chino Hills.

The Anaverde Formation has yielded the fossilized leaf impressions representing a diversity of extinct Pliocene species of land plants at a number of fossil localities in the Anaverde Valley area of Palmdale.

The older alluvium consists of comparatively flat-lying and dissected alluvial fan deposits that often occur as terraces lying at slightly higher elevations than the adjacent younger alluvium. The older alluvium has yielded the fossilized bones and teeth of extinct species of Pleistocene land mammals, including rabbits, rodents, dire wolves, mastodons, mammoths, camels, and horses, at fossil sites along the southern margin of the Antelope Valley near Palmdale and along the margins of the San Gabriel Valley. Generally, older fine-grained alluvium has a higher potential to include paleontological resources. However, near the foothills and along the major drainages of the San Gabriel Mountains older alluvium may be too coarse grained to contain fossil remains.

The younger alluvium consists of flat-lying, unconsolidated, and undissected alluvial deposits of valleys and floodplains. At and near the surface, the younger alluvium probably is too young to contain remains old enough to be considered fossilized. However, at depths as shallow as 5 feet or less, the younger alluvium has produced the fossilized bones and teeth of extinct species of Pleistocene land mammals, including ground sloths, mammoths, camels, and bison, in the Chino Hills at Tonner Canyon and in the Chino Valley. However, the younger alluvium possibly is too coarse grained to contain fossil remains in some areas near the foothills of the San Gabriel Mountains and the Sierra Nevada and along the major drainages in the San Gabriel Mountains.

The stream channel deposits consist of unconsolidated and undissected deposits that fill major drainages. At and near the surface, the stream channel deposits probably are too young to contain remains old enough to be considered fossilized. Moreover, these deposits possibly are also too coarse grained to contain fossil remains, even at depth.

Based on the above, the proposed Project has the potential to encounter rock units known to contain scientifically important fossils. As noted earlier, such potential impacts would be reduced to less than significant levels with implementation of paleontological monitoring and other related APMs. Specific monitoring requirements that would be implemented are summarized below in Table 4.17-3.

**TABLE 4.17-3  
CONSTRUCTION MONITORING REQUIREMENTS  
BY SEGMENT AND ROCK UNIT**

Segments and Sub-segments	Measures/Rock Units			Impact Level After APM Implementation
	Igneous and Metamorphic Rock Units	Tertiary Sedimentary Rock Units including Older Alluvium <sup>1</sup>	Younger Alluvium <sup>2</sup>	
4	No Monitoring Required	Monitoring in Fine Grained Strata	Monitoring Below 5'	Less-than-significant
5	No Monitoring Required	Monitoring in Fine Grained Strata	Monitoring Below 5'	Less-than-significant
6	No Monitoring Required	Monitoring in Fine Grained Strata	Monitoring Below 5'	Less-than-significant
7	No Monitoring Required	Monitoring in Fine Grained Strata	Monitoring Below 5'	Less-than-significant
8A, B, C	No Monitoring Required	Monitoring in Fine Grained Strata	Monitoring Below 5'	Less-than-significant
9	No Monitoring Required	Monitoring in Fine Grained Strata	Monitoring Below 5'	Less-than-significant
10, 10A, 10B	No Monitoring Required	Monitoring in Fine Grained Strata	Monitoring Below 5'	Less-than-significant
11 (North and South)	No Monitoring Required	Monitoring in Fine Grained Strata	Monitoring Below 5'	Less-than-significant

<sup>1</sup> No monitoring would be required if strata were too coarse grained to contain identifiable fossil remains.

<sup>2</sup> No monitoring would be required at depths less than 5 feet below present ground surface, unless fossil remains were encountered by ground-disturbing activities, and where strata were too coarse grained to contain identifiable fossil remains.

#### **4.17.6.2 Segment 4**

**4.17.6.2.1 Environmental Setting.** The Segment generally crosses Younger Quaternary Alluvium (or Younger Alluvium, i.e., Qa and Qal) and occasionally crosses Older Quaternary Alluvium (or Older Alluvium, i.e., Qoa, Qog, and Qc) between Cottonwind and Whirlwind Substation, either side Fairmont Butte and Antelope Buttes between the Whirlwind Substation (north) and the Antelope Substation (south), and west of and near Antelope Substation. Pending further investigation, both rock units have an undetermined potential for containing fossil remains, except nearest the foot of the Sierra Nevada, where the Older Alluvium is considered of low importance because it is possibly too coarse grained to contain identifiable fossil remains. Younger Alluvium occurs along the lower elevations north of SR138 and in scattered occurrences along numerous ravines and dry washes west of

the Antelope Substation. North of SR138, alluvium has been cultivated, which has deeply disturbed the surface zone. Older (Pre-Tertiary) igneous and metamorphic rock units at the Fairmont Butte and Antelope Buttes are non-fossil-bearing.

**4.17.6.2.2 Impact Analysis.** Ground-disturbing Project activities impacting paleontological resources generally involve shallow disturbances from grading for access and spur roads and tower pads as well as foundation construction which requires excavation of LST and TSP foundations that may be up to 60 feet deep in some locations. Approximately 165 towers would be constructed in Segment 4 between Cottonwind, Whirlwind, and Antelope Substations.

**Construction.** Ground disturbance during construction could impact paleontological resources within Younger and Older Alluvium at or near the surface and beneath the zone of agricultural disturbance. Near Fairmont Butte and Antelope Buttes, igneous rock units are overlain by Older Alluvium above 2550-foot elevations; further south, Segment 4 approaches similar elevations on the lower slopes of the hills and would reach undisturbed or Older Alluvium in the deeper portions of foundation excavations.

The Project would potentially encounter resources in the Older Alluvium that would be of Moderate to High importance, except near the mountain ranges, where the rock unit may be too coarse grained to contain identifiable fossil remains. At and near the surface, the Younger Alluvium would be expected to have fewer important paleontological resources and thereby receive a lesser importance (e.g., Low) and sensitivity, but possibly Moderate at depth and where fine grained alluvium is identified. The sensitivity is considered higher (i.e., High) for fossil remains in the Older Alluvium in Segment 4 north of Whirlwind Substation, as well as those areas near the Antelope Buttes and Portal Ridge. Areas of exception would be adjacent to these prominences, where the rock unit probably is too coarse grained to contain identifiable fossil remains.

Implementation of construction monitoring and other APMs detailed in Section 4.17.5 and listed in Table 4.17-3 would reduce these impacts to less than significant levels. APMs would be implemented in those portions of Segment 4 underlain by rock units of Undetermined, Moderate, and High paleontological importance or impact sensitivity. Appropriate measures would be applied at least from S4 MP 0-8, 9-11, and 13-14, but only in those areas where the monitor determines that strata are fine grained and contain identifiable fossil remains. Such measures would include, but would not be limited to, paleontological monitoring of project-related ground-disturbing activities, recovery of fossil remains, and recording associated specimen and site data. The paleontological APMs may also result in beneficial effects by providing for the recovery of fossil remains that otherwise would never be exposed and studied. Therefore, impacts are expected to be less than significant.

**Operations.** Operating activities for the power lines and towers (e.g., washing, road/pad clearance, replacements, etc.) do not involve any activities that could affect paleontological resources. No impacts are expected.

**4.17.6.2.3 Mitigation Measures.** The aforementioned APMs have been incorporated into the Project design, and potentially significant impacts have been avoided or reduced to a less-than-significant level, and no mitigation measures are required.

**4.17.6.2.4 Impact Significance After Mitigations.** The potential impacts to paleontological resources associated with construction and operation of Segment 4 are considered to be less than significant.

### **4.17.6.3 Segment 5**

Segment 5 forms the connection between the Antelope and Vincent Substation and for Segment 4 on the north and Segments 6/7 and 11 on the south. The Segment lies primarily between Lancaster and Soledad Canyon (SR14).

**4.17.6.3.1 Environmental Setting.** The Segment crosses Older Alluvium and the Anaverde Formation north and south of Portal Ridge-Leona Valley, north of Soledad Canyon-Tuckerway Ranch Valley (north of SR14), and finally along the approach to Vincent Substation (between Soledad Canyon and Kentucky Springs Canyon) at MP 4-5 and 15-18.

Younger Alluvium occurs north of Portal Ridge (MP 0-4) and in scattered occurrences along numerous ravines and dry washes from MP 0-4, 6-7, and 15-18. Other older (Pre-Tertiary) rock units (MP 4-6 and 7-16) are non-fossil-bearing. These units and their importance, and productivity are summarized for Segment 5 in Tables 4.17-1, and -2.

A number of late Pleistocene fossil continental vertebrate localities occur in sediments of ancient Lake Thompson (includes Rosamond Lake), but these localities all occur below an elevation of 2,325 feet, below the elevation of the segment. Several other localities in the Antelope Valley, at elevations above 2,325 feet, have yielded remains from 0 to 10 feet below the surface at General William J. Fox Airfield and at localities east of Little Rock Wash. The remains represent a leopard lizard, gopher, and a large land mammal, which are of Holocene or late Pleistocene age. These few occurrences indicate that there is only a moderate potential for additional, similar, scientifically important fossil remains being encountered by Project-related ground-disturbing activities where the segment is underlain by Younger Alluvium. For this reason, the Younger Alluvium is considered moderately important.

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Along the San Andreas Fault in and near Palmdale, the Older Alluvium includes the Harold Formation, which has yielded the fossilized bones and teeth of extinct species of Pleistocene (Ice Age) land mammal species, including a jackrabbit, a cottontail, a deer mouse, the California vole, a harvest mouse, possibly the dire wolf, the American mastodon, a mammoth, possibly the western horse, and the western camel. The remains from the Harold Formation are scientifically important because their taxonomic diversity and respective species, particularly those of the packrat, have allowed the determination of the geologic age of the formation. These occurrences indicate that there is a high potential for additional, similar, scientifically important fossil remains being encountered by Project-related ground-disturbing activities where the segment is underlain by the Harold Formation in Leona Valley and along Portal Ridge. There also is a potential that some of the remains might represent new species or species previously not recorded from the Harold Formation. For these reasons, the Older Alluvium (Harold Formation) is considered highly important.

Along the San Andreas Fault in and near Palmdale, the upper, clay shale member of the continental Anaverde Formation has yielded fossilized leaves representing a taxonomically diverse floral assemblage consisting of twenty-one extinct species of Pliocene land plants. The species represented include pines, palms, poplars, willows, oaks, avocado, sycamore, sumac, and California lilac. The leaves from the Anaverde Formation are scientifically important because their respective species have allowed the paleoenvironmental and paleoclimatic reconstructions of the western Antelope Valley and vicinity during the Pliocene Epoch. These occurrences indicate that there is a high potential for additional, similar, scientifically important fossil remains being encountered by ground-disturbing activities where the segment is underlain by the Anaverde Formation. There is a potential that some of the remains might represent new species or species previously not recorded from the Anaverde Formation. For these reasons, the Anaverde Formation is considered highly important.

**4.17.6.3.2 Impact Analysis.** Ground-disturbing Project activities impacting paleontological resources generally involve shallow disturbances from grading for access and spur roads and tower pads as well as foundation construction, which requires boring for foundations with holes 2 to 5 feet in diameter for towers and depths up to 60 feet. Approximately 67 LSTs would be constructed in Segment 5 between Antelope and Vincent Substations and especially at several locations where changes in transmission line orientation are proposed.

**Construction.** Ground-disturbing activities have the potential to encounter paleontological resources of the Younger Alluvium from the Antelope substation and up to the lower slopes of Portal Ridge where Older Alluvium lies against the igneous rock units. The potential is lower if the Older and Younger Alluvium are too coarse-grained to contain identifiable fossil remains. Older Alluvium (Harold Formation) and the Anaverde Formation is present in the

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proposed Project area and fossils may be encountered in Leona, Anaverde, and Tuckerway Ranch Valleys. Further south in Soledad Canyon, the Segment crosses numerous infrastructure developments which have caused surface disturbances and filling. As a result, there is low potential for impacts to occur from grading. However, tower foundations may be located on previously undisturbed ground which may include Older Alluvium of the higher valley terraces. Most ridges are formed of igneous and metamorphic rock units that lack fossils.

The Project would potentially affect resources in the Older Alluvium that would be of Moderate to High importance, except near the mountain ranges, where the rock unit probably is too coarse grained to contain identifiable fossil remains. The impacts are summarized for Segment 5 in Table 4.17-2. The sensitivity is considered higher for fossil remains in the Older Alluvium in the southern sub-segments of Segment 5, north of Vincent Substation, and those areas near the Portal Ridge and ridges further south. An area of exception would be adjacent to these ridges, where the rock unit probably is too coarse grained to contain identifiable fossil remains.

APMs detailed in Section 4.17.5 will be implemented in those portions of Segment 5 underlain by rock units of Undetermined, Moderate, and High paleontological importance or impact sensitivity. Appropriate measures will be applied at least from MPs 4-5, and 15-18, but only in those areas of these sub-segments where the strata are fine grained and contain identifiable fossil remains. Such measures will include, but not be limited to, the paleontological monitoring of project-related ground-disturbing activities, recovery of fossil remains, and recording associated specimen and site data. With implementation of APMs, impacts on paleontological resources will be reduced to a less than significant level. The paleontological APMs may also result in beneficial effects by providing for the recovery of fossil remains that would otherwise never be exposed without these activities and, therefore been available for recovery and subsequent study. Therefore, impacts would be reduced to a less than significant level.

***Operations.*** Operating activities for the power lines and towers (e.g., washing, road/pad clearance, replacements, etc.) do not involve any activities that could affect paleontological resources. No impacts are expected.

**4.17.6.3.3 Mitigation Measures.** The aforementioned APMs have been incorporated into the Project design, and potentially significant impacts have been avoided or reduced to a less-than-significant level, and no mitigation measures are required.

**4.17.6.3.4 Impact Significance After Mitigations.** The potential impacts to paleontological resources associated with construction and operation of Segment 5 are considered to be less than significant.

**4.17.6.4 Segment 6**

Segment 6 forms the connection between the Vincent Substation and Segment 7 to the south and generally crosses the Angeles National Forest lands of the San Gabriel Mountains.

**4.17.6.4.1 Environmental Setting.** The Segment corridor crosses the predominant igneous and metamorphic rock units of the Angeles National Forest (ANF), with scattered occurrences of Younger and Older Alluvium located along Kentucky Springs, Aliso and Mill Creek canyons on the northern slopes (S6 MP 0-6 and 8-9), Upper Big Tujunga Canyon, and the San Gabriel River canyon on the southern slopes (S6 MP 15-16). Younger Alluvium (Qa, Qal, and Qg) occurs along the active channels with Older Alluvium forming terraces above it. The predominant rock units, however, are non-fossil-bearing igneous and metamorphic units.

Because of the coarse-grained nature of the alluvial units in the steep, narrow canyons, the potential for identifiable fossils is low. The only potential exists in the Older Alluvium along Kentucky Springs and Aliso Canyons, near Vincent Substation, and below Mill Creek summit and Canyon. These units and their importance and productivity are summarized for Segment 6 in Tables 4.17-1, and 4.17-2.

**4.17.6.4.2 Impact Analysis.** Ground-disturbing Project activities impacting paleontological resources generally involve shallow disturbances from grading for access and spur roads and tower pads as well as foundation construction, which requires boring for foundations with holes 2 to 5 feet in diameter for towers and depths of 35 feet. Approximately 106 LSTs and 34 TSPs would be constructed in Segment 6 south of the Vincent Substation, specifically at several locations where the line changes in orientation.

**Construction.** No impacts would occur in the non-fossil-bearing igneous and metamorphic rock units forming the predominant portion of the San Gabriel Mountains. Because of the steepness of terrain, tower pad and road construction from S6 MP 0 to S6 MP 8 may involve larger areas of Older Alluvium along Kentucky Springs and Aliso and Mill Creek Canyons and creating a higher potential to encounter paleontological resources, unless it is too coarse grained to contain identifiable fossil remains. The impacts of the Project on resources in the Older Alluvium would be of Low importance for most of the segment and Moderate to High Importance for the limited northern canyon sub-segment sections. The impacts are summarized for Segment 6 in Table 4.17-2. With implementation of APMs, these impacts would be reduced to a less-than-significant level.

**Operations.** Operating activities for the power lines and towers (e.g., washing, road/pad clearance, replacements, etc.) do not involve any activities that could affect paleontological resources. No impacts are expected.

**4.17.6.4.3 Mitigation.** The aforementioned APMs have been incorporated into the Project design, and potentially significant impacts have been avoided or reduced to a less-than-significant level, and no mitigation measures are required.

**4.16.6.4.4 Impact Significance After Mitigations.** The potential impacts to paleontological resources associated with construction and operation of Segment 6 are considered to be less than significant.

#### **4.17.6.5 Segment 7**

Segment 7 forms the connection between Segment 6 to the north and Mesa Substation and generally crosses the urban area of the San Gabriel Valley southward to Whittier Narrows and Mesa Substation in the Montebello Hills.

**4.17.6.5.1 Environmental Setting.** The Segment crosses Younger Alluvium and may occasionally cross Older Alluvium along the southern slopes of the San Gabriel Mountains south of the ANF. Younger Alluvium and active channel gravels occur along the lower elevations south of the San Gabriel Valley, and in scattered occurrences along the San Gabriel River floodplain from S7 MP 3-14. The Pico member of the Fernando Formation occurs in the Montebello Hills. A fossil site in the Younger Alluvium south of the San Gabriel Mountains in Pasadena yielded the fossilized remains of a mammoth.

However, the proximity to the base of the San Gabriel Mountains and the San Gabriel River suggest that both rock units probably are very coarse grained, creating a low potential for encountering scientifically important fossil remains where Segment 7 is underlain by these rock units in the San Gabriel Valley. The Pico Member has yielded the fossilized remains of Pliocene marine microfossils, invertebrates (barnacles, sand dollars, snails, clams, tusk shells) and vertebrates (whales). Some rock units along the San Gabriel Mountains (S7 MP 0-2) are igneous and metamorphic units and are non-fossil-bearing. These units and their importance, and productivity are summarized for Segment 7 in Tables 4.17-1, and 4.17-2.

**4.17.6.5.2 Impact Analysis.** Ground-disturbing Project activities impacting paleontological resources generally involve shallow disturbances from grading for access and spur roads and tower pads as well as foundation construction, which requires boring for foundations with holes 2 to 5 feet in diameter for towers and depths of up to 60 feet. Approximately 79 LSTs and two TSPs would be constructed between the Segments 6/7 transition and the Mesa

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Substation and especially at several changes in orientation across the San Gabriel River channel and near substations and the San Gabriel Junction.

**Construction.** Ground-disturbing activities have the potential to encounter paleontological resources of Younger Alluvium from Duarte up to the northern side of the Whittier Narrows. Older Alluvium is also encountered just north of the Montebello Hills and the Mesa Substation. The depths of tower and pole foundations would be expected to fully penetrate disturbed and filled zones and may reach previously undisturbed ground, which may include Older Alluvium of higher terraces and even the underlying Tertiary rock units. However, because of their proximity to the base of the San Gabriel Mountains and the San Gabriel River, these rock units may be too coarse grained to contain identifiable fossil remains. An area of exception is at the foot of the Montebello Hills, where impacts probably would be of moderate importance. The potential for encountering fossils in the Pico Member of the Fernando Formation, as a result of ground-disturbing activities, would be Higher, due to a higher concentration of fossil remains.

The impacts of the Project on the potential resources in the Older and Younger Alluvium would be of Low importance because of the presumed coarse-grained nature of the sediments comprising both rock units (see Table 4.17-2). The sensitivity is considered higher for fossil remains in the Older Alluvium at the northern end of the Segment 7. Implementation of APMs would reduce impacts to less than significant levels.

**Operations.** Operating activities for the power lines and towers (e.g., washing, road/pad clearance, replacements, etc.) do not involve any activities that could affect paleontological resources. No impacts are expected.

**4.17.6.5.3 Mitigation.** The aforementioned APMs have been incorporated into the Project design, and potentially significant impacts have been avoided or reduced to a less-than-significant level, and no mitigation measures are required.

**4.17.6.5.4 Impact Significance After Mitigations.** The potential impacts to paleontological resources associated with construction and operation of Segment 7 are considered to be less than significant.

**4.17.6.6 Segment 8**

Segment 8 forms the connection between the San Gabriel Junction at the Whittier Narrows, with interconnections to Mesa Substation and Mira Loma Substation to the east. The Segment begins in the Montebello Hills to the west, crosses the urbanized area of the Whittier Narrows (west) and the Chino Valley (east) and the more open space ridges of the Puente and Chino Hills. In the eastern third of Segment 8, two additional connections exist

between the Chino and Mira Loma Substation. This area also includes a length (>1,500 feet) of underground 66 kV cable.

**4.17.6.6.1 Environmental Setting.** Paleontological resources of Segment 8 are more diverse and higher in importance than any other segment of the Project. The Segment corridor crosses most recent Younger Alluvium and active channel gravels along the San Gabriel River floodplain in the Whittier Narrows and in the eastern quarter of Segment 8 from S8 MP 0-5 and 25-35. The Segment occasionally crosses Older Alluvium along the eastern and western slopes of the Puente Hills between Interstate 605, State Route 51 and 60, and in the Chino Valley, east of Chino Substation. The central and westerly portions of Segment 8 cross late Tertiary rock units of the Puente Hills, which have numerous paleontological resources containing the most important resources of the Segment and most of the Project.

The La Vida Shale, Soquel Sandstone, and Yorba Shale Members of the Monterey Formation, the Sycamore Canyon Formation, and the Repetto and Pico Members of the Fernando Formation have yielded the fossilized remains of late Tertiary (Miocene and Pliocene) land plants and marine microfossils (foraminifers), algae (sea weed), invertebrates (snails, clams, cephalopods, barnacles, crabs, shrimps, sand dollars, heart urchins), and/or vertebrates (sharks, rays, fishes, turtles, birds, desmostylids, whales) at numerous fossil localities in the San Jose, Puente, and Chino Hills, as well as the northern Santa Ana Mountains. The remains from these rock units are scientifically important because of their taxonomic diversity and because their respective species have allowed the determinations of the geologic ages of the fossil-bearing rock units, and the reconstruction of their depositional environments. These occurrences indicate that there is a high potential for encountering similar, scientifically important fossil remains where the segment is underlain by the rock units. There also is a potential that some of the remains might representing new species or species previously not recorded from the rock units. For these reasons, the rock units are all considered highly important.

A fossil site in the Older Alluvium just north of the San Jose Hills in San Dimas yielded the fossilized bones and teeth of a Pleistocene (Ice Age) mammoth. The occurrence of only one recorded fossil site near the segment suggests that there is no more than a moderate potential for encountering similar, scientifically important fossil remains the segment is underlain by Older Alluvium. For this reason, the Older Alluvium is considered moderately important in Segment 8.

The Younger Alluvium has yielded the fossilized bones and teeth of extinct Pleistocene (Ice Age) land mammals, including ground sloths, mammoths, camels, and bison, at depths as shallow as 5 feet below the surface in the Chino Hills, Tonner Canyon, Champagne, and within the proximity of Chino Valley. The remains from the Younger Alluvium are

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scientifically important because of their taxonomic diversity and because they indicate that strata containing remains old enough to be considered fossilized occur at shallow depths in areas underlain by this rock unit. These occurrences also indicate that there is a high potential for encountering similar, scientifically important fossil remains where the segment is underlain by Younger Alluvium. For these reasons, the rock units are all considered highly important. These units and their importance and productivity are summarized for Segment 8 of the Project in Tables 4.17-1, and 4.17-2.

**4.17.6.6.2 Impact Analysis.** Ground-disturbing Project activities impacting paleontological resources generally involve shallow disturbances from grading for access and spur roads and tower pads as well as foundation construction. Segment 8 would contain approximately 226 LSTs and TSPs between the San Gabriel Junction (west) and the Chino and Mira Loma Substations (east), specifically at several locations where the line changes in orientation.

**Construction.** Ground-disturbing activities across the Montebello, Puente and Chino Hills, and in the Chino Valley have the potential to encounter paleontological resources of the Tertiary rock units and Younger Alluvium near the ground surface. Borings for tower/pole foundations would be deeper (down to 30 feet below ground levels) in the eastern third of Segment 8 in Whittier Narrows where Quaternary Alluvium exists Borings would be much shallower (e.g., 5 to 10 feet deep) across the Puente Hills and near Mesa Substation, in the harder Tertiary rock units with less disturbance but with expected higher potential for encountering fossils.

Relocation of overhead sub-transmission lines to underground routes requires considerable trenching through the near-surface disturbed zone (<5 feet depth) and may be expected to have a higher expectation of encountering sub-surface fossil remains. More than 1,500 feet of such trenching is required.

The impacts of the Project on the potential resources in the Tertiary rock units and Older Alluvium would be of Moderate to High importance, and summarized for Segment 8 in Table 4.17-2. The sensitivity is considered high for fossil remains in the Tertiary rock units across the majority of the central and western portions of Segment 8. Implementation of APMs would reduce impacts to a less-than-significant level.

**Operations.** Operating activities for the power lines and towers (e.g., washing, road/pad clearance, replacements, etc.) do not involve any activities that could affect paleontological resources. No impacts are expected.

**4.17.6.6.3 Mitigation.** The aforementioned APMs have been incorporated into the Project design, and potentially significant impacts have been avoided or reduced to a less-than-significant level, and no mitigation is required.

**4.17.6.6.4 Impact Significance After Mitigations.** The potential impacts to paleontological resources associated with construction and operation of Segment 8 are considered to be less than significant.

**4.17.6.7 Segment 9 Substations**

Construction of one new and two expanded substations requires excavations, filing, and numerous foundations. Excavations would be relatively shallow (3 to 15 feet) but cover larger areas (e.g., 100,000 sq ft vs. 10,000 ft) than those for tower/pole pads. The new Whirlwind and the expanded Vincent Substation will affect a larger area and require deeper excavations than other substations. The expanded Antelope Substation requires large areas and many deeper excavations. Existing facilities will be upgraded in the Gould, Mesa, and Mira Loma Substation, and trenching would remain in disturbed fill zone or non-fossil-bearing igneous or metamorphic rock units, even at the Mira Loma Substation.

**4.17.6.7.1 Environmental Setting.** Summary inventories of paleontological resources at the various substations are provided below according to the Project geographical sequence from north to south. The rock units underlying the substation sites and their importance and productivity are summarized in Tables 4.17-1 and 4.17-2.

**Whirlwind Substation.** Whirlwind Substation, including three alternative sites in one-mile square area, is located on Younger and/or Older Alluvium and, pending further investigation, ground-disturbing activities would have an undetermined potential for encountering fossil remains. Because the underlying strata probably becomes coarser grained as the segment approaches the mountains, the potential for fossil-bearing strata decreases.

**Antelope Substation.** Antelope Substation, Segment 4 and 5, would be expanded from its existing site and located at a relative low elevation in the western Mojave Desert. Because the area has been disturbed before (to a depth of maybe 3 feet) by excavation, grading, and filling, fewer in situ fossils are expected. However, depths of individual foundations have not been determined. A small number of ground-disturbing activities (e.g., grounding grids) are expected to extend below 5 feet (disturbed zone from agricultural cultivation and previous construction activities). Pending further investigation, ground-disturbing activities would have an undetermined potential for encountering fossil remains.

**Vincent Substation.** Vincent Substation, Segment 5, 6, and 11, would be expanded from its existing site and located at a relative moderate elevation above the Soledad Canyon floodplain on the northern slopes of the San Gabriel Mountains. The underlying rock units are expected to be Older Alluvium, which may be too coarse grained to contain identifiable fossil remains.

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**Mesa Substation.** Mesa Substation equipment would be upgraded. The underlying rock units are expected to be Older Alluvium, which may be too coarse grained to contain fossil remains.

**Mira Loma Substation.** Mira Loma Substation, Segment 8A, B, and C in the Chino Valley, would be upgraded only. The site is underlain by Younger Alluvium, which has yielded Pleistocene (Ice Age) land mammal remains in the immediate area. As no grounding grid is required, foundations are expected to extend to less than 5 feet (disturbed zone from agricultural cultivation and previous construction activities), although fossil remains have been encountered in the area at depths only a few feet below the surface.

**Gould Substation.** Gould Substation, Segment 11, area has been disturbed before by both excavation and extensive filling, and is founded on non-fossil-bearing igneous and metamorphic rock units.

**4.17.6.7.2 Impact Analysis.** Summary assessments for paleontological resources at the various substations are provided below according to the Project geographical sequence (e.g., north to south).

**Construction.**

**Whirlwind Substation.** Whirlwind Substation (including three alternative sites in one-mile square area) is located on Younger and/or Older Alluvium. Major ground-disturbing activities over a large area and to depths below the disturbed zones would have an Undetermined potential for encountering paleontological resources.

**Antelope Substation.** Antelope Substation expansion requires major ground-disturbing activities over a large area and to depths below the disturbed zones. Such activities would have an Undetermined potential for encountering paleontological resources in the Younger Alluvium.

**Vincent Substation.** Vincent Substation expansion requires major ground-disturbing and other construction activities over a large area and to depths below the disturbed zones. The possible coarse-grained nature of the sediments suggest that such activities would have only a Low potential for encountering paleontological resources in the Older Alluvium.

**Gould Substation.** Gould Substation would be upgraded on its existing site and construction is expected to not encounter fossils. No impacts are expected to arise from construction.

**Mesa Substation.** Mesa Substation would be upgraded on its existing site and construction is expected to not encounter fossils. Impacts of only Low importance are expected to arise from construction.

**Mira Loma Substation.** Mira Loma Substation would be upgraded on its existing site. If ground-disturbing activities extend to sufficient depth, such activities have a high potential for encountering remains in the Younger Alluvium at the Mira Loma Substation, where fossil remains have been encountered at depths only a few feet below the surface in the Younger Alluvium.

The impacts of the Project on the potential resources in the Older and Younger Alluvium would be undetermined only at the Whirlwind and Antelope Substation, and of High importance only at the Mira Loma Substation, as summarized in Table 4.17-2. Implementation of APMs would reduce impacts to a less-than-significant level.

**Operations.** Operating activities for the power lines and towers (e.g., washing, road/pad clearance, replacements, etc.) do not involve any activities that could affect paleontological resources. No impacts are expected.

**4.17.6.7.3 Mitigation.** The aforementioned APMs have been incorporated into the Project design, and potentially significant impacts have been avoided or reduced to a less-than-significant level, and no mitigation measures are required.

**4.17.6.7.4 Impact Significance After Mitigations.** The potential impacts to paleontological resources associated with construction and operation of Segment 9 are considered to be less than significant.

#### **4.17.6.8 Segment 10**

Segment 10 forms the connection for the Windhub Substation, the wind-turbine power collection network, the Whirlwind Substation, and Segment 4 overhead transmission lines. Segment 10 generally follows the Los Angeles Aqueduct along the lower slopes of the Tehachapi Mountains.

**4.17.6.8.1 Environmental Setting.** Segment 10 passes from the Windhub Substation across transitional rock units of Younger (Qal) and Older Alluvium (Qc) to the Whirlwind Substation and the north end of Segment 4. Segment 10 has two alternative alignments, 10A and 10B, both of which also cross Younger and Older Alluvium. Pending further investigation, there is an undetermined potential for encountering fossil remains in both rock units. An area of exception would be nearest the foot of the Sierra Nevada, where the rock units possibly are too coarse grained to contain identifiable fossil remains, creating a low

potential for fossil remains. These units and their importance and productivity are summarized for Segment 10 of the Project in Tables 4.17-1, and 4.17-2.

**4.17.6.8.2 Impact Analysis.** Ground-disturbing Project activities impacting paleontological resources generally involve shallow disturbances from grading for access and spur roads and tower pads as well as foundation construction. Approximately 96 LSTs would be constructed between Windhub and Whirlwind Substation and especially at several locations where the T/L alignment changes such as aqueduct crossings, and near the substations. Depending on the selected Whirlwind Substation site, the Segment 10 T/L may be extended or reduced by about 1.0 mile.

**Construction.** Segment 10 lies north of the aqueduct and would be expected to encounter fossils in the Older Alluvium, and thereby typical tower foundation construction and associated new ground-disturbing activities in this sub-segment would be expected to cause impacts that, pending further investigation would be of undetermined importance, on paleontological resources. The impacts of the Project on the potential resources in the Older Alluvium would be of undetermined and possibly Low to Moderate importance, as summarized for Segment 10 in Table 4.17-2. Implementation of APMs would reduce all impacts to a less-than-significant level.

**Operations.** Operating activities for the power lines and towers (e.g., washing, road/pad clearance, replacements, etc.) do not involve any activities that could affect paleontological resources. No impacts are expected.

**4.17.6.8.3 Mitigation.** The aforementioned APMs have been incorporated into the Project design, and potentially significant impacts have been avoided or reduced to a less-than-significant level, and no mitigation measures are required.

**4.17.6.8.4 Impact Significance After Mitigations.** The potential impacts to paleontological resources associated with construction and operation of Segment 10 are considered to be less than significant.

#### **4.17.6.9 Segment 11**

Segment 11 passes across the San Gabriel Mountains and the San Gabriel Valley between Vincent, and Mesa Substations, via the Gould Substation and crosses two different major geological and paleontological areas (i.e., Segment 11 North and Segment 11 South), similar to those of the combined Segment 6 and Segment 7.

**4.17.6.9.1 Environmental Setting.** Segment 11 crosses the non-fossil-bearing igneous and metamorphic rock units of the San Gabriel Mountains. Periodic deposits of Younger and

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Older Alluvium occur along valleys on the northern slopes (Kentucky Springs and Aliso Canyons), along active channels and elevated terraces, on the lower southern slopes of the San Gabriel Mountains, and across the San Gabriel Valley to the Mesa Substation in the Montebello Hills. The Older and Younger Alluvium at the southern end of the Segment are of undetermined importance and may be too coarse grained to contain fossil remains. To the west in the downtown Los Angeles area, both units have yielded the remains of Pleistocene (Ice Age) land mammals. The southern end of the segment crosses the Pico Member of the Fernando Formation. The Pico Member has yielded the fossilized remains of Pliocene marine microfossils, invertebrates (barnacles, sand dollars, snails, clams, tusk shells) and vertebrates (whales). These limited and isolated units and their importance and productivity are summarized for Segment 11, both northern and southern sub-segments of the Project in Tables 4.17-1 and 4.17-2.

**4.17.6.9.2 Impact Analysis.** Ground-disturbing Project activities impacting paleontological resources generally involve shallow disturbances from grading for access and spur roads and tower pads as well as foundation construction, which consists of boring for foundations of holes of 2 to 3 feet in diameter and to depths of 60 feet. Approximately 74 LSTs and 2 poles would be constructed between Vincent and Gould Substation and in the vicinity of the Gould Substation, specifically where the T/L changes in orientation.

**Construction.** Ground-disturbing activities have the potential to encounter paleontological resources of Undetermined and High importance only in the San Gabriel Valley and adjacent to the Montebello Hills, within the Pico Member and Older and Younger Alluvium. There is a higher potential to encounter fossils in Older and Younger Alluvium in the sub-segment interval of S11 MP 0-4. The remainder (S11 MP 4-19) of Segment 11 (Vincent to Gould Substation) crosses only igneous and metamorphic rock units of the Batholith, and no impacts on paleontological resources would be expected. From Gould to Mesa Substation (S11 MP 19-36), little or no ground-disturbing would occur as the T/L activities would involve adding a new conductor to existing towers. No major ground-disturbing activities are expected to occur at S11 MP 25, 28, and 34-35 (containing Older Alluvium), and therefore there is a low potential to encounter paleontological resources. The impacts of the Project on the potential resources are summarized for Segment 11 in Table 4.17-2. Implementation of APMs would reduce any impacts to a less-than-significant level.

**Operations.** Operating activities for the power lines and towers (e.g., washing, road/pad clearance, replacements, etc.) do not involve any activities that could affect paleontological resources. No impacts are expected.

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**4.17.6.9.3 Mitigation.** The aforementioned APMs have been incorporated into the Project design, and potentially significant impacts have been avoided or reduced to a less-than-significant level, and no mitigation measures are required.

**4.17.6.9.4 Impact Significance After Mitigations.** The potential impacts to paleontological resources associated with construction and operation of Segment 11 are considered to be less than significant.

**4.17.7 References**

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