# Appendix G. Simi Valley Double Track and Platform Project Paleontological Resources Constraints Analysis

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# Memorandum

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| Date: | Monday, January 18, 2021 |
| Project: | Simi Valley Double Track and Platform Project |
| To: | Elizabeth Lun, P.E., Acting Assistant Director, Southern California Optimized Rail Expansion Program, Southern California Regional Rail Authority |
| From: | Courtney Richards, M.S., Paleo Solutions, Inc. |
| Subject: | **Paleontological Resources Constraints Analysis** |

Paleo Solutions, Inc. (Paleo Solutions) was retained by HDR Engineering, Inc. to conduct a paleontological resources constraints analysis in support of the Simi Valley Double Track and Platform Project (Project) for the Southern California Regional Rail Authority as a part of the larger Southern California Optimized Rail Expansion Program.

This initial research provides an overview of available information regarding documented paleontological resources within the paleontological resources study area, as well as an indication of the paleontological sensitivity of the area. The goal of this memorandum is to identify the paleontological potential of the Project site and make recommendations for the avoidance of adverse impacts on paleontological resources that could occur as a result of the proposed construction. This memorandum was completed in accordance with the California Environmental Quality Act (CEQA).

# 1 Project Location

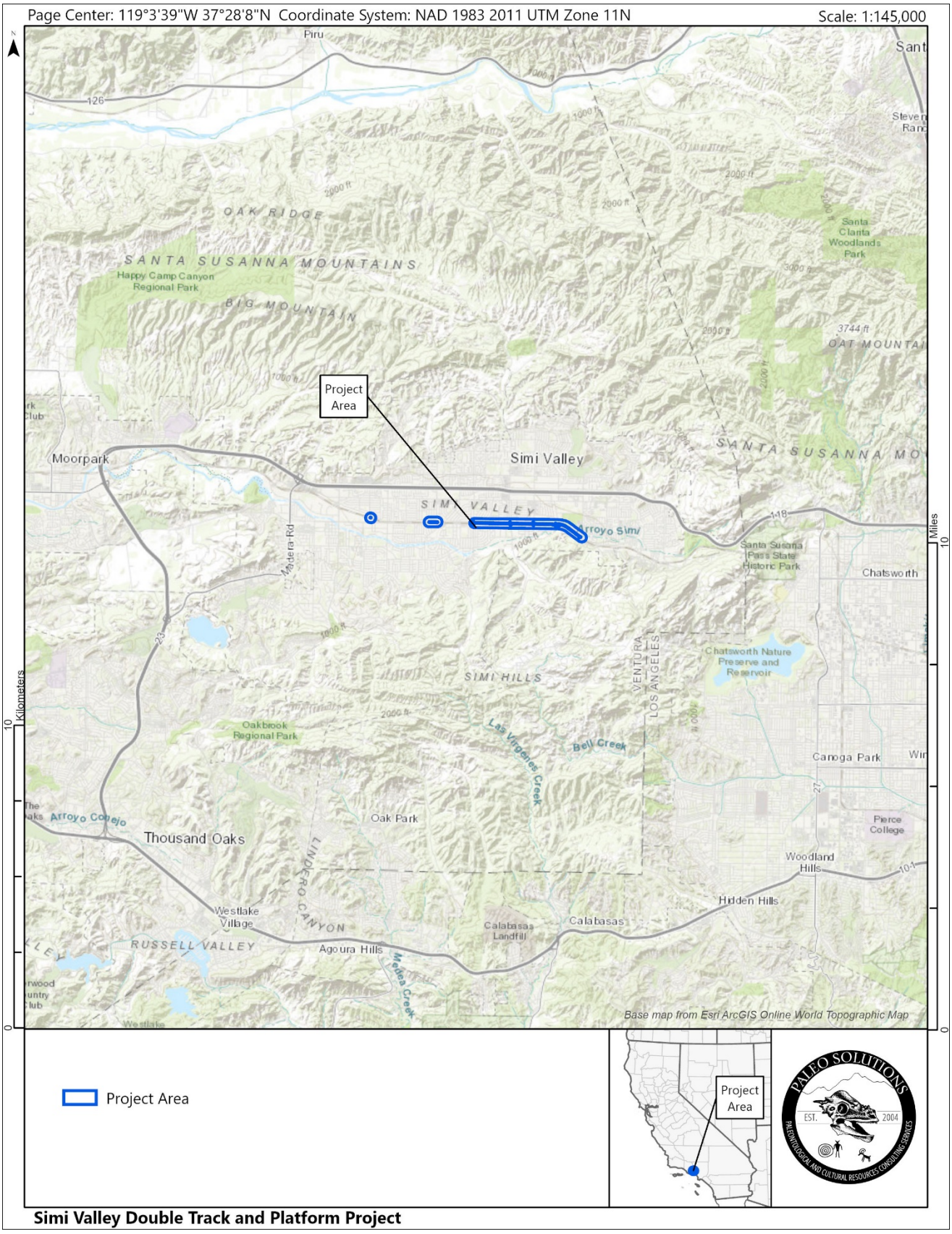
The Project is located in the City of Simi Valley in Ventura County, California (Figure 2-1) on the Simi Valley East, California topographic quadrangle. The Project is located between Mile Post (MP) 436.20 and MP 438.40, with two small, discontinuous impact areas at MP 433.96 and MP 435.13 (Figure 2-2). The Project is located in the Southern California Regional Rail Authority's Ventura Subdivision within Ventura County.

Geologic mapping by Dibblee and Ehrenspeck (1992a, 1992b) indicates that the Project site is underlain by Holocene-age alluvial gravel, sand, and clay of valley and floodplain areas; Holocene-age gravel and sand of major stream channels; and middle Eocene-age Llajas Formation, basal cobble conglomerate. In addition, middle Eocene-age Llajas Formation, gray micaceous claystone-siltstone; Paleocene-age Santa Susana Formation, dark gray micaceous clay; and Paleocene-age Santa Susana Formation, light to tan sandstone are mapped within a 0.5-mile buffer of the Project site (Figure 2-3).

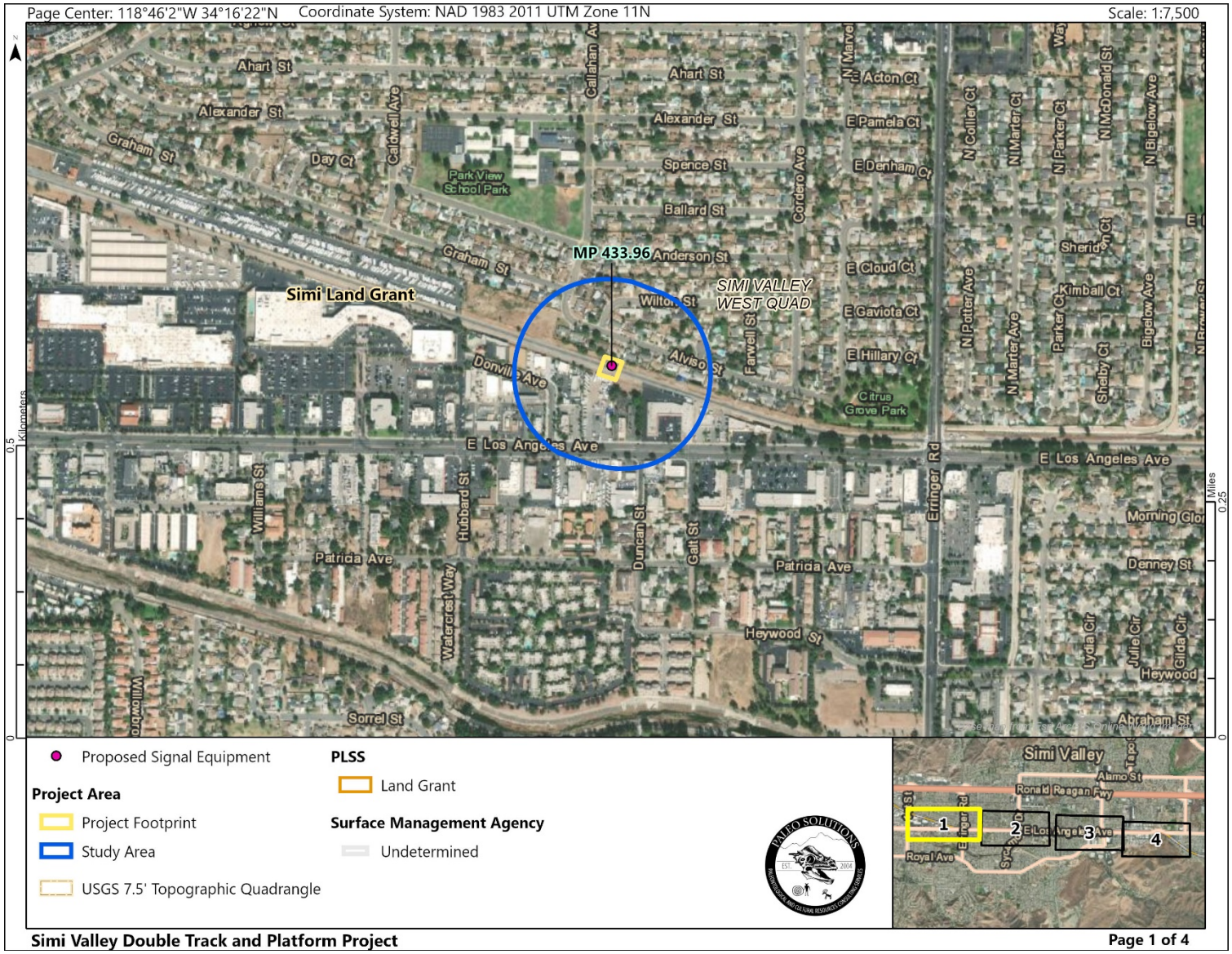
# 2 Project Description

The Southern California Regional Rail Authority is proposing the Project to improve safety and increase operational capacity. The Project includes the construction of a new side platform and pedestrian underpass, the construction of a second main track, implementation of two new Control Points, Control Point Sequoia (at MP 436.30) and Control Point Arroyo (at MP 438.40), and new intermediate signals (at MP 433.96, MP 435.13, and MP 437.30). Supporting construction includes earthwork, retaining walls, drainage improvements, signal modifications, utility modifications, track upgrades or shifts. The Project would occur primarily within existing railroad right-of-way owned by the Southern California Regional Rail Authority and Union Pacific Railroad. Construction is expected to begin as early as April 2022 and would last for approximately 19 months.

## Figure 2-1. Project Location Map



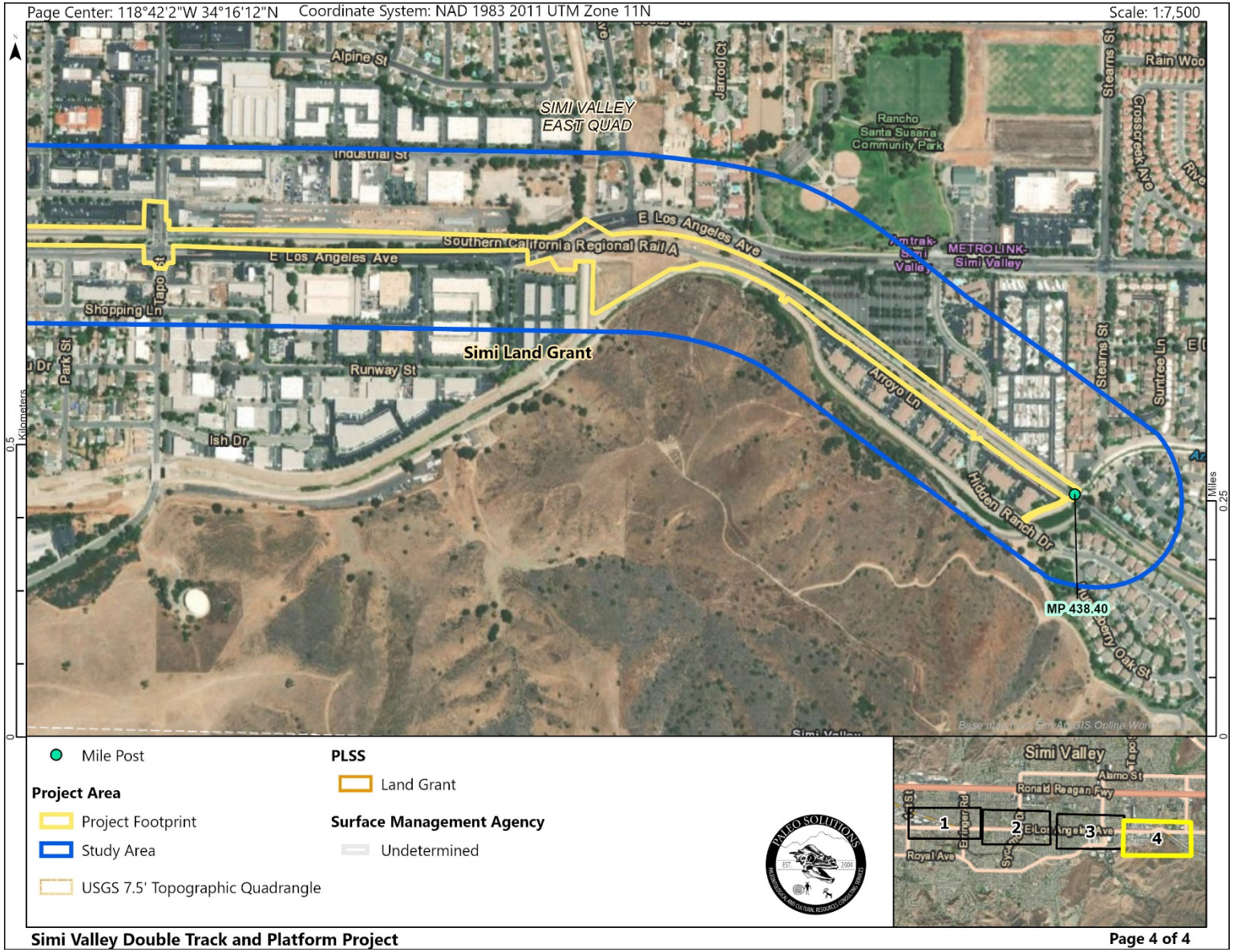
## Figure 2-2. Project Overview Map (Sheet 1 of 4)



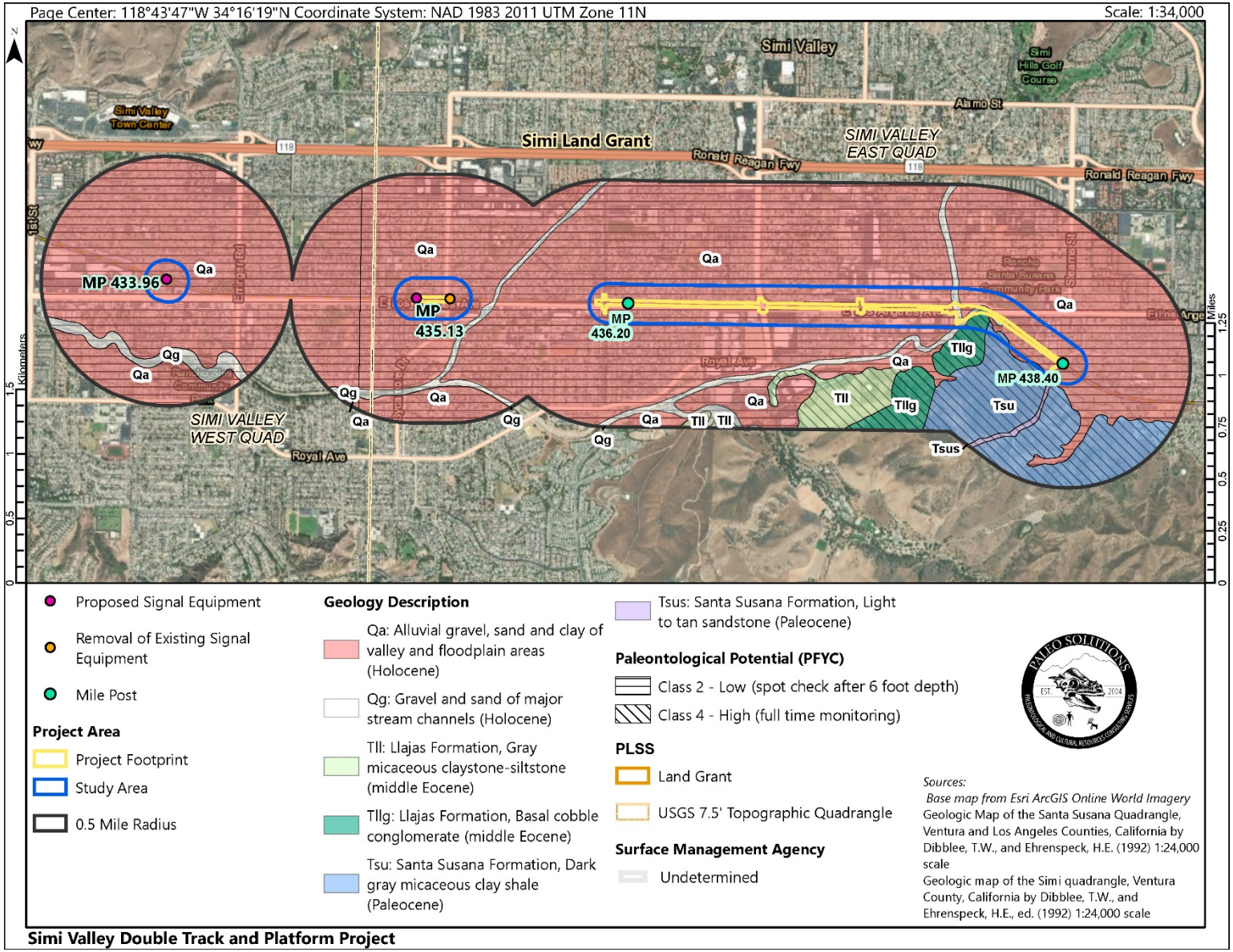
## Figure 2-2. Project Overview Map (Sheet 2 of 4)

## Figure 2-2. Project Overview Map (Sheet 3 of 4)

## Figure 2-2. Project Overview Map (Sheet 4 of 4)



## Figure 2-3. Project Geologic Map



# 3 Regulatory Setting

This section of the memorandum presents the state and local regulatory requirements pertaining to paleontological resources that could apply to the Project.

## 3.1 State Regulations

### 3.1.1 CEQA

The procedures, types of activities, persons, and public agencies required to comply with CEQA are defined in the Guidelines for Implementation of CEQA (State CEQA Guidelines), as amended on March 18, 2010 (Title 14, Section 15000 et seq. of the California Code of Regulations), and further amended January 4, 2013, and December 28, 2018. One of the questions listed in the CEQA Environmental Checklist is: “Would the project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?” (State CEQA Guidelines Appendix G, Section VII, Part F).

### 3.1.2 State of California Public Resource Code

The California Public Resources Code (Chapter 1.7), Sections 5097 and 30244, include additional state-level requirements for the assessment and management of paleontological resources. These statutes require reasonable mitigation of adverse impacts on paleontological resources resulting from development on state lands, and define the excavation, destruction, or removal of paleontological sites or features from public lands without the express permission of the jurisdictional agency as a misdemeanor. As used in Section 5097, state lands refer to lands owned by, or under the jurisdiction of, the state or any state agency. Public lands are defined as lands owned by, or under the jurisdiction of, the state, or any city, county, district, authority, or public corporation, or any agency thereof.

## 3.2 Local Regulations

### 3.2.1 Ventura County

The Resources Element of the *Ventura County General Plan* (County of Ventura 2013) specifically addresses paleontological resources in chapter 1.8. This chapter discusses the paleontological background and resources extensively and provides two goals (1.8.1.1 and 1.8.1.2) and three policies (1.8.2.1, 1.8.2.2, and 1.8.2.3) for the preservation of paleontological resources within the county. Section 1.8.3 has one program regarding paleontological resources. The two goals require that the county identify, inventory, preserve, and protect the paleontological resources of Ventura County for their scientific, educational, and cultural value. Additionally, the county must work to enhance cooperation with cities, special districts, other appropriate organizations, and private landowners in acknowledging and preserving the county's paleontological resources.

The three policies pertaining to paleontological resources state that discretionary developments will be assessed for potential paleontological resource impacts—except when exempt from such requirements by CEQA. Such assessments will be incorporated into a countywide paleontological resource database. Discretionary development will be designed or re-designed to avoid potential

impacts to significant paleontological resources whenever possible. Unavoidable impacts, whenever possible, will be reduced to a less than significant level and/or will be mitigated by extracting maximum recoverable data. Determinations of impacts, significance, and mitigation will be made by qualified paleontological consultants. Finally, mitigation of significant impacts on paleontological resources will be performed in consultation with professionals.

One program item specifically relates to paleontological resources and paleontological mitigation. It states that Ventura County's Planning Division will continue to compile and retain a list of qualified paleontological consultants to provide additional information to complete Initial Studies and Environmental Analyses.

# 4 Methods

The paleontological scope of work included an analysis of existing data, consisting of a geologic map review, a review of literature and online databases, and a review of the Natural History Museum of Los Angeles County (LACM) record search. Paleontological sensitivity assignments were determined using the Bureau of Land Management (BLM) Potential Fossil Yield Classification (PFYC) system (BLM 2016). Betsy Kruk, M.S., completed the background research and authored this memorandum. Elisa Barrios, B.S., prepared the geographic information system maps. Courtney Richards, M.S., performed the technical review of this memorandum and oversaw all aspects of the Project as the paleontological principal investigator.

The paleontological resources study area is defined as the surface of the Project site, the subsurface of the Project site, and a 500-foot buffer around the Project site.

## 4.1 Analysis of Existing Data

Paleo Solutions reviewed geologic mapping of the Project site and a 0.5-mile buffer by Dibblee and Ehrenspeck (1992a, 1992b). The literature reviewed included published and unpublished scientific papers. A paleontological museum record search was conducted at LACM. Samuel McLeod, Ph.D., conducted the search (dated July 3, 2020), which is included in Attachment 1. Additional record searches of online databases, including the University of California Museum of Paleontology (UCMP) and the PaleoBiology Database (PBDB), were also completed by Paleo Solutions.

## 4.2 Criteria for Evaluating Paleontological Sensitivity

Because of its demonstrated usefulness as a resource management tool, the PFYC has been utilized for many years for projects across the country, regardless of land ownership. It is a predictive resource management tool that classifies geologic units on their likelihood to contain paleontological resources on a scale of 1 (very low potential) to 5 (very high potential). This system is intended to aid in predicting, assessing, and mitigating paleontological resources. The PFYC ranking system is summarized in Table 4-1.

### Table 4-1. Potential Fossil Yield Classification

| BLM PFYC Designation | Assignment Criteria Guidelines and Management Summary (PFYC System) |
|---|---|
| 1 = Very Low Potential | The geologic units are not likely to contain recognizable paleontological resources. |
| | The units are igneous or metamorphic in nature and are not likely to contain recognizable paleontological resources apart from air-fall and reworked volcanic ash units. |
| | The units are Precambrian in age. |
| | Management concern is usually negligible, and impact mitigation is unnecessary except in rare or isolated circumstances. |
| 2 = Low Potential | The geologic units are not likely to contain paleontological resources. |
| | Field surveys have verified that scientifically important paleontological resources are not present or are rare. |
| | The units are generally younger than 10,000 years before present. |
| | The units are recent eolian deposits. |
| | The sediments exhibit substantial physical and chemical changes (i.e., diagenetic alteration) that make fossil preservation unlikely. |
| | Management concern is generally low, and impact mitigation is usually unnecessary except in occasional or isolated circumstances. |
| 3 = Moderate Potential | The geologic units are sedimentary in origin, and the fossil content varies in significance, abundance, and predictable occurrence. |
| | The units are marine in origin with sporadic known occurrences of paleontological resources. |
| | Paleontological resources may occur intermittently, but these occurrences are widely scattered. |
| | The potential for authorized land use to impact a scientifically important paleontological resource is known to be low to moderate. |
| | Management concerns are moderate. Management options could include record searches, predisturbance surveys, monitoring, mitigation, or avoidance. Opportunities may exist for hobby collecting. Surface-disturbing activities may require sufficient assessment to determine whether scientifically important paleontological resources occur in the area of a proposed action, and whether the action could affect the paleontological resources. |
| 4 = High Potential | The geologic units are known to contain a high occurrence of paleontological resources. |
| | Scientifically important paleontological resources have been documented in the units but may vary in occurrence and predictability. |
| | Rare or uncommon fossils, including nonvertebrate (such as soft body preservation) or unusual plant fossils, may be present in the units. |
| | Illegal collecting activities may impact some areas of the unit. |

### Table 4-1. Potential Fossil Yield Classification

| BLM PFYC Designation | Assignment Criteria Guidelines and Management Summary (PFYC System) |
|---|---|
| | Management concern is moderate to high depending on the proposed action. A field survey by a qualified paleontologist is often needed to assess local conditions. On-site monitoring or spot-checking may be necessary during land-disturbing activities. Avoidance of known paleontological resources may be necessary. |
| 5 = Very High Potential | The geologic units are highly fossiliferous and consistently and predictably produce scientifically important paleontological resources. |
| | Scientifically important paleontological resources have been documented and occur consistently in the units. |
| | Paleontological resources in the units are highly susceptible to adverse impacts from surface disturbing activities. |
| | The unit is frequently the focus of illegal collecting activities. |
| | Management concern is high to very high. A field survey by a qualified paleontologist is almost always needed, and on-site monitoring may be necessary during land use activities. Avoidance or resource preservation through controlled access, designation of areas of avoidance, or special management designations should be considered. |
| U = Unknown Potential | The geologic units cannot receive informed PFYC assignments. |
| | The geological units may exhibit features or preservational conditions that suggest scientifically important paleontological resources could be present, but little information about the actual paleontological resources of the unit or area is known. |
| | The geologic units represented on a map are based on lithologic character or basis of origin but have not been studied in detail. |
| | Scientific literature for the units does not exist or does not reveal the nature of paleontological resources in the units. |
| | Reports of paleontological resources in the units are anecdotal or have not been verified. |
| | The area or geologic unit is poorly or under-studied. |
| | BLM staff has not yet been able to assess the nature of the geologic unit. |
| | Until a provisional assignment is made, geologic units with unknown potential have medium to high management concerns. Field surveys are normally necessary, especially prior to authorizing a ground-disturbing activity. |

Source: BLM 2016

Notes:

BLM=Bureau of Land Management; PFYC=Potential Fossil Yield Classification

# 5 Results

The Project site is located within the Los Angeles Basin, which is one of the largest and deepest valleys in Southern California (Prothero 2017). The Los Angeles Basin is traditionally considered to be part of the Peninsular Ranges Geomorphic Province but is tectonically related to the Transverse Ranges Geomorphic Province (Harden 2004). The Los Angeles Basin is filled with over 18,000 feet of sediments that accumulated over the past 4 million years as a result of uplift of the mountains of the western Transverse Ranges and contemporaneous sinking of the basin associated with the rotation of the Transverse Ranges (Harden 2004; Prothero 2017; Norris and Webb 1990).

## 5.1 Geologic Map and Literature Review

Geologic mapping by Dibblee and Ehrenspeck (1992a, 1992b) indicates that the Project site is underlain by Holocene-age alluvial gravel, sand, and clay of valley and floodplain areas; Holocene-age gravel and sand of major stream channels; and middle Eocene-age Llajas Formation, basal cobble conglomerate. In addition, middle Eocene-age Llajas Formation, gray micaceous claystone-siltstone; Paleocene-age Santa Susana Formation, dark gray micaceous clay; and Paleocene-age Santa Susana Formation, light to tan sandstone are mapped within a 0.5-mile buffer of the Project site (Figure 2-3). The geologic units within the 0.5-mile buffer may be present in the subsurface of the Project site, and unmapped recent artificial fill is likely present at the surface of the Project site. Therefore, these units are included in the paleontological analysis.

### 5.1.1 Artificial Fill

Artificial fill comprises recent deposits of previously disturbed sediments emplaced by construction operations and are found in areas where recent construction has taken place. Color is highly variable, and sediments are mottled in appearance. These sediments are not mapped within the Project site but are likely to be encountered in previously disturbed portions of the Project site.

### 5.1.2 Younger Sedimentary Deposits

Younger surficial sedimentary deposits are Holocene-age (less than 11,000 years old) and include Holocene-age alluvial gravel, sand, and clay of valley and floodplain areas and Holocene-age gravel and sand of major stream channels. These deposits are generally unconsolidated and undissected (Dibblee and Ehrenspeck 1992a, 1992b). Holocene-age alluvial gravel, sand, and clay underlies the majority of the Project site, while Holocene-age gravel and sand of major stream channels underlies the Project site in a small area just west of the Simi Valley Station (Figure 2-3).

### 5.1.3 Older Sedimentary Deposits

Older sedimentary deposits were formed during the Pleistocene (approximately 11,000 years ago to 2.58 million years ago). These sediments are comprised of older alluvial gravel, sand, and silt/clay, more specifically, sub-angular detritus of Miocene-age shale and sandstone (Dibblee and Ehrenspeck 1992a, 1992b). Pleistocene-age older alluvium is mapped due north of the Project site, but outside of the 0.5-mile buffer. Based on the regional mapping and the stratigraphic relationship between younger and older alluvial units, older alluvial deposits are likely at various depths beneath Holocene-age deposits within portions of the Project site.

### 5.1.4 Llajas Formation

Middle Eocene-age Llajas Formation was deposited between approximately 38 and 47.8 million years ago and is comprised of two members: a gray micaceous claystone-siltstone and light gray to tan, soft to semi-friable sandstone that is mostly fine-grained with claystone predominating south of Simi Valley; and a gray to brown basal cobble conglomerate composed of granitic, metavolcanic, and quartzitic cobbles in a sandy matrix (Dibblee and Ehrenspeck 1992a, 1992b). Middle Eocene-age Llajas Formation is mapped to the south and southeast of the Simi Valley Station and continues west along the tracks until the Tapo Canyon Road at-grade crossing (Figure 2-3).

### 5.1.5 Santa Susana Formation

Paleocene-age Santa Susana Formation was deposited between approximately 56 and 66 million years ago and is comprised of dark gray micaceous clay shale that includes siltstone and thin sandstone layers and a light gray to tan sandstone (Dibblee and Ehrenspeck 1992a, 1992b). Paleocene-age Santa Susana Formation is mapped to the south and southeast of the Project site between MP 438.40 and the Simi Valley Station (Figure 2-3).

## 5.2 Paleontological Resources

### 5.2.1 Paleontological Search Results

Paleo Solutions requested a paleontological search of records maintained by LACM. The museum responded on July 3, 2020 that no vertebrate fossil localities are recorded from within the Project site (McLeod 2020). However, there are several localities within the Project vicinity from geologic units similar to those that underlie the Project site. Specifically, localities LACM 7594, 7455, 6107, and 1406 are recorded from Pleistocene-age older sedimentary deposits.

Locality 7594, located just east of due north of the Project site, at Marr Ranch, near the mouth of Chivo Canyon produced fossil mastodon (*Mammut*) (McLeod 2020; Table 5-1). Locality 7455, located west-northwest of the Project site, in the ravine just west of Dry Canyon, produced fossil mastodon (*Mammut*) (McLeod 2020; Table 5-1). Locality 6107, located west-northwest of the Project site, in a small eastern tributary of Alamos Canyon, produced fossil horse (*Equus occidentalis*) (McLeod 2020; Table 5-1). Locality 1406, located in Santa Susana Pass, due east of the Project site, produced fossil mastodon (*Mammut*) (McLeod 2020; Table 5-1).

### 5.2.2 Literature and Database Search Results

#### Artificial fill

Any fossil resources contained within these sediments would have been removed from their original deposition locations and lack critical stratigraphic contextual data. Therefore, these deposits are considered to have a low potential (PFYC 2) for producing scientifically important paleontological resources based on BLM PFYC guidelines (BLM 2016).

### Younger Sedimentary Deposits

Holocene-age sediments are typically too young to contain fossilized material (BLM 2016), but they may overlie sensitive older (e.g., Pleistocene- to Paleocene-age) deposits at variable depth. Holocene-age alluvial gravel, sand, and clay of valley and floodplain areas, and Holocene-age gravel and sand of major stream channels are considered to have a low potential (PFYC 2) for producing scientifically important paleontological resources based on BLM PFYC guidelines (BLM 2016).

### Older Sedimentary Deposits

Recorded specimens from Ventura County include flightless sea duck (*Chendytes* sp., *Chendytes lawi*, *Chendytes milleri*), mammoth (*Mammuthus, Mammuthus pacificus*), bison (*Bison*), horse (*Equus*), and seal (*Pinnipedia*) (PBDB 2020; UCMP 2020; Table 5-1). Additional localities recorded from Pleistocene-age sedimentary deposits throughout Southern California have produced specimens including mammoth (*Mammuthus*), mastodon (*Mammut*), camel (Camelidae), horse (Equidae), bison (*Bison*), giant ground sloth (*Megatherium*), peccary (Tayassuidae), cheetah (*Acinonyx*), lion (*Panthera*), saber-toothed cat (*Smilodon*), capybara (*Hydrochoerus*), dire wolf (*Canis dirus*), and numerous taxa of smaller mammals (Rodentia) (Blake 1991; Jahns 1954; Jefferson 1991; Table 5-1). Therefore, late Pleistocene-age older sedimentary deposits are considered to have a moderate potential (PFYC 3) for producing paleontological resources based on BLM PFYC guidelines (BLM 2016).

### Llajas Formation

Recorded specimens from Ventura County include gastropod (Gastropoda), bivalve (*Bivalvia*), eagle ray (*Myliobatis* sp.), mackerel shark (*Striatolamia macrota*), and sand shark (*Odontaspis* sp.) (PBDB 2020; UCMP 2020; Table 5-1). Therefore, middle Eocene-age Llajas Formation, gray micaceous claystone-siltstone and basal cobble conglomerate are considered to have a moderate potential (PFYC 3) for producing paleontological resources based on BLM PFYC guidelines (BLM 2016).

### Santa Susana Formation

Recorded specimens from Ventura County include turtle/tortoise (Testudines), hidden neck turtle (Cryptodira), sand shark (*Carcharias clavata*), gastropod (Gastropoda), and bivalve (*Bivalvia*) (PBDB 2020; UCMP 2020; Table 5-1). Therefore, Paleocene-age Santa Susana Formation, dark gray micaceous clay shale and light to tan sandstone are considered to have a moderate potential (PFYC 3) for producing paleontological resources based on BLM PFYC guidelines (BLM 2016).

## Table 5-1. Paleontological Literature and Record Search Results Summary

| Institutional Locality Number or Name | Geologic Unit and Age | Taxon | Common Name | Location | Source |
|---|---|---|---|---|---|
| LACM 7594 | Older alluvium (Pleistocene) | *Mammut* | mastodon | Due north of the Project site, at Marr Ranch, near the mouth of Chivo Canyon | McLeod 2020 |
| LACM 7455 | Older alluvium (Pleistocene) | *Mammut* | mastodon | West-northwest of the Project site, in the ravine just west of Dry Canyon | McLeod 2020 |
| LACM 6107 | Older alluvium (Pleistocene) | *Equus occidentalis* | horse | West-northwest of the Project site, in a small eastern tributary of Alamos Canyon | McLeod 2020 |
| LACM 1406 | Older alluvium (Pleistocene) | *Mammut* | mastodon | Santa Susana Pass, almost due east of the Project site | McLeod 2020 |
| UCMP V78030; UCMP V65287; UCMP V5809; UCMP V5756; PBDB 200315 | Older sedimentary deposits (Pleistocene) | *Chendytes sp.*<br>*Chendytes lawi*<br>*Chendytes milleri*<br>*Mammuthus*<br>*Mammuthus pacificus*<br>*Bison*<br>*Equus*<br>*Pinnipedia* | flightless sea duck<br>flightless sea duck<br>flightless sea duck<br>mammoth<br>mammoth<br>bison<br>horse<br>seal | Ventura County | UCMP 2020 |
| Not reported | Older sedimentary deposits (Pleistocene) | *Mammuthus*<br>*Mammut*<br>Camelidae<br>Equidae<br>*Bison*<br>*Megatherium*<br>Tayassuidae<br>*Acinonyx* | mammoth<br>mastodon<br>camel<br>horse<br>bison<br>giant ground sloth<br>peccary<br>cheetah | Southern California | Blake 1991;<br>Jahns 1954;<br>Jefferson 1991 |

**Table 5-1. Paleontological Literature and Record Search Results Summary**

| Institutional Locality Number or Name | Geologic Unit and Age | Taxon | Common Name | Location | Source |
|---|---|---|---|---|---|
| | | *Panthera*<br>*Smilodon*<br>*Hydrochoerus*<br>*Canis dirus*<br>Rodentia | lion<br>saber-toothed cat<br>capybara<br>dire wolf<br>rodent | | |
| UCMP 3310; UCMP 7019; PBDB 51922: PBDB 8012: | Llajas Formation (middle Eocene) | Gastropoda<br>*Bivalvia*<br>*Myliobatis sp.*<br>*Striatolamia macrota*<br>*Odontaspis sp.* | gastropod<br>bivalve<br>eagle ray<br>mackerel shark<br>sand shark | Ventura County | PBDB 2020; UCMP 2020 |
| UCMP V5061; UCMP 3754: PBDB 193035; PBDB 177668 | Santa Susana Formation (Paleocene) | *Testudines*<br>*Cryptodira*<br>*Carcharias clavata*<br>Gastropoda<br>*Bivalvia* | turtle/tortoise<br>hidden neck turtle<br>sand shark<br>gastropod<br>bivalve | Ventura County | UCMP 2020 |

Notes:
LACM=Natural History Museum of Los Angeles County; PBDB=PaleoBiology Database; UCMP=University of California Museum of Paleontology

# 6 Impacts on Paleontological Resources

Impacts on paleontological resources can generally be classified as direct, indirect, or cumulative. Direct adverse impacts on surface or subsurface paleontological resources are the result of destruction by breakage and crushing as the result of surface disturbing actions, including construction excavations. In areas that contain paleontologically sensitive geologic units, ground disturbance has the potential to adversely impact surface and subsurface paleontological resources of scientific importance. Without mitigation, these fossils, and the paleontological data they could provide if properly recovered and documented, could be adversely impacted (damaged or destroyed), rendering them permanently unavailable to science and society.

Indirect impacts typically include those effects that result from the continuing implementation of management decisions and resulting activities, including normal ongoing operations of facilities constructed within a given project site. They also occur as the result of the construction of new roads and trails in areas that were previously less accessible. This increases public access, and therefore, increases the likelihood of the loss of paleontological resources through vandalism and unlawful collecting. Human activities that increase erosion also cause indirect impacts on surface and subsurface fossils as the result of exposure, transport, weathering, and reburial.

Cumulative impacts can result from incrementally minor, but collectively significant, actions taking place over a period of time. The incremental loss of paleontological resources over time as a result of construction-related surface disturbance or vandalism and unlawful collection would represent a significant cumulative adverse impact because it would result in the destruction of nonrenewable paleontological resources and the associated irretrievable loss of scientific information.

Excavations within the Project site that impact middle Eocene-age Llajas Formation at the surface (between Simi Valley Station and Tapo Canyon Road at-grade crossing), or excavations that impact, Pleistocene-age older sedimentary deposits, middle Eocene-age Llajas Formation, or Paleocene-age Santa Susana Formation at depth could encounter scientifically important paleontological resources. Surface grading or shallow excavations entirely within artificial fill or Holocene-age sediments are unlikely to uncover scientifically important fossil vertebrate remains since any recovered resources will lack stratigraphic context. However, these deposits may shallowly overlie older sedimentary deposits, and adverse impacts could occur if excavations occur where older sedimentary deposits occur at depth (i.e., buried below the surface).

No indirect or cumulative impacts are anticipated from any of the planned Project activities.

# 7 Conclusions and Recommendations

Paleontological potential was assessed using the BLM PFYC system (BLM 2016) (Table 4-1). The Pleistocene-age older sedimentary deposits, middle Eocene-age Llajas Formation, and Paleocene-age Santa Susana Formation are considered to have a moderate paleontological potential (PFYC 3). Therefore, it is recommended that the following paleontological mitigation measures be implemented during the construction phase of the Project.

**MM-PAL-1:** **Paleontological Monitoring.** The Project proponent will retain a qualified paleontologist to perform full-time monitoring during excavations impacting geologic units with moderate paleontological potential (PFYC 3), either at the surface (e.g., upper 6 feet of the Project site) or at depth (e.g., present below the surface at depths greater than 6 feet deep). Monitoring locations are shown on Figure 2-3.

Excavations determined to be entirely within previously disturbed sediments do not require monitoring.

**MM-PAL-2:** **Paleontological Spot Checks.** The Project proponent will retain a qualified paleontologist to perform initial spot checks during excavations that exceed depths of 6 feet into geologic units with low paleontological potential (PFYC 2) to determine if paleontologically sensitive sediments (PFYC 3) are present in the subsurface. If paleontologically sensitive deposits are observed, full-time monitoring should be implemented in those areas in accordance with MM-PAL-1. Spot-checking locations are shown on Figure 2-3.

Excavations determined to be entirely within previously disturbed sediments do not require spot checks.

**MM-PAL-3:** **Unanticipated Discovery of Paleontological Resources.** In the event that paleontological resources are observed, work will be halted within 20 feet of the discovery until they can be evaluated by the qualified paleontologist. If determined to be scientifically important, the paleontological resources will be recovered, prepared to the point of curation, identified, and curated at the Natural History Museum of Los Angeles County (LACM) or another accredited repository along with associated field data.

**MM-PAL-4:** **Paleontological Reporting.** At the completion of ground-disturbing activities, a report documenting the methods and results of paleontological monitoring will be prepared by the qualified paleontologist.

Sincerely,

Courtney Richards, M.S.

Principal Paleontologist, Paleo Solutions

# 8 References

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# Attachment 1. Record Search Results

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Vertebrate Paleontology Section
Telephone: (213) 763-3325

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3 July 2020

Paleo Solutions, Inc.
911 South Primrose Avenue, Unit N
Monrovia, CA 91016

Attn: Elisa Barrios, GIS Specialist

re: Paleontological resources for the proposed Simi Valley Double Track and Platform Project, in the City of Simi Valley, Ventura County, project area

Dear Elisa:

I have conducted a thorough search of our paleontology collection records for the locality and specimen data for the proposed Simi Valley Double Track and Platform Project, in the City of Simi Valley, Ventura County, project area as outlined on the portion of the Simi Valley East USGS topographic quadrangle maps that you sent to me via e-mail on 18 June 2020. We do not have any vertebrate fossil localities that lie within the proposed project area boundaries, but we do have localities nearby from the same sedimentary deposits that occur at in the proposed project area, either at the surface or at depth.

Surface deposits in almost the entire proposed project area consist of younger Quaternary Alluvium, derived predominately as alluvial fan deposits from the hills to the north. These deposits typically do not contain significant vertebrate fossils in the very uppermost layers, but at relatively shallow depth they may be underlain with older Quaternary deposits that do contain significant vertebrate fossils.

Our closest fossil vertebrate locality from older Quaternary deposits is LACM 7594, just east of due north of the proposed project area at Marr Ranch near the mouth of Chivo Canyon, that produced a fossil specimen of mastodon, *Mammut*. West-northwest of the proposed project area, in the ravine just west of Dry Canyon, our older Quaternary locality LACM 7455 produced

a skull and partial skeleton of a mastodon, *Mammut*. Further to the west-northwest of the proposed project area, in a small eastern tributary of Alamos Canyon, our older Quaternary locality LACM 6107 produced a fossil specimen of horse, *Equus occidentalis*. In Santa Susana Pass almost due east of the proposed project area, our older Quaternary locality LACM 1406 produced another fossil specimen of mastodon, *Mammut*, from a stream bed.

Shallow excavations in the younger Quaternary Alluvium exposed throughout the proposed project area are unlikely to encounter significant fossil vertebrate remains. Deeper excavations that extend down into older Quaternary deposits, however, may well uncover significant vertebrate fossils. Any substantial excavations in the proposed project area, therefore, should be monitored closely to quickly and professionally recover any fossil remains discovered while not impeding development. Sediment samples should 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

Samuel A. McLeod, Ph.D.
Vertebrate Paleontology

enclosure: invoice