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Paleontological Resources Technical Report

Perris at Pentecostal
City of Moreno Valley
Riverside County, California

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Executive Summary

This technical report provides an assessment of paleontological resources at the proposed Perris at Pentecostal project (Project) site in the City of Moreno Valley, Riverside County, California. The purpose of this report is to identify and summarize paleontological resources that occur within the Project site and immediate vicinity, identify Project elements (if any) that may negatively impact paleontological resources, and provide, if necessary, recommendations to reduce any potential negative impacts to less than significant levels. The report includes the results of institutional records searches conducted at the San Diego Natural History Museum (SDNHM) and Western Science Center (WSC).

The 20.4-acre Project site is comprised of Assessor's Parcel Numbers (APNs) 485-220-006, -007, -008, -009, -015, -043, and -044, and is bordered to the south by Iris Avenue, to the west by Emma Lane, to the north by Santiago Drive, and to the east by existing commercial development (occupying APNs 485-220-030 and -031) and vacant lots (APNs 485-220-019, -026, and -027) along Perris Boulevard. The Project proposes to construct a residential development to include 18 2-story residential buildings (containing 12 units per building) and three 3-story residential buildings (containing a total of 210 units), for a total of 426 residential units. A 2-story 8,000 square foot club/leasing building is also planned. Additional anticipated site development will include construction of interior roadways, gates, surface parking lots, carports, hardscaping, landscaping, subgrade wet and dry utilities, and a water quality basin, located in the southeastern corner of the site. In addition, approximately 1.845 acres of public open space is proposed to be set aside in the northeastern portion of the site. The Project also includes offsite improvements to Emma Lane and Santiago Drive.

Based on published geologic mapping, the proposed Project site is primarily underlain by late Pleistocene- to Holocene-age (less than approximately 129,000 years old) young alluvial-fan deposits (Qya). In addition, early to middle Pleistocene-age (approximately 2.58 million to 774,000 years old) very old alluvial-fan deposits (Qvof) are mapped in the northeastern corner of the Project site. These older Pleistocene-age sediments presumably also underlie Holocene-age sediments throughout the site. The depth of this transition is conservatively estimated to occur at 10 feet below ground surface (bgs).

WSC reports several recorded fossil collection localities in similar Pleistocene-age alluvial deposits located approximately 5 miles northeast of the proposed Project site that produced fossil remains of giant ground sloth (*Megalonyx jeffersonii or Nothrotheriops shastensis*), camelid (*Hemiauchenia*), and horse (*Equus*). In addition, significant fossils were discovered approximately 17 miles to the southeast of the Project site in Pleistocene-age braided stream and lake deposits exposed during construction of the Diamond Valley Lake project. Recovered fossils from this project represent a diversity of "Ice Age" mammals (e.g., ground sloth, weasel, skunk, badger, wolf, saber-toothed cat, American lion, puma, peccary, camel, pronghorn antelope, deer, bison, mastodon, and mammoth). Further, the San Bernardino County Museum (SBCM) reports several recorded fossil collection localities in the City of Menifee, approximately 13 miles to the south of the Project site. These localities yielded fossil remains of western camel (*Camelops hesternus*), as well as small-bodied vertebrates including lizards, rodents, and rabbits.

A high paleontological sensitivity is assigned to Quaternary very old alluvial-fan deposits underlying the Project site. This assignment is supported by the occurrence of known fossils in these deposits within the City of Moreno Valley and elsewhere in western Riverside County. The high sensitivity (category B) rating assigned to these deposits by the County of Riverside specifically notes that fossils are likely to be encountered at or exceeding 4 feet bgs. These deposits are also conservatively estimated to occur at depths as shallow as 10 feet bgs in areas where Holocene young alluvial-fan deposits are mapped at the surface. Holocene-age alluvial-fan deposits are assigned a low paleontological potential/sensitivity rating.

As currently proposed, construction of the Project will involve only minor grading and trenching (extending approximately 5 feet bgs), with excavation of the water quality basin extending to approximately 9 feet bgs, and thus will likely be confined to Holocene-age alluvial fan deposits with a low paleontological potential/sensitivity. Based on these factors, construction is unlikely to result in negative impacts to paleontological resources, and therefore paleontological mitigation is not recommended for the Project. However, in the unlikely event that fossils are unearthed during construction (i.e., an inadvertent discovery), measures are provided to ensure proper collection and treatment of the fossils.

Contents

1.0 Introduction

1.1 Project Description

This technical report provides an assessment of paleontological resources for the proposed Perris at Pentecostal project (Project) site located in the City of Moreno Valley, Riverside County, California (Figure 1). The 20.4-acre Project site is comprised of Assessor's Parcel Numbers (APNs) 485-220-006, -007, -008, -009, -015, -043, and -044, and is bordered to the south by Iris Avenue, to the west by Emma Lane, to the north by Santiago Drive, and to the east by existing commercial development (occupying APNs 485-220-030 and -031) and vacant lots (APNs 485-220-019, -026, and -027) along Perris Boulevard. The Project proposes to construct a residential development to include 18 2-story residential buildings (containing 12 units per building) and three 3-story residential buildings (containing a total of 210 units), for a total of 426 residential units. A 2-story 8,000 square foot club/leasing building is also planned. Additional anticipated site development will include construction of interior roadways, gates, surface parking lots, carports, hardscaping, landscaping, subgrade wet and dry utilities, and a water quality basin, located in the southeastern corner of the site. In addition, approximately 1.845 acres of public open space is proposed to be set aside in the northeastern portion of the site. The Project also includes offsite improvements to Emma Lane and Santiago Drive.

1.2 Scope of Work

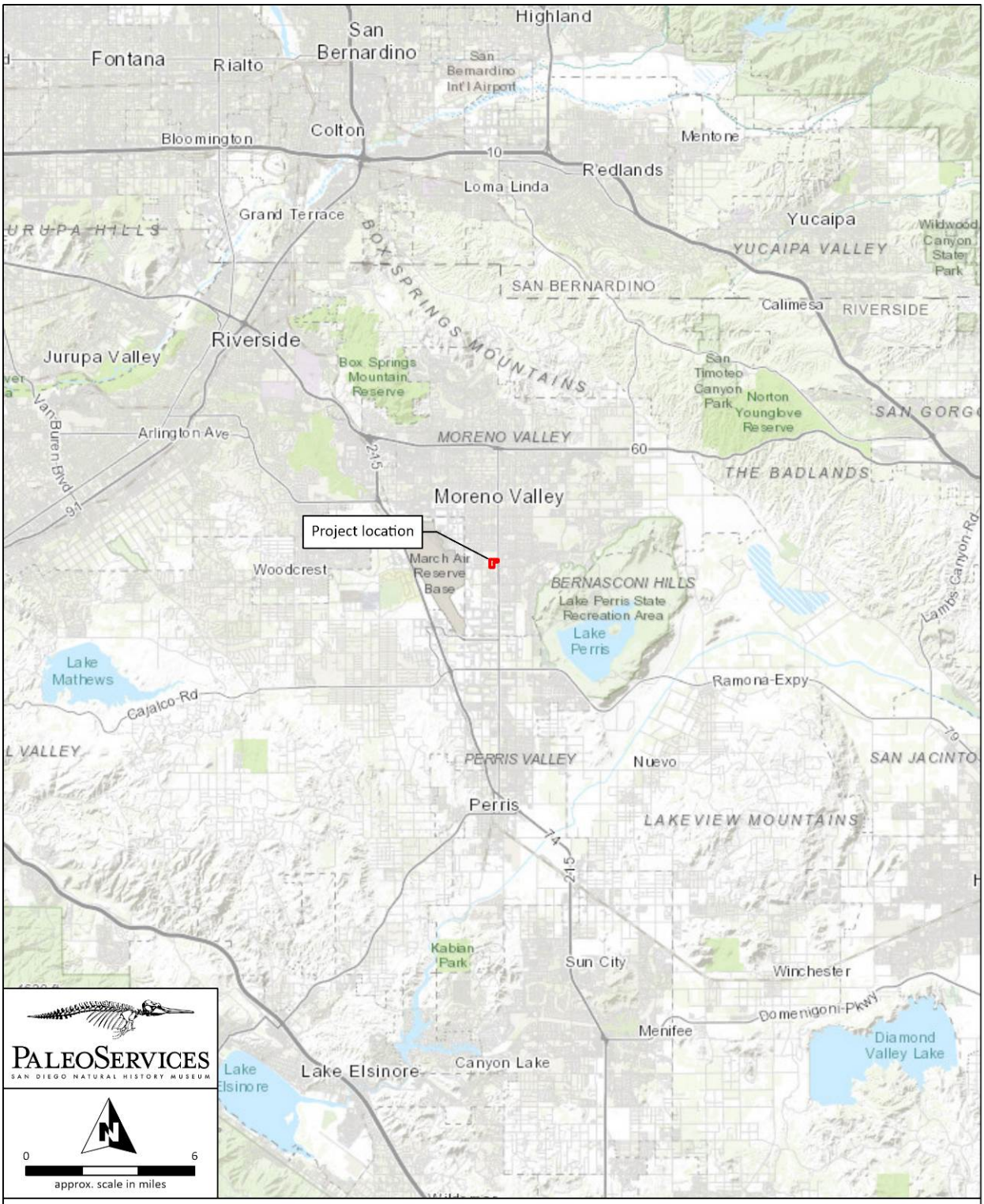
Because the Project site occurs in an area partially underlain by native sedimentary deposits, a paleontological resource assessment was conducted in order to satisfy City of Moreno Valley and County of Riverside requirements and to evaluate whether the proposed Project has the potential to negatively impact paleontological resources. The assessment addresses potential impacts to paleontological resources that may occur during construction of the proposed Project by summarizing existing paleontological resource data at the Project site, evaluating the significance of these resources, examining potential Project-related impacts to paleontological resources, and, if necessary, suggesting mitigation measures to reduce impacts to paleontological resources to less than significant levels. The assessment also includes the results of a literature review of relevant geological and paleontological reports and institutional records searches of the paleontological collections at the San Diego Natural History Museum (SDNHM) and Western Science Center (WSC). This technical report was prepared by Katie M. McComas and Thomas A. Deméré of the Department of PaleoServices, SDNHM.

1.3 Definition of Paleontological Resources

As defined here, paleontological resources (i.e., fossils) are the buried remains and/or traces of prehistoric organisms (i.e., animals, plants, and microbes). Body fossils such as bones, teeth, shells, leaves, and wood, as well as trace fossils such as tracks, trails, burrows, and footprints, are found in the geologic units/formations within which they were originally buried. The primary factor determining whether an object is a fossil or not is not how the organic remain or trace is preserved (e.g., "petrified"), but rather the age of the organic remain or trace. Although typically it is assumed that fossils must be older than ~11,700 years (i.e., the generally accepted end of the last glacial period of the Pleistocene Epoch), organic remains older than recorded human history and/or older than middle Holocene (about 5,000 radiocarbon years) can also be considered to represent fossils (SVP, 2010).

Fossils are considered important scientific and educational resources because they serve as direct and indirect evidence of prehistoric life and are used to understand the history of life on Earth, the nature of past environments and climates, the membership and structure of ancient ecosystems, and the pattern and process of organic evolution and extinction. In addition, fossils are considered to be non-renewable

resources because typically the organisms they represent no longer exist. Thus, once destroyed, a particular fossil can never be replaced.



Sources: Terrain Hillshade, World Topographic Map, Esri et al., 2021

Figure 1: Project overview map, Perris at Pentecostal, City of Moreno Valley, Riverside County, California

Finally, paleontological resources can be thought of as including not only the actual fossil remains and traces, but also the fossil collection localities and the geologic units containing those localities. The locality includes both the geographic and stratigraphic context of fossils—the place on the earth and stratum (deposited during a particular time in earth's history) from which the fossils were collected. Localities themselves may persist for decades, in the case of a fossil-bearing outcrop that is protected from natural or human impacts, or may be temporarily exposed and ultimately destroyed, as is the case for fossil-bearing strata uncovered by erosion or construction. Localities are documented with a set of coordinates and a measured stratigraphic section tied to elevation detailing the lithology of the fossil-bearing stratum as well as that of overlying and underlying strata. This information provides essential context for any future scientific study and educational use of the recovered fossils.

1.3.1 Definition of Significant Paleontological Resources

The California Environmental Quality Act (CEQA, Public Resources Code Section 21000 et seq.) dictates that a paleontological resource is considered significant if it "has yielded, or may be likely to yield, information important in prehistory or history" (Section 15064.5, [a][3][D]). The Society of Vertebrate Paleontology (SVP) has further defined significant paleontological resources as consisting of "fossils and fossiliferous deposits[…]consisting of identifiable vertebrate fossils, large or small, uncommon invertebrate, plant, and trace fossils, and other data that provide taphonomic, taxonomic, phylogenetic, paleoecologic, stratigraphic, and/or biochronologic information" (SVP, 2010).

1.4 Regulatory Framework

Paleontological resources are considered scientifically and educationally significant nonrenewable resources, and as such they are protected under state (e.g., California Environmental Quality Act [CEQA]; Public Resources Code) and local (City of Moreno Valley; County of Riverside) laws, regulations, and ordinances, outlined below.

1.4.1 State

Notable State legislative protection for paleontological resources includes the California Environmental Quality Act and the Public Resources Code.

The **California Environmental Quality Act (CEQA, Public Resources Code Section 21000 et seq.)** protects paleontological resources on both state and private lands in California. This act requires the identification of environmental impacts of a Project, the determination of significance of the impacts, and the identification of alternative and/or mitigation measures to reduce adverse environmental impacts. The Guidelines for the Implementation of CEQA (Title 14, Chapter 3, California Code of Regulations: 15000 et seq.) outlines these necessary procedures for complying with CEQA. Paleontological resources are specifically included as a question in the CEQA Environmental Checklist (Section 15023, Appendix G): "Will the proposed project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature." Also applicable to paleontological resources is the checklist question: "Does the project have the potential to… eliminate important examples of major periods of California history or pre-history."

Other state requirements for paleontological resource management are included in the **Public Resources Code (Chapter 1.7), Section 5097.5 and 30244**. These statutes prohibit the removal of any paleontological site or feature on public lands without permission of the jurisdictional agency, defines the removal of paleontological sites or features as a misdemeanor, and requires reasonable mitigation of adverse impacts to paleontological resources from developments on public (state) lands.

1.4.2 Local

The **Multipurpose Open Space Element of the Riverside County General Plan** identifies the occurrence of important historical, archaeological, and paleontological resources within the County. Several policies of the County's General Plan Multipurpose Open Space Element address paleontological resources directly, and provide the following recommendations:

- Policy OS 19.6: Whenever existing information indicates that a site proposed for development has high paleontological sensitivity … a paleontological resource impact mitigation program (PRIMP) shall be filed with the County Geologist prior to site grading. The PRIMP shall specify the steps to be taken to mitigate impacts to paleontological resources.
- Policy OS 19.7: Whenever existing information indicates that a site proposed for development has low paleontological sensitivity … no direct mitigation is required unless a fossil is encountered during site development. Should a fossil be encountered, the County Geologist shall be notified and a paleontologist shall be retained by the project proponent. The paleontologist shall document the extent and potential significance of the paleontological resources on the site and establish appropriate mitigation measures for further site development.
- Policy OS 19.8: Whenever existing information indicates that a site proposed for development has undetermined paleontological sensitivity … a report shall be filed with the County Geologist documenting the extent and potential significance of the paleontological resources on site and identifying mitigation measures for the fossil and for impacts to significant paleontological resources prior to approval of that department.
- Policy OS 19.9: Whenever paleontological resources are found, the County Geologist shall direct them to a facility within Riverside County for their curation, including the Western Science Center in the City of Hemet.

As outlined below, in Section 2.2, Riverside County has provided criteria to assess the sensitivity of paleontological resources.

The **City of Moreno Valley General Plan (Chapter 9, Section 9.7.3 Conservation Element 7-6)** sets forth the goal of reducing potential impacts to archaeological or paleontological resources in areas where they are "known or reasonably expected to exist, based on the citywide survey conducted by the UCR Archaeological Research Unit". The Final Program EIR incorporating the results of the referenced survey provides mapping that summarizes areas of High, Low, and Undetermined paleontological resource sensitivity (City of Moreno Valley, 2006).

2.0 Methods

2.1 Paleontological Records Searches and Literature Review

Paleontological records searches were conducted at the SDNHM and WSC in order to determine if any documented fossil collection localities occur within the Project site or immediate surrounding area. The SDNHM records search involved examination of the paleontological database for any records of known fossil collection localities from sedimentary deposits similar to those underlying the Project site within an approximately 1-mile radius. A formal records search of the paleontological collections at WSC was also requested (WSC, 2021; Appendix A).

Additionally, a review was conducted of relevant published geologic mapping (e.g., Morton and Matti, 2002; Morton and Miller, 2006), published geological and paleontological reports (e.g., Springer et al., 2009), and other relevant literature (e.g., unpublished paleontological mitigation reports). This approach was followed in recognition of the direct relationship between paleontological resources and the geologic units within which they are entombed. Knowing the geologic history of a particular area and the fossil productivity of geologic units that occur in that area, makes it is possible to predict where fossils may, or may not, be encountered.

2.2 Paleontological Resource Assessment Criteria

The County of Riverside has developed standards for assessing paleontological potential/sensitivity that are based, in part, on the standards set forth by Society of Vertebrate Paleontology (SVP, 2010), and that also take into account the possibility for adverse impacts due to human influence. The County recognizes a tripartite scale: High Potential (High A and High B subcategories), Low Potential, and Undetermined Potential.

The City of Moreno Valley General Plan EIR (July 2006) adopted the County of Riverside paleontological resource standards, with the exception that the City does not distinguish subcategories within the High Sensitivity category.

The specific criteria for each scale of Paleontological Sensitivity is outlined below.

2.2.1 High Potential/Sensitivity

High sensitivity is assigned to geologic units known to contain paleontological localities with rare, well-preserved, critical fossil materials for stratigraphic or paleoenvironmental interpretation, and fossils providing important information about the paleobiology and evolutionary history (phylogeny) of animal and plant groups. Generally speaking, highly sensitive formations produce vertebrate fossil remains or are considered to have the potential to produce such remains.

In Riverside County, High Paleontological Potential A is assigned to rock units present immediately at the surface, while High Paleontological Potential B is assigned to rock units found at a depth of 4 feet or greater below ground surface (bgs).

2.2.2 Low Potential/Sensitivity

Low sensitivity is assigned to geologic units that, based on their relative youthful age and/or high-energy depositional history, are judged unlikely to produce important fossil remains. Typically, low sensitivity formations produce invertebrate fossil remains in low abundance. Low paleontological potential is also assigned to geologic formations that are entirely igneous in origin and therefore have no potential for producing fossil remains, or to artificial fill materials which lose the stratigraphic/geologic context of any contained organic remains (e.g., fossils).

2.2.3 Undetermined Potential/Sensitivity

Undetermined sensitivity is assigned to geologic units that exhibit geologic features and preservational conditions that suggest significant fossils could be present, but little information about the geology and/or paleontological resources of the unit or the area is known. This may indicate the unit or area is poorly studied, and field surveys may be useful for more precisely determining the paleontological sensitivity.

2.3 Paleontological Impact Analysis

Direct impacts to paleontological resources occur when earthwork activities (e.g., mass grading, utility trenching) cut into the geologic units within which fossils are buried and physically destroy the fossil remains. As such, only earthwork activities that will disturb potentially fossil-bearing sedimentary deposits (i.e., those rated with a high or undetermined paleontological sensitivity) have the potential to significantly impact paleontological resources. Paleontological mitigation typically is recommended to reduce any negative impacts to paleontological resources to less than significant levels.

The purpose of the impact analysis is to determine which (if any) of the proposed Project-related earthwork activities may disturb potentially fossil-bearing geologic units, and where and at what depths this earthwork will occur. The paleontological impact analysis involved analysis of available project documents, and comparison with geological and paleontological data gathered during the records searches and literature review.

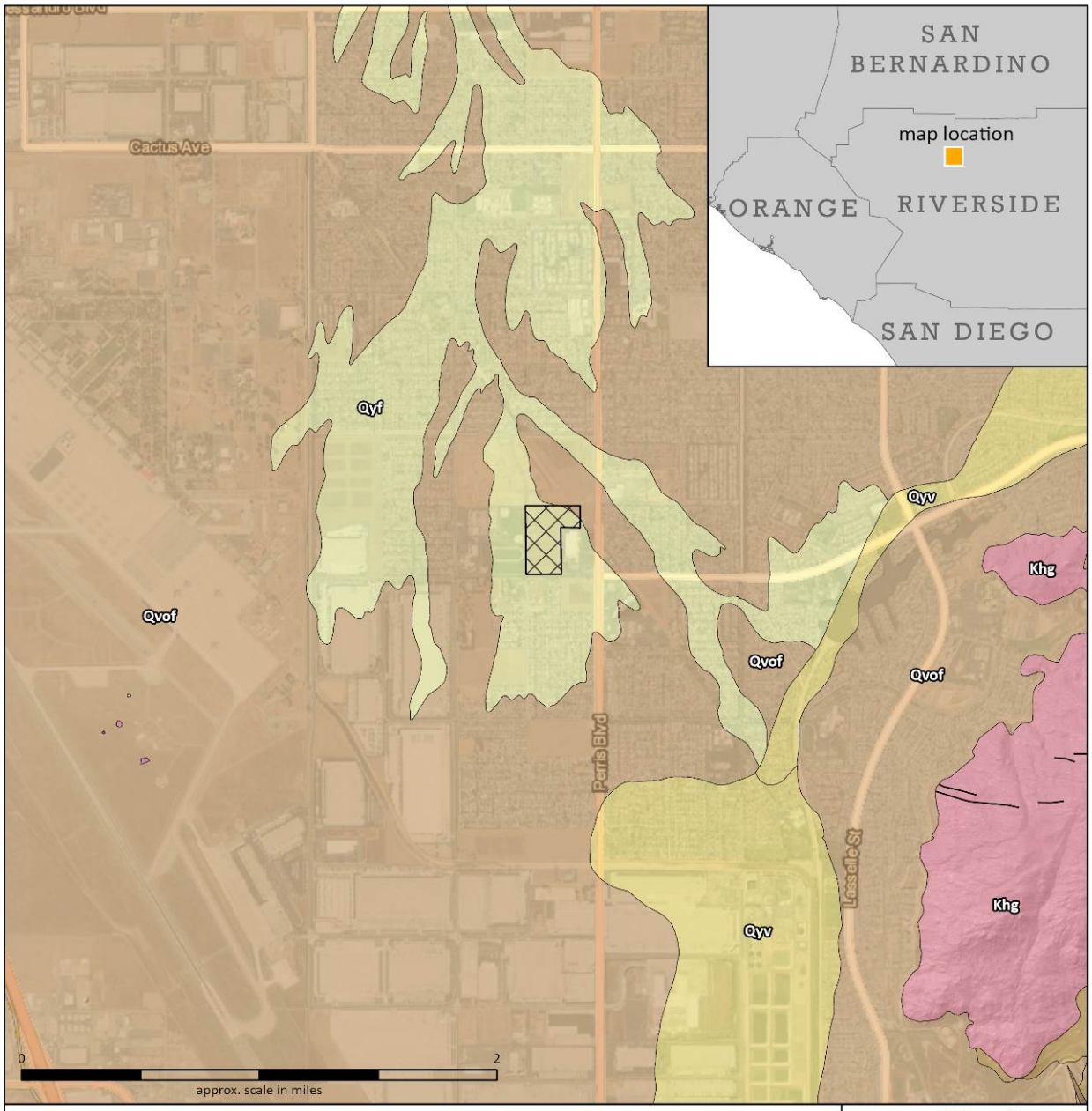
3.0 Results

3.1 Results of the Records Searches and Literature Review

3.1.1 Project Geology

Geologic setting: The proposed Project site is located within the Perris Block of the Peninsular Ranges Geomorphic Province (English, 1926; Norris and Webb, 1990). This structural block is surficially expressed as a relatively low relief, weathered basin punctuated by resistant hills and small mountains, and is surrounded by the Sana Ana Mountains to the west and south, the San Jacinto Mountains to the east, and the San Gabriel and San Bernardino Mountains to the north. The Perris Block is a fault-controlled region, with the San Jacinto Fault to the northeast and the Elsinore Fault to the southwest. Faulting is responsible for the uplift of the surrounding mountain ranges, and the down drop of the Perris Block. As a consequence, the surrounding mountain ranges are actively being eroded, and the sediments derived from this erosion are being deposited in the basin lowlands as alluvial fans and/or stream channel deposits. These surficial deposits overlie a deeply weathered mass of Cretaceous plutonic igneous rocks of the Peninsular Ranges Batholith and older metasedimentary basement rocks.

Project-specific geology: The proposed Project site is primarily underlain by late Pleistocene- to Holocene-age (less than approximately 129,000 years old) young alluvial-fan deposits (Qya) (Morton and Matti, 2002; Morton and Miller, 2006). In addition, early to middle Pleistocene-age (approximately 2.58 million to 774,000 years old) very old alluvial-fan deposits (Qvof) are mapped in the northeastern corner of the Project site (Morton and Matti, 2002; Morton and Miller, 2006) (Figure 2). These older Pleistocene-age sediments presumably also underlie Holocene-age sediments throughout the site. The depth of this transition is conservatively estimated to occur at 10 feet bgs. The alluvial sediments were likely deposited on an irregular plutonic bedrock terrain by a south-flowing drainage system or by local alluvial fans derived from the highlands to the east of the Project site.



Sources: Geology from Morton and Miller, 2006; Terrain Hillshade, World Transportation and Imagery, Esri et al., 2021

Figure 2: Geologic map of the Project site, Perris at Pentecostal, City of Moreno Valley, Riverside County, California

3.1.2 Project Paleontology

A records search request of paleontological collections data at the WSC generated a response that there are no recorded WSC fossil collection localities within a one mile radius of the proposed Project site. However, multiple localities were documented in similar Pleistocene-age alluvial deposits during construction of the Aldi Distribution Center, located approximately 5 miles northeast of the proposed Project site (WSC, 2021; Appendix A). These localities produced isolated fossil remains of giant ground sloth (*Megalonyx jeffersonii* or *Nothrotheriops shastensis*), camelid (*Hemiauchenia*), and horse (*Equus*) (LSA, 2014). The fossil-bearing deposits were exposed at depths of 11 and 13 feet bgs in an area where young alluvial-fan deposits are mapped at the surface (LSA, 2014).

In addition, significant fossils were discovered approximately 17 miles to the south-southeast of the Project site in Pleistocene-age braided stream and lake deposits exposed during construction of the Diamond Valley Lake project. Recovered fossils consist of large-bodied "Ice Age" mammals (e.g., ground sloth, weasel, skunk, badger, wolf, saber-toothed cat, American lion, puma, peccary, camel, pronghorn antelope, deer, bison, mastodon, and mammoth) (Springer et al., 2009, 2010). Further, the San Bernardino County Museum (SBCM) reports several recorded paleontological collection localities in the northeastern and eastern portions of the City of Menifee, approximately 13 miles south of the Project site. These fossil localities yielded fossil remains of western camel (*Camelops hesternus*) and small-bodied vertebrates including lizards, rodents, and rabbits (SBCM, 2010).

The paleontological records search conducted at the SDNHM found no records of fossil collection localities from within a one mile radius of the Project site.

3.2 Results of the Paleontological Resource Assessment

The City of Moreno Valley General Plan EIR (City of Moreno Valley, 2006) assigns all alluvial deposits exposed across the floor of Moreno Valley (including the Project site) a low paleontological potential, while the County of Riverside General Plan (County of Riverside, 2015) assigns the sedimentary deposits in the Project site and vicinity a high paleontological potential/sensitivity (category B). This difference in assignment of resource potential/sensitivity is most likely due to the fact that the City's report treats all alluvial deposits in the area as Recent in age and does not differentiate between the surficial, primarily Holocene-age sediments (Qyf) and the older Pleistocene-age sediments (Qvof) that occur in the shallow subsurface. The high paleontological potential/sensitivity (category B) rating assigned to older Pleistocene-age sediments by the County of Riverside is supported by the known occurrence of fossils in the City of Moreno Valley (Appendix A) and elsewhere in western Riverside County. The Holocene-age alluvial-fan deposits (Qyf) exposed at the Project site are assigned a low paleontological potential/sensitivity rating, based on the relatively young geologic age of these deposits.

Within the Project site, Qvof deposits are presumably exposed at or near the surface in the northeastern corner of the site (where indicated by existing geological mapping) and are estimated to be overlain by approximately 10 feet of primarily Holocene-age alluvial-fan deposits (Qyf) throughout the rest of the site (Figure 2). Therefore, a 4 foot depth impact threshold is applied where Qvof deposits are mapped at the surface and a 10 foot depth impact threshold is applied where Qyf deposits are mapped (Figure 3).

3.3 Results of the Paleontological Impact Analysis

Based on the preliminary grading plans, the Project proposes to construct 18 2-story buildings and three 3-story buildings containing a total of 426 residential units, a 2-story club/leasing building, and attendant surface parking, carports, interior roadways, gates, hardscaping, landscaping, subgrade wet and dry utilities, and offsite improvements to Emma Lane and Santiago Drive. Grading for the creation of level building pads and trenching for subgrade utilities is anticipated to extend approximately 5 feet bgs.

The grading plans also indicate that a water quality basin will be constructed in the southeastern corner of the site, adjacent to Iris Avenue. The basin is anticipated to require somewhat deeper excavations, extending approximately 9 feet bgs. The northeastern portion of the site is proposed to be set aside as public open space, and will be minimally landscaped, with cuts/fills on the order of approximately 2 vertical feet. Offsite improvements to Emma Lane and Santiago Drive will involve excavations extending approximately 1.5 to 2 feet bgs.

Based on the as-published geologic mapping of the site, the majority of site grading and trenching will take place in areas mapped as Qyf, where impacts to paleontological resources are unlikely to occur at depths shallower than 10 feet bgs. As currently proposed, construction excavation will not exceed this 10 foot depth threshold. Although the northeastern corner of the Project site has Qvof deposits mapped at the surface, the majority of this area is proposed as public open space, and only minimal grading (if any) is anticipated. The work that is proposed for this area will not exceed the 4 foot depth threshold for Qvof deposits, and is therefore unlikely to result in impacts to paleontological resources. General site grading and trenching for subgrade utilities in the far northeastern corner of the Project site also appear to be unlikely to extend significantly into areas mapped as Qvof deposits, and therefore this work is unlikely to result in impacts to paleontological resources. Offsite improvements to the eastern portion of Santiago Drive are also underlain by Qvof deposits, but grading in this area is anticipated to be relatively shallow (up to 2 feet bgs), and is therefore also unlikely to result in impacts to paleontological resources.

Table 1. Summary of Project impacts and paleontological monitoring recommendations.

Project Components	Anticipated Depth of Earthwork	Impact Analysis	Monitoring recommended?
Site grading	Approximately 5 feet bgs	No impacts anticipated	**No**
Trenching for subgrade utilities	Approximately 5 feet bgs	No impacts anticipated	**No**
Water quality basin excavation	Approximately 9 feet bgs	No impacts anticipated	**No**
Landscaping of public open space	Approximately 2 feet bgs	No impacts anticipated	**No**
Offsite improvements to Emma Lane & Santiago Drive	Approximately 2 feet bgs	No impacts anticipated	**No**

Sources: Terrain Hillshade, World Transportation and Imagery, Esri et al., 2021

Figure 3: Paleontological sensitivity map, Perris at Pentecostal, City of Moreno Valley, Riverside County, California

4.0 Recommendations & Conclusions

Implementation of a paleontological mitigation program is not recommended for the proposed Project because Project-related earthwork, as currently outlined, is not anticipated to negatively impact paleontological resources (i.e., earthwork will not extend deep enough to impact geologic units with high paleontological potential/sensitivity). However, in the unlikely event that fossils are unearthed during earthwork activities (i.e., an inadvertent discovery), the following measures should be implemented.

4.1 Mitigation Measures

MM PALEO-1: Upon discovery of an unearthed fossil, earthwork in the vicinity of the discovery shall immediately halt, and a Qualified Paleontologist should be retained to evaluate the discovery. Earthwork shall be diverted until the significance of the fossil discovery can be assessed by the Qualified Paleontologist. If the fossil discovery is deemed significant, the fossil shall be recovered using appropriate recovery techniques based on the type, size, and mode of preservation of the unearthed fossil. Relevant geologic, stratigraphic, and taphonomic data should be gathered during the recovery phase to provide critical provenance context. Earthwork may resume in the area of the fossil discovery once the fossil has been recovered, and the Qualified Paleontologist deems the site has been mitigated to the extent necessary. Additional earthwork following the fossil discovery may be monitored for paleontological resources on an as-needed basis, at the discretion of the Qualified Paleontologist.

A Qualified Paleontologist is defined as an individual with an M.S. or Ph.D. in paleontology or geology that is experienced with paleontological procedures and techniques, who is knowledgeable in the geology and paleontology of Riverside County, and who has worked as a paleontological mitigation project supervisor for at least one year.

MM PALEO-2: Recovered fossils shall be prepared, identified, catalogued, and stored in a recognized professional repository (e.g., Western Science Center) along with associated field notes, photographs, and compiled fossil locality data. Donation of the fossils should be accompanied by financial support for initial specimen storage. A final summary report should be completed that outlines the results of the mitigation program. This report should include discussions of the methods used, stratigraphic section(s) exposed, fossils collected, and significance of recovered fossils. This report shall be submitted to appropriate agencies, as well as to the designated repository.

5.0 References

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Appendix A

Records Search Results: Western Science Center

WESTERN SCIENCE CENTER

San Diego Natural History Museum
Katie McComas
1788 El Prado
San Diego, CA 92101

October 12, 2021

Dear Ms. McComas,

This letter presents the results of a record search conducted for the Perris at Pentecostal in the city of Moreno Valley, Riverside County, California. The project site is located north of Iris Avenue, south of Santiago Drive, east of Indian Street, and west of Perris Boulevard in Section 19, Township 3 South, and Range 3 West, on the *Sunnymead, CA* USGS 7.5-minute quadrangle.

The geologic units underlying the project area are mapped entirely as alluvial fan units dating from the early Pleistocene to Holocene epoch (Morton et al., 2002). Pleistocene alluvial units are considered to be of high paleontological sensitivity, and while the Western Science Center does not have localities within the project area or a one-mile radius, we do have multiple localities in similarly mapped sediments throughout Riverside County and as close as five miles to the northeast associated with the Aldi Distribution Center Project. The Aldi Distribution Center Project resulted in large herbivore specimens identified to *Equus* sp., *Hemiauchenia sp*., and *Megalonyx jeffersoni*, and Pleistocene sediments throughout Riverside County are known to produce fossils associated with mastodon (*Mammut pacificus*), mammoth (*Mammuthus columbi*), sabertooth cat (*Smilodon fatalis*), camel (*Camelops hesternus*) and many more.

Any fossil specimens recovered from the Perris at Pentecostal Project would be scientifically significant. Excavation activity associated with the development of the project area would impact the paleontologically sensitive Pleistocene alluvial units, and it is the recommendation of the Western Science Center that a paleontological resource mitigation program be put in place to monitor, salvage, and curate any recovered fossils from the study area.

If you have any questions, or would like further information about the Aldi Distribution Center Project, please feel free to contact me at dradford@westerncentermuseum.org

Sincerely,

Darla Radford
Collections Manager