

PALEONTOLOGICAL RECORDS SEARCH, LITERATURE REVIEW SUMMARY REPORT FOR THE PENTAIR INDUSTRIAL EXPANSION PROJECT

City of Moorpark

March 15, 2022
9620 Chesapeake Drive, Suite 202
San Diego, CA 92123
(21321)

Freddy Carrillo
Associate Planner
City of Moorpark
799 Moorpark Ave
Moorpark, CA 93021

Subject: Pentair Industrial Expansion Project Paleontological Records Search and Literature Review Summary Letter Report

Dear Mr. Carrillo,

Chambers Group, Inc. (Chambers Group) is providing this report for paleontological resources services to City of Moorpark in support of the proposed Pentair Industrial Expansion Project (Project) in the City of Moorpark, Ventura County, California. Chambers Group has completed a Desktop Assessment of Paleontological Resources sensitivity. This assessment included paleontological resources record search and literature review for the study area (Figure 1). The purpose of the review was to gather and analyze information needed to assess the potential for impacts to paleontological resources within the proposed Project site.

Location and Geologic Setting

The proposed Pentair Industrial Expansion Project in Moorpark is located within Little Simi Valley, an area with a complex geologic history. As part of the Transverse Ranges geomorphic province, the region is comprised of east-west trending sequence of mountain ranges and valleys. The province itself can be divided into over a dozen smaller regions including the late Cenozoic Ventura basin, an elongated sedimentary trough in which Moorpark is located (Squires 1997). The western portion of the basin is covered by the Pacific Ocean while the eastern boundary of the basin is the San Gabriel fault. The Ventura basin is bound by the Santa Ynez Mountains and Topatopa Mountains to the north and by the Santa Monica Mountains to the south.

Methods of Review

A paleontological record search was requested by the Natural History Museum of Los Angeles County on November 5, 2021. The records search results were provided to Chambers Group on November 19, 2021. The search produced no known fossil localities that lie within the Proposed Project site, but localities have been documented nearby within the same sedimentary deposits found within the Project site (Bell 2021). A fossil mammoth (*Mammuthus*) and a specimen belonging to the horse family (*Equidae*) (LACM VP 1680) was discovered from an unknown Pleistocene formation at depths 14-15 feet below ground surface in Conejo Valley, 1 mile northwest of Newbury Park. A fossil horse (*Equus occidentalis*) ([locality] LACM VP 6107) was found at the surface in Pleistocene terrace deposits east of Alamos Canyon and north of Hwy 118, Strathearn, and a Pleistocene-aged Mastodon (Mammut) (LACM VP 7455) from unknown depths was found at the Shea Homes Big Sky Ranch Development project off of Legacy Drive, north of Simi Valley. In addition to the macrovertebrates, scallops (*Aequipecten sp.*) (LACM IP 1146) were found at the surface where the Pico Formation was exposed along the south flank of the Las Posas Hills between Little Simi Valley and Santa Rosa



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Valley, unspecified surface finds of invertebrates (LACM IP 30280) from the Las Posas Sand south of Presilla Road, and an eagle ray (*Myliobatis*) was found at unknown depths from the Los Posas Sand at Los Posas Hills, Camarillo.

A self-search was also conducted through the University of California Museum of Paleontology Berkeley (UCMP) database. A tooth from a fossil horse (*Equus occidentalis*) (#32958) dating to the Pleistocene/Pliocene was discovered from the Saugus Formation in Camarillo, Ventura County.



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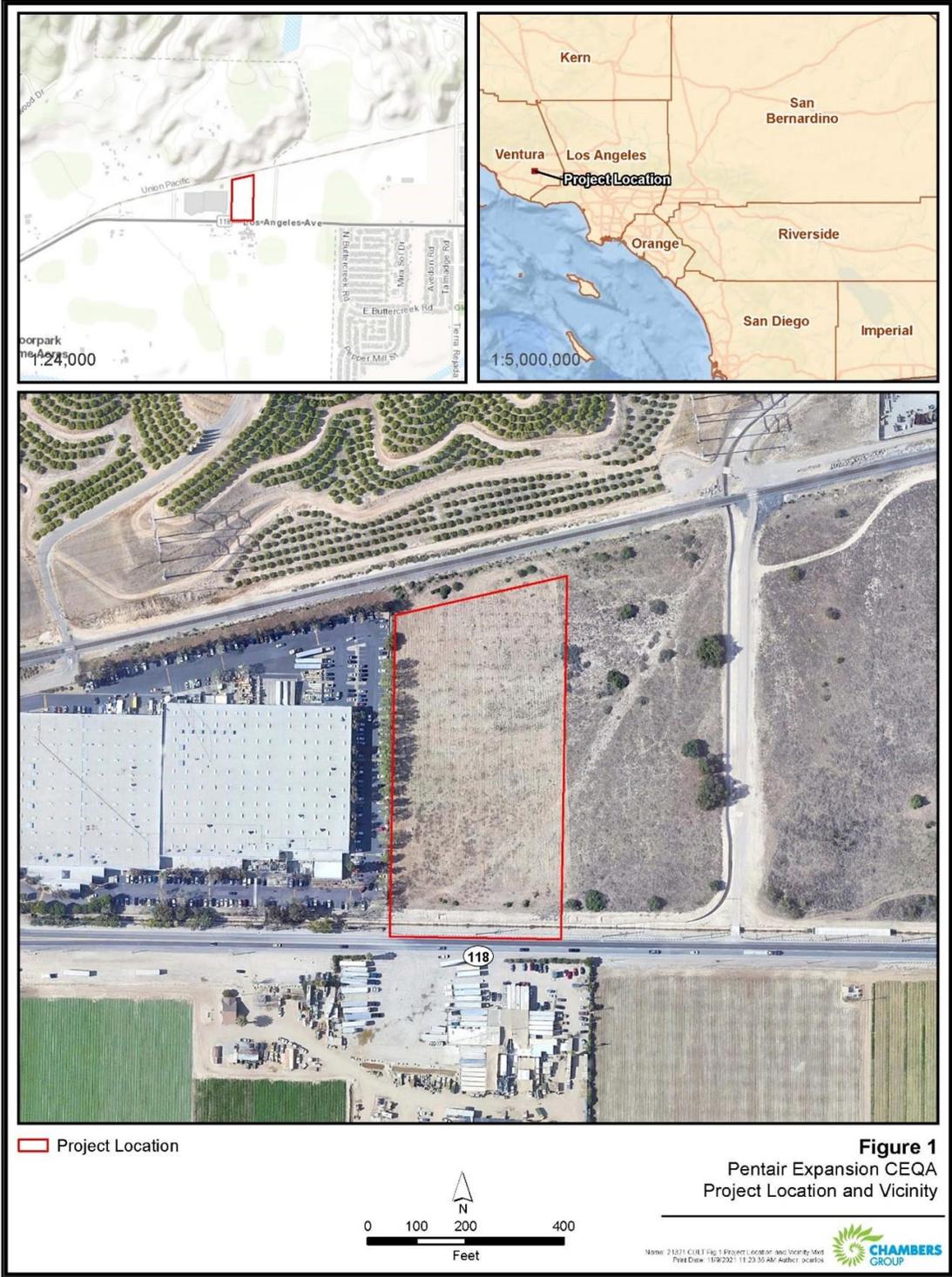


Figure 1: Project Location and Vicinity



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Discussion

As evident above, the occurrences of paleontological resources are closely tied to the geologic units (formations or members) that contain them. With this in mind, a detailed literature search was conducted on the geologic units underlying the Project site as well as their paleontological sensitivity to produce paleontological resources. Geologic mapping by Jennings and Strand (1969) indicates that Holocene alluvium (last 10,000 years) and upper Pleistocene (500,000 to 10,000 years) nonmarine terrace deposits have been mapped within the proposed Project. Given that paleontological resources have been documented nearby in deeper units, there is the potential to impact the marine to nonmarine Saugus Formation (late Pliocene to late Pleistocene), Las Posas Formation (early to middle Pleistocene), and Pliocene to middle Pleistocene Pico Formation as well. Below is a brief description of each geologic unit in the Project site.

Holocene Alluvium

Holocene alluvium surficial deposits cover the valley floor. This alluvium is composed of unconsolidated sandy, silty, clay materials representing alluvial fan and valley deposits, colluvium, active alluvial fans, and active stream deposits. These deposits are generally void of fossils due to their relatively young age.

Late Pleistocene Nonmarine Terrace Deposits

Quaternary terrace deposits appear mainly as soil-like varying from fine sandy clays to clayey sands to reddish-brown medium to very coarse sands and gravels (City of Moorpark 1994). As fossil vertebrates have been identified from Pleistocene deposits in the past, there is a likelihood of encountering similar fossils during Project construction.

Late Pliocene to late Pleistocene Saugus Formation

The Plio-Pleistocene Saugus Formation can be divided into a lower marine portion and a nonmarine upper portion. The lower portion is composed of interfingering sandstone, coquinite, and conglomerate deposits with occurrences of limestone and laminated mudstone representing a shallow marine environment (White 1985). The sandstone in this lower unit is very rich in macrofossils including snails, clams, sea urchins, sand dollars, great-white shark teeth, whale, and land plants (Squire 1997). The upper portion of the Saugus Formation consists of poorly indurated, medium to coarse sandstone interbedded with pebble-boulder conglomerate representing a river floodplain deposit (White 1985). The sandstone and conglomerate within this upper portion have yielded fossil remains of horse, tapir, deer, and mastodons (Squire 1997). The contact between the lower and upper is gradational and is represented by interfingering of shallow-marine beds with river deposits.

Early to middle Pleistocene Las Posas Formation

The Las Posas Formation consists of shallow marine, coarse sandstone silty sandstone, and pebbly sandstone with interbedded mudstone and conglomerate (National Park Service 2016). The formation crops out on either side of the Las Posas Valley in the Las Posas Hills, on the south side of the South Mountain/Oak Ridge west of Long Canyon, and west of Fillmore on the north side of the Santa Clara River in Ventura Basin. It conformably overlies the Pico Formation and is dominated by invertebrate fossils and bivalve-dominated beds.

Pliocene to middle Pleistocene Pico Formation

The Upper Pliocene Pico Formation represents marine siltstone and silty shale with minor sandstone and pebbly sandstone. The formation interfingers with brackish-water and nonmarine beds of the overlying Saugus Formation (Winterer and Durham 1962). Turbidity currents found in the lower part of the Pico Formation suggest the likely deposition of the mixed depth assemblage of molluscan faunas.



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Recommendations

Due to the sensitivity of the Project site and surrounding area to produce paleontological resources during ground disturbing activities, mitigation measures that are in line with standards set by the City of Moorpark and will serve to reduce potential impacts are recommended prior to ground disturbance. As well as following the County of Ventura's goals pertaining to paleontological resources outlined in Sections 1.8.1 & 1.8.2 of the Resources element of the County of Ventura General Plan, these mitigation measures are recommended to ensure that the Guidelines of the Society of Vertebrate Paleontology (SVP) and the Guidelines of the State Office of Historic Preservation are fulfilled and shall be performed in consultation with professional archaeologists and paleontologists. The following mitigation measures should be considered and implemented in support of this Project with the intent to reduce potential impacts to paleontological resources to less than significant:

MM PAL-01: Prior to issuance of a Zoning Clearance for a grading permit, the applicant shall be required to obtain the services of a qualified project paleontologist to remain on-call for the duration of the proposed ground disturbing construction activity. The paleontologist selected must be approved in writing by the Community Development Director. Upon approval or request by the Community Development Director, a paleontological mitigation plan (PMP) outlining procedures for paleontological data recovery shall be prepared for the Proposed Project and submitted to the Community Development Director for review and approval. The development and implementation of the PMP shall include consultations with the Applicant's engineering geologist as well as a requirement that the curation of all specimens recovered under any scenario shall be through the Los Angeles County Museum of Natural History (LACMNH). All specimens become the property of the City of Moorpark unless the City chooses otherwise. If the City accepts ownership, the curation location may be revised. The PMP shall include developing a multilevel ranking system, or Potential Fossil Yield Classification (PFYC), as a tool to demonstrate the potential yield of fossils within a given stratigraphic unit. The PMP shall outline the monitoring and salvage protocols to address paleontological resources encountered during ground disturbing activities. As well as the appropriate recording, collection, and processing protocols to appropriately address any resources discovered. The cost of data recovery is limited to the discovery of a reasonable sample of available material. The interpretation of reasonableness rests with the Community Development Director.

MM-PAL-2 At the completion of all ground-disturbing activities, the project paleontologist shall prepare a final paleontological mitigation report summarizing all monitoring efforts and observations, as performed in line with the PMP, and all paleontological resources encountered, if any. As well as providing follow-up reports of any specific discovery, if necessary.

Chambers Group is available to assist with any further support, document preparation, or consultation related to Paleontological resources. Please contact the Chambers Group Project Manager/Planner, Meghan Gibson, or the Chambers Group Principal Investigator for Paleontology and author of this report at the contact information below if you have any questions or comments regarding this report.



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Sincerely,
CHAMBERS GROUP, INC.

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