APPENDIX D-3

PALEONTOLOGICAL RESOURCES REVIEW

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MEMORANDUM

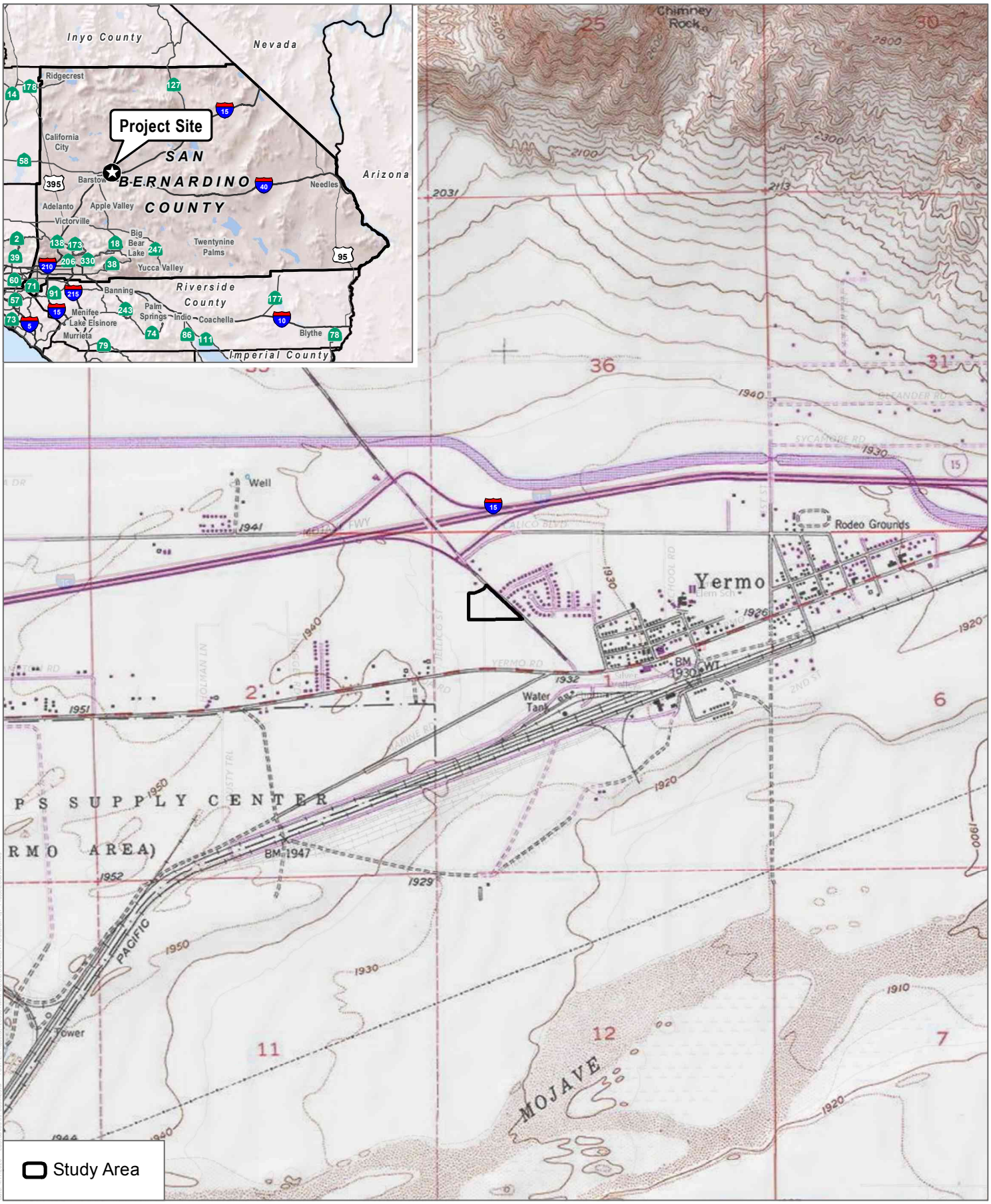
To:	LAV//Pinnacle Engineering
From:	Michael Williams, Ph.D.
Subject:	Paleontological Resources Review - Yermo Convenience Store and Gas Station
Date:	May 18, 2023
cc:	Jason Collins, Sarah Siren, Linda Kry, Heather McDevitt, Dudek
Attachment(s):	San Bernardino County Museum Records Search Results

Dudek is providing this memorandum after completing a review of the potential for impacts to paleontological resources during construction activities for the Yermo Convenience Store and Gas Station Project (proposed Project) site located in the City of Yermo, San Bernardino County, California. The County of San Bernardino (County) is the lead agency and responsible for compliance with the California Environmental Quality Act (CEQA). This paleontological resources study included a paleontological resources records search conducted by the San Bernardino County Museum (SBCM), in addition to a review of published geological maps and paleontological literature. This study was conducted in accordance with CEQA, the Mitigation Monitoring and Reporting Program adopted by the County (August 2020), and guidelines from the Society of Vertebrate Paleontology (SVP 2010).

Project Location and Description

The proposed Project is located in the Mojave Desert, in the City of Yermo, approximately 10 miles northeast of Barstow, just south of the Calico Mountains and approximately 0.20 miles south of Interstate (I)-15 Freeway. The proposed Project site falls on public land survey system (PLSS) Section 1 of Township 9 North, Range 1 East of the Yermo, CA 7.5-minute USGS Quadrangle (Figure 1). The proposed 5.72-acre Project site is currently undeveloped and is geographically bound by Telstar Court to the north, Calico Road to the east as well as undeveloped land immediately to the south and west.

The proposed Project includes the development of a convenience store and gas station.



SOURCE: USGS 7.5-Minute Series Yermo Quadrangle

DUDEK

0 1,000 2,000 Feet
0 285 570 Meters
1:24,000

FIGURE 1

Project Location

Yermo Gas Station Project

Regulatory Framework

California Environmental Quality Act

CEQA Guidelines require that all private and public activities not specifically exempted be evaluated against the potential for environmental damage, including effects to paleontological resources. Paleontological resources, which are limited, nonrenewable resources of scientific, cultural, and educational value, are recognized as part of the environment under these state guidelines. This study satisfies project requirements in accordance with CEQA (13 PRC, 21000 et seq.) and Public Resources Code Section 5097.5 (Stats 1965, c 1136, p. 2792). This analysis also complies with guidelines and significance criteria specified by SVP (2010).

Paleontological resources are explicitly afforded protection by CEQA, specifically in Section VII(f) of CEQA Guidelines Appendix G, the "Environmental Checklist Form," which addresses the potential for adverse impacts to "unique paleontological resource[s] or site[s] or … unique geological feature[s]." This provision covers fossils of signal importance – remains of species or genera new to science, for example, or fossils exhibiting features not previously recognized for a given animal group – as well as localities that yield fossils significant in their abundance, diversity, preservation, and so forth. Further, CEQA provides that generally, a resource shall be considered "historically significant" if it has yielded or may be likely to yield information important in prehistory (PRC 15064.5 [a][3][D]). Paleontological resources would fall within this category. The PRC, Chapter 1.7, sections 5097.5 and 30244 also regulates removal of paleontological resources from state lands, defines unauthorized removal of fossil resources as a misdemeanor, and requires mitigation of disturbed sites.

County of San Bernardino and Mitigation Monitoring and Reporting Program

The County completed a Final Program Environmental Impact Report (PEIR) in August 2020, State Clearinghouse No. 2017101033. The PEIR is a Countywide Plan, Chapter 5.5 addressing Paleontological Resources states, "This legislation directs the Secretaries of the U.S. Department of the Interior (USDI) and U.S. Department of Agriculture (USDA) to manage and protect paleontological resources on federal land using "scientific principles and expertise."

A Mitigation Monitoring and Reporting Program (MMRP) was developed in conjunction with the PEIR to "provide a vehicle" by which monitor mitigation measures and conditions of approval outlined in the San Bernardino Countywide Plan Draft Program Environmental Impact Report (PEIR) and the Final PEIR (State Clearinghouse No. 2017101033).

Geological and Paleontological Setting

The proposed Project is located within the in the Mojave Desert Geomorphic Province (Morton and Miller 2006; CGS 2002). This geomorphic province is characterized as a broad interior region of isolated mountain ranges separated by expanses of desert playas. There are two important fault trends that control topography, a prominent northwest to southeast trend and a secondary east-west trend (apparent alignment with Transverse Ranges is

significant). The Mojave Desert province is wedge-shaped, sharp-angled tract of arid land bounded by the Garlock fault to the north (southern boundary Sierra Nevada) and the San Andreas fault to the west, where it bends east from its northwest trend. The northern boundary of the Mojave Desert province is separated from the prominent Basin and Range by the eastern extension of the Garlock fault (Dibblee 1967).

More specifically, the proposed Project is located within the western Mojave Desert region also known as the Mojave Block. The Mojave Block is a tectonic block bounded on the southwest by the San Andreas fault zone and on the northwest by the Garlock fault zone, along which the bordering mountains were elevated (Bartley et al 1990). Both zones are vertical crustal breaks.

According to published geological mapping by Dibblee and Minch (2008) at a 1:62,500 scale, the proposed Project site is mapped as recent to late Pleistocene (approximately 11,700 to 129,000 years ago) alluvial sand deposits (map unit Qa). This geological unit consists of light gray, coarse- to fine-grained arkosic sand deposited in valley areas and has low paleontological sensitivity on the surface that increases to high with depth, where the deposits become old enough to preserve fossils.

Mapped Holocene alluvial deposits are often shallowly underlain by late Pleistocene paleosols (fossil soil horizons) that contain important vertebrate microfauna (Stewart et al. 2012; Stewart and Hakel 2016). A paleosol near the town of Hinkley in San Bernadino County, west of the proposed Project site produced late Pleistocene specimens of tortoise (*Gopherus* sp.), unidentified bird, rabbit (*Lepus californicus* and *Sylvilagus* sp.), and artiodactyl tooth fragments (Stewart and Hakel 2016). Near the town of Blythe, 100's of microvertebrate fossils and several macrovertebrate fossils (e.g., articulated tortoise shells and appendicular elements) were collected from several paleosols in areas mapped as Holocene and/or Pleistocene alluvial deposits (Stewart et al. 2012).

In his compilation of Quaternary (Pleistocene and Holocene) vertebrates from California, Jefferson (1991) lists numerous Pleistocene vertebrate localities from San Bernardino County. Some of the taxa from these fossil localities include fossil fish (*Gila bicolor*), amphibians, reptiles, birds, and small and large mammals (*e.g.,* horse [*Equus*], camel [*Camelops*], dog [*Canis*], hare [*Lepus sp.*], and mammoth [*Mammuthus* sp.])

Paleontological Records Search

Dudek requested a paleontological records search from the SBCM on March 20, 2023, and the results were received on May 4, 2023. While the SBCM did not report any fossil localities from within the proposed Project site or within the one-mile radius buffer, they did report fossil localities from deposits similar to those underlying the site at depth (Attachment A). The closest vertebrate fossil locality from Pleistocene deposits is SBCM 1.76.4, which approximately 1.65 miles south of the proposed Project site, yielded camelid tooth fragments, discovered as float at the base of eroded hills. The next closest Pleistocene fossil vertebrate locality, SBCM 1.76.11, which is located approximately 1.7 miles south-southeast of the proposed Project site, produced a partial skeleton and of a juvenile camelid from approximately 1.5 feet below the ground surface. The fossils were preserved within a late Pleistocene sandy siltstone associated with the Mojave River (Attachment A).

Findings and Recommendations

No paleontological resources were identified within the proposed Project area as a result of the institutional records search, published geological maps, and desktop geological review. Given the likely presence of Pleistocene alluvial deposits or paleosols under the mapped Holocene alluvial sand deposits within the proposed Project site and the vertebrate fossils recovered from Pleistocene alluvium in other areas of San Bernardino County, intact paleontological resources may be encountered below a surficial layer of Holocene alluvial deposits during proposed Project excavations. In the event that intact paleontological resources are located on the proposed Project site, ground-disturbing activities associated with construction of the proposed Project, such as grading during site preparation and trenching for utilities at depths greater than five feet below the existing ground surface, have the potential to destroy a unique paleontological resource or site. Without mitigation, the potential damage to paleontological resources would be a potentially significant impact. However, upon implementation of Mitigation Measure (MM)- 5.5 Cultural Resources section 5-5, level Low to High, impacts would be reduced to below a level of significance. Impacts of the proposed Project are considered less than significant with mitigation incorporated during construction. No further mitigation is required.

MM 5.5, Section 5-5 Low to High (SVP)/Class 2 to Class 4–5 (BLM)—All projects involving ground disturbance in previously undisturbed areas mapped with low-to-high paleontological sensitivity will only require monitoring if construction activity will exceed the depth of the low sensitivity surficial sediments. The underlying sediments may have high paleontological sensitivity, and therefore work in those units might require paleontological monitoring, as designated by the Qualified Paleontologist in the PRMMP. When determining the depth at which the transition to high sensitivity occurs and monitoring becomes necessary, the Qualified Paleontologist should take into account: a) the most recent local geologic mapping, b) depths at which fossils have been found in the vicinity of the project area, as revealed by the museum records search, and c) geotechnical studies of the project area, if available.

Should you have any questions relating to this report and its findings please contact Michael Williams (mwilliams@dudek.com).

Respectfully Submitted,

Michael Williams, Ph.D.
Paleontologist
Mobile: 225.892.7622
Email: mwilliams@dudek.com

Att.: *Figure 1, Regional Location Map*
Attachment A, Confidential SBCM Paleontological Records Search Results

cc: *Sarah Siren, Jason Collins, Linda Kry, Heather McDevitt, Dudek*

References

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Morton, D.M. and F.K. Miller. 2006, Geologic map of the San Bernardino and Santa Ana 30' x 60' quadrangles, California: U.S. Geological Survey, Open-File Report OF-2006-1217, scale 1:100,000.

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Confidential Appendix A

SBCM Records Search Results (Confidential)

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SAN BERNARDINO COUNTY

Museum
Division of Earth Science

Scott Kottkamp
Curator of Earth Science

April 10th, 2023

Dudek
Attn: Jason Collins
605 Third Street
Encinitas, CA 92024

PALEONTOLOGY RECORDS REVIEW for Yermo Convenience Store and Gas Station, Yermo, San Bernardino County, California

Dear Mr. Collins,

The Division of Earth Science of the San Bernardino County Museum (SBCM) has completed a record search for the above-named project in San Bernardino County, California. The proposed project site (Yermo Convenience Store and Gas Station) is in the unincorporated community of Yermo, California as shown on the United States Geological Survey (USGS) 7.5-minute Yermo, California quadrangle.

According to geologic mapping of the area by Dibblee (1970), the entire project area is located on top of Holocene age alluvial sediments (Qa). The alluvial sediments consist primarily of sand and gravel sourced from nearby mountains. Qa is unlikely to be fossiliferous, but directly overlies older alluvium of Pleistocene age (Qoa) that is known to be highly fossiliferous throughout San Bernardino County. Qoa underlies Qa at variable depth – in the local region, fossiliferous Pleistocene alluvium was uncovered as little as 0.46 m (1.5 ft) below the surface (see SBCM 1.76.11, below).

For this review, I conducted a search of the Regional Paleontological Locality Inventory (RPLI) at the SBCM. The results of this search indicate that no paleontological localities are situated within the project area, nor within a one-mile radius of its perimeter. The closest locality, SBCM 1.76.4, is approximately 1.65 miles to the south. Camelid tooth fragments were found at

SBCM 1.76.4 as float in and at the base of eroded bluffs. These tooth fragments were not collected owing to their very poor quality of preservation. Locality SBCM 1.76.11 is also located nearby, slightly northeast of SBCM 1.76.4 and 1.7 miles south-southeast of the project site. The partial skeleton and skull of a juvenile camelid were recovered from this locality 0.46 m (1.5 ft) below the surface. The fossils were found in a late Pleistocene age buff sandy siltstone, overlain by alluvial sand and overlying fluviatile gravel beds, situated within 6.1 m (20 ft) tall bluffs on the south side of the Mojave River's bed.

This records search covers only the paleontological records of the San Bernardino County Museum. 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.

Please do not hesitate to contact us with any further questions that you may have.

Sincerely,

Scott Kottkamp

Scott Kottkamp, Curator of Earth Science
Division of Earth Science
San Bernardino County Museum

Literature Cited

Dibblee, T.W. 19670. Geologic map of the Daggett quadrangle, San Bernardino County, California. US Geological Survey. Miscellaneous Geologic Investigations Map I-592. Scale 1:62,500. Available at: https://ngmdb.usgs.gov/Prodesc/proddesc_115.htm (accessed 23 March 2023).