

PALEONTOLOGICAL ASSESSMENT FOR THE BEYOND MARKET AND CAR WASH PROJECT

CITY OF PALMDALE
LOS ANGELES COUNTY, CALIFORNIA

APNs 3018-028-023 and -052 to -054

Prepared on Behalf of:

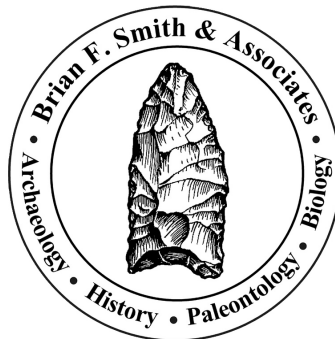
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Prepared for:

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June 29, 2022

Paleontological Database Information

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Report Date: June 29, 2022

Report Title: Paleontological Assessment for the Beyond Market and Car
Wash Project, City of Palmdale, Los Angeles County, California

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Assessor's Parcel Numbers: 3018-028-023 and -052 to -054

USGS Quadrangle: Section 30, Township 6 North, Range 11 West of the USGS
Palmdale, California 7.5' Quadrangle.

Study Area: 5.6 acres

Key Words: Paleontological assessment; Pleistocene alluvial fan deposits;
City of Palmdale.

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I. INTRODUCTION AND LOCATION

A paleontological resource assessment has been completed for the Beyond Market and Car Wash Project, located at the northwest corner of 25th Street East and Avenue R in the city of Palmdale, Los Angeles County, California (Figures 1 and 2). The 5.6-acre project consists of four parcels, identified as Assessor's Parcel Numbers 3018-028-023 and -052 to -054. On the United States Geological Survey 7.5-minute, 1:24,000-scale *Palmdale, California* topographic quadrangle map, the project is located in Section 30, Township 6 North, Range 11 West, of the San Bernardino Baseline and Meridian. The project proposes the construction of a gas station, a convenience store with a drive-thru fast-food restaurant, and an automated car wash. Currently, the property is undeveloped.

As the lead agency, the City of Palmdale has required the preparation of a paleontological assessment to evaluate the project's potential to yield paleontological resources. The paleontological assessment of the project included a review of paleontological literature and fossil locality records for a previous project in the area; a review of the underlying geology; and recommendations to mitigate impacts to potential paleontological resources, if necessary.

II. REGULATORY SETTING

The California Environmental Quality Act (CEQA), which is patterned after the National Environmental Policy Act, is the overriding environmental regulation that sets the requirement for protecting California's paleontological resources. CEQA mandates that governing permitting agencies (lead agencies) set their own guidelines for the protection of nonrenewable paleontological resources under their jurisdiction.

State of California

Under "Guidelines for Implementation of the California Environmental Quality Act," as amended in December 2018 (California Code of Regulations [CCR] Title 14, Division 6, Chapter 3, Sections 15000 et seq.), procedures define the types of activities, persons, and public agencies required to comply with CEQA. Section 15063 of the CCR provides a process by which a lead agency may review a project's potential impact to the environment, whether the impacts are significant, and provide recommendations, if necessary.

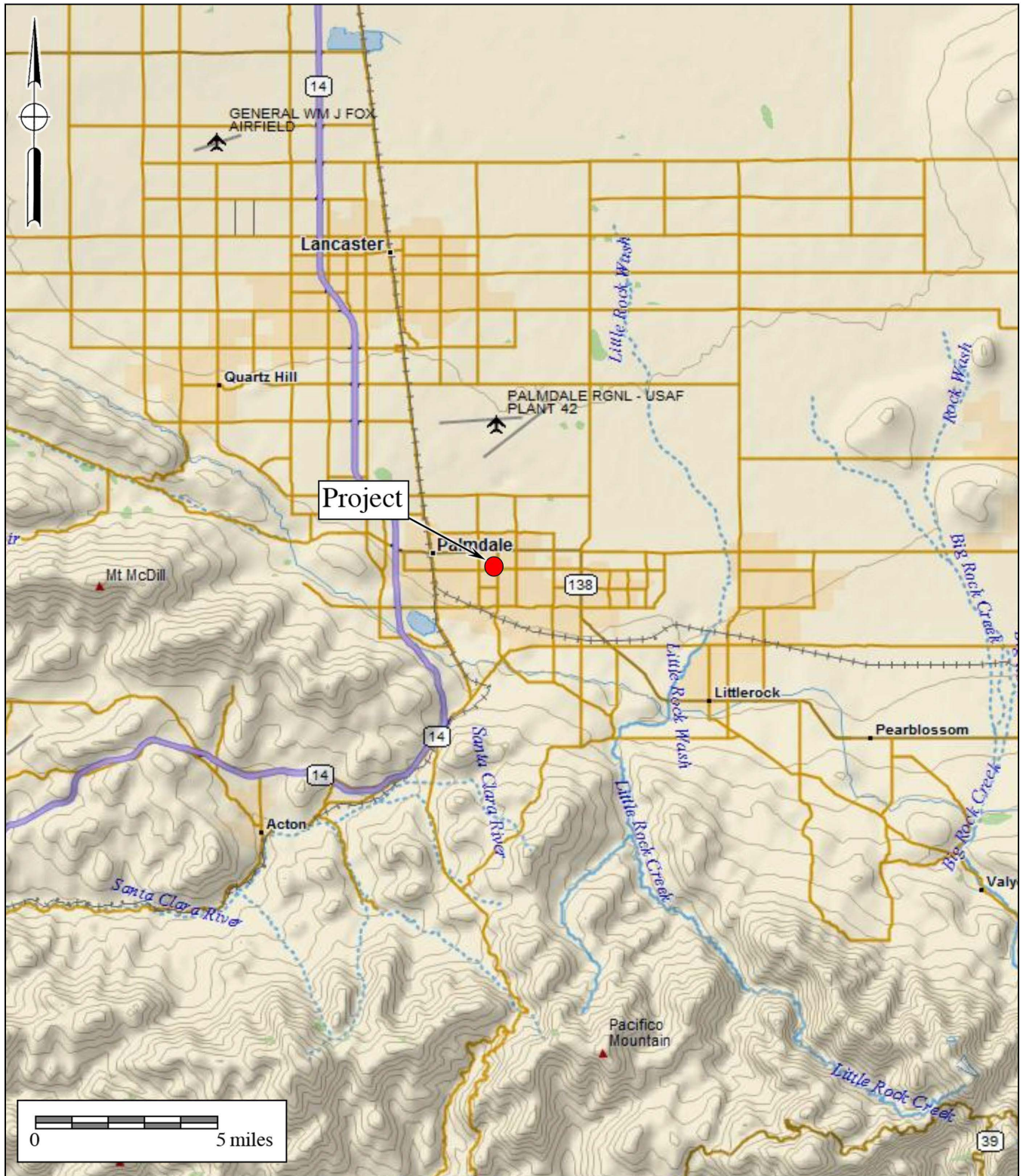


Figure 1
General Location Map

The Beyond Market and Car Wash Project

DeLorme (1:250,000)



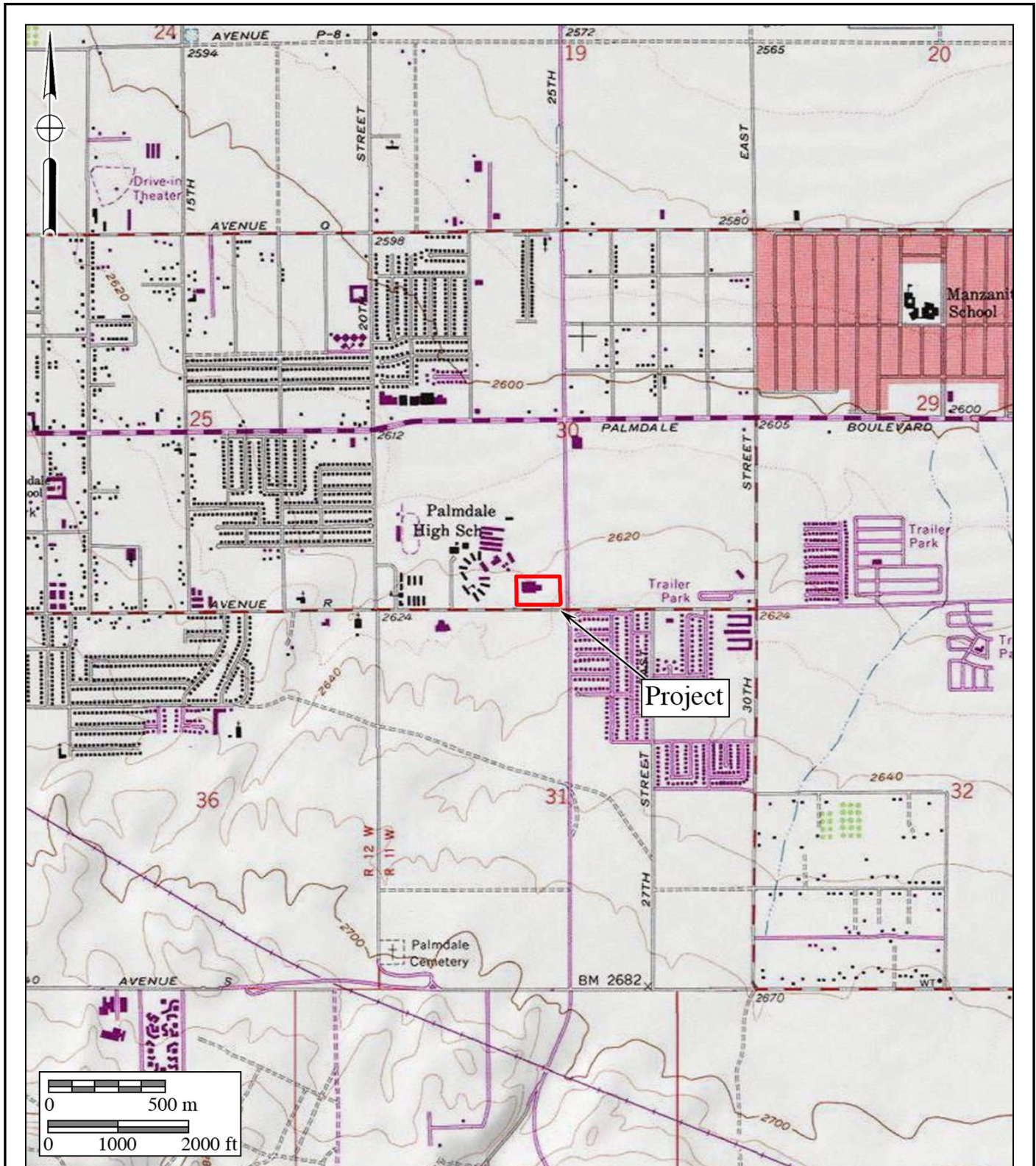


Figure 2

Project Location Map

The Beyond Market and Car Wash Project

USGS Palmdale Quadrangle (7.5-minute series)



In CEQA's Environmental Checklist Form, one of the questions to answer is, "Would the project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?" (Appendix G, Section VII, Part f). This is to ensure compliance with California Public Resources Code Section 5097.5, the law that protects nonrenewable resources, including fossils, which is paraphrased below:

- a) A person shall not knowingly and willfully excavate upon, or remove, destroy, injure or deface any historic or prehistoric ruins, burial grounds, archaeological or vertebrate paleontological site, including fossilized footprints, inscriptions made by human agency, rock art, or any other archaeological, paleontological or historical feature, situated on public lands, except with the express permission of the public agency having jurisdiction over such lands.
- b) As used in this section, "public lands" means lands owned by, or under the jurisdiction of, the state, or any city, county, district, authority, or public corporation, or any agency thereof.
- c) A violation of this section is a misdemeanor.

City of Palmdale

The Environmental Resources Element of the General Plan of the City of Palmdale addresses the related issues of resource conservation and open space, and provides a basis to evaluate existing resources and plan for their protection (City of Palmdale 1993). In the Environmental Resources Element, Policy ER7.1.3 states:

Policy ER7.1.3: Require that new development protect significant historic, paleontological, or archaeological resources, or provide for other appropriate mitigation. (City of Palmdale 1993: ER-14).

The City will implement the policy as follows:

V. Cultural Resources: The City will map all known historic, archaeological, and paleontological resources and ensure the protection of these resources. The City will review plans for development in potentially sensitive areas. Development in paleontologically and archaeologically sensitive areas where impacts cannot be mitigated will be discouraged. (City of Palmdale 1993: ER-26)

Applications of paleontological resource sensitivity to geologic formations by the City of Palmdale are summarized in Section V of this report.

III. GEOLOGY

As shown on Figure 3, most of the project overlies Holocene to late Pleistocene-aged young alluvial fan deposits (pale yellow areas labeled “Qyf,” after Lancaster et al. 2012). The young alluvial fan deposits are described as unconsolidated to slightly consolidated, silt, sand, gravel, cobble, and boulder deposits. The western portion of the project is overlain by a veneer of Holocene alluvium, largely composed of unconsolidated sand (very pale yellow areas labeled “Qa” on Figure 3). Pleistocene old alluvial fan deposits (“Qof”) are mapped immediately west of the project.

IV. PALEONTOLOGICAL RESOURCES

Definition

Paleontological resources are the remains of prehistoric life that have been preserved in geologic strata. These remains are called fossils and include bones, shells, teeth, and plant remains (including their impressions, casts, and molds) in the sedimentary matrix, as well as trace fossils such as footprints and burrows. Fossils are considered older than 5,000 years of age (Society of Vertebrate Paleontology [SVP] 2010) but may include younger remains (subfossils) when viewed in the context of local extinction of the organism or habitat, for example. Fossils are considered a nonrenewable resource under state and local guidelines (see Section II).

Fossil Locality Search

A paleontological records search was performed by the Los Angeles County Museum of Natural History (LACM) for the project (Bell 2022). The record search indicated the closest locality is approximately four to six miles to the southeast, consisting of Pleistocene microvertebrates represented by the fossilized bones of reptiles, mammals, and birds (LACM locs. 5942–5950). These localities ranged in depth from the near-surface to nine feet, but are mapped in areas identified as Holocene alluvial fan deposits (Lancaster et al. 2012), implying that at least some Pleistocene-aged deposits are very near the surface with a minimal cover of Holocene deposits. The remaining fossil localities listed by Bell (2022) are several miles distant, mostly in northern Lancaster and beyond.

A paleontological literature review and collections and locality records search was conducted for the project using records from prior Brian F. Smith and Associates, Inc. (BFSA) projects, the San Bernardino County Museum, the LACM, and the Western Science Center in Hemet, as well as data from published and unpublished paleontological literature (Jefferson 1991, 2009). The resulting locality records search did not identify any previously recorded fossil localities from within the project boundaries.

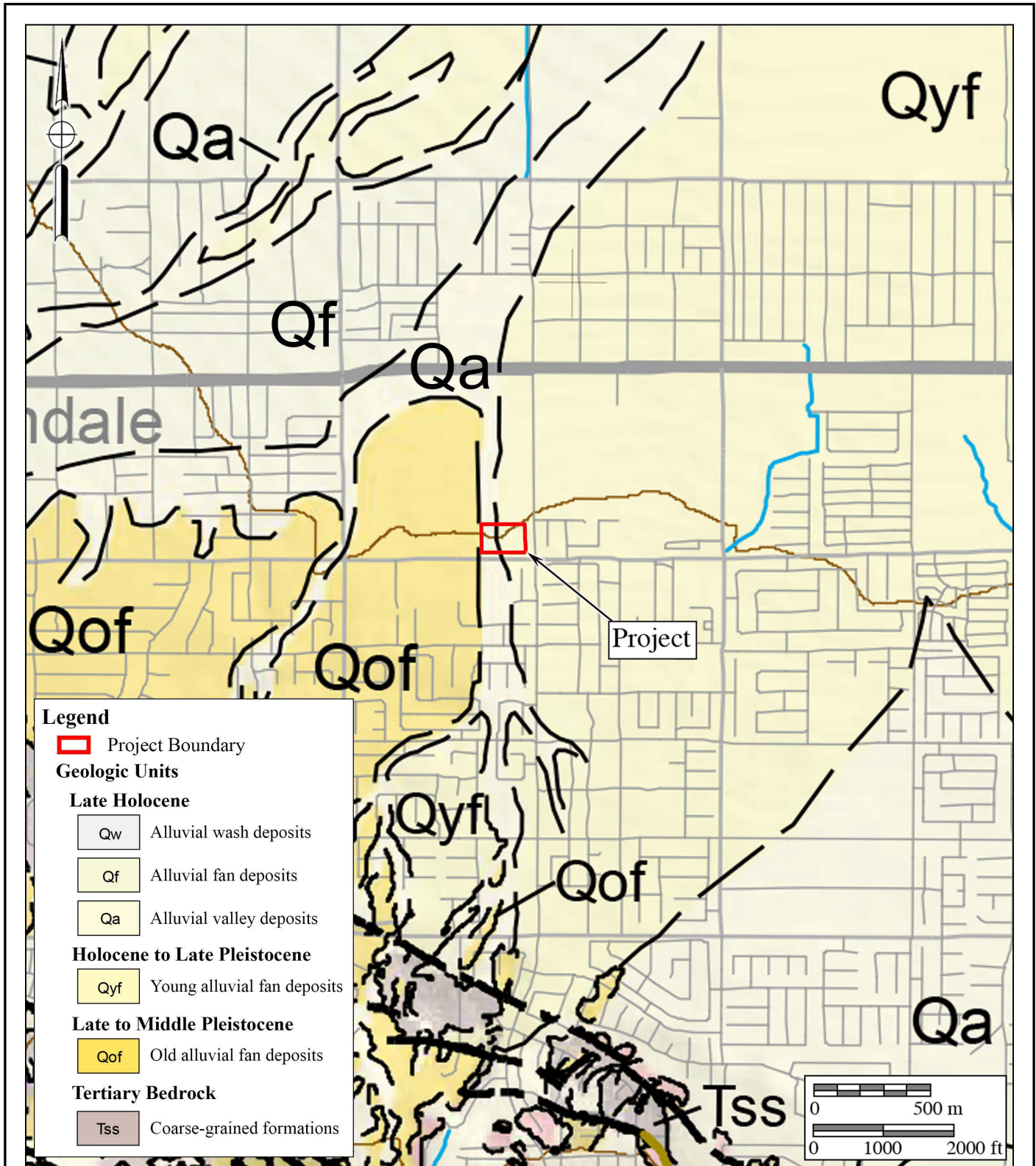


Figure 3
Geologic Map

The Beyond Market and Car Wash Project

Geology after Lancaster et al. (2012)



V. PALEONTOLOGICAL SENSITIVITY

Overview

The degree of paleontological sensitivity of any particular area is based on a number of factors, including the documented presence of fossiliferous resources on a site or in nearby areas, the presence of documented fossils within a particular geologic formation or lithostratigraphic unit, and whether or not the original depositional environment of the sediments is one that might have been conducive to the accumulation of organic remains that might have become fossilized over time. Holocene alluvium is generally considered to be geologically too young to contain significant nonrenewable paleontological resources (*i.e.*, fossils) and is thus typically assigned a low paleontological sensitivity. Pleistocene (more than 11,700-year-old) alluvial and alluvial fan deposits in the Inland Empire and Mojave Desert, however, often yield important Ice Age terrestrial vertebrate fossils, such as extinct mammoths, mastodons, giant ground sloths, extinct species of horse, bison, camel, saber-toothed cats, and others (Jefferson 1991, 2009). These Pleistocene sediments are thus accorded a High paleontological resource sensitivity.

Professional Standards

The SVP (2010) has drafted guidelines that include four categories of paleontological sensitivity for geologic units (formations) that might be impacted by a proposed project, as listed below:

- High Potential: Rock units from which vertebrate or significant invertebrate, plant, or trace fossils have been recovered.
- Undetermined Potential: Rock units for which little information is available concerning their paleontological content, geologic age, and depositional environment, and that further study is needed to determine the potential of the rock unit.
- Low Potential: Rock units that are poorly represented by fossil specimens in institutional collections or based on a general scientific consensus that only preserve fossils in rare circumstances.
- No Potential: Rock units that have no potential to contain significant paleontological resources, such as high-grade metamorphic rocks and plutonic igneous rocks.

Using these criteria, the presence of nearby significant fossil localities yielded by similar alluvial fan deposits as those at the project, the Holocene to late Pleistocene young alluvial fan deposits may be considered to have an undetermined to high potential to yield paleontological resources.

City of Palmdale Assessment

In the Environmental Resources Element of the City's General Plan, the paleontological sensitivity of geologic formations mapped within the city are classified according to their potential to yield fossil resources (City of Palmdale 1993: ER-44). An assignment of "unknown potential" appears to be applied to the alluvial deposits mapped at the project, stating, "The Pleistocene alluvium which is of high potential is covered by a thin layer of recent alluvium. This layer has an unknown potential for producing paleontologic resources" (City of Palmdale 1993). This statement is roughly in line with the disposition of the nearby fossil localities discussed in Section IV. Correspondingly, Pleistocene lacustrine and fluvial deposits are accorded a high paleontological potential/sensitivity in the Environmental Resources Element.

The analysis of paleontological resources by the Environmental Resources Element concludes, "The City's low-lying areas consist of Quaternary alluvium which is known to contain numerous vertebrate fossils. Although no other paleontological resources have been recorded in the Planning Area, their existence should not be precluded or dismissed" (City of Palmdale 1993: ER-45). A map of paleontological sensitivity indicates the project is within an area designated as having an "undetermined" potential for paleontological resources (City of Palmdale 1993: ER-65).

VI. CONCLUSIONS AND RECOMMENDATIONS

Research has confirmed the existence of potentially fossiliferous Holocene to Pleistocene-aged young alluvial fan deposits ("Qyf" on Figure 3) that are mapped at the surface of the project. The known occurrence of significant terrestrial vertebrate fossils at shallow depths from alluvial deposits from the Mojave Desert and the moderate to high paleontological sensitivity rating assigned to Pleistocene-aged alluvial deposits for yielding paleontological resources all support paleontological monitoring be implemented during mass grading and excavation activities in undisturbed alluvial deposits in order to mitigate any adverse impacts (loss or destruction) to potential nonrenewable paleontological resources. Full-time monitoring of undisturbed alluvial fan deposits at the project is warranted starting at the surface. The Holocene alluvial deposits mapped at the western one-fourth of the project are not required to be monitored; however, these deposits are anticipated to consist of a relatively thin cover over older deposits that mapped at the surface of the remainder of the project. It is recommended that the Holocene deposits be monitored part-time, at the discretion of the project paleontologist.

The following Paleontological Resource Impact Mitigation Program (PRIMP), outlined below, is based on the findings stated above. A PRIMP, when submitted to the City of Palmdale, should be approved by the City prior to the issuance and approval of grading permits for the project. This suggested PRIMP, when implemented, would reduce impacts to potential paleontological resources to a level below significant:

1. Prior to initiation of any grading, drilling, and/or excavation activities, a preconstruction meeting will be held and attended by the paleontologist of record, representatives of the grading contractor and subcontractors, the project owner or developer, and a representative of the lead agency. The nature of potential paleontological resources shall be discussed, as well as the protocol that is to be implemented following the discovery of any fossiliferous materials.
2. Monitoring of mass grading and excavation activities in areas identified as likely to contain paleontological resources shall be performed by a qualified/project paleontologist or paleontological monitor. Monitoring shall be performed starting at the surface on a full-time basis; Holocene alluvial deposits should be monitored part-time at the discretion of the project paleontologist. The timing and duration of the monitoring of excavation activities within the alluvial fan deposits shall be at the discretion of the project paleontologist based on the geological conditions observed by the paleontological monitor and/or the project paleontologist.
3. Paleontological monitors will be equipped to salvage fossils as they are unearthed to avoid construction delays. The monitor must be empowered to temporarily halt or divert equipment to allow removal of abundant or large specimens in a timely manner. Monitoring may be reduced if the potentially fossiliferous units are not present in the subsurface, or, if present, are determined upon exposure and examination by qualified paleontological personnel to have low potential to contain fossil resources. The monitor shall notify the project paleontologist, who will then notify the concerned parties of the discovery.
4. Paleontological salvage during trenching and boring activities is typically from the generated spoils and does not delay the trenching or drilling activities. Fossils are collected and placed in cardboard flats or plastic buckets and identified by field number, collector, and date collected. Notes are taken on the map location and stratigraphy of the site, which is photographed before it is vacated, and the fossils are removed to a safe place. On mass grading projects, discovered fossil sites are protected by flagging to prevent them from being overrun by earthmovers (scrapers) before salvage begins. Fossils are collected in a similar manner, with notes and photographs being taken before removing the fossils. Precise location of the site is determined with the use of handheld GPS units. If the site involves remains from a large terrestrial vertebrate, such as large bone(s) or a mammoth tusk, that is/are too large to be easily removed by a single monitor, a fossil recovery crew shall excavate around the find, encase the find within a plaster and burlap jacket, and remove it after the plaster is set. For large fossils, use of the contractor's construction equipment may be solicited to help remove the jacket to a safe location.
5. Isolated fossils are collected by hand, wrapped in paper, and placed in temporary collecting flats or five-gallon buckets. Notes are taken on the map location and

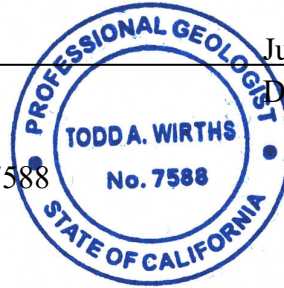
- stratigraphy of the site, which is photographed before it is vacated, and the fossils are removed to a safe place.
6. Particularly small invertebrate fossils typically represent multiple specimens of a limited number of organisms, and a scientifically suitable sample can be obtained from one to several five-gallon buckets of fossiliferous sediment. If it is possible to dry screen the sediment in the field, a concentrated sample may consist of one or two buckets of material. For vertebrate fossils, the test is usually the observed presence of small pieces of bones within the sediments. If present, multiple five-gallon buckets of sediment can be collected and returned to a separate facility to wet-screen the sediment.
 7. In accordance with the “Microfossil Salvage” section of the SVP guidelines (2010:7), bulk sampling and screening of fine-grained sedimentary deposits (including carbonate-rich paleosols) must be performed if the deposits are identified to possess indications of producing fossil “microvertebrates” to test the feasibility of the deposit to yield fossil bones and teeth.
 8. In the laboratory, individual fossils are cleaned of extraneous matrix, any breaks are repaired, and the specimen, if needed, is stabilized by soaking in an archivally approved acrylic hardener (*e.g.*, a solution of acetone and Paraloid B-72).
 9. Recovered specimens are prepared to a point of identification and permanent preservation (not display), including screen-washing sediments to recover small invertebrates and vertebrates. Preparation of individual vertebrate fossils is often more time-consuming than for accumulations of invertebrate fossils.
 10. Identification and curation of specimens into a professional, accredited public museum repository with a commitment to archival conservation and permanent retrievable storage (*e.g.*, the LACM) shall be conducted. The paleontological program should include a written repository agreement prior to the initiation of mitigation activities. Prior to curation, the lead agency (*e.g.*, the City of Palmdale) will be consulted on the repository/museum to receive the fossil material.
 11. A final monitoring and mitigation report of findings and significance will be prepared, including lists of all fossils recovered and necessary maps and graphics to accurately record their original location(s). The report, when submitted to, and accepted by, the appropriate lead agency, will signify satisfactory completion of the project program to mitigate impacts to any potential nonrenewable paleontological resources (*i.e.*, fossils) that might have been lost or otherwise adversely affected without such a program in place.

VII. CERTIFICATION

I hereby certify that the statements furnished above and in the attached exhibits present the data and information required for this paleontological report, and that the facts, statements, and information presented are true and correct to the best of my knowledge and belief, and have been compiled in accordance with CEQA criteria.



Todd A. Wirths
Senior Paleontologist
California Professional Geologist No. 7588



June 29, 2022

Date

VIII. REFERENCES

- Bell, A. 2022. Paleontological resources for the Beyond Market and Car Wash Project. Unpublished letter for Brian F. Smith and Associates, Inc., Poway, California, by the Natural History Museum of Los Angeles County, Los Angeles, California.
- City of Palmdale. 1993. Environmental resources element of the general plan. <https://cityofpalmdale.org/DocumentCenter/View/569/Environmental-Resources-Element-PDF>.
- Jefferson, G.T. 1991. A catalogue of late Quaternary vertebrates from California: Part two, mammals. Natural History Museum of Los Angeles County, Technical Reports, no. 7: i-v + 1-129.
- Jefferson, G.T. 2009. A catalogue of Blancan and Irvingtonian vertebrates and floras from Arizona, southern California, Nevada, Utah, and northwestern Mexico. Unpublished draft manuscript, Colorado Desert District Stout Research Center, Anza-Borrego Desert State Park, Borrego Springs, California.
- Lancaster, J.T., Hernandez, J.L., Haydon, W.D, Dawson, T.E., and Hayhurst, C.A. 2012. Geologic map of Quaternary surficial deposits in southern California: Lancaster 30' x 60' Quadrangle. California Geological Survey Special Report 217, Plate 22.
- Society of Vertebrate Paleontology. 2010. Standard Procedures for the Assessment and Mitigation of Adverse Impacts to Paleontological Resources; by the SVP Impact Mitigation Guidelines Revision Committee: Electronic document, https://vertpaleo.org/wp-content/uploads/2021/01/SVP_Impact_Mitigation_Guidelines-1.pdf.

APPENDIX A

Qualifications of Key Personnel

APPENDIX B

Fossil Locality Search Report

Natural History Museum
of Los Angeles County
900 Exposition Boulevard
Los Angeles, CA 90007

tel 213.763.DINO
www.nhm.org

Research & Collections

e-mail: paleorecords@nhm.org

June 12, 2022

Brian F. Smith and Associates, Inc.
Attn: Todd Wirths

re: Paleontological resources for the Beyond Market and Car Wash Project (22-195)

Dear Todd:

I have conducted a thorough search of our paleontology collection records for the locality and specimen data for proposed development at the Beyond Market and Car Wash Project area as outlined on the portion of the Palmdale USGS topographic quadrangle map that you sent to me via e-mail on June 6, 2022. We do not have any fossil localities that lie directly within the proposed project area, but we do have fossil localities nearby from the same sedimentary deposits that occur in the proposed project area, either at the surface or at depth.

The following table shows the closest known localities in the collection of the Natural History Museum of Los Angeles County (NHMLA).

Locality Number	Location	Formation	Taxa	Depth
LACM VP CIT 451	Near intersection of E Barrel Springs Rd & 47th St E (Palmdale Quad)	Harold Formation	Mastodon (Mammutidae), horse family (Equidae)	Unknown
LACM VP 5942-5950	Along Avenue S from Palmdale to Lake Los Angeles	Unknown formation (Holocene)	Kingsnake (<i>Lampropeltis</i>), Lizard (Lacertilia), leopard lizard (<i>Gambelia</i>); snake (Ophidia), gopher snake (<i>Pituophis</i>); rabbit (<i>Lagomorpha</i>), rodent (Rodentia), Pocket gopher (<i>Thomomys</i>), pocket mouse (<i>Chaetodippus</i>), kangaroo rat (<i>Dipodomys</i>); birds (Aves)	0-9 ft bgs
LACM VP 7884	E of the SE corner of the intersection of East 3rd Street & East Avenue H-13	Unknown formation (Pleistocene; fluvial brown clayey silt)	Camel (<i>Camelops hesternus</i>)	4 feet bgs
LACM VP 7853	Waste Management of North America Lancaster Landfill	Unknown formation (Pleistocene; sandy loess under a dune deposit strand,	Rabbit (<i>Sylvagus</i>), camel family (Camelidae), antelope squirrel (<i>Ammospermophilus</i>), kangaroo rat (<i>Dipodimus</i>), pocket mouse	3-11 feet bgs

sandy siltstone, siltstone to clayey siltstone)	(<i>Perognathus</i>), pack rat (<i>Neotoma</i>), deer mouse (<i>Peromyscus</i>), vole family (Microtinae), iguana (<i>Dipsosaurus</i>), pocket gopher (<i>Thomomys</i>), spiny lizard (<i>Sceloporus</i>), side blotched lizard (<i>Uta</i>), colubrid snakes (<i>Trimorphodon</i> , <i>Masticophis</i> , <i>Phyllorhynchus</i>), night lizard (<i>Xantusia</i>), western alligator lizard (<i>Elgaria</i>), toothy skinks (<i>Plestiodon</i>), whiptail lizard (<i>Aspidocelis</i>), spiny lizards (Phrynosomatidae), smelt (Osmeridae)
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near the California Aquaduct between the Tehachapi Mountains & the Rosamond Hills north of Willow Springs	Unknown formation (Pleistocene)	Camel (<i>Hemiauchenia</i>)	21 feet bgs
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VP, Vertebrate Paleontology; IP, Invertebrate Paleontology; bgs, below ground surface

**Locality is 25 feet below carbon-14 accelerator mass spectrometry date of 43180 +/-710 years*

This records search covers only the records of the NHMLA. It is not intended as a paleontological assessment of the project area for the purposes of CEQA or NEPA. Potentially fossil-bearing units are present in the project area, either at the surface or in the subsurface. As such, NHMLA recommends that a full paleontological assessment of the project area be conducted by a paleontologist meeting Bureau of Land Management or Society of Vertebrate Paleontology standards.

Sincerely,



Alyssa Bell, Ph.D.
Natural History Museum of Los Angeles County

enclosure: invoice