PALEONTOLOGICAL ASSESSMENT FOR THE ETHANAC BUSINESS CENTER PROJECT

CITY OF MENIFEE RIVERSIDE COUNTY, CALIFORNIA

APNs 331-060-021 and -036

Prepared for:

EPD Solutions, Inc.
2355 Main Street, Suite 100
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Submitted to:

City of Menifee
29844 Haun Road
Menifee, California 92586

Prepared by:

Brian F. Smith and Associates, Inc.
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March 3, 2022

Paleontological Database Information

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Report Date:	March 3, 2022
Report Title:	Paleontological Assessment for the Ethanac Business Center Project, City of Menifee, Riverside County, California (APNs 331-060-021 and -036)
Prepared for:	EPD Solutions, Inc. 2355 Main Street, Suite 100 Irvine, California 92614
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Prepared by:	Brian F. Smith and Associates, Inc. 14010 Poway Road, Suite A Poway, California 92064
USGS Quadrangle:	Section 16, Township 5 South, Range 3 West of the *Romoland*, *California* 7.5-minute Quadrangle.
Study Area:	13.9 acres
Key Words:	Paleontological assessment; Pleistocene old alluvial fan deposits; mammalian fossil bones; full-time monitoring below five feet; City of Menifee.

Table of Contents

Appendices

List of Figures

I. INTRODUCTION AND LOCATION

A paleontological resource assessment has been completed for the Ethanac Business Center Project, located southwest of the intersection of Ethanac and Barnett roads in the city of Menifee in Riverside County, California (Figures 1 and 2). On the U.S. Geological Survey 7.5-minute, 1:24,000-scale *Romoland*, *California* topographic quadrangle map, the project is located in Section 16, Township 5 South, Range 3 West, of the San Bernardino Baseline and Meridian (Figure 2). The project consists of two parcels (Assessor's Parcel Numbers 331-060-021 and -036) totaling 13.9 acres. A commercial and/or professional facility consisting of two buildings is planned for the project, along with associated parking and infrastructure. An estimated cut of 17,776 cubic yards is proposed for earthwork construction.

As the lead agency, the City of Menifee 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 in the area; a review of the underlying geology; and recommendations to mitigate impacts to potential paleontological resources, if necessary. A project survey for paleontological resources was not conducted since the project site is flat and has been disturbed from prior agricultural use.

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.

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 by which protects nonrenewable resources including fossils, which is paraphrased below:

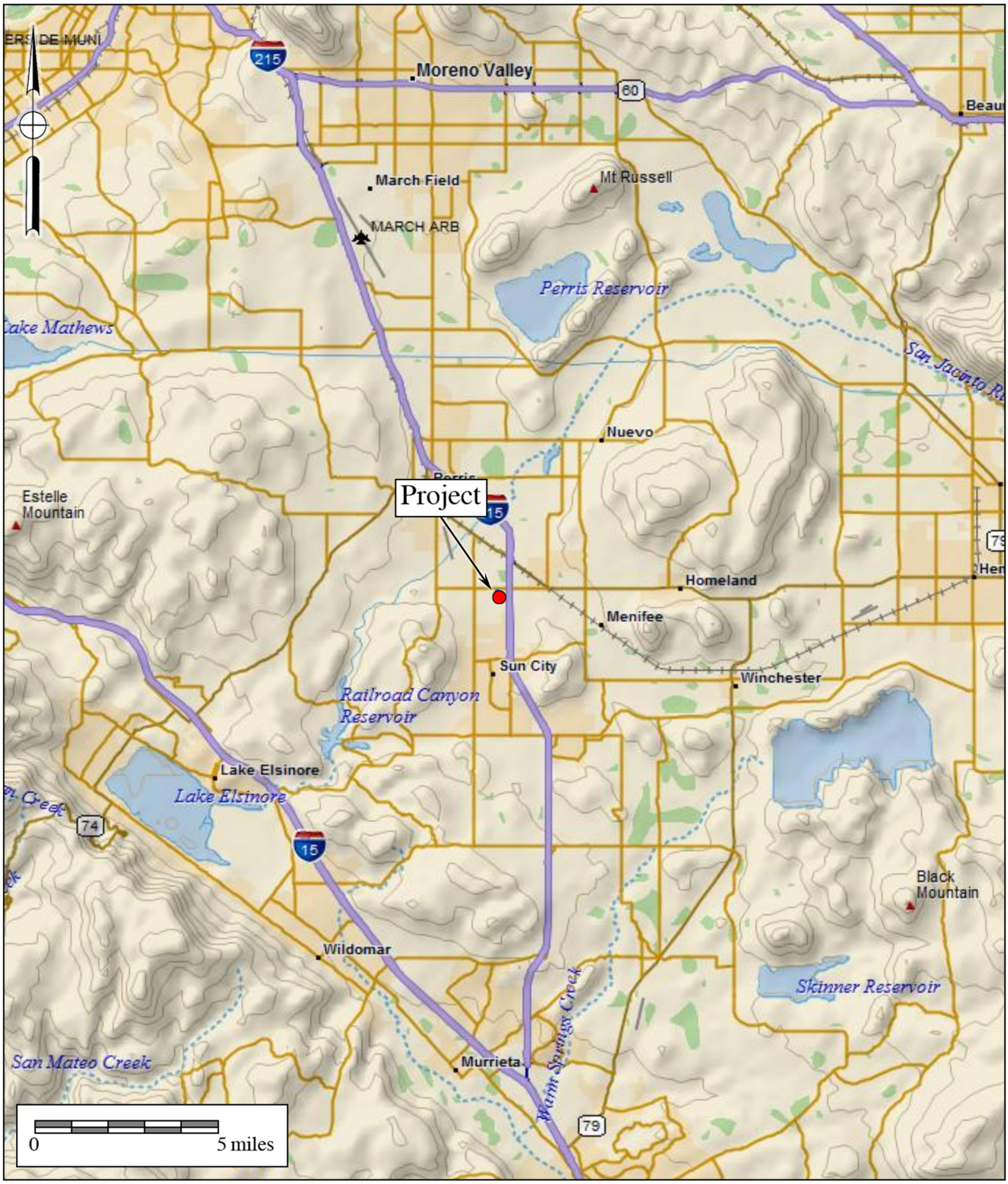


Figure 1

General Location Map

The Ethanac Business Center Project

DeLorme (1:250,000)

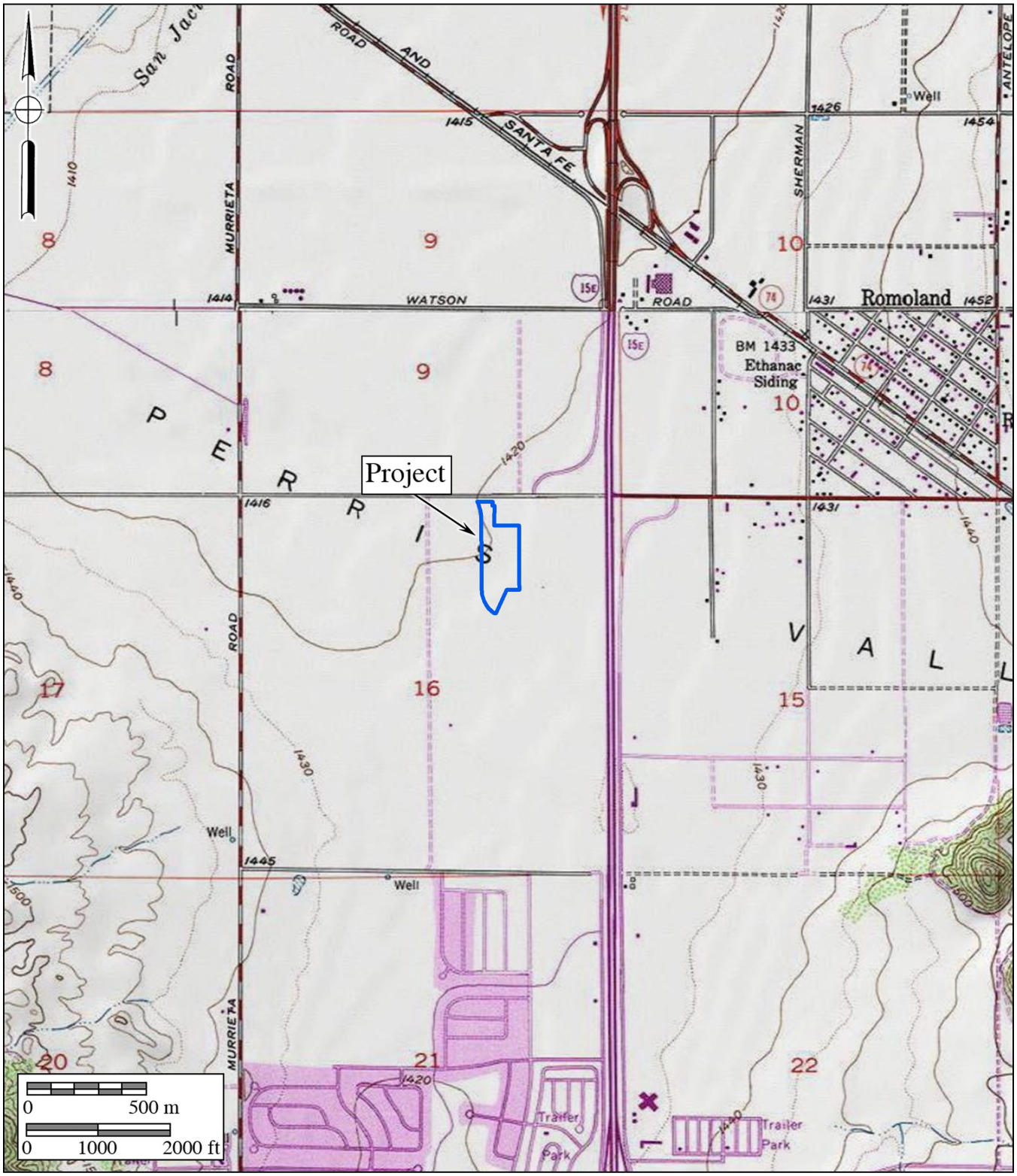


Figure 2

Project Location Map

The Ethanac Business Center Project

USGS *Romoland* and *Perris* Quadrangles (7.5-minute series)

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 Menifee

The City of Menifee has allocated guidelines addressing paleontological resources in the Open Space and Conservation Element (Exhibit OSC-4) of the City's General Plan (City of Menifee 2013). Exhibit OSC-4 identifies the level of paleontological resource sensitivity of the mapped geologic formations within the city limits and their potential to yield nonrenewable paleontological resources (fossils). However, the exhibit does not provide any specific guidance or other definitions, such as monitoring depth thresholds.

III. GEOLOGY

Regionally, the project lies within the central part of the Perris Block, a structural block bounded on the west by the Elsinore fault zone and on the east by the San Jacinto fault zone. The hills surrounding the region consist of eroded masses of exhumed Cretaceous and older crystalline and metamorphic rocks separated by flat valleys filled with geologically young sediments. The project is located on late to middle Pleistocene (approximately 0.5 million years old and less) old alluvial fan sediments, consisting of indurated deposits of reddish-brown sand (Figures 3A and 3B, after Morton 2003a, 2003b). Some old alluvial fan deposits include a thin, discontinuous surficial layer of Holocene alluvium. According to Woodford et al. (1971), the thickness of the alluvial deposits overlying the granitic bedrock basement beneath the project is approximately 220 feet.

Ancient soil zones (paleosols) developed within Pleistocene sedimentary deposits are not uncommon in the Menifee and Perris areas, and are characterized in these areas by a reddish coloration at a certain interval(s) below the surface. Stewart et al. (2012) and Raum et al. (2014) report on occurrences of paleosols in Riverside County yielding Pleistocene vertebrate fossils. Instances of fossiliferous paleosols have also recently been documented in Kern County (Stewart and Hakel 2019) and San Bernardino County (Stewart and Hakel 2016, 2017). Fossils yielded by Pleistocene paleosols are covered in Section V of this report.

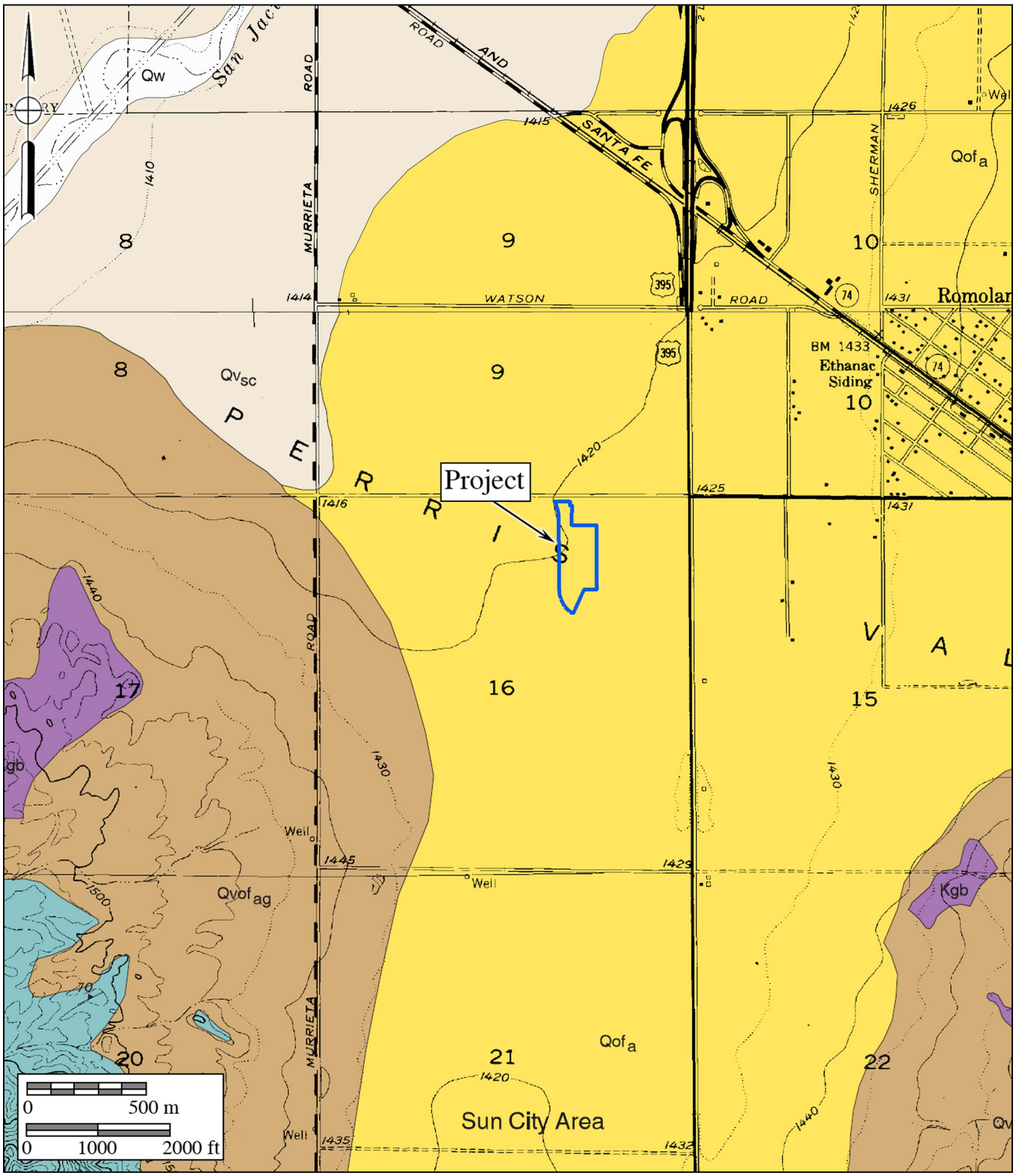


Figure 3A

Geologic Map

The Ethanac Business Center Project

Geology after Morton (2003a and 2003b)

DESCRIPTION OF MAP UNITS

Holocene

Qw — **Very young wash deposits (late Holocene)**—Unconsolidated bouldery to sandy alluvium of active and recently active washes

Qv — **Very young alluvial valley deposits (late Holocene)**—Active and recently active fluvial deposits along valley floors. Consists of unconsolidated sandy, silty, or clay-bearing alluvium

Late to middle Pleistocene

Qof — **Old alluvial fan deposits (late to middle Pleistocene)**—Reddish brown, gravel and sand alluvial fan deposits; indurated, commonly slightly dissected. In places includes thin alluvial fan deposits of Holocene age

Middle to early Pleistocene

Qvof — **Very old alluvial fan deposits (middle to early Pleistocene)**—Mostly well-dissected, well-indurated, reddish-brown alluvial fan deposits. Grain size chiefly sand and gravel

Cretaceous crystalline rocks

Kgb — **Gabbro (Cretaceous)**—Mainly hornblende gabbro. Includes Virginia quartz-norite and gabbro of Dudley (1935), and San Marcos gabbro of Larsen (1948). Typically brown-weathering, medium-to very coarse-grained hornblende gabbro; very large poikilitic hornblende crystals are common, and very locally gabbro is pegmatitic. Much is quite heterogeneous in composition and texture. Includes noritic and dioritic composition rocks

Mesozoic metamorphic rocks

Mzq — **Quartz-rich rocks (Mesozoic)**—Quartzite and quartz-rich metasandstone

Figure 3B

Geologic Map Key

The Ethanac Business Center Project

Geology after Morton (2003a and 2003b)

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 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 (Section II of this report).

Fossil Locality Search

A paleontological literature review and collections and records search was conducted for the nearby On-Deck Project by the San Bernardino County Museum (SBCM) (Cortez 2021, attached). The On-Deck Project is located northeast of the current project on the north side of Matthews Road, a distance of about one mile. The records search found that the nearest known fossil locality is located "approximately 8 to 9 miles southeast of the proposed project at Diamond Valley lake," consisting of hundreds of specimens of Ice Age mammal bones (Cortez 2021, attached). Construction associated with the Diamond Valley Lake reservoir yielded vast numbers of terrestrial Ice Age vertebrate fossils (Anderson et al. 2002; Springer et al. 1999, 2009) that are now housed in the Western Science Center (WSC) in Hemet.

An older paleontological literature review and collections and records search was conducted for the City of Menifee General Plan in 2010 (Scott 2010, attached). The report identified 22 fossil localities in the northeast part of Menifee and one additional locality on the east side of the city. The fossils included the remains of an extinct camel, as well as those of small mammals such as rabbits, rodents, and lizards. These localities are located approximately two miles east of the Ethanac Business Center Project. Based on the numerous previously recorded vertebrate fossil localities from Quaternary alluvial and alluvial fan deposits across western Riverside County (*e.g.,* Jefferson 1991), the SBCM and the WSC both regard Quaternary old alluvial fan sediments as having a high potential to contain significant paleontological resources, and therefore would recommend that a program be implemented to "mitigate impacts to [potential] nonrenewable paleontological resources" (Scott 2010).

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 (older than 11,700 years old) alluvial and alluvial fan deposits in the Inland Empire and western Riverside County, however, are known to yield important terrestrial vertebrate fossils, such as extinct mammoths, mastodons, giant ground sloths, extinct species of horse, bison, camel, saber-toothed cats, and others (Jefferson 1991). These Pleistocene sediments are thus accorded a high paleontological resource sensitivity.

Professional Standards

The Society of Vertebrate Paleontology (SVP) 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 (SVP 2010):

- *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 upon 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, based on the age of the geologic formation at the project and the fossil record of similar deposits in the region, the project may be considered to have an undetermined to high potential to yield significant paleontological resources.

City of Menifee Sensitivity

Exhibit OSC-4 of the Open Space and Conservation Element of the City of Menifee General Plan (City of Menifee 2013) assigns a "High Paleologic (*sic;* Paleontologic) Sensitivity" to this area of the city, where old alluvial fan deposits are mapped at the surface (Figure 4). However, no specific guidance or monitoring depth thresholds are provided.

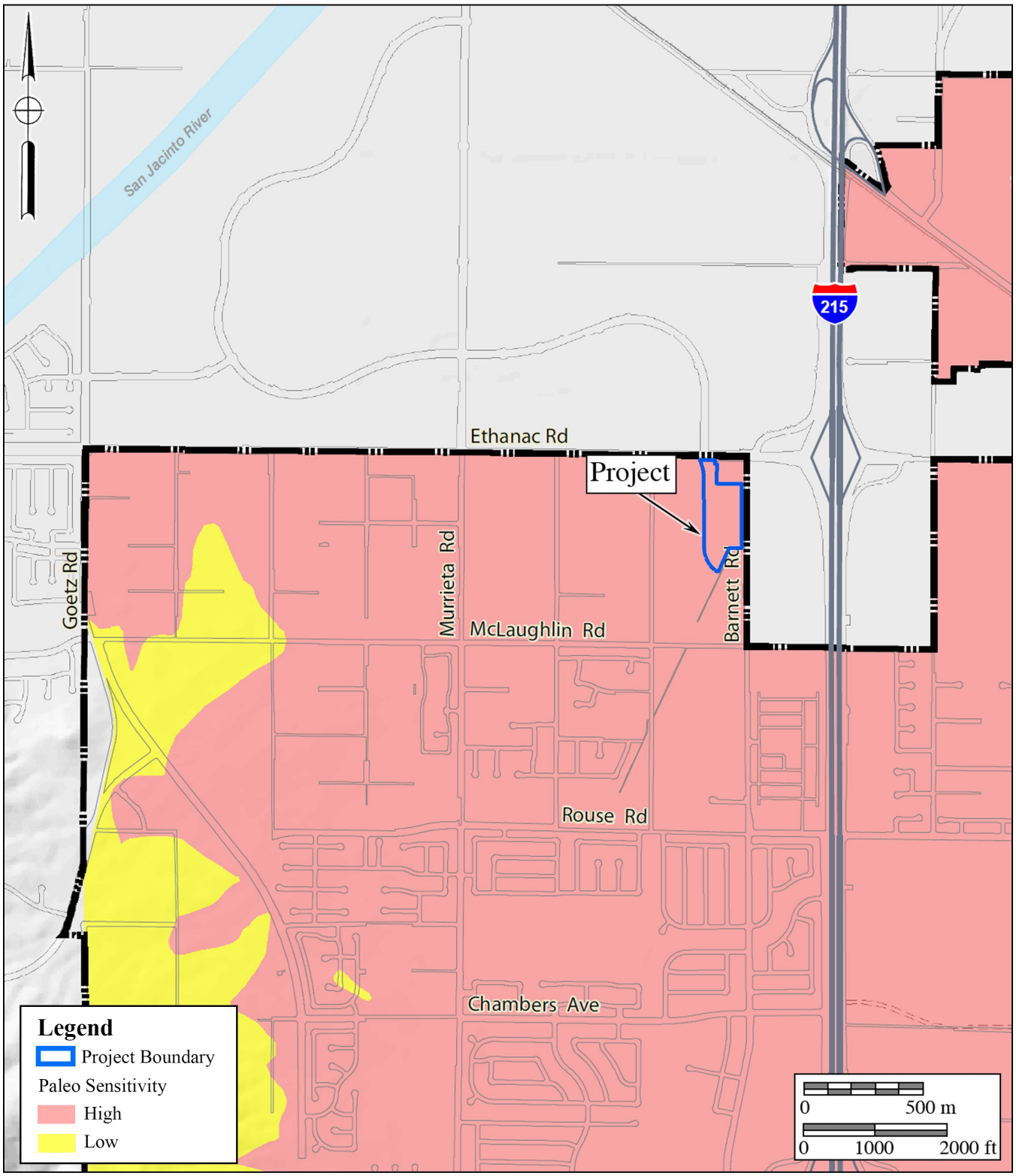


Figure 4

Paleontological Sensitivity Map

The Ethanac Business Center Project

After City of Menifee General Plan (2013)

VI. CONCLUSIONS AND RECOMMENDATIONS

Research has confirmed the existence of the potentially fossiliferous Pleistocene old alluvial fan deposits at the project. The occurrence of terrestrial vertebrate fossils from Pleistocene alluvial fan deposits in western Riverside County is well documented. The "High" paleontological sensitivity rating assigned to these formations for yielding paleontological resources supports the recommendation that paleontological monitoring be implemented during mass grading and excavation activities in these deposits to mitigate any adverse impacts (loss or destruction) to potential nonrenewable paleontological resources. Full-time monitoring of undisturbed old alluvial deposits at the project is warranted starting at five feet below the surface. A monitoring plan is suggested below.

Paleontological Mitigation Monitoring and Reporting Program (MMRP)

The following MMRP guidelines, outlined below, are based on the findings stated above. Paleontological monitoring may be reduced upon the observations and recommendations of the professional-level project paleontologist. The following paleontological MMRP, when implemented, would reduce potential impacts of paleontological resources to a level below significant:

1. Monitoring of mass grading and excavation activities in areas identified as likely to contain paleontological resources shall be performed by a city-qualified paleontologist or paleontological monitor supervised by a city-qualified paleontologist. Starting at five feet below the surface, monitoring will be conducted full-time in areas of grading or excavation in undisturbed Pleistocene old alluvial fan deposits.
2. 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.
3. 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

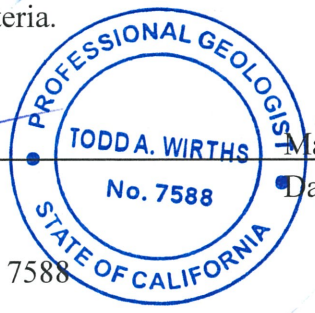
protected by flagging to prevent them from being overrun by earthmovers (scrapers) before salvage begins. Fossils are collected in a similar manner, with notes and photographs being taken before removing the fossils. Precise location of the site is determined with the use of handheld GPS units. If the 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.

4. 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.
5. 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, as multiple five-gallon buckets of sediment can be collected and returned to a separate facility to wet-screen the sediment.
6. 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.
7. 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).
8. 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.
9. 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 WSC) 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 (the City of Menifee) will be consulted on the repository/museum to receive the fossil material.

10. A final 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.



March 3, 2022

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

Date

VIII. REFERENCES

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APPENDIX A

Qualifications of Key Personnel

Todd A. Wirths, MS, PG No. 7588

Senior Paleontologist

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Education

Master of Science, Geological Sciences, San Diego State University, California **1995**

Bachelor of Arts, Earth Sciences, University of California, Santa Cruz **1992**

Professional Certifications

California Professional Geologist #7588, 2003
Riverside County Approved Paleontologist
San Diego County Qualified Paleontologist
Orange County Certified Paleontologist
OSHA HAZWOPER 40-hour trained; current 8-hour annual refresher

Professional Memberships

Board member, San Diego Geological Society
San Diego Association of Geologists; past President (2012) and Vice President (2011)
South Coast Geological Society
Southern California Paleontological Society

Experience

Mr. Wirths has more than a dozen years of professional experience as a senior-level paleontologist throughout southern California. He is also a certified California Professional Geologist. At BFSA, Mr. Wirths conducts on-site paleontological monitoring, trains and supervises junior staff, and performs all research and reporting duties for locations throughout Los Angeles, Ventura, San Bernardino, Riverside, Orange, San Diego, and Imperial Counties. Mr. Wirths was formerly a senior project manager conducting environmental investigations and remediation projects for petroleum hydrocarbon-impacted sites across southern California.

Selected Recent Reports

2019 *Paleontological Assessment for the 10575 Foothill Boulevard Project, City of Rancho Cucamonga, San Bernardino County, California*. Prepared for T&B Planning, Inc. Report on file at Brian F. Smith and Associates, Inc., Poway, California.

2019 *Paleontological Assessment for the MorningStar Marguerite Project, Mission Viejo, Orange County, California.* Prepared for T&B Planning. Report on file at Brian F. Smith and Associates, Inc., Poway, California.

2019 *Paleontological Monitoring Report for the Nimitz Crossing Project, City of San Diego.* Prepared for Voltaire 24, LP. Report on file at Brian F. Smith and Associates, Inc., Poway, California.

2019 *Paleontological Resource Impact Mitigation Program (PRIMP) for the Jack Rabbit Trail Logistics Center Project, City of Beaumont, Riverside County, California.* Prepared for JRT BP 1, LLC. Report on file at Brian F. Smith and Associates, Inc., Poway, California.

2020 *Paleontological Monitoring Report for the Oceanside Beachfront Resort Project, Oceanside, San California.* Prepared for S.D. Malkin Properties. Report on file at Brian F. Smith and Associates, Inc., Poway, California.

2020 *Paleontological Resource Impact Mitigation Program for the Nakase Project, Lake Forest, Orange County, San California.* Prepared for Glenn Lukos Associates, Inc. Report on file at Brian F. Smith and Associates, Inc., Poway, California.

2020 *Paleontological Resource Impact Mitigation Program for the Sunset Crossroads Project, Banning, Riverside County*. Prepared for NP Banning Industrial, LLC. Report on file at Brian F. Smith and Associates, Inc., Poway, California.

2020 *Paleontological Assessment for the Ortega Plaza Project, Lake Elsinore, Riverside County*. Prepared for Empire Design Group. Report on file at Brian F. Smith and Associates, Inc., Poway, California.

2020 *Paleontological Resource Record Search Update for the Green River Ranch III Project, Green River Ranch Specific Plan SP00-001, City of Corona, California*. Prepared for Western Realco. Report on file at Brian F. Smith and Associates, Inc., Poway, California.

2020 *Paleontological Assessment for the Cypress/Slover Industrial Center Project, City of Fontana, San Bernardino County, California*. Prepared for T&B Planning, Inc. Report on file at Brian F. Smith and Associates, Inc., Poway, California.

2020 *Paleontological Monitoring Report for the Imperial Landfill Expansion Project (Phase VI, Segment C-2), Imperial County, California*. Prepared for Republic Services, Inc. Report on file at Brian F. Smith and Associates, Inc., Poway, California.

2021 *Paleontological Assessment for the Manitou Court Logistics Center Project, City of Jurupa Valley, Riverside County, California*. Prepared for Link Industrial. Report on file at Brian F. Smith and Associates, Inc., Poway, California.

2021 *Paleontological Resource Impact Mitigation Program for the Del Oro (Tract 36852) Project, Menifee, Riverside County*. Prepared for D.R. Horton. Report on file at Brian F. Smith and Associates, Inc., Poway, California.

2021 *Paleontological Assessment for the Alessandro Corporate Center Project (Planning Case PR-2020-000519), City of Riverside, Riverside County, California*. Prepared for OZI Alessandro, LLC. Report on file at Brian F. Smith and Associates, Inc., Poway, California.

2021 *Paleontological Monitoring Report for the Boardwalk Project, La Jolla, City of San Diego*. Prepared for Project Management Advisors, Inc. Report on file at Brian F. Smith and Associates, Inc., Poway, California.

APPENDIX B

Paleontological Records Searches

SAN BERNARDINO COUNTY MUSEUM

2024 Orange Tree Lane • Redlands, California USA 92374-4560
(909) 307-2669 • Fax (909) 307-0539 • www.sbcountymuseum.org
TDD (909) 792-1462

COUNTY OF SAN BERNARDINO

ROBERT L. McKERNAN
Director

1 June 2010

Discovery Works, Incorporated
attn: Beth Padon
10591 Bloomfield
Los Alamitos, CA 90720

re: **PALEONTOLOGY LITERATURE AND RECORDS REVIEW, CITY OF MENIFEE GENERAL PLAN, RIVERSIDE COUNTY, CALIFORNIA**

Dear Ms. Padon,

The Division of Geological Sciences of the San Bernardino County Museum (SBCM) has completed a literature review and records search for the City of Menifee General Plan in Riverside County, California. Specifically, the study area encompasses all or portions of sections 10 through 17 and 20 through 36, Township 5 South, Range 3 West, San Bernardino Base and Meridian; sections 25 and 36, T 5S, R 4W, SBB&M; section 19, T 6S, R 2W, SBB&M; and sections 1 through 6, 8 through 17, and 20 through 24, T 6S, R 3W, SBB&M, as seen on the Romoland, California 7.5' United States Geological Survey topographic quadrangle map (1953 edition). Portions of the City of Menifee not mapped on this quadrangle were not considered in this review, at your request.

Previous geologic mapping (Rogers, 1965; Morton, 2003) indicates that the City of Menifee is located on relatively flat-lying alluvial plains surrounding and separating several small to moderate hills. In general, these topographic highs and lows can be used as a baseline against which to estimate paleontologic sensitivity: the hills generally lack potential for significant fossil resources (although see below), while the alluvial plains and the sediments flanking the base of the hills have high paleontologic sensitivity.

The low-lying alluvial plains in the City of Menifee consist primarily of surface exposures of Quaternary sedimentary deposits ranging in age from the earliest Pleistocene to the earliest Holocene Epochs. These sedimentary rock units are mapped as very old fan deposits of middle to early Pleistocene age (= unit **Qvof**), older fan deposits of middle to late Pleistocene age (= **Qof**$_a$), and young alluvial fan and valley deposits of Holocene and latest Pleistocene age (= **Qya, Qyf**, and **Qyv**). The very old fan deposits occur at the base and lower flanks of the low hills present throughout the city, while younger Holocene deposits are constrained in washes and shallow arroyos where they form a thin sedimentary veneer over older Pleistocene alluvium. The remainder of the flat-lying areas within the city are middle to later Pleistocene fan deposits. Of these sedimentary units, the young alluvial fan and valley deposits are too young geologically to have any potential to

contain significant vertebrate fossils. For this reason, these sediments are assigned low paleontologic sensitivity. In contrast, Pleistocene alluvial valley deposits and very old fan deposits, mapped throughout the project alignment, have high paleontologic sensitivity. Similar older Pleistocene alluvial sediments elsewhere throughout Riverside and San Bernardino Counties and the Inland Empire have been reported to yield significant fossils of plants and extinct animals from the Ice Age (Jefferson, 1991; Reynolds and Reynolds, 1991; Anderson and others, 2002; Scott and Cox, 2008; Springer and others, 2009, 2010). Fossils recovered from these Pleistocene sediments represent extinct taxa including mammoths, mastodons, ground sloths, dire wolves, short-faced bears, sabre-toothed cats, large and small horses, large and small camels, and bison (Jefferson, 1991; Reynolds and Reynolds, 1991; Scott and Cox, 2008; Springer and others, 2009, 2010).

With respect to the low hills throughout the City of Menifee, these consist for the most part (after Morton, 2003) of rock outcrops with low potential to contain significant fossil resources. Outcrops include Mesozoic metasedimentary rocks of the Peninsular Ranges batholith (= units **M_zgp, M_zi, M_zp, M_zq, M_zqg,** and **M_zu**) and Cretaceous granitic rocks of the Peninsular Ranges batholith (= **Kgb, Kdvg, Kpvg, Kpvt,** and **Kt**), as well as intermixed Mesozoic schist and Cretaceous granitics (=**KgMz**). These Mesozoic metasedimentary rocks and Cretaceous granitic rocks have no potential to contain significant fossil resources. However, the hills forming the western border of the City of Menifee do incorporate low-lying areas in portions of sections 30 and 31, T 5S, R 3W, and sections 25 and 36, T 5S, R 4W, that are mapped (Morton, 2003) as early to middle Pleistocene older alluvial channel gravels (= **$Qvoa_g$**). These sediments have undetermined potential to contain fossil resources.

For this review, I conducted a search of the Regional Paleontologic Locality Inventory (RPLI) at the SBCM. The results of this search indicate that several previously-recorded paleontologic resource localities are present within the boundaries of the study area. Paleontologic resource localities SBCM 5.6.626, 5.6.671 - 5.6.683, and 5.6.868 - 5.6.875 are situated within the northeastern portion of the city, while locality SBCM 5.6.627 is located near the eastern city border. (Data for these localities are not provided herein, but should be requested as appropriate when excavation or development is planned in these portions of the city.) These localities yielded fossil remains of extinct camel (*Camelops hesternus*) and small vertebrates, including rabbits, rodents and lizards. The presence of these localities in the study area confirms the presence of fossiliferous Pleistocene alluvium in the region, and demonstrates the high paleontologic sensitivity of this alluvium. This sensitivity is further reinforced by the relative proximity of the proposed project alignment to Diamond Valley Lake, situated several miles to the east; construction of this lake resulted in the recovery of several thousand fossils of late Pleistocene age from subsurface Pleistocene alluvium (Scott and Cox, 2008; Springer and others, 2009, 2010).

Recommendations

The results of the literature review and the check of the RPLI at the SBCM demonstrate that excavation in conjunction with development will have high potential to adversely impact significant nonrenewable paleontologic resources present within portions of the City of Menifee, particularly the flat-lying alluvial plains. When projects are scheduled or planned to be conducted in these

regions, a qualified vertebrate paleontologist must be retained to develop a program to mitigate impacts to such resources. These mitigation programs should be consistent with the provisions of the California Environmental Quality Act (Scott and Springer, 2003), as well as with regulations currently implemented by the County of Riverside and the proposed guidelines of the Society of Vertebrate Paleontology. These programs should include, but not be limited to:

1. Monitoring of excavation in areas identified as likely to contain paleontologic resources by a qualified paleontologic monitor. Paleontologic monitors should be equipped to salvage fossils as they are unearthed, to avoid construction delays, and to remove samples of sediments that are likely to contain the remains of small fossil invertebrates and vertebrates. Monitors must be empowered to temporarily halt or divert equipment to allow removal of abundant or large specimens.

2. Preparation of recovered specimens to a point of identification and permanent preservation, including washing of sediments to recover small invertebrates and vertebrates. Preparation and stabilization of all recovered fossils are essential in order to fully mitigate adverse impacts to the resources (Scott and others, 2004).

3. Identification and curation of specimens into an established, accredited museum repository with permanent retrievable paleontologic storage (e.g., SBCM). These procedures are also essential steps in effective paleontologic mitigation (Scott and others, 2004) and CEQA compliance (Scott and Springer, 2003). The paleontologist must have a written repository agreement in hand prior to the initiation of mitigation activities. Mitigation of adverse impacts to significant paleontologic resources is not complete until such curation into an established, accredited museum repository has been fully completed and documented.

4. Preparation of a report of findings with an appended itemized inventory of specimens. The report and inventory, when submitted to the appropriate Lead Agency along with confirmation of the curation of recovered specimens into an established, accredited museum repository, will signify completion of the program to mitigate impacts to paleontologic resources.

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

Sincerely,

Eric Scott, Curator of Paleontology
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San Bernardino County Museum

Division of Earth Sciences

15 February, 2021

Brian F. Smith and Associates, Inc.
Attn: Todd Wirths
14010 Poway Rd.,
Poway CA 92064

PALEONTOLOGY RECORDS REVIEW for proposed On-Deck project, Riverside County, California

Dear Mr. Wirths,

The Division of Earth Sciences of the San Bernardino County Museum (SBCM) has completed a records search for the above-named project in Riverside County, California. The proposed On-Deck project is located in the City of Menifee, California as shown on the United States Geological Survey (USGS) 7.5 Romoland, California quadrangles.

Previous geologic mapping (Morton, 2003) of that region indicates the proposed development is located on Pleistocene aged alluvial fan deposits (Qof). These middle- late Pleistocene alluvial sediments that are found elsewhere throughout San Bernardino and Riverside counties have reported to yield significant fossils of extinct animals from the Ice Age.

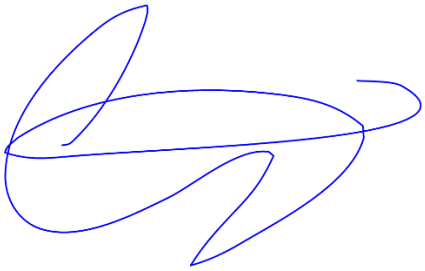
For this review, I conducted a search of the Regional Paleontological Locality Inventory (RPLI) at the SBCM. The results of this search indicate that no paleontological resources have been discovered within the proposed project. The nearest fossil sites are located approximately 8 to 9 miles southeast of the proposed project at Diamond Valley lake where hundreds of fossils belonging to Pleistocene megafauna such as Mastodon, ground sloth, camels, and horses were uncovered from older alluvium (Qof). These fossil remains are now housed at the Western Science Center in Hemet, California.

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,



Crystal Cortez, Curator of Earth Sciences
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