

PALEONTOLOGICAL ASSESSMENT FOR THE VERNOLA RANCH PROJECT

**CITY OF JURUPA VALLEY,
RIVERSIDE COUNTY, CALIFORNIA**

Prepared on Behalf of:

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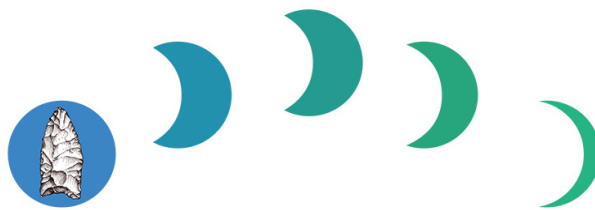
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October 10, 2023



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Paleontological Database Information

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Report Date: October 10, 2023

Report Title: Paleontological Assessment for the Vernola Ranch Project, City
of Jurupa Valley, Riverside County, California

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***Assessor's Parcel
Numbers:*** 160-050-005, -021, -023, -063, -067, -068, -070, -072, -073, and
-074

USGS Quadrangle: *Corona North, California (7.5-minute)*

Study Area: 200.7 acres

Key Words: Paleontological assessment; Pleistocene very old alluvial fan
deposits; City of Jurupa Valley; full-time paleontological
monitoring.

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I. INTRODUCTION AND LOCATION

A paleontological resource assessment has been completed for the Vernola Ranch Project (Assessor's Parcel Numbers [APNs] 160-050-005, -021, -023, -063, -067, -068, -070, -072, -073, and -074), which is located between Interstate 15, Pats Ranch Road, Bellegrave Avenue, and Limonite Avenue, along the western edge of the city of Jurupa Valley in Riverside County, California (Figures 1 and 2). On the U.S. Geological Survey (USGS) 1:24,000-scale *Corona North, California* (7.5-minute) topographic quadrangle map, the project is located within Sections 18 and 19, Township 2 South, Range 6 West of the San Bernardino Baseline and Meridian (see Figure 2). The 200.7-acre project includes the grading of the property for the construction of a 153-acre Vernola Ranch Specific Plan (VRSP) residential development, the grading of an additional 36 acres for future development as well as 11.7 acres of road improvements. The project proposes approximately 1,576 homes (single-family, multi-family, townhomes, and other housing types), recreation areas, network of trails and parks, internal street network, open space, landscaping, and approximately 11.7 acres of street improvements on Limonite Avenue, Pats Ranch Road, and Bellegrave Avenue. The project also includes an overlay for a potential school site located at the northeast portion of the property. The project properties are currently vacant, except for a wooden barn in the north portion, and the land has recently been cleared and disked.

As the lead agency, the City of Jurupa Valley 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 paleontological site survey; a review of paleontological literature and records of fossil localities 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.

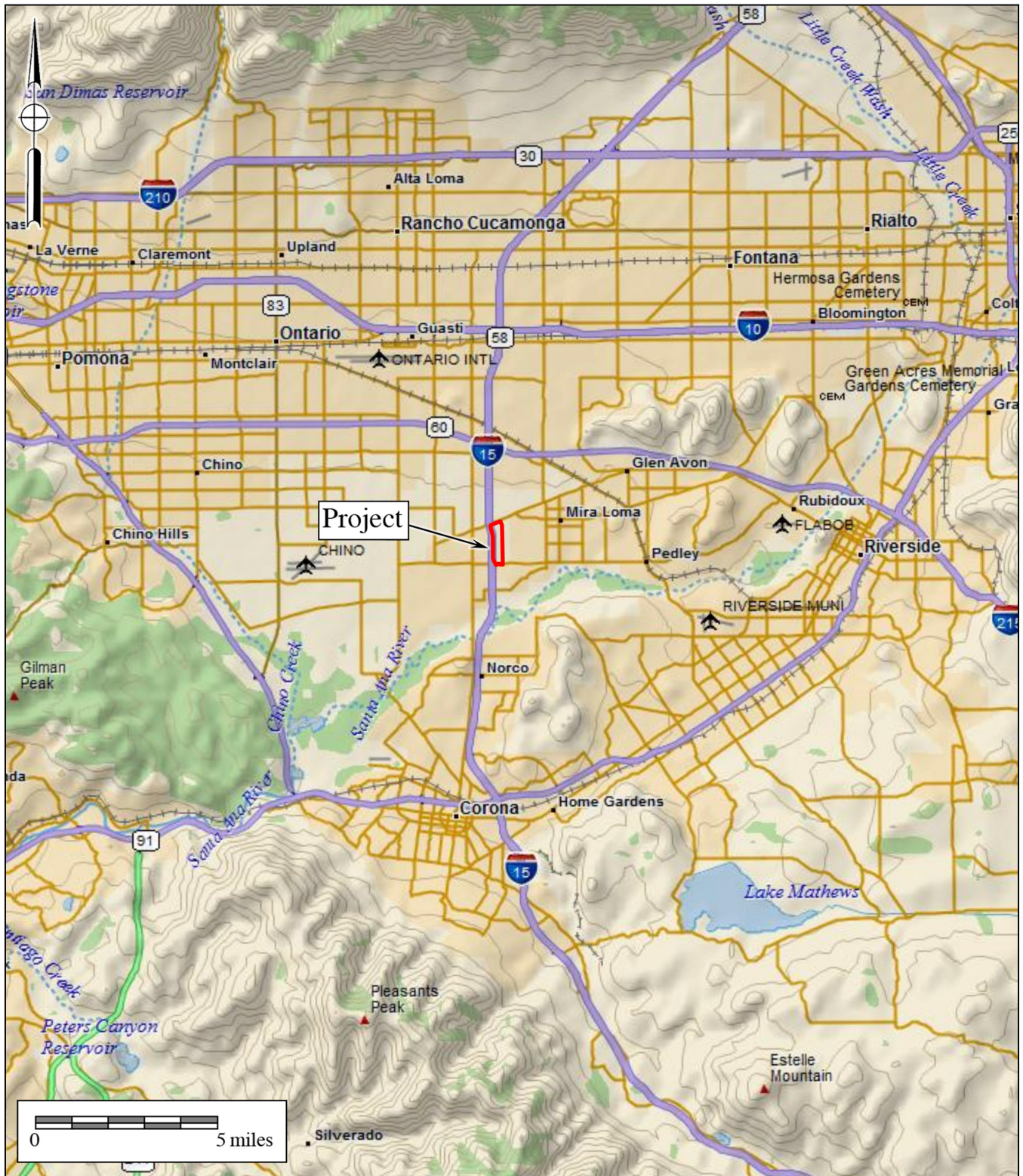


Figure 1
General Location Map
 The Vernola Ranch Project
 DeLorme (1:250,000)

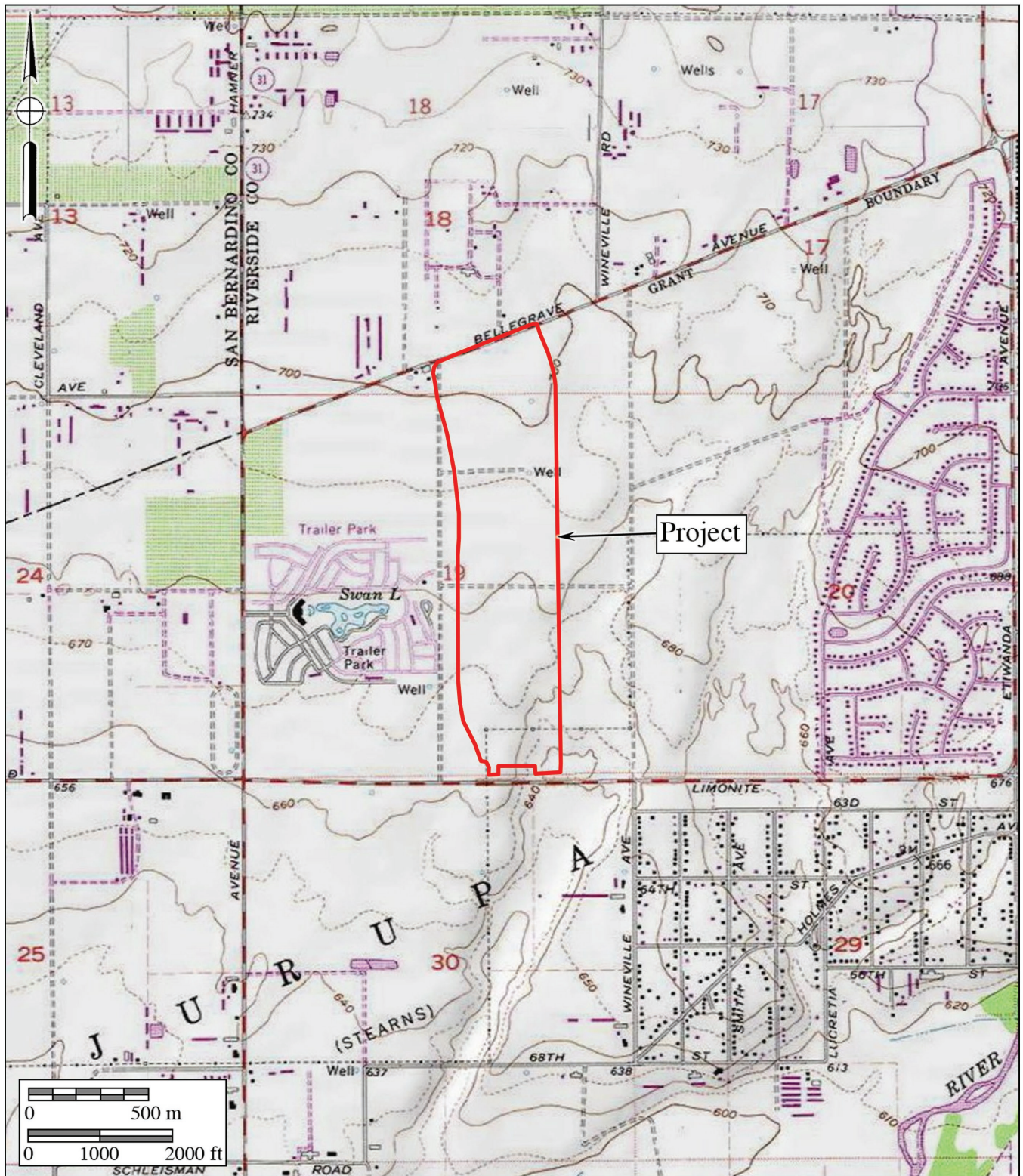


Figure 2
Project Location Map
 The Vernola Ranch Project

USGS *Corona North* and *Guasti* Quadrangles (7.5-minute series)



BFS Environmental Services
 A Perennial Company

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:

- 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 Jurupa Valley

The 2017 City of Jurupa Valley General Plan (City of Jurupa Valley 2017a) presents general, non-specific policies for preserving cultural and paleontological resources. The General Plan includes a map that delineates the levels of paleontological sensitivity assigned to the geologic formations within the city limits, given as Low, High B, or High A (City of Jurupa Valley 2017a:4–36). The General Plan explains that the paleontological sensitivity “map is used in the environmental assessment of development proposals and the determination of required impact mitigation” (City of Jurupa Valley 2017a). It should be noted that the City’s General Plan map is an exact replica of the County of Riverside’s interactive paleontological sensitivity mapping tool, except the County provides definitions of the sensitivity values, whereas the General Plan does not.

The appendices to the 2017 City of Jurupa Valley General Plan provide mitigation and monitoring guidelines for paleontological resources. Mitigation Measure 4.5.5.3A states:

Prior to issuance of a grading permit, a project applicant must demonstrate if the proposed project grading will impact underlying soil units or geologic formations that have a moderate to high potential to yield fossiliferous materials. If the potential for fossil discovery is low, no pre-grading monitoring needs to be established. If the potential for fossil discovery is moderate to high, the applicant must provide a paleontological monitor during rough grading of the project. If a paleontologist is not onsite and possible fossil materials are found, work shall be halted in that area until the material can be assessed by a qualified professional. If materials are found onsite during grading, a qualified professional shall evaluate the find and determine if it represents a significant paleontological resource. If the resource is determined to be significant, the paleontologist shall supervise removal of the material and determine the most appropriate archival storage of the material. This measure shall be implemented to the satisfaction of the City Planning Department. (City of Jurupa Valley 2017b:115)

III. GEOLOGY

Geologically, on the 1:24,000-scale geologic map of the 7.5-minute *Corona North* Quadrangle (Figures 3A and 3B, after Morton and Gray 2002), the project site is located on the broad alluvial plain with southward-flowing tributary drainages within the ancestral Santa Ana River watershed. The project is mapped as being underlain by three surficial sedimentary deposits. Most of the project is mapped as Holocene- and late Pleistocene-aged young eolian (wind-blown) deposits (inactive sand dunes) composed of unconsolidated, well sorted, fine- to medium-grained sand (area shown in yellow with red dots and labeled “Qye” on Figures 3A and 3B). Covering much of the southeast portion of the project are early Pleistocene-aged very old alluvial channel deposits, consisting of variably consolidated and indurated deposits of sand with as much as two to three meters of pedogenic soil development (area colored mustard and labeled “Qvoa_a” on Figures 3A and 3B). Holocene- and late Pleistocene-aged young alluvial channel deposits are mapped at the southeastern corner (pink area with red dots labeled as “Qya_a” on Figures 3A and 3B). These deposits consist of fine- to medium-grained sands that are slightly consolidated to cemented and slightly to moderately dissected, with slight to moderate soil development (Morton and Gray 2002).

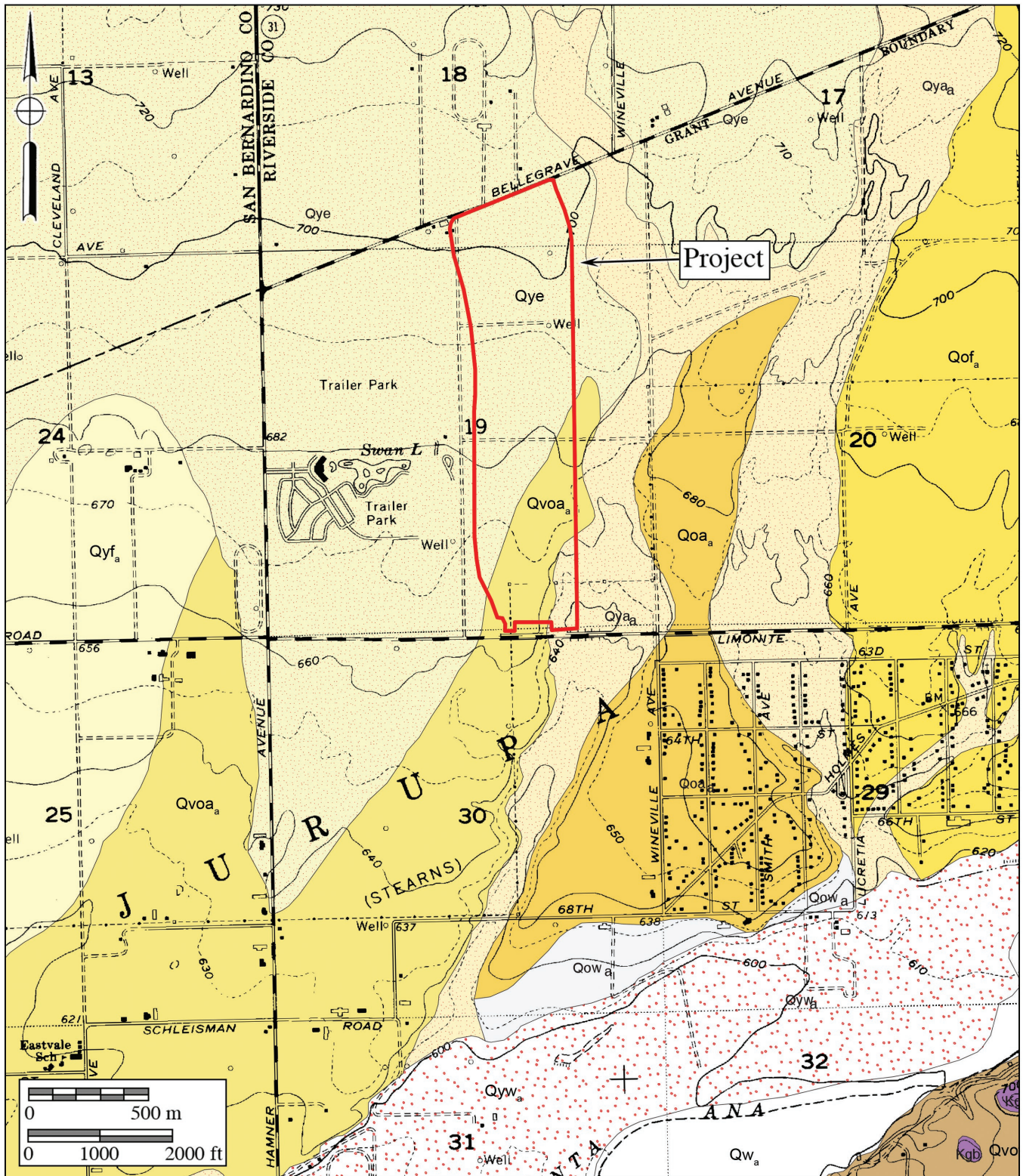
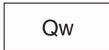


Figure 3A
Geologic Map

The Vernola Ranch Project
Geology after Morton and Gray (2002)

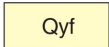
DESCRIPTION OF MAP UNITS

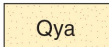
Holocene

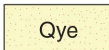
 **Qw** **Very young wash deposits**

Holocene and late Pleistocene

 **Qyw** **Young wash deposits**

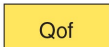
 **Qyf** **Young alluvial fan deposits**

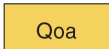
 **Qya** **Young alluvial channel deposits**

 **Qye** **Young eolian deposits**

Late to middle Pleistocene

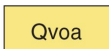
 **Qow** **Old wash deposits**

 **Qof** **Old alluvial fan deposits**

 **Qoa** **Old alluvial channel deposits**

Early Pleistocene

 **Qvof** **Very old alluvial fan deposits**

 **Qvoa** **Very old alluvial channel deposits**

Cretaceous

 **Kgb** **Gabbro**

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), for example, when viewed in the context of local extinction of the organism or habitat. Fossils are considered a nonrenewable resource under state and local policies (see Section II of this report).

Fossil Locality Records Search

A paleontological literature review and collections and locality records search was conducted for the project using records from prior BFSa Environmental Services, a Perennial Company (BFSa), projects the Division of Geological Sciences at the San Bernardino County Museum (SBCM), the Los Angeles County Museum of Natural History (LACM), and the Western Science Center (WSC) 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 boundaries of the project. The closest known recorded fossil locality is approximately 1.5 miles west of the project, consisting of the remains of a whipsnake (*Masticophis* sp.), found at a depth of nine to 11 feet (LACM locality no. 7811). About one-half mile west of LACM loc. 7811, BFSa paleontological monitors discovered Pleistocene vertebrate fossils during trenching activities at the County Line Channel Project (Kennedy et al. 2005). Fossils occurred at depths ranging from 11 to 17 feet deep and consisted of fragmentary bones from a camel (*Camelops* sp. cf. *C. hesternus*), a fragmentary jaw of a bighorn sheep (*Ovis canadensis*), and several unidentifiable large mammal bone fragments. About 2.5 miles west of the current project in Ontario, fragmentary Pleistocene mammalian bones were recovered from depths of five to seven feet deep at a residential subdivision project (Wirths 2021). The County Line Channel and Ontario specimens are housed at the WSC. The closest known fossil locality recorded by the SBCM is approximately three to four miles north, also in Ontario, consisting of the remains of a Pleistocene mammoth (SBCM loc. no. 5.1.8; The Planning Center 2009; Jefferson 2009).

Field Survey

BFSa staff conducted a site visit on November 23, 2021. Visibility of the natural ground surface was excellent as the agricultural fields had recently been cleared and plowed. The entire property has been cultivated for decades and no undisturbed areas exist within the project. No paleontological resources were identified as a result of the survey.

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, therefore, is typically assigned a low paleontological sensitivity. Pleistocene (more than 11,700 years old) alluvial and alluvial fan deposits in the Inland Empire, however, often yield important Ice Age terrestrial vertebrate fossils, such as extinct mammoths, mastodons, giant ground sloths, extinct species of horse, bison, and camel, saber-toothed cats, and others (Jefferson 1991). Therefore, these Pleistocene deposits are accorded a high paleontological resource sensitivity.

Professional Standards

The Society of Vertebrate Paleontology (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, based on the presence of nearby significant fossil localities from LACM, WSC, and SBCM and the strong likelihood that the nearby fossil localities originated from the same geologic formations as those which underlie the project at depth, the Pleistocene very old alluvial channel deposits can be considered to have a high potential to yield significant paleontological resources. The Holocene- and late Pleistocene-aged young eolian and young alluvial channel deposits may be considered to have an undetermined to high potential,

considering their age range reaching the present time and likely depth-constrained fossil potential (*i.e.*, sedimentary deposits become older with depth).

Paleontological Sensitivity Assessment

The regulatory agency reviewing this document is the City of Jurupa Valley; however, the City's paleontological sensitivity criteria (City of Jurupa Valley 2017a) is based on the County of Riverside Land Information System interactive online database (County of Riverside 2021). Figure 4 shows the project on a City of Jurupa Valley map, which delineates the degrees of paleontological sensitivity assigned to the geologic formations within the city limits (Low, High B, or High A) (City of Jurupa Valley 2017a:4–36), but this discussion will reference the sensitivity value definitions provided by the County of Riverside (2021).

As shown on Figure 4, the northern three-fourths of the project is tinted green, indicating a “High B” paleontological sensitivity (City of Jurupa Valley 2017a). The County of Riverside identifies a “High B” ranking as “equivalent to High A, but ... based on the occurrence of fossils at a specified depth below the surface. The category High B indicates that fossils are likely to be encountered at or below four feet of depth, and may be impacted during excavation by construction activities” (County of Riverside 2021). Deposits at the southern fourth of the project are assigned a “High A” paleontological sensitivity, shown in blue. The County of Riverside has defined areas assigned a “High A potential” for yielding paleontological resources “based on [the presence of] geologic formations or mappable rock units that are rocks that contain fossilized body elements, and trace fossils such as tracks, nests and eggs. These fossils occur on or below the surface” (County of Riverside 2021).

As a reflection of published geologic maps, the delineations of paleontological sensitivity, as shown on Figure 4, are intended to follow the contacts of certain geologic formations as presented in Figure 3A. The sensitivity delineations on Figure 4 are inaccurate: blue-tinted “High A” areas of sensitivity should match the early Pleistocene-aged very old alluvial channel deposits, while the green-tinted “High B” areas are intended to highlight the Holocene- and late Pleistocene-aged young eolian and alluvial deposits. Therefore, areas of “High A” sensitivity are indicated by the areas mapped as very old alluvial channel deposits on Figure 3A, while the remainder of the project is rated as “High B.”



VI. CONCLUSIONS AND RECOMMENDATIONS

Research has revealed the presence of early Pleistocene-aged very old alluvial channel deposits mapped at the southern portion of the project. In western Riverside County, old and very old alluvial fan deposits are known to yield terrestrial vertebrate fossils. A Paleontological Resources Impact Mitigation Program (PRIMP) should be implemented for earth disturbance impacts to the Pleistocene very old alluvial fan deposits. Paleontological monitoring is recommended beginning at the surface where these deposits are mapped within the project (“Qvoa_a” on Figure 3A). Holocene- and late Pleistocene-aged young eolian and young alluvial channel deposits cover the remainder of the project. Paleontological monitoring is recommended where these deposits are mapped on Figure 3A, starting at a depth of four feet.

A proposed PRIMP is detailed below. When implemented with the provisions of CEQA and the guidelines of the Society of Vertebrate Paleontology (2010), this PRIMP would mitigate any adverse impacts (loss or destruction) to potential, nonrenewable paleontological resources (fossils), if present, to a level below significant.

Proposed PRIMP

1. Monitoring of mass grading and excavation activities in areas identified as likely to contain paleontological resources shall be performed by a qualified paleontologist or paleontological monitor. Starting at the surface, monitoring shall be performed full-time in Pleistocene very old alluvial fan deposits as mapped by Morton and Gray (2002). Starting at a depth of four feet, monitoring will be conducted full-time in areas of grading or excavation in undisturbed sediments of Holocene- and late Pleistocene-aged young eolian and young alluvial channel deposits as mapped by Morton and Gray (2002).
2. If a fossil(s) is found at a shallower depth within young eolian or young alluvial fan deposits where mapped at the project, earth disturbance activities should be halted within a radius of 50 feet from the location of the fossil and a project-level paleontologist shall be consulted to determine the significance of the fossilized remains. If the fossil(s) is deemed significant by the project paleontologist, full-time monitoring should be initiated.
3. Monitoring may be reduced if the potentially fossiliferous units are not present in the subsurface or, if present, are determined by qualified paleontological personnel upon exposure and examination to have a low potential to contain or yield fossil resources.
4. Paleontological monitors will 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. The monitor must be empowered to temporarily halt or divert equipment to allow for the removal of abundant or large specimens in a timely manner.
5. Paleontological salvage during trenching and boring activities is typically from the

generated spoils and does not delay the trenching or drilling activities. Fossils will be collected and placed in cardboard flats or plastic buckets and identified by field number, collector, and date collected. Notes will be taken on the map location and stratigraphy of the discovery site, and the discovery site will be 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 buckets of fossiliferous sediment. If it is possible in the field, concentrated samples may be dry-screened for the presence of small bone fragments within the sediments. If present, multiple buckets of sediment may be collected and returned to a separate facility to wet-screen the sediment. 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).
7. Recovered specimens will be prepared to a point of identification and permanent preservation, including screen-washing sediments to recover small vertebrates and invertebrates if indicated by the results of test sampling. Preparation of any individual vertebrate fossils is often more time-consuming than that of invertebrate fossils.
8. All fossils must be deposited in an accredited institution (university or museum) that maintains collections of paleontological materials. All costs of the paleontological monitoring and mitigation program, including any one-time charges by the receiving institution, are the responsibility of the developer. Typically, the WSC in Hemet is the preferred repository for fossils found in Riverside County.
9. A final monitoring and mitigation report documenting findings and significance will be prepared, including lists of all fossils recovered and necessary maps and graphics to accurately record their original location(s). A letter documenting receipt and acceptance of all fossil collections by the receiving institution must be included in the final report. The report, when submitted to and accepted by the appropriate lead agency (*e.g.*, the City of Jurupa Valley), will signify satisfactory completion of the project program to mitigate impacts to any nonrenewable paleontological resources.

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.



October 10, 2023

Todd A. Wirths

Date

Senior Paleontologist

California Professional Geologist No. 7588

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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E ducation

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

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

P rofessional C ertifications

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

P rofessional M emberships

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

E xperience

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 BFSAE nvironmental Services, 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.

S elected R ecent R eports

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.
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- 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.
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