
Appendix E-5

Paleontological Resources Review Memorandum

MEMORANDUM

To: Brian Rupp, Mesa Verde Owner, LLC
From: Sarah Siren, MSc and Michael Williams, PhD, Paleontologists (with contributions from Keshia Montifolca, MA, RPA and Adam Giacinto, MA, RPA)
Subject: Paleontological Resources Review: Mesa Verde Specific Plan 2023 Project
Date: September 6, 2023 – Revised March 22, 2024
cc: Kristin Starbird and Michael Williams, PhD, Dudek
Attachment(s): A: Figure 1 Geological Map, B: BFSA Paleontological Resource Assessment, C: Paleontological Records Search Results (Confidential), D: Field Photographs.

Dudek is providing this Paleontological Resources Review Memorandum to assess the potential for impacts to paleontological resources during construction activities for the Mesa Verde Specific Plan 2023 Project (Project) located southwest of Interstate 10 in the northwestern portion of the City of Calimesa, within the County of Riverside, California (Attachment A; Figure 1). This region is characterized by the San Timoteo Badlands and contains a thick sequence (almost 2,000 m) of terrestrial sedimentary deposits ranging in age from the latest Miocene to the middle Pleistocene (Albright, 2000).

The Project site (the 1,463.1 acre Project location) is relatively undeveloped and underlain by Holocene (~less than 11,700 years old) alluvial fan deposits (map unit Qf); late to middle Pleistocene (~11,700 to 774,000 years ago) older axial channel deposits (map unit Qoa₁), middle to early Pleistocene (~774,000 to 2.58 million years ago [mya]) very old sedimentary deposits, and middle Pleistocene to early Pliocene (~1.5 mya to 4 mya) San Timoteo Formation (upper Member = map unit Qstu) (Cohen et al., 2023; Dibblee and Minch, 2004; Matti et al., 2015; Morton and Miller, 2006a) (Attachment A; Figure 1). A paleontological resources assessment was conducted by Brian F. Smith and Associates, Inc. in 2015 and updated in 2017. According to the BFSA (2017) analysis, the Project site has a high potential to yield paleontological resources (i.e., high sensitivity) due to the presence of Pleistocene older alluvial deposits and the San Timoteo Formation (Attachment B). However, Holocene alluvial fan deposits mapped within the Project site are too young to contain significant paleontological resources and thus have low potential to yield such resources (Attachment B-BFSA, 2017; Cohen et al., 2023; Dibblee and Minch, 2004).

BFSA (2017) referenced a records search conducted by the San Bernardino County Museum (SBCM) in an earlier assessment by Leslie (2004), which documented three (3) paleontological resource localities from within the Project site itself (Attachment B). Dudek requested paleontological records searches from the Natural History Museum of Los Angeles County (NHMLA) and the Western Science Center (WSC). The NHMLA results were received on April 9, 2023 and detail Pleistocene and older sedimentary deposits in the area that have yielded fossil localities (NHMLA, 2023; WSC, 2023; Attachment C). The NHMLA locality in the San Timoteo Badlands, LACM (Los Angeles County Museum) VP (Vertebrate Paleontology) 7618 to 7622 and LACM VP CIT (California Institute of Technology) 132-133, yielded Pleistocene megafaunal remains, including horse (Equidae) and camel (Camelidae) specimens. LACM 4540 from the gravel pits west of Jack Rabbit trail, yielded the remains of an extinct horse (Equidae). Localities VP 1653 and LACM IP 437, located north of the Soboba Indian Reservation, yielded Pleistocene invertebrates, including insect (*Sobobapteron kirkbaye*) and brachiopod (*Terebratalia hemphili*) specimens, in addition to vertebrates, including monkfish (*Squatina*) and stickleback (*Gasterosteus*). Locality LACM VP 4135 located north of Banning, near Beaumont, yielded a camel (Camelidae) specimen. The Mount Eden Formation east of Eden Hot Springs has produced fossil specimens of deer, camel, horse, and rhinoceros (LACM VP 1118-1119).

The WSC paleontological records search results letter was received on May 12, 2023. No paleontological resources were documented from the Project site according to the WSC (2023) records search results.

The intensive pedestrian survey for this Project was performed by Dudek Archaeologists and Paleontologists Keshia Montifolca, David Alexander, Seth Bruck, and Daphne Tomlin from April 17, 2023 to April 25, 2023. The survey was conducted using standard paleontological procedures and techniques. Survey transects were spaced 15 meters where possible; however, actual survey transect spacing varied depending on ground visibility. Where transects were not feasible (such as on slopes greater than 25°), transects were not utilized. Instead, a mixed approach (opportunistic survey) was utilized, selectively examining terraces, cut banks, triangles, and ridges where possible, and utilizing existing access trails.

Formal transects were not used for the majority of the northwesternmost and central sections of the Project site. These areas, approximately 30 percent of the Project area, consist of numerous slopes great than 30 degrees and dense vegetation, with ground visibility of less than 25%. Due to the steep slopes or vegetation, the mixed survey approach was used. All survey transects were oriented parallel to the long-axis of the Project site, or to major topographic features. Transect spacing was kept using a combination of compasses and field tablets equipped with a mobile ESRI ArcGIS application with real-time locations plotted on aerials. The crew moved together as a team to ensure accurate transect spacing and to facilitate resource identification.

Within each transect, the ground surface was examined for fossils. Ground disturbances such as burrows, cut banks, and drainages were also visually inspected for exposed subsurface fossils. No paleontological resources were discovered during this survey.

A secondary, supplemental pedestrian survey of the Project site was conducted on April 27, 2023 by Michael Williams, PhD and David Alexander, BA. The focus of this survey was to examine the canyon that bisects the Project site from the northeast to the southwest, determine whether paleontological resources are present on the ground surface, and field check the published geological mapping and records search results. Other than fossil root casts, no paleontological resources were observed during the survey. Although major portions of the surface of the Project site were obscured by vegetation, good exposures of the mapped very old sedimentary deposits and the San Timoteo Formation were observed in the canyon (Attachment D). Additionally, a potential paleosol (fossil soil horizon) was examined and photographed during the survey (Attachment D).

A third, supplemental pedestrian survey, of the expanded Project area was conducted along County Line Road on January 31, 2024 by David Alexander, BA. The majority of the survey area was developed and either covered by asphalt, cement, or residential landscaping. There were a few exposures observed near the east and west ends of the road, where the very old sedimentary deposits were exposed in road cuts, and the San Timoteo Formation was exposed with the overlying very old sedimentary deposits in a large drainage at the west end of the survey area. No paleontological resources were discovered during this survey.

The older axial channel deposits (map unit Qoa₁), very old sedimentary deposits (map unit Qvor), and the San Timoteo Formation have been known to yield significant paleontological resources in the region. The middle to early Pleistocene very old sedimentary deposits and the middle Pleistocene to early Pliocene San Timoteo Formation contain fossils that date back to the Irvingtonian and Blancan North American Land Mammal Ages (NALMAs). Ranging from 1.5 to 4 million years in age, the San Timoteo Formation deposits can be as much as 2,000 meters thick in the San Timoteo Badlands (Albright, 2000). Fossil mammals recovered from the San Timoteo Formation include mastodon, horse, camel, antelope, dog, bear, rodent, and rabbit (Eric Scott, pers. comm. 2003). The upper portion of this formation is reddish in color, and fines upward, into paleosols, which have produced many of the

fossils previously reported. The Shutt Ranch Local Fauna, which was dated at 780,000 to 990,000 years ago, was also recovered from upper portion of this formation (Albright, 1999, 2000; Morton and Miller, 2006b). In addition, layers of “massive, very fine grained, light gray calcareous “marls’... representing shallow marshes of limited extent” occur within the formation (Albright, 2000).

During construction monitoring for the Sandalwood Drive Extension (SDE) project in Calimesa, which is included in the Project site, Paleo Environmental Associates, Inc. (PEAI) salvaged approximately 515 terrestrial fossils from 23 fossil localities from fine-grained, fluvial (river or stream) deposits within the Upper San Timoteo Formation (PEAI, 2010). Of the 515 fossil specimens, approximately 475 were collected during sediment screening of one locality. The aforementioned Shutt Ranch Local Fauna was recovered just north of the SDE project and seven fossil specimens from the SDE project are shared with the Shutt Ranch Local Fauna. Fossil specimens salvaged from the SDE project include, but are not limited to, tortoise (Testudinidae), lizard (Iguanidae), snakes (Colubridae? and Crotalidae?), bird (Aves), rabbits (*Sylvilagus*), rodents (*Dipodomys*, *Neotoma lepida?*, *Microtus californicus?*), bats (Microchiroptera), horse (*Equus*), camel (*Plianchenia?*), and possible mammoth (*Mammuthus?*).

Paleontological resources have been discovered within the Project site as a result of previous investigations by other consultants (BFSA, 2017; Leslie, 2004; PEA, 2010). Given the proximity and number of past fossil discoveries in the surrounding area within Pleistocene and older sedimentary deposits, the Project site is likely to produce paleontological resources.

In the event that intact paleontological resources are located on the Project site, ground-disturbing activities associated with construction of the project, such as grading during site preparation, large diameter drilling (two feet or greater), and trenching for utilities have the potential to destroy a unique paleontological resource or site. Without mitigation, the potential damage to paleontological resources during construction would be a potentially significant impact. However, upon implementation of MM-GEO-1, impacts would be reduced to below a level of significance. Impacts of the Project are considered less than significant with mitigation incorporated during construction.

MM-GEO-1: Prior to commencement of any earthmoving activity on-site, the Project Applicant/Developer shall retain a Qualified Paleontologist per the Society of Vertebrate Paleontology (SVP) (2010) guidelines to prepare a Paleontological Resources Impact Mitigation Program (PRIMP) for the project. The PRIMP shall be consistent with the SVP (2010) guidelines and shall, at a minimum, outline requirements for: (1) preconstruction meeting attendance and worker environmental awareness training; (2) where monitoring is required within the proposed Project site and procedures for adequate paleontological monitoring; and (3) discoveries treatment and paleontological sampling, reporting, and collections management. These requirements shall include, but not be limited to, the following:

- **Construction Worker Paleontological Resources Sensitivity Training.** Prior to the commencement of project ground-disturbing activities, a Qualified Paleontologist shall present a paleontological resources sensitivity training (or may be provided via digital recording) to project construction personnel. The Qualified Paleontologist shall inform construction personnel about the laws protecting paleontological resources; the types of paleontological resources that could be encountered; the proper procedures to follow in the event of a paleontological discovery; and safety precautions to be taken when working with paleontological monitors.
- **Paleontological Monitoring and Sampling.** During grading and excavation activities, a Qualified Paleontological Monitor in accordance with the SVP (2010) guidelines shall be present to monitor the earth-moving activities during all rough grading and other significant ground-disturbing activities (including augering) in Pleistocene alluvial fan deposits and older axial channel deposits, the middle

Pleistocene to early Pliocene San Timoteo Formation, and in applicable areas of the project site based on construction plans and/or geotechnical reports. Site activities shall include sediment sampling for microvertebrate fossils. Should paleontological resources be encountered, the Qualified Paleontological Monitor shall have the authority to halt ground-disturbing activities; shall rope off the find with a 50-foot radius buffer; and shall immediately notify the Qualified Paleontologist of the find.

- **Paleontological Resources Recovery Plan.** If paleontological resources are discovered during earthmoving activities, a Qualified Paleontologist shall prepare and submit a Paleontological Resources Recovery Plan (PRRP) to the City for review and approval. The recovery plan shall include, but is not limited to, sampling and fossil recovery procedures pertinent to the type(s) of fossil discovered, museum curation for any scientifically significant specimen recovered, and a report of findings. Recommendations in the PRRP shall be implemented before construction activities can resume at the site where the paleontological resources were discovered. Once documentation and collection of the find is completed, the Qualified Paleontological Monitor shall remove the rope and allow grading to recommence in the area of the find. Following Project ground disturbing activities, the Qualified Paleontologist shall prepare a final monitoring report documenting the paleontological monitoring activities and any fossils collected during project implementation. The report shall contain an appropriate description of the fossils, treatment, and curation. A copy of the PRRP and final monitoring report shall be filed with the City and the designated repository (if fossils are recovered and curated) along with field notes and any other supporting documentation.

The PRIMP shall also include a statement that any fossil lab or curation costs (if necessary due to fossil recovery) are the responsibility of the Project Applicant/Developer. The PRIMP shall be reviewed and approved by the City prior to any earthmoving activity on-site.

With implementation of this MM-GEO-1, potential impacts to paleontological resources would be less than significant under the California Environmental Quality Act.

Please contact me at ssiren@dudek.com or (760) 846-9326, or Michael Williams, PhD, at mwilliams@dudek.com or (225) 892-7622 if you have any questions or concerns or need additional information.

Sincerely,



Sarah Siren, MSc
Paleontologist



Michael Williams, PhD
Paleontologist

References:

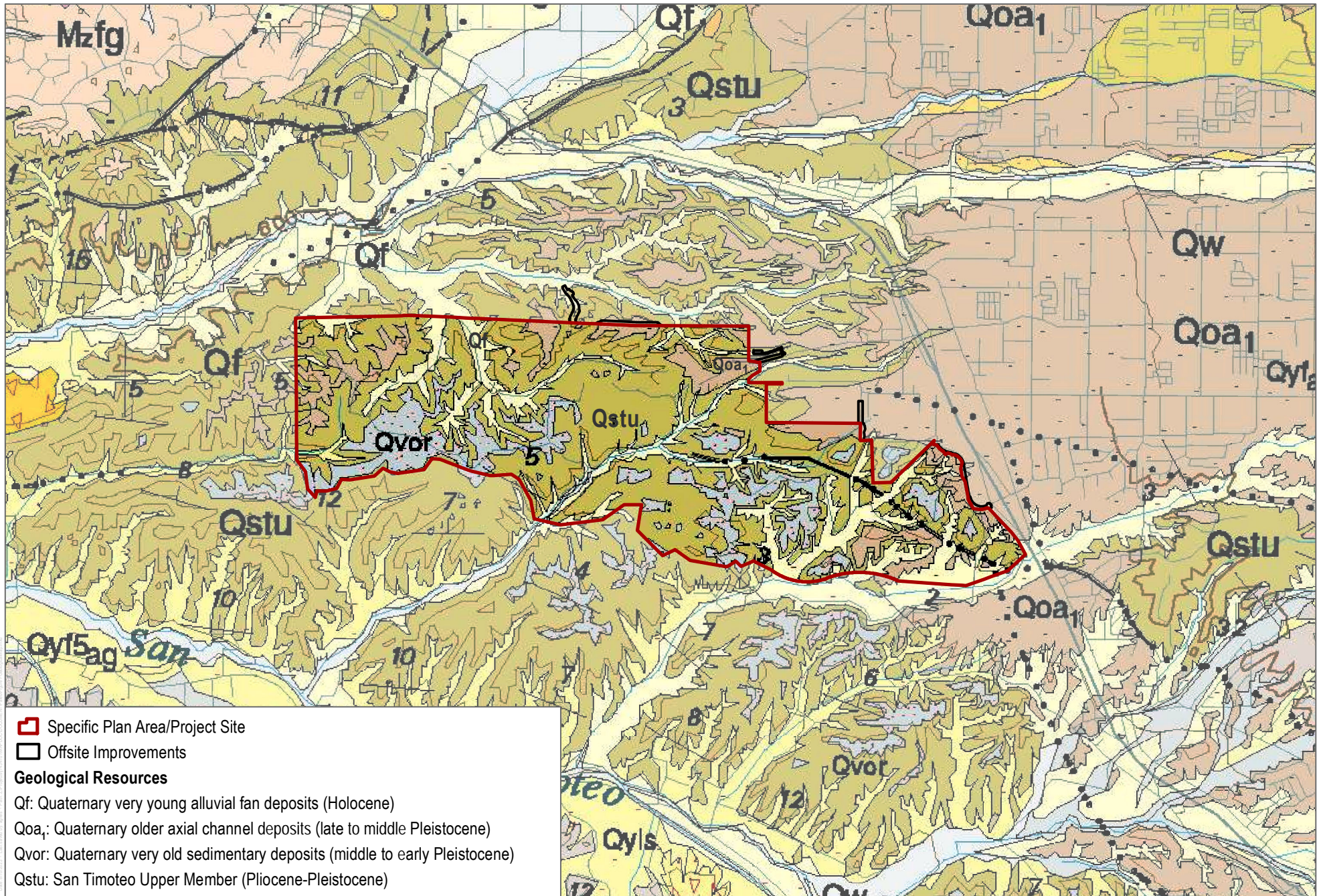
- Albright, L.B., III, 2000. Biostratigraphy and Vertebrate Paleontology of the San Timoteo Badlands, Southern California: University of California Publications, Geological Sciences, vol. 144. p. 1-121, 8 pl.
- Albright, L.B.III. 1999. Magnetostratigraphy and biochronology of the San Timoteo Badlands, southern California, with implications for local Pliocene –Pleistocene tectonic and Depositional Patterns. Geological Society of America Bulletin;111, no. 9; pp. 1265-1293.
- Brian F. Smith and Associates, Inc. 2017 (Attachment B). Paleontological Resource Assessment, Mesa Verde Estates Project, Cities of Calimesa and Yucaipa, Riverside and San Bernardino Counties, California. Submitted by G.L. Kennedy, PhD, and T.A. Wirths, MS, PG. Dated September 22, 2015, revised August, 11, 2017.
- Cohen, K.M., S.C. Finney, P.L. Gibbard, and J.-X. Fan. 2023. The ICS International Chronostratigraphic Chart.” Episodes 36: 199--204. 2013; Updated. Available at: <http://www.stratigraphy.org/ICSchart/ChronostratChart2023-04.pdf>.
- Dibblee, T.W. and J.A. Minch. 2004. Geologic map of the Yucaipa quadrangle, Riverside County, California, Dibblee Geological Foundation, Dibblee Foundation Map DF-124, 1:24,000.
- Leslie, T.A. 2004. Results of a pre-construction paleontological resources assessment of a 1,490 .5-acre property primarily located in Calimesa, California. Unpublished report prepared for Fiesta Development, Inc., Corona, California, by Thomas Leslie Corporation, Temecula, California.
- Matti, J.C., D.M. Morton, and V.E. Langenheim. 2015. Geologic and geophysical maps of the El Casco 7.5' quadrangle, Riverside County, southern California, with accompanying geologic-map database, U.S. Geological Survey, Open-File Report OF-2010-1274, 1:24,000.
- Morton, D.M. and F.K. Miller. 2006a, Geologic map of the San Bernardino and Santa Ana 30' x 60' quadrangles, California: U.S. Geological Survey, Open-File Report OF-2006-1217, scale 1:100,000.
- Morton, D.M. and F.K. Miller. 2006b. Geologic Map of the San Bernardino and Santa Ana 30-minute x 60-minute quadrangles, California, Geology and Description of Map Units, Version 1.0: U.S. Geological Survey, Open-File Report OF-2006-1217. 194 pp.
- Natural History Museum of Los Angeles County (NHMLA)(Attachment C). 2023. Paleontological Resources for the Mesa Verde Specific Plan Project (PN: 14341.04). Records Search Results Letter from A. Bell with the Natural History Museum of Los Angeles County, Los Angeles, California.
- Paleo Environmental Associates, Inc. (PEAI). 2010. Paleontologic Resource Impact Mitigation Program Final Technical Report Of Results And Findings Prepared In Support Of Sandalwood Drive Extension Calimesa, Riverside County, California. Unpublished technical report prepared for the Yucaipa-Calimesa Joint Unified School District Facilities and Support Services Department. Dated: March 2010.
- Scott, E., 2003, Personal communication with E. Scott, Curator, San Bernardino County Museum.

Society of Vertebrate Paleontology (SVP). 2010. Standard Procedures for the Assessment and Mitigation of Adverse Impacts to Paleontological Resources. 11 p. Available at: https://vertpaleo.org/wp-content/uploads/2021/01/SVP_Impact_Mitigation_Guidelines-1.pdf.

Western Science Center (WSC)(Attachment C). 2023. Records Search Results Letter. Dated May 12, 2023.

Attachment A

Figure 1



SOURCE: National Geologic Map Database San Bernardino and Santa Ana 30'x60' quadrangles, Morton, D.m., and Miller, F.K

FIGURE 1

Geological Map

Attachment B

BFSA Paleontological Resource Assessment



22 September 2015;
Revised 11 August 2017

Mr. Paul Kim
Mesa Verde RE Ventures, LLC
2 Park Plaza, Suite 1250
Irvine, California 92614

Subject: Paleontological Resource Assessment, Mesa Verde Estates Project, Cities of Calimesa and Yucaipa, Riverside and San Bernardino Counties, California

Dear Mr. Kim:

Introduction and Location: This letter report concerns the evaluation of two paleontological resource assessment reports previously prepared for the approximately 1,493-acre site of the proposed Mesa Verde Estates project and approximately 11 acres of off-site road improvements planned for the northern San Timoteo Badlands area and mainly located in the city of Calimesa in Riverside County, California (Attachments 1 and 2). The proposed project site also includes a narrow strip of land on the northern edge of the project that is located within the city of Yucaipa in San Bernardino County. On the U. S. Geological Survey 7.5-minute, 1:24,000-scale Yucaipa and El Casco topographic quadrangle maps (Attachment 2), the project location encompasses much of Sections 14, 15, 16, and 17, and smaller portions of Sections 9, 22, and 23, Township 2 South, Range 2 West, San Bernardino Base and Meridian.

Geology: The boundaries of the proposed Mesa Verde Estates project site are overlain on updated geologic maps of the 7.5-minute, 1:24,000-scale Yucaipa quadrangle (J. C. Matti, *et al.*, 2003) and the 30x60-minute, 1:100,000-scale Santa Ana quadrangle (D. M. Morton, 2004) (shown at a scale of 1:24,000 on Attachment 3). These show a greater level of geologic detail than previously shown in the paleontological assessment report by T. A. Leslie (2004, fig. 4) based on the 1:250,000-scale geologic maps of the San Bernardino and Santa Ana two-degree sheets.

Geologically, the project area is dominated by exposures of interbedded sandstone and conglomerate of the Pleistocene or Plio-Pleistocene upper member of the San Timoteo beds (upper San Timoteo formation) of C. Frick (1921), who described the fossil vertebrate fauna from this formation. This unit is shown both as “QTstu” and “Qstu” on Attachment 3. The San Timoteo formation is overlain in the northern and eastern parts of the project area by Quaternary (Pleistocene) older alluvium (Qoa₁ on Attachment 3), and in the southern and more easterly portions by Quaternary (Pleistocene) very old regolith (Qvor on Attachment 3). The term “regolith” refers to any of a variety of undifferentiated surface materials, including alluvium, that

covers or overlies the underlying bedrock (here, the San Timoteo formation sediments). In addition, sediments in the canyon heads and proximal tributary drainages of Yucaipa Creek in the north, and San Timoteo Canyon in the south, are assigned to several late Holocene (*i.e.*, modern) unconsolidated alluvial units consisting of gravel, sand, and silty alluvium (*i.e.*, Qw_{ag} [modern wash sediments], Qya₅ [young axial channel deposits], and Qyf_{5ag} and Qvyf [young and very young alluvial fan deposits]). All of these late Holocene sediment types are geologically too young to have any paleontological significance.

Collections and Records Searches: Institutional records searches of the paleontological holdings of local museums and/or universities are an important aspect of evaluating the paleontological resource potential of any area and help to determine the level of monitoring and mitigation measures that would need to be implemented in the case of grading and earth-moving activities concomitant with any future developments in an area. Unlike archaeological records searches, which identify sites that may contain the entire cultural resource, paleontological records searches identify fossil localities that indicate the likelihood of finding fossils throughout any particular geologic formation, rather than just at that one particular location.

The paleontological resource evaluation previously prepared for this project by Leslie (2004) solicited records searches at both the San Bernardino County Museum (SBCM) in Redlands and the Vertebrate Paleontology Section of the Natural History Museum of Los Angeles County (LACM-VP) in Los Angeles. The SBCM records search revealed three known fossil localities within the bounds of the proposed Mesa Verde Estates project area (Leslie, 2004, fig. 2) and noted that “several dozen paleontologic resource localities are recorded from within just a few miles” of the project area (Leslie, 2004, section A-8.2). The LACM-VP records search did not identify any fossil localities within the project bounds, but did note that there were LACM localities “nearby that occur in the same sedimentary unit” (Leslie, 2004, section A-8.1).

The paleontological resource evaluation previously prepared for this project by Sanka (2006) for the access roads part of the project only included a records search report from the SBCM, which revealed one locality already identified by the SBCM records search report cited in Leslie (2004). Because the fossil vertebrates collected by both Frick (1921) and Albright (1999) were deposited at the University of California Museum of Paleontology (UCMP) in Berkeley, an Internet records search was conducted for any fossil localities in their locality database from the San Timoteo formation. An additional 36 UCMP fossil localities were identified from the San Timoteo formation in that report (attached herein), although not specifically located on a geologic map.

Paleontological Sensitivity: The San Timoteo formation has a long established history of yielding fossil vertebrate specimens, going back almost a century to the early work of Frick (1921). See Albright (1999), Leslie (2004), and the SBCM report in Sanka (2006) for literature citations of the published work on these fossils. As noted in the SBCM report in Sanka (2006), “The San Timoteo Formation is extremely fossiliferous and has a high potential to contain significant nonrenewable paleontological resources subject to adverse impacts by excavation during [future] development.” The formation is thus assigned a high paleontological sensitivity (Leslie, 2004; Sanka, 2006).

Much of the project area is also overlain by Quaternary older alluvial deposits that are shown as Qoa₁ and Qvor (“regolith”) on Attachment 3. Older Pleistocene alluvial sediments throughout the Inland Empire of Riverside and San Bernardino Counties have also yielded an abundance of fossil plants and Ice Age mammal remains (SBCM collection records). Because the Quaternary older

alluvium has a high potential to yield significant nonrenewable paleontologic resources, it is also assigned a high paleontologic sensitivity.

The unconsolidated late Holocene (*i.e.*, modern) alluvial units in the local canyon bottoms (*i.e.*, Qw_{ag} [modern wash sediments], Qya₅ [young axial channel deposits], and Qyf_{5ag} and Qvyf [young and very young alluvial fan deposits]) are geologically too young to have any paleontological significance and are thus assigned a low paleontologic sensitivity. See Leslie (2004, fig. 5) for a map showing areas of high and low paleontological sensitivity.

Mitigation Measures: The paleontological assessment by Leslie (2004) and the SBCM report in Sanka (2006) provide a thorough review of the paleontological sensitivity of the Mesa Verde Estates project area, and each report lists adequate mitigation measures that should be implemented in order to reduce any adverse impacts of development to nonrenewable paleontological resources to a level below significant. Mitigation measures cited in Leslie (2004, Section VI, Recommended Mitigation Measures) are the more detailed of the two and provide a comprehensive list of procedures that should be conducted to adequately protect potential paleontological resources in the project area. However, because the older alluvial sediments across the site are assigned a high resource potential and paleontologic sensitivity (Leslie, 2004; Sanka, 2006), and because we do not have any information on the thickness of soil cover across the project area, we recommend that the 10-foot (3-meter) threshold for the initiation of monitoring of grading activities be eliminated. “Grubbing” and removal of vegetation activities, however, need not be monitored. We understand that most of the canyon areas, which have a low paleontological sensitivity, will not be subject to grading activities, and that they will be bridged where crossed by the planned roadways.

Summary and Conclusions: The previously prepared paleontological assessments of the Mesa Verde Estates project area by Leslie (2004) and associated access roads by Sanka (2006) are thorough and comprehensive. Along with the recommendation that paleontological monitoring *not* be subject to the 10-foot threshold for the initiation of monitoring of grading activities (Leslie, 2004), the proposed mitigation measures adequately provide the protection against potential adverse impacts to any nonrenewable paleontological resources that would likely be encountered during the grading and earth-moving phase of development of the proposed Mesa Verde Estates subdivision project. No further preconstruction work is recommended in regard to the protection of potential paleontological resources on the project site.

If you have any questions regarding this investigation, please feel free to contact us at our Poway address. Thank you for the opportunity to provide paleontological services on this project.

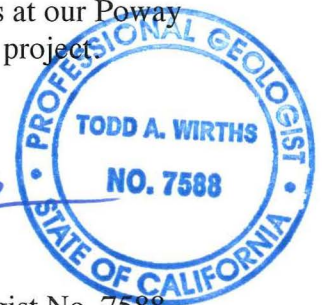
Sincerely,



George L. Kennedy, Ph.D.
Senior Paleontologist



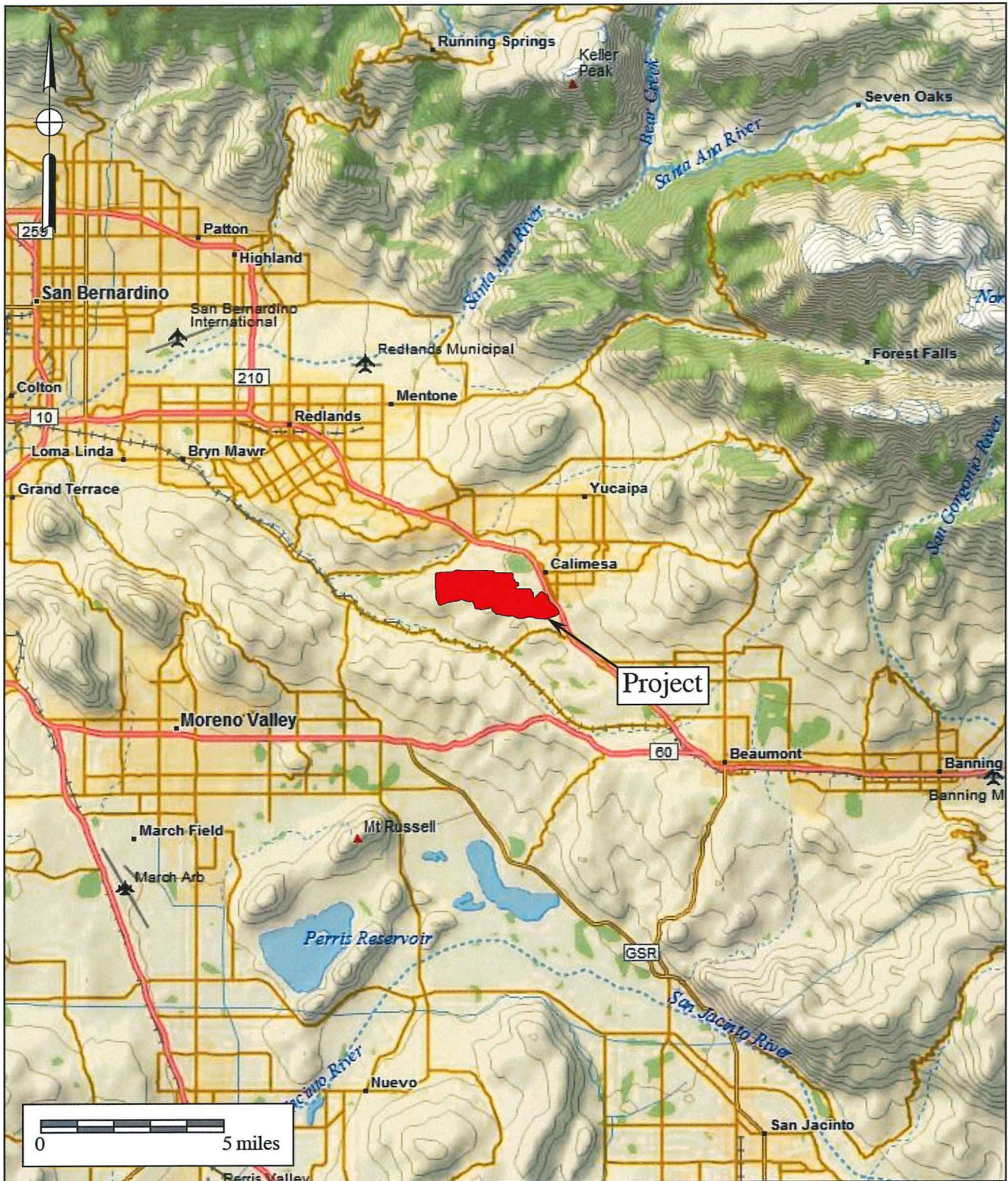
Todd A. Wirths, M.S., P.G.
California Professional Geologist No. 7588



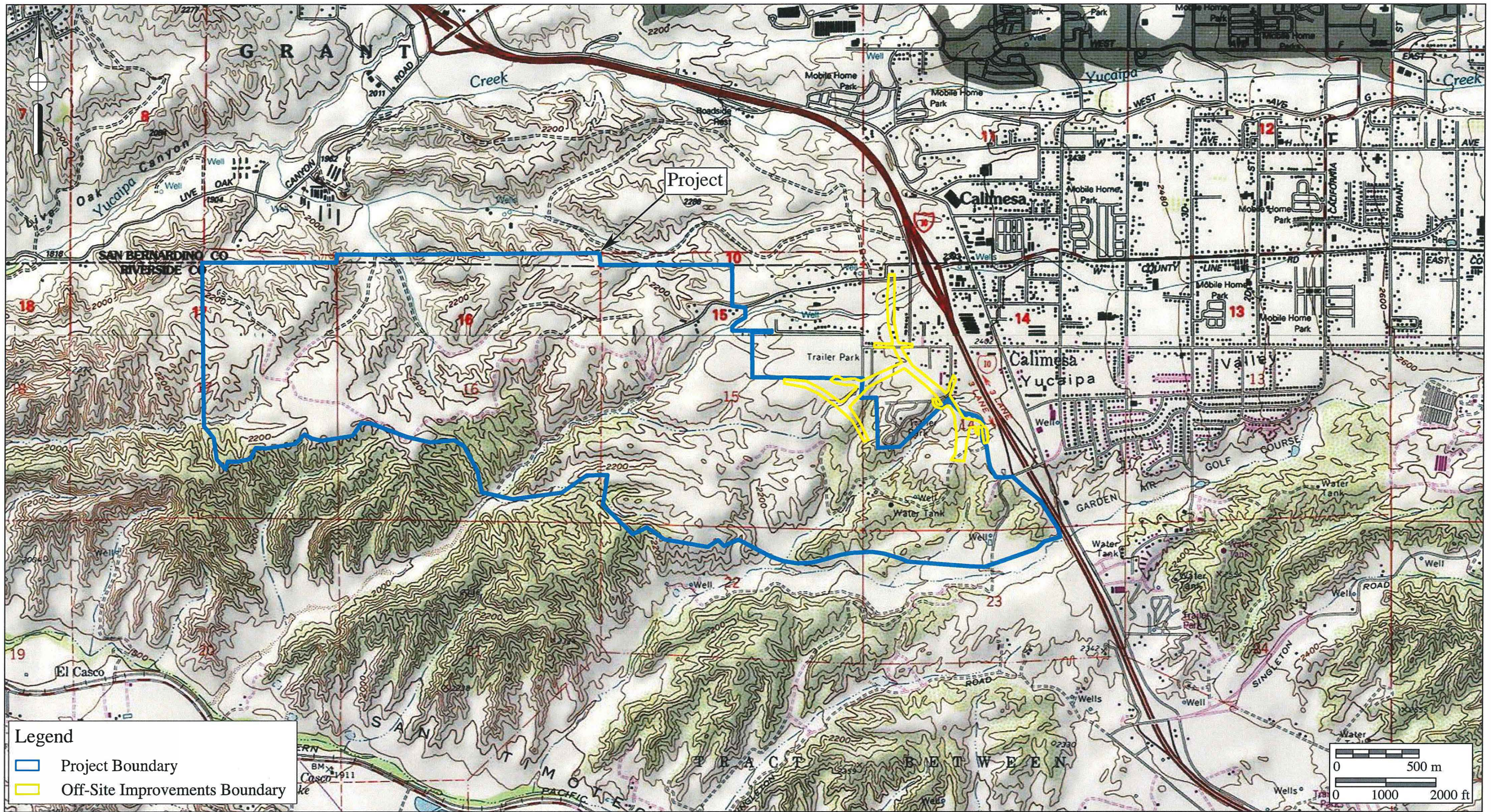
Attachments: Index maps, geologic map, UCMP records search summary

References Cited:

- Albright, L. B., III. 1999. Biostratigraphy and vertebrate paleontology of the San Timoteo Badlands, southern California. University of California Publications in Geological Sciences, 44: i-xiii + 1-121, figs. 1-21, pls. 1-8, tables 1-16.
- Frick, Childs. 1921. Extinct vertebrate faunas of the badlands of Bautista Creek and San Timoteo Cañon, southern California. University of California Publications, Bulletin of the Department of Geological Sciences, 12(5): 277-424, pls. 43-50.
- Leslie, T. A. 2004. Results of a pre-construction paleontological resources assessment of a 1,490.5-acre property primarily located in Calimesa, California. Unpublished report prepared for Fiesta Development, Inc., Corona, California, by Thomas Leslie Corporation, Temecula, California.
- Matti, J. C., Morton, D. M., Cox, B. F., Carson, S. E., and Yetter, T. J. 2003. Geologic map of the Yucaipa 7.5' quadrangle, San Bernardino and Riverside Counties, California. U. S. Geological Survey, Open-File Report 03-301: 1 sheet with text (scale 1:24,000).
- Morton, D. M. 2004. Preliminary digital geologic map of the Santa Ana 30' x 60' quadrangle, southern California. Version 2. U. S. Geological Survey, Open-File Report 99-172: sheets 1-2 (scale 1:100,000).
- Sanka, J. M. 2006. Phase I cultural resources assessment and paleontological records review, Mesa Verde Estates access road project, Calimesa, Riverside County, California. Unpublished report prepared for Fiesta Development, Corona, California, by Michael Brandman Associates, Irvine, California.

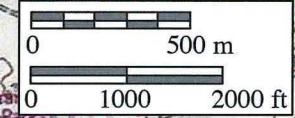


Attachment 1
General Location Map
 The Mesa Verde Estates Project
 DeLorme (1:250,000)

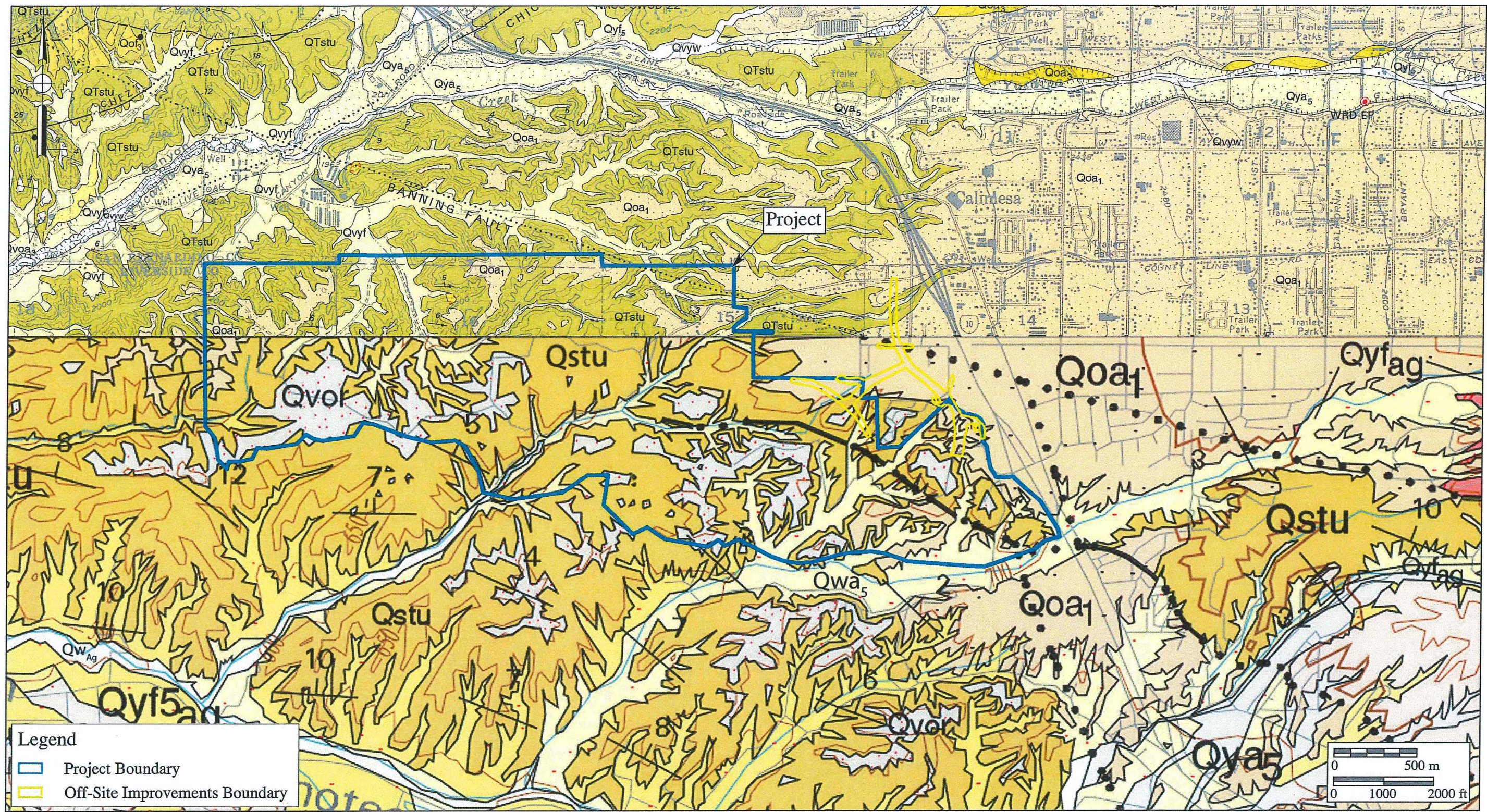


Legend

- ▭ Project Boundary
- ▭ Off-Site Improvements Boundary



Attachment 2
Project Location Map
 The Mesa Verde Estates Project
 USGS Yucaipa and El Casco Quadrangles (7.5-minute series)



Legend
 — Project Boundary
 — Off-Site Improvements Boundary

0 500 m
 0 1000 2000 ft

Attachment 3

Geologic Map

The Mesa Verde Estates Project

Geology after Matti *et al.* (2003) and Morton (2004)



Number of matches: 36

- [Download your results](#) (tab-delimited text file with .xls file extension, 36 lines, file size = 4.8 K)
- [Map localities with a US county](#)

Query: SELECT FROM ucmp_loc2 WHERE ucmp_coll like "%V%" and formation like "%San Timoteo%" ORDER BY loc_prefix,cast(loc_num as unsigned integer),loc_suffix

Click on the Loc ID to see the full locality record

Loc ID	Coll	Locality Name	County	State / Province	Country	Cont	Period	Epoch	Formation	Member	Storage Age	Flora/Fauna
-3248	v	San Timoteo	Riverside County	California	United States	North America	Tertiary	Pliocene	San Timoteo		Blancan	
-3249	v	San Timoteo	Riverside County	California	United States	North America	Tertiary	Pliocene	San Timoteo		Blancan	
-3250	v	San Timoteo	Riverside County	California	United States	North America	Tertiary	Pliocene	San Timoteo		Blancan	
-3251	v	San Timoteo	Riverside County	California	United States	North America	Tertiary	Pliocene	San Timoteo		Blancan	
-3252	v	San Timoteo	Riverside County	California	United States	North America	Tertiary	Pliocene	San Timoteo		Blancan	
-3253	v	San Timoteo	Riverside County	California	United States	North America	Tertiary	Pliocene	San Timoteo		Blancan	
-3254	v	San Timoteo	Riverside County	California	United States	North America	Tertiary	Pliocene	San Timoteo		Blancan	
-3255	v	San Timoteo	Riverside County	California	United States	North America	Tertiary	Pliocene	San Timoteo		Blancan	
-3256	v	San Timoteo	Riverside County	California	United States	North America	Tertiary	Pliocene	San Timoteo		Blancan	
-3257	v	San Timoteo 10	Riverside County	California	United States	North America	Tertiary	Pliocene	San Timoteo		Blancan	
-3258	v	San Timoteo 11	Riverside County	California	United States	North America	Tertiary	Pliocene	San Timoteo		Blancan	
-3259	v	San Timoteo 12	Riverside County	California	United States	North America	Tertiary	Pliocene	San Timoteo		Blancan	
-3260	v	San Timoteo 13	Riverside County	California	United States	North America	Tertiary	Pliocene	San Timoteo		Blancan	
-3261	v	San Timoteo 14	Riverside County	California	United States	North America	Tertiary	Pliocene	San Timoteo		Blancan	
-3262	v	San Timoteo 15	Riverside County	California	United States	North America	Tertiary	Pliocene	San Timoteo		Blancan	
-3263	v	San Timoteo 16	Riverside County	California	United States	North America	Tertiary	Pliocene	San Timoteo		Blancan	
-3264	v	San Timoteo 17	Riverside County	California	United States	North America	Tertiary	Pliocene	San Timoteo		Blancan	
RV7150	v		Riverside County	California	United States	North America	Tertiary	Pliocene	San Timoteo		Blancan	
RV9601	v	San Timoteo Paleomag. Site 157A	Riverside County	California	United States	North America	Tertiary	Pliocene	San Timoteo	Unit 3	Blancan	
RV9602	v	San Timoteo Paleomag. Site 160A	Riverside County	California	United States	North America	Tertiary	Pliocene	San Timoteo	Unit 3	Blancan	
RV9603	v	San Timoteo Paleomag. Site 160B	Riverside County	California	United States	North America	Tertiary	Pliocene	San Timoteo	Unit 3	Blancan	
RV9604	v	San Timoteo Paleomag. Site 160C	Riverside County	California	United States	North America	Tertiary	Pliocene	San Timoteo	Unit 3	Blancan	

RV9604	v	Paleomag. Site 164	County	California	States	America	Tertiary	Pliocene	Timoteo	Unit 3	Blancan	
RV9605	v	San Timoteo Paleomag. Site 164A	Riverside County	California	United States	North America	Tertiary	Pliocene	San Timoteo	Unit 3	Blancan	
RV9606	v	San Timoteo Paleomag. Site 176B	Riverside County	California	United States	North America	Tertiary	Pliocene	San Timoteo	Unit 3	Blancan	
RV9607	v	San Timoteo Paleomag. Site 177	Riverside County	California	United States	North America	Tertiary	Pliocene	San Timoteo	Unit 3	Blancan	
RV9608	v	San Timoteo Paleomag. Site 181A	Riverside County	California	United States	North America	Tertiary	Pliocene	San Timoteo	Unit 3	Blancan	
RV9609	v	San Timoteo Paleomag. Site 182	Riverside County	California	United States	North America	Tertiary	Pliocene	San Timoteo	Unit 3	Blancan	
RV9610	v	San Timoteo Paleomag. Site 187	Riverside County	California	United States	North America	Tertiary	Pliocene	San Timoteo	Unit 4	Blancan	
RV9611	v	San Timoteo Paleomag. Site 195	Riverside County	California	United States	North America	Tertiary	Pliocene	San Timoteo	Unit 4	Blancan	
RV9612	v	San Timoteo Paleomag. Site 202A	Riverside County	California	United States	North America	Tertiary	Pleistocene	San Timoteo	Unit 4	Irvingtonian	
RV9613	v	San Timoteo Paleomag. Site 304	Riverside County	California	United States	North America	Tertiary	Pliocene	San Timoteo		Blancan	
RV9614	v	San Timoteo Paleomag. Site 311	Riverside County	California	United States	North America	Tertiary	Pliocene	San Timoteo		Blancan	
RV9615	v	San Timoteo Paleomag. Site 313	Riverside County	California	United States	North America	Tertiary	Pliocene	San Timoteo		Blancan	
RV9616	v	San Timoteo Paleomag. Site 350	Riverside County	California	United States	North America	Tertiary	Pliocene	San Timoteo		Irvingtonian	
RV9617	v	San Timoteo Paleomag. Site HTS	Riverside County	California	United States	North America	Tertiary	Pliocene	San Timoteo		Blancan	
V65406	v	San Timoteo Fm General	Riverside County	California	United States	North America	Tertiary	Pliocene	San Timoteo		Blancan	

Notice: Please read the [UCMP copyright notice and disclaimer](#) before using UCMP records in analyses or reports.

[Search Specimens](#) • [Search Localities](#) • [Photos](#) • [About the Catalog](#) • [Notice and Disclaimer](#)
[UCMP Home](#) • [UCMP Collections](#) • [BSCIT](#) • [Berkeley Natural History Museums](#) ❄️

Attachment C

Paleontological Records Search Results (*Confidential*)

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

April 9, 2023

Dudek

Attn: Michael Williams

re: Paleontological resources for the Mesa Verde Specific Plan Project (PN: 14341.04)

Dear Michael:

I have conducted a thorough search of our paleontology collection records for the locality and specimen data for proposed development at the Mesa Verde Specific Plan project area as outlined on the portion of the El Casco, Redlands, Sunnymead, Yucaipa USGS topographic quadrangles map that you sent to me via e-mail on April 4, 2023. 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 7618 - 7622, CIT132, CIT133	San Timoteo Badlands; E of Moreno & NW of Eden Hot Springs	San Timoteo Formation	Horse family (Equidae); Camel family (Camelidae)	Surface
LACM VP 4540	Junction of Jackrabbit Trail & Gilman Springs Road; San Jacinto Valley	Unnamed formation (Pleistocene, gravel pit)	Horse Family (Equidae)	Unknown
LACM VP 1653; LACM IP 437	Saboba Indian Reservation; five miles east of San Jacint	Unknown formation (Pleistocene)	Monkfish (<i>Squatina</i>), Stickleback (<i>Gasterosteus</i>); Invertebrates – insect (<i>Sobobapteron kirkbayeri</i>), brachiopod (<i>Terebratalia hemphilli</i>)	Unknown
LACM VP 4135	Near Beaumont, CA; north of Banning, CA	Unknown formation (Pleistocene; possibly Imperial or San Timoteo)	Camel family (Camelidae)	Unknown
LACM VP 1118, 1119	East of Eden Hot Springs	Mount Eden Formation (well)	Deer family (Cervidae), camel family (Camelidae), horse family	Unknown, found in an

stratified greenish
sandy shale)

(Equidae), rhinoceros family
(Rhinoceroidea)

abandoned
quarry and
stream bed

VP, Vertebrate Paleontology; IP, Invertebrate Paleontology; bgs, below ground surface

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



May 12th, 2023

DUDEK
Michael Williams
605 Third Street
Encinitas, CA 92024

Dear Mr. Williams,

This letter presents the results of a record search conducted for Mesa Verde Specific Plan Project located in the city of Calimesa, San Bernardino County, CA. The project is located south and west of Interstate 10 on Township 2 South, Range 2 West, Sections 8, 9, 14, 15, 16, 17, 22, 23, 24, 25, 26, 27, and 28 on the *El Casco, CA, Redlands, CA, Sunnymead, CA, and Yucaipa, CA* USGS 7.5 minute quadrangles.

The geologic units underlying this project are mapped almost entirely as alluvial deposits from the Holocene and Pleistocene epochs (Dibblee and Minch 2004, Matti, Morton, and Langenheim 2015). Holocene alluvial units are considered to be of high preservation value, but material found is unlikely to be fossil material due to the relatively modern associated dates of the deposits. Pleistocene alluvial units are considered to be of high preservation value and are likely to contain fossils. The Western Science Center does not have localities within the project area or within a 3 mile radius, which was chosen to accommodate the size of the project area. El Casco Substation Project lies approximately a mile and a half south of the project area - these specimens were found in deposits currently mapped as the Pleistocene and Pliocene aged San Timoteo Formation.

Any fossil specimens recovered from the Mesa Verde Specific Plan Project would be scientifically significant. Excavation activity associated with the development of the project area would impact the paleontologically sensitive Pleistocene units, and it is the recommendation of the Western Science Center that a paleontological resource mitigation program be put in place to monitor, salvage, and curate any recovered fossils from the study area.

If you have any questions, or would like more information, including about the El Casco Substation Project, please feel free to contact me at bstoneburg@westerncentermuseum.org.

Sincerely,

A handwritten signature in black ink, appearing to read 'Brittney Stoneburg', written in a cursive style.

Brittney Elizabeth Stoneburg, MSc
Collections Manager

Attachment D

Field Photographs



Photograph 1: Photograph of central canyon in area mapped by Morton and Miller (2006a) as upper San Timoteo Formation (photograph taken by Michael Williams).



Photograph 2: Rock inclusion and root casts within the central drainage. Area mapped by Morton and Miller (2006a) as upper San Timoteo Formation. (photograph taken by David Alexander).



Photograph 3: Photograph of mapped San Timoteo Formation within the central drainage (photograph taken by David Alexander).



Photograph 4: Photograph of marl underlying coarser grained sediments within the central canyon in an area mapped by Morton and Miller (2006a) as upper San Timoteo Formation (photograph taken by Michael Williams).



Photograph 5: Photograph of a potential paleosol within a road, as indicated by the white calcium carbonate, in an area mapped by Morton and Miller (2006a) as very old sedimentary deposits (photograph taken by Michael Williams).



Photograph 6: Close up photograph of a potential paleosol within a road, as indicated by the white calcium carbonate, in an area mapped by Morton and Miller (2006a) as very old sedimentary deposits (photograph taken by Michael Williams).



Photograph 7: Creek bed bedrock exposure, Upper San Timoteo Formation in bottom half and old axial channel deposits above as mapped by Morton and Miller (2006a), on south side of County Line Road at west end of extended survey (photograph taken by David Alexander).



Photograph 8: Road cut exposure, approximately 15 feet high. Located on the north side of County Line Road just east of the water tanks. Sediments of the old axial channel deposits as mapped by Morton and Miller (2006a). (photograph taken by David Alexander, facing west).

DUDEK

MAIN OFFICE
605 THIRD STREET
ENCINITAS, CALIFORNIA 92024
T 800.450.1818 F 760.632.0164