Appendix D

Paleontological Resources Technical Report

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PALEONTOLOGY - ARCHAEOLOGY - HISTORY

PALEONTOLOGICAL RESOURCES TECHNICAL REPORT FOR THE KASSAB TRAVEL CENTER PROJECT, CITY OF LAKE ELSINORE, CALIFORNIA

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Principal Investigator:
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Project Number: 4083
Type of Study: Paleontological Resources Assessment
Localities: None within five miles of the project in late Pleistocene alluvium
USGS Quadrangle: Elsinore 7.5'
Area: 2.39 acres
Key Words: modern artificial fill (PFYC 1), Holocene to late Pleistocene axial channel deposits (PFYC 2 at surface, PFYC 3a at more than 8 feet deep), early Pleistocene very old alluvial fan (PFYC 3b); negative survey

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Federal Certifications 8(a), SDB, EDWOSB
State Certifications DBE, WBE, SBE, UDBE

TABLE OF CONTENTS

LIST OF FIGURES

SUMMARY OF FINDINGS

This purpose of this study was to determine the potential effects on paleontological resources during construction of the Kassab Travel Center Project in the City of Lake Elsinore, Riverside County, California. Planned vertical impacts of this 2.39 acre project are six to seven feet for utilities, while the majority of the site will only be excavated two to three feet deep.

The project surface is mapped entirely as Holocene to late Pleistocene axial channel deposits. Results of the record search indicate that no previous fossil localities have been from late Pleistocene alluvial sediments within five miles of the proposed project. Based on other recorded localities, late Pleistocene fossils typically begin appearing about 8 to 10 feet deep in California valleys.

During the survey, only the surface of the Holocene to late Pleistocene axial channel deposits could be observed. No fossils were encountered during the survey.

The Holocene to late Pleistocene axial channel deposits are ranked as low (Potential Fossil Yield Classification 2) sensitivity at the surface and increasing to moderate and patchy sensitivity (Potential Fossil Yield Classification 3a) at depths of more than 8 ft.

Based on the study findings, fossils are unlikely to be encountered during construction activities. If unanticipated discoveries of paleontological resources occur during construction, all work within 50 feet of the discovery should be halted until the find has been evaluated by a qualified paleontologist.

INTRODUCTION

PURPOSE OF STUDY

This purpose of this study was to determine the potential effects on paleontological resources during construction of the Kassab Travel Center Project (project) in the City of Lake Elsinore, Riverside County, California (Figure 1). This report complies with the California Environmental Quality Act and the City of Lake Elsinore General Plan.

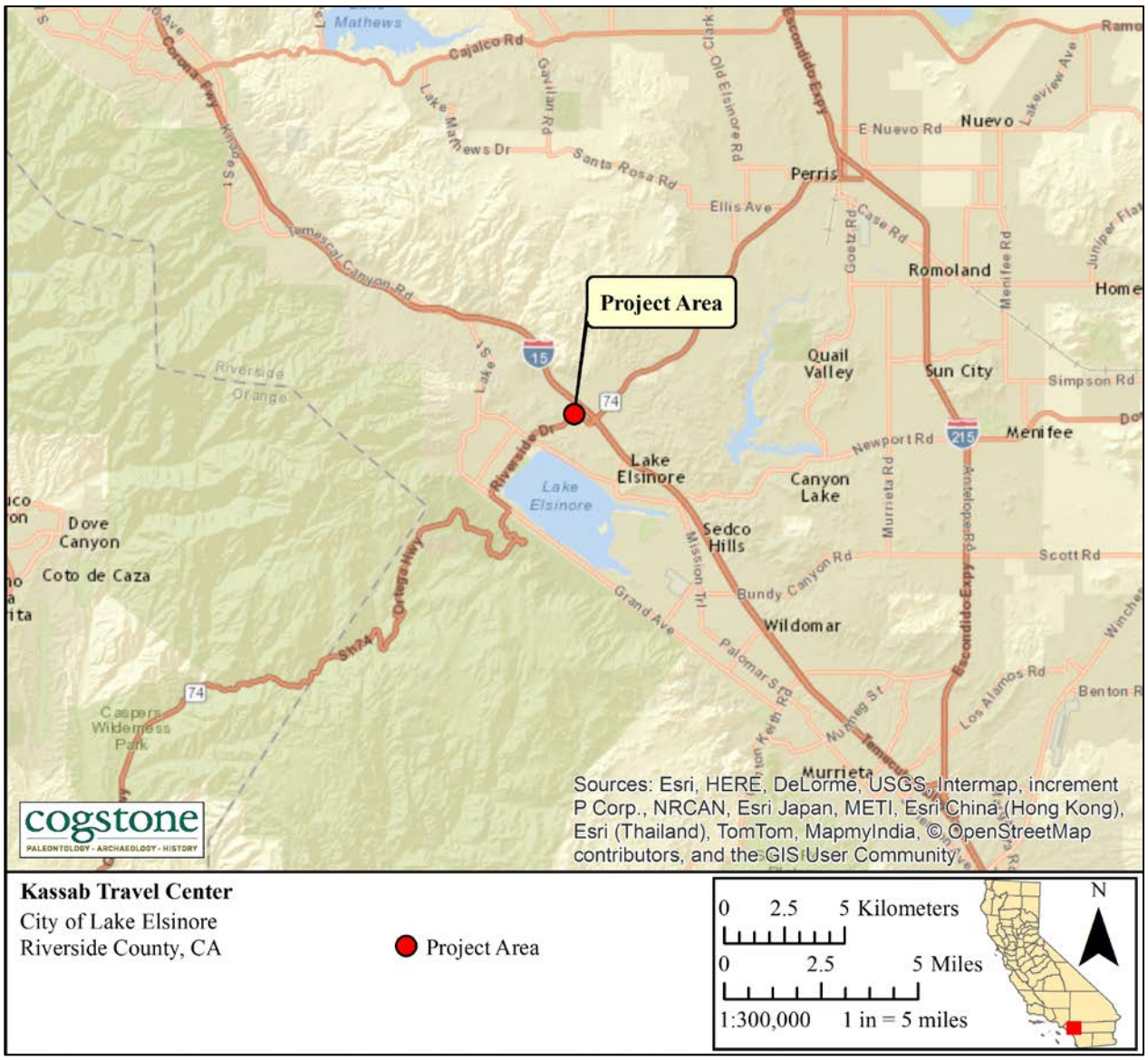

Figure 1. Project vicinity

PROJECT DESCRIPTION AND LOCATION

The proposed Kassab Travel Center will consist of a 6,000 square foot convenience store with three quick serve restaurants, two covered gas dispensing areas totaling 5,264 square feet, and a free standing 2,543 square foot fast food restaurant with a drive-through. Maximum depth of excavation will be six to seven feet for utilities, while the majority of the site will only be excavated two to three feet deep.

This 2.39 acre project is located within the Lake Elsinore 7.5 minute United States Geological Survey (USGS) quadrangle in section 31 of Township 5 South, Range 5 West and section 36 of Township 5 South, Range 4 West, of the San Bernardino Base and Meridian (Figure 2).

PROJECT PERSONNEL

Cogstone conducted the paleontological resources studies and a brief resume of the Principal Investigator are appended (Appendix A). Additional qualifications of key Cogstone staff are available at http://www.cogstone.com/key-staff/

- Kim Scott served as the Principal Paleontologist for the project and wrote this report. Scott has a M. S. in Biology with an emphasis in paleontology from California State University, San Bernardino, a B.S. in Geology with an emphasis in paleontology from the University of California, Los Angeles, and over 20 years of experience in California paleontology and geology.

- Dr. John Harris reviewed this report for quality control. He has a Ph.D. in Geology from the University of Bristol (U.K.), an M.A. in Geology from the University of Texas, Austin, a B.S. in Geology from the University of Leicester (U.K.). Dr. Harris has more than 40 years of experience in Cenozoic paleontology and specializes in terrestrial vertebrate species from Rancho la Brea California and Africa.

- Megan Wilson performed the survey and prepared the Geographic Information System (GIS) maps throughout this report. Wilson has a M.A. in Anthropology from California State University Fullerton, a GIS certification, over five years of experience in California archaeology, and is cross-trained in paleontology.

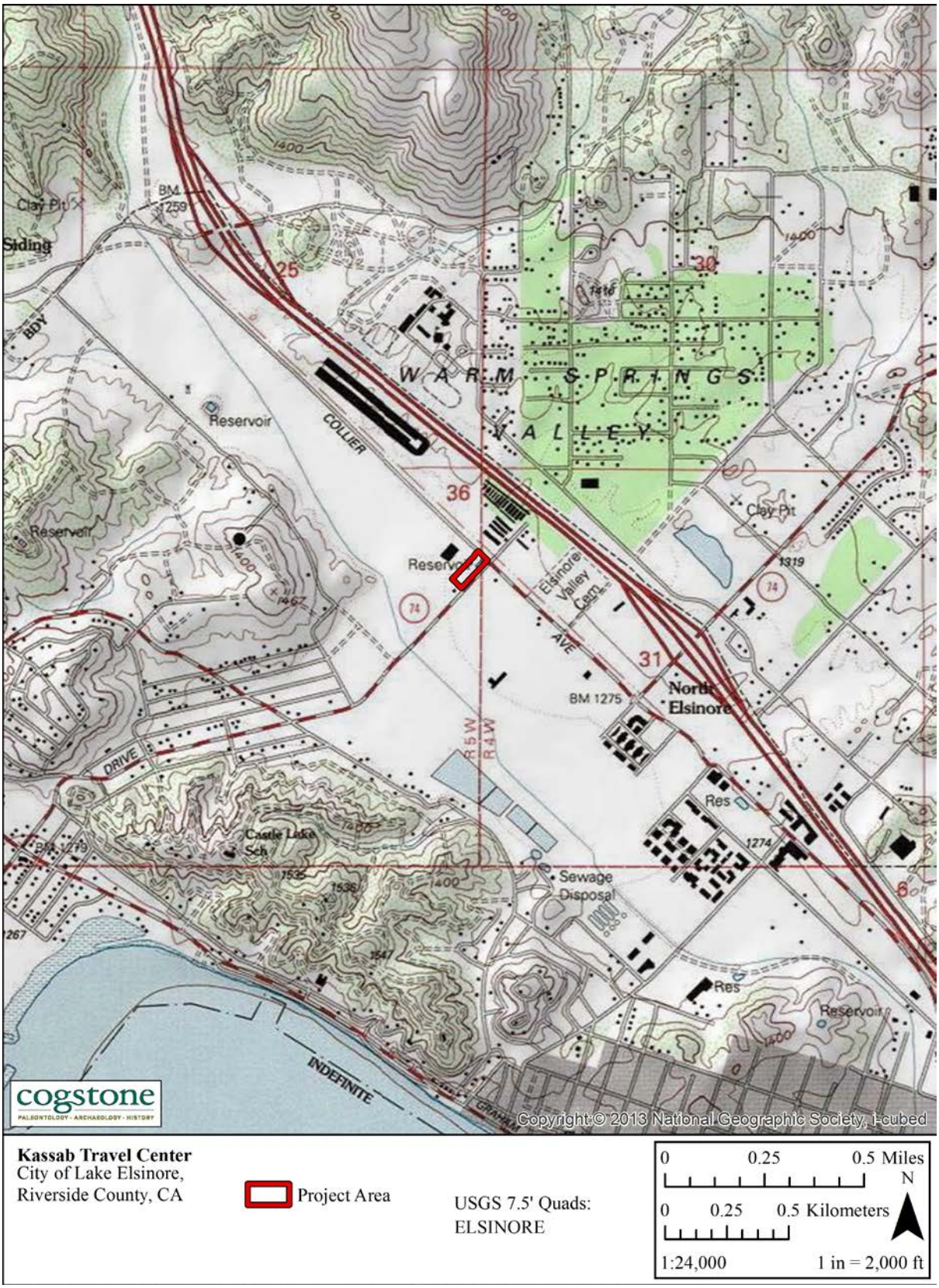

Figure 2. Project location

REGULATORY ENVIRONMENT

STATE LAWS AND REGULATIONS

Paleontological resources are protected by state law. This protection extends to all vertebrate fossils (animals with backbones) and any unique paleontological locality.

CALIFORNIA ENVIRONMENTAL QUALITY ACT

CEQA declares that it is state policy to: "take all action necessary to provide the people of this state with...historic environmental qualities." It further states that public or private projects financed or approved by the state are subject to environmental review by the state. All such projects, unless entitled to an exemption, may proceed only after this requirement has been satisfied. CEQA requires detailed studies that analyze the environmental effects of a proposed project. In the event that a project is determined to have a potential significant environmental effect, the act requires that alternative plans and mitigation measures be considered. If paleontological resources are identified as being within the proposed project study area, the sponsoring agency must take those resources into consideration when evaluating project effects. The level of consideration may vary with the importance of the resource.

CALIFORNIA ADMINISTRATIVE CODE, TITLE 14, SECTION 4307

This section states that “No person shall remove, injure, deface or destroy any object of paleontological, archeological or historical interest or value.”

CITY OF LAKE ELSINORE

The Project must also comply with the Resource Protection and Preservation Chapter of the Lake Elsinore General Plan approved on December 13, 2011 (Lake Elsinore 2011). The goals and policies for cultural resources are outlined in Goal 6 and Goal 7.

Policy 6.1: Encourage the preservation of significant archaeological, historical, and other cultural resources located within the City.

Policy 7.2: Continue to identify, document, evaluate, designate, and preserve the cultural resources in the City.

Policy 7.3: Continue to update a citywide inventory of cultural resources in conformance with state standards and procedures while maintaining the confidentiality of information as required by law.

PALEONTOLOGICAL RESOURCES SIGNIFICANCE CRITERIA

Only qualified, trained paleontologists with specific expertise in the type of fossils being evaluated can determine the scientific significance of paleontological resources. Fossils are considered to be significant if one or more of the following criteria apply:

1. The fossils provide information on the evolutionary relationships and developmental trends among organisms, living or extinct;
2. The fossils provide data useful for determining the age(s) of the rock unit or sedimentary stratum, including data important in determining the depositional history of the region and the timing of geologic events therein;
3. The fossils provide data regarding the development of biological communities or interaction between paleobotanical and paleozoological biotas;
4. The fossils demonstrate unusual or spectacular circumstances in the history of life;
5. The fossils are in short supply and/or in danger of being depleted or destroyed by the elements, vandalism, or commercial exploitation, and are not found in other geographic locations.

As so defined, significant paleontological resources are determined to be fossils or assemblages of fossils that are unique, unusual, rare, uncommon, or diagnostically important. Significant fossils can include remains of large to very small aquatic and terrestrial vertebrates or remains of plants and animals previously not represented in certain portions of the stratigraphy. Assemblages of fossils that might aid stratigraphic correlation, particularly those offering data for the interpretation of tectonic events, geomorphologic evolution, and paleoclimatology are also critically important (Scott and Springer, 2003; Scott et al., 2004).

BACKGROUND

GEOLOGICAL SETTING

This project is located within the Peninsular Range Geomorphic Province which extends from Mount San Jacinto in the north to Baja, California in the south and includes the Inland Empire, Los Angeles, Orange County, and San Diego areas of California. The Peninsular Ranges Geomorphic Province is located in the southwestern corner of California and is bounded by the Transverse Ranges Geomorphic Province to the north and the Colorado Desert Geomorphic Province to the east. This geomorphic province is characterized by elongated northwest-trending mountain ridges separated by sediment-floored valleys. Many faults to the

west of the Salton Trough section of the San Andreas Fault Zone, parallel this northwest-south east trending fault zone and have taken up some of the strain of the San Andreas. The Lake Elsinore Fault Zone is one such fault zone.

To the north of the project, the San Andreas Fault Zone travels up Cajon Pass where it is the boundary between the Pacific Plate and the North American Plate. The Transverse Ranges include the San Bernardino and San Gabriel mountains along with the paralleling ranges and result from these two plates grinding past each other and "catching" along the bend in the San Andreas. The project is located on the Pacific Plate which is composed of numerous blocks that can move independently (Wagner 2002).

STRATIGRAPHY

The project surface is mapped entirely as Holocene to late Pleistocene (less than 126,000 years old) axial channel deposits. Sediments consist of slightly to moderately indurated, alluvially deposited, silts to sands (Morton and Miller 2006).

PALEONTOLOGICAL RECORD SEARCHES

The records and literature search reviewed information from within five miles of the proposed project. San Bernardino County Museum record searches near to the project were consulted for local information (Scott 2006, 2007, 2014). Online databases including the Natural History Museum of Los Angeles County, Department of Invertebrate Paleontology (LACMIP 2017), the Paleobiology Database (PBDB 2017), and the University of California Museum of Paleontology Database (UCMP 2017) were also searched for localities near to the project. Print resources including published material (Hay 1927; Jefferson 1991a, 1991b, 2012 unpublished) and unpublished project reports (Gust and Wexelblatt 2012) were searched for fossil localities.

Results of the record search indicate that no previous fossil localities have been from late Pleistocene alluvial sediments within five miles of the proposed project. Within California valley areas, late Pleistocene fossils typically begin appearing about 8 to 10 feet deep. Shallower sediments in the valleys usually do not contain the remains of extinct animals, although Holocene remains less than 11,700 years old may be present.

RECONNAISSANCE SURVEY

The survey stage is an important part of the project's environmental assessment phase. The purpose is to confirm that field observations conform to the geological maps of the project area. Sediments are assessed for their potential to contain fossils. Additionally, if there are known paleontological resources the survey will verify the exact location of those resources, the condition or integrity of each resource, and the proximity of the resource to the project area. All undeveloped ground surface areas within the ground disturbance portion of the project area are examined. Existing ground disturbances (e.g., cutbanks, ditches, animal burrows, etc.) are visually inspected. Photographs of the project area, including ground surface visibility and items of interest, are taken with a digital camera.

Megan Wilson performed a joint archaeological and paleontological field survey of the entire project area on May 24, 2017.

SURVEY RESULTS

Ground visibility was a maximum of 30% due overgrowth of weeds (Figure 3). Only the surface of the Holocene to late Pleistocene axial channel deposits could be observed as no culverts, washes, or other cuts were present. Surficial sediments consisted of minimally oxidized, light yellowish grey, silts and sands. Larger clasts consisted entirely of construction materials (concrete, pipe, pebbles, rock, etc.) and other trash (Figure 4). No fossils were encountered during the survey.

Figure 3. Onsite overgrowth

Figure 4. Surficial sediments with dumped pipe and rock

PALEONTOLOGICAL SENSITIVITY

A multilevel ranking system was developed by professional resource managers within the Bureau of Land Management (BLM) as a practical tool to assess the sensitivity of sediments for fossils. The Potential Fossil Yield Classification (PFYC) system (BLM, 2008; Appendix B) has a multi-level scale based on demonstrated yield of fossils. The PFYC system provides additional guidance regarding assessment and management for different fossil yield rankings.

Fossil resources occur in geologic units (e.g., formations or members). The probability for finding significant fossils in a project area can be broadly predicted from previous records of fossils recovered from the geologic units present in and/or adjacent to the study area. The geological setting and the number of known fossil localities help determine the paleontological sensitivity according to PFYC criteria

Sediments that are close to their basement rock source are typically coarse; those farther from the basement rock source are finer. The chance of fossils being preserved greatly increases once the average size of the sediment particles is reduced to 5 mm in diameter or less. Moreover, fossil preservation also greatly increases after natural burial in rivers, lakes, or oceans. Remains left on the ground surface become weathered by the sun or consumed by scavengers and bacterial activity, usually within 20 years or less. So the sands, silts, and clays of rivers, lakes, and oceans are the most likely sediments to contain fossils.

Using the PFYC system, geologic units are classified according to the relative abundance of vertebrate fossils or scientifically significant invertebrate or plant fossils and their sensitivity to adverse impacts within the known extent of the geological unit. Although significant localities may occasionally occur in a geologic unit, a few widely scattered important fossils or localities do not necessarily indicate a higher PFYC value; instead, the relative abundance of localities is intended to be the major determinant for the value assignment.

Based on other recorded localities, late Pleistocene fossils typically begin appearing about 8 to 10 feet deep in California valleys. Shallower sediments in the valleys usually do not contain the remains of extinct animals, although Holocene (less than 11,700 years old) remains may be present. The Holocene to late Pleistocene axial channel deposits are ranked as low (PFYC 2) sensitivity at the surface and increasing to moderate and patchy sensitivity (PFYC 3a) at depths below 8 feet.

CONCLUSIONS AND RECOMMENDATIONS

The proposed maximum depth of cuts is six to seven feet below the current ground surface. Only Holocene to late Pleistocene axial channel deposits may be impacted by the proposed project construction activities. No late Pleistocene fossils were identified within five miles of the proposed project in sediments comparable to those within the study area. Based on other finds from California valley areas, late Pleistocene fossils typically begin appearing between 8 to 10 feet deep. On this basis, it is considered unlikely that fossils meeting significance criteria will be encountered on this project; therefore, no mitigation is recommended. If unanticipated discoveries of paleontological resources occur during construction, all work within 50 feet of the discovery should be halted until the find has been evaluated by a qualified paleontologist.

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APPENDIX A: QUALIFICATIONS

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PALEONTOLOGY - ARCHAEOLOGY - HISTORY

KIM SCOTT
Principal Investigator for Paleontology
Field & Lab Director for Paleontology

EDUCATION

2000 B.S., Geology with paleontology emphasis, University of California, Los Angeles
2013 M.S., Biology with a paleontology emphasis, California State University, San Bernardino

SUMMARY QUALIFICATIONS

Scott has more than 20 years of experience in California paleontology and geology. She is a qualified geologist and field paleontologist with extensive survey, monitoring and fossil salvage experience. In addition, she has special skills in fossil preparation (cleaning and stabilization) and preparation of stratigraphic sections and other documentation for fossil localities. Scott serves as company safety officer and is the author of the company safety and paleontology manuals.

SELECTED PROJECTS

Temecula Gateway EIR, Riverside County, CA. A Planned Development Overlay/Zone Change and General Plan Amendment. Prepared an assessment report for a 9-acre parcel for the EIR. Sub to PMC. Co-Principal Investigator/Report Co-author. 2015

Interstate 15 (I-15) / Limonite Avenue Interchange Improvement Project, Caltrans District 8, Eastvale, Riverside County, CA. The proposed project would replace the existing Limonite Avenue OC and would widen the roadway from four lanes to six lanes. Prepared a Paleontological Mitigation Plan. Sub to Dokken Engineering. Co-Principal Investigator/Report Co-author. 2015.

Perris Valley Line Project, Metrolink - Riverside County Transportation Commission, Riverside County, CA. The project was a 24-mile extension of the Metrolink 91 Line. Managed paleontological monitoring for construction of four new stations, upgrading associated track and utility relocations to extend the Metrolink connection from Riverside through Moreno Valley to Perris. Prepared an abbreviated Paleontological Assessment, supervised all field activities and prepared the Paleontological Resources Monitoring Compliance Report. Sub to HDR Engineering. Project Manager and Principal Paleontologist. 2013-2016.

SR 91 Widening Project, Caltrans District 8, Riverside, Riverside County, CA. Caltrans widening from the Interstate 60/ State Route 91/ State Route 215 interchange to the Adams Street bridge (Post mile marker 15.6 to 21.6). Construction activities included the addition of two High Occupancy Vehicle (HOV) lanes (one for either direction), interchange reconfiguration, overhead replacement, and undercrossing widening and pavement restriping within the Right of Way (ROW). Supervised paleontological monitoring, monitored, prepared fossils, and prepared the mitigation report. Under contract to Applied Earthworks. Field and Laboratory Supervisor/Report Co-author. 2011-2012.

Fogarty Substation, Southern California Edison, near Lake Elsinore, Riverside County, CA. Project consisted of construction of an Edison substation. Performed site visits, WEAP training, and reporting. Field Director. 2010.

El Casco Substation Project, Southern California Edison, Riverside County. Performed preconstruction mitigation measures and prepared portions of Paleontological Resources Treatment Plan. Field and Lab Director and Report co-author. 2009

APPENDIX B: SENSITIVITY RANKING CRITERIA

PFYC Rank	PFYC Description (BLM, 2007)
1	Very Low. The occurrence of significant fossils is non-existent or extremely rare. Includes igneous or metamorphic and Precambrian or older rocks. Assessment or mitigation of paleontological resources is usually unnecessary.
2	Low. Sedimentary geologic units that are not likely to contain vertebrate fossils or scientifically significant nonvertebrate fossils. Includes rock units too young to produce fossils, sediments with significant physical and chemical changes (e.g., diagenetic alteration) and having few to no fossils known. Assessment or mitigation of paleontological resources is not likely to be necessary.
3b	Potentially Moderate but Undemonstrated Potential. Units exhibit geologic features and preservational conditions that suggest fossils could be present, but no vertebrate fossils or only common types of plant and invertebrate fossils are known. Surface-disturbing activities may require field assessment to determine appropriate course of action.
3a	Moderate Potential. Units are known to contain vertebrate fossils or scientifically significant nonvertebrate fossils, but these occurrences are widely scattered and of low abundance. Common invertebrate or plant fossils may be found. Surface-disturbing activities may require field assessment to determine appropriate course of action.
4	High. Geologic units containing a high occurrence of significant fossils. Fossils must be abundant per locality. Vertebrate fossils or scientifically significant invertebrate or plant fossils are known to occur and have been documented, but may vary in occurrence and predictability. If impacts to significant fossils can be anticipated, on-the-ground surveys prior to authorizing the surface disturbing action will usually be necessary. On-site monitoring or spot-checking may be necessary during construction activities.
5	Very High. Highly fossiliferous geologic units that consistently and predictably produce vertebrate fossils or scientifically significant invertebrate or plant fossils. Vertebrate fossils or scientifically significant invertebrate fossils are known or can reasonably be expected to occur in the impacted area. On-the-ground surveys prior to authorizing any surface disturbing activities will usually be necessary. On-site monitoring may be necessary during construction activities.

As per BLM (2008).