APPENDIX H

Paleontological Resources Technical Report

Paleontological Resources Assessment for the Amended SSU6 Project, Imperial County, California

Prepared for

AECOM Environment

Prepared by

SWCA Environmental Consultants
Pasadena Office

Revised January 2009

PALEONTOLOGICAL RESOURCES ASSESSMENT FOR THE AMENDED SSU6 PROJECT
IMPERIAL COUNTY, CALIFORNIA

SWCA PROJECT NUMBER 15028

SUBMITTED TO:
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PROJECT SUMMARY

PURPOSE AND SCOPE

SWCA Environmental Consultants was retained by AECOM Environment (AECOM) to conduct supplemental paleontological resources services for the Amended Salton Sea Unit 6 Geothermal Power Project (Amended Project or Project), located near the city of Calipatria, Imperial County, California. The scope of services included (1) a supplemental museum records search, (2) a supplemental paleontological field survey, and (3) preparation of this technical report of findings that includes recommended mitigation measures.

DATES OF INVESTIGATION

The museum records searches were requested by SWCA on December 12, 2008. A paleontological reconnaissance survey of the original SSU6 Project area (including the proposed plant site and transmission line right-of-way [ROW]) was performed by PaleoResource Consultants on March 12 and 13, 2002 as part of the AFC for the original SSU6 Project. A supplemental survey of the Amended SSU6 Project area (including injection well sites, gas pipelines, and the borrow pit site) was performed by SWCA on December 11 and 12, 2008. This draft technical report was completed on December 19, 2008.

RESULTS OF THE INVESTIGATION

According to geologic mapping by Jennings (1967), the entire Project area is underlain by Quaternary-age Lake Cahuilla Beds. Museum collections records maintained by the Natural History Museum of Los Angeles County (LACM), the San Bernardino County Museum (SBCM), the San Diego Museum of Natural History (SDNHM), and the University of California Museum of Paleontology (UCMP) indicate that no previously recorded fossil localities exist directly within the proposed Amended Project area. However, at least four significant vertebrate fossil localities have been recorded somewhat nearby (but greater than 1 mile away) and from within the same geologic sediments underlying the Amended Project area. During the course of the field survey, SWCA paleontologists did not discover any significant fossil resources or localities. However, numerous modern (nonindigenous) clams were discovered in the vicinity of numerous irrigation ditches and were noted as nonsignificant fossil occurrences.

The combined results of the museum records searches, literature review, and field survey indicate that geologic sediments underlying the Amended Project area have a high paleontological sensitivity. Therefore, construction of the Amended Project may potentially result in an adverse impact to nonrenewable fossil resources and will require implementation of paleontological resources mitigation measures to ensure that impacts are at a less-than-significant level.

RECOMMENDATIONS

SWCA recommends that a qualified paleontologist be retained to design and implement a Paleontological Resources Monitoring and Mitigation Plan (PRMPP) during any ground disturbances related to the proposed Amended Project. All significant fossils recovered during construction monitoring should be prepared, stabilized, identified, and permanently curated in an approved repository or museum.

DISPOSITION OF DATA

This report will be filed with AECOM. A copy will be retained at SWCA Environmental Consultants, along with maps, field notes, photographs, and all other records relating to the Project.

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INTRODUCTION

This report presents the findings of a supplemental paleontological resource assessment of the Amended Salton Sea Unit 6 (SSU6) Geothermal Power Project (Amended Project or Project) located in Imperial County, California. This study was performed to evaluate the paleontological sensitivity of the Project area and vicinity, assess potential Project-related impacts on paleontological resources, and provide recommendations for the management of paleontological resources. This study was conducted in accordance with the professional guidelines established by the Society of Vertebrate Paleontology (SVP) (1995) and requirements set forth by the California Energy Commission (CEC) (2007).

DEFINITION AND SIGNIFICANCE OF PALEONTOLOGICAL RESOURCES

Paleontology is a multidisciplinary science that combines elements of geology, biology, chemistry, and physics in an effort to understand the history of life on earth. Paleontological resources, or fossils, are the remains, imprints, or traces of once-living organisms preserved in rocks and sediments. These include mineralized, partially mineralized, or unmineralized bones and teeth, soft tissues, shells, wood, leaf impressions, footprints, burrows, and microscopic remains. The fossil record is the only evidence that life on earth has existed for more than 3.6 billion years. Fossils are considered nonrenewable resources because the organisms they represent no longer exist (Murphey and Daitch, 2007). Thus, once destroyed, a fossil can never be replaced. Fossils are an important scientific and educational resource because they are used to:

- Study the phylogenetic relationships between extinct organisms, as well as their relationships to modern groups
- Elucidate the taphonomic, behavioral, temporal, and diagenetic pathways responsible for fossil preservation, including biases in the fossil record
- Reconstruct ancient environments, climate change, and paleoecological relationships
- Provide a measure of relative geologic dating, which forms the basis for biochronology and biostratigraphy, and which is an independent and supporting line of evidence for isotopic dating
- Study the geographic distribution of organisms and tectonic movements of land masses and ocean basins through time
- Study patterns and processes of evolution, extinction, and speciation
- Identify past and potential future human-caused effects to global environments and climates (Murphey and Daitch, 2007)

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

Fossils are classified as nonrenewable scientific resources and are protected by various laws, ordinances, regulations, and standards (LORS) across the country. The SVP (1995) has established professional standards for the assessment and mitigation of adverse impacts to paleontological resources. This paleontological assessment was conducted in accordance with the LORS that are applicable to paleontological resources within the Project area. These LORS are summarized in Table 1 and the following paragraphs.

FEDERAL

Federal legislative protection for paleontological resources stems from the Antiquities Act of 1906 (Public Law [PL] 59-209; 16 United States Code [USC] 431 et seq.; 34 Stat. 225), which calls for

protection of historic landmarks, historic and prehistoric structures, and other objects of historic or scientific interest on federally administered lands. Federal protection for significant paleontological resources would apply to the Project if any construction or other related project impacts occurred on federally owned or managed lands. No federal protection of paleontological resources pertains to this Project.

STATE

With regard to paleontological resources, the CEC environmental review process under the Warren-Alquist Act is considered functionally equivalent to that of the California Environmental Quality Act (CEQA) (Public Resources Code [PRC] Sections 15000 et seq.). Guidelines for the Implementation of CEQA, as amended March 29, 1999 (Title 14, Chapter 3, California Code of Regulations 15000 et seq.) define procedures, types of activities, persons, and public agencies required to comply with CEQA, and include as one of the questions to be answered in the Environmental Checklist (Section 15023, Appendix G, Section XIV, Part a) the following: "*Will the proposed project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?*"

Other state requirements for paleontological resources management are included in PRC Chapter 1.7, Sections 5097.5 and 30244. These statutes prohibit the removal of any paleontological site or feature on public lands without permission of the jurisdictional agency, define the removal of paleontological sites or features as a misdemeanor, and require reasonable mitigation of adverse impacts to paleontological resources from developments on public (state) lands. These protections would apply to the proposed project only if the state or a state agency were to obtain ownership of project lands during the term of the project license.

LOCAL

The Imperial County General Plan serves as the primary policy statement by the County Board of Supervisors for implementing development policies and land uses. Goals and Objectives, as stated in the Land Use Element of the General Plan, provide direction for private development and guidelines for land use decision making. These Goals and Objectives repeatedly mention preserving natural resources and the natural environment and avoiding adverse environmental impacts. Objective 8.8 specifically states that the siting of future facilities for the transmission of electricity should be compatible with the environment. Goal 9 deals with the protection of environmental resources and states that the County will identify and preserve significant natural, cultural, and community character resources. Objective 9.1 requires the preservation of important natural resources, including prehistoric sites. The Amended Project would achieve these objectives with the implementation of the mitigation measures specified in Section 5.9.4.

Table 1. Summary of Paleontological Laws, Ordinances, Regulations, and Standards Applicable to the Project

Agency/Owner	Pertinent Paleontological LORS
Federal	None
State	CEQA
County	Imperial County General Plan

PROFESSIONAL STANDARDS

The SVP has established standard guidelines (SVP, 1995) that outline professional protocols and practices for the conducting of paleontological resource assessments and surveys, monitoring and

mitigation, data and fossil recovery, sampling procedures, and specimen preparation, identification, analysis, and curation. Most practicing professional vertebrate paleontologists adhere closely to the SVP's assessment, mitigation, and monitoring requirements as specifically provided in its standard guidelines. Typically, state regulatory agencies with paleontological LORS accept and use the professional standards set forth by the SVP.

As defined by the SVP (1995:26), significant nonrenewable paleontological resources are defined as:

> …Fossils and fossiliferous deposits here restricted to vertebrate fossils and their taphonomic and associated environmental indicators. This definition excludes invertebrate or paleobotanical fossils except when present within a given vertebrate assemblage. Certain invertebrate and plant fossils may be defined as significant by a project paleontologist, local paleontologist, specialists, or special interest groups, or by lead agencies or local governments.

As defined by the SVP (1995:26), significant fossiliferous deposits are defined as:

> A rock unit or formation which contains significant nonrenewable paleontologic resources, here defined as comprising one or more identifiable vertebrate fossils, large or small, and any associated invertebrate and plant fossils, traces and other data that provide taphonomic, taxonomic, phylogenetic, ecologic, and stratigraphic information (ichnites and trace fossils generated by vertebrate animals, e.g., trackways, or nests and middens which provide datable material and climatic information). Paleontologic resources are considered to be older than recorded history and/or older than 5,000 years, BP [before present].

Based on the significance definitions of the SVP (1995), all identifiable vertebrate fossils are considered to have significant scientific value. This position is held because vertebrate fossils are relatively uncommon, and only rarely will a fossil locality yield a statistically significant number of specimens of the same genus. Therefore, every vertebrate fossil found has the potential to provide significant new information on the taxon it represents, its paleoenvironment, and/or its distribution. Furthermore, all geologic units in which vertebrate fossils have previously been found are considered to have high sensitivity. Identifiable plant and invertebrate fossils are considered significant if found in association with vertebrate fossils or if defined as significant by project paleontologists, specialists, or local government agencies.

A geologic unit known to contain significant fossils is considered to be "sensitive" to adverse impacts if there is a high probability that earth-moving or ground-disturbing activities in that rock unit will either disturb or destroy fossil remains directly or indirectly. This definition of sensitivity differs fundamentally from that for archaeological resources as follows:

> It is extremely important to distinguish between archaeological and paleontological (fossil) resource sites when defining the sensitivity of rock units. The boundaries of archaeological sites define the areal extent of the resource. Paleontologic sites, however, indicate that the containing sedimentary rock unit or formation is fossiliferous. The limits of the entire rock formation, both areal and stratigraphic, therefore define the scope of the paleontologic potential in each case. [SVP, 1995]

Many archaeological sites contain features that are visually detectable on the surface. In contrast, fossils are contained within surficial sediments or bedrock and are therefore not observable or detectable unless exposed by erosion or human activity. Monitoring by experienced paleontologists greatly increases the

probability that fossils will be discovered during ground-disturbing activities and that, if these remains are significant, successful mitigation and salvage efforts may be undertaken to prevent adverse impacts to these resources.

RESOURCE ASSESSMENT GUIDELINES

Paleontological resources are limited, nonrenewable resources of scientific, cultural, and educational value and are afforded protection under federal (National Environmental Policy Act [NEPA]), state (California Environmental Quality Act [CEQA]), and local (Imperial County) laws and regulations. This study satisfies project requirements in accordance with CEQA (13 PRC, 2100 et seq.) and PRC Section 5097.5 (Stats 1965, c 1136, p. 2792). This analysis also complies with guidelines and significance criteria specified by the SVP (1995) and requirements set forth by the CEC in Appendix B, Information Requirements for an Application of the CEC's Power Plant Site Certification Regulations (CEC 2007)

PALEONTOLOGICAL SENSITIVITY

Paleontological sensitivity is defined as the potential for a geologic unit to produce scientifically significant fossils. This is determined by rock type, past history of the geologic unit in producing significant fossils, and fossil localities recorded from that unit. Paleontological sensitivity is derived from the known fossil data collected from the entire geologic unit, not just from a specific survey. In its "Standard Guidelines for the Assessment and Mitigation of Adverse Impacts to Nonrenewable Paleontologic Resources," the SVP (1995:23) defines three categories of paleontological sensitivity (potential) for sedimentary rock units: high, low, and undetermined:

- **High Potential.** Rock units from which vertebrate or significant invertebrate fossils or suites of plant fossils have been recovered and are considered to have a high potential for containing significant nonrenewable fossiliferous resources. These units include, but are not limited to, sedimentary formations and some volcanic formations that contain significant nonrenewable paleontologic resources anywhere within their geographical extent and sedimentary rock units temporally or lithologically suitable for the preservation of fossils. Sensitivity comprises both (a) the potential for yielding abundant or significant vertebrate fossils or for yielding a few significant fossils, large or small, vertebrate, invertebrate, or botanical; and (b) the importance of recovered evidence for new and significant taxonomic, phylogenetic, ecologic, or stratigraphic data. Areas that contain potentially datable organic remains older than Recent, including deposits associated with nests or middens, and areas that may contain new vertebrate deposits, traces, or trackways are also classified as significant.
- **Low Potential.** Reports in the paleontological literature or field surveys by a qualified vertebrate paleontologist may allow determination that some areas or units have low potentials for yielding significant fossils. Such units will be poorly represented by specimens in institutional collections.
- **Undetermined Potential.** Specific areas underlain by sedimentary rock units for which little information is available are considered to have undetermined fossiliferous potentials.

It should be noted that highly metamorphosed rocks and granitic rock units do not generally yield fossils and therefore have low potential to yield significant nonrenewable fossiliferous resources.

In general terms, for geologic units with high potential, full-time monitoring typically is recommended during any project-related ground disturbance. For geologic units with low potential, protection or salvage efforts typically are not required. For geologic units with undetermined potential, field surveys by a

qualified paleontologist are usually recommended to specifically determine the paleontologic potential of the rock units present within the study area.

PROJECT LOCATION

The Amended Project is located on the southeastern shore of the Salton Sea, northwest of the city of Calipatria, Imperial County, California. The Project is multi-component and consists of a proposed 160-acre plant site, three approximately 5-acre injection well sites, an approximately 70-acre borrow site, and approximately 3.5 linear miles of proposed brine injection pipeline alignments as shown on Figure 1. The Project area is mapped within Sections 3 & 4 of Township 12S, Range 13E and Sections 33 & 34 of Township 11S, Range 13E on the Obsidian Butte, CA 7.5-minute U.S. Geological Survey (USGS) quadrangle.

PROJECT PERSONNEL

SWCA paleontologist Justin Strauss conducted the fieldwork. Jessica DeBusk requested the museum records searches and authored this report. GIS Specialist Fozia Bashir produced graphics. Technical Editor Michelle Treviño edited and formatted this report. Cara Corsetti, Qualified Paleontologist and SWCA Paleontology Program Director, managed this project and provided quality assurance/quality control (QA/QC) review of this technical report.

METHODS

Due to the nature of the fossil record, paleontologists cannot know either the quality or the quantity of fossils present in a given geologic unit prior to natural erosion or human-caused exposure. Therefore, in the absence of surface fossils, it is necessary to assess the sensitivity of rock units based on their known potential to produce scientifically significant fossils elsewhere within the same geologic unit (both within and outside of the study area) or a unit representative of the same depositional environment.

MUSEUM RECORDS SEARCH

For the purposes of this supplemental analysis, museum records searches were performed by the Vertebrate Paleontology Section of the Natural History Museum of Los Angeles County (LACM), Vertebrate Collections at the University of California Museum of Paleontology (UCMP), and the Paleontology Section of the San Diego Natural History Museum (SDNHM). A search of museum records maintained by the San Bernardino County Museum (SBCM) was performed at the request of PaleoResource Consultants in 2002. Museum collections records were searched for the purposes of determining whether there are any known fossil localities in or near the Project site, identifying the geologic units present in the Project area, and determining the paleontological sensitivity ratings of those geologic units to assess potential impacts to nonrenewable paleontological resources (McLeod, 2008; Randall, 2008). Published and unpublished literature and geologic maps were reviewed, and mitigation measures specific to this Project were developed in accordance with the SVP's professional standards and guidelines (1995). Using information from the records searches and literature review, a geologic map and paleontological sensitivity map was created.

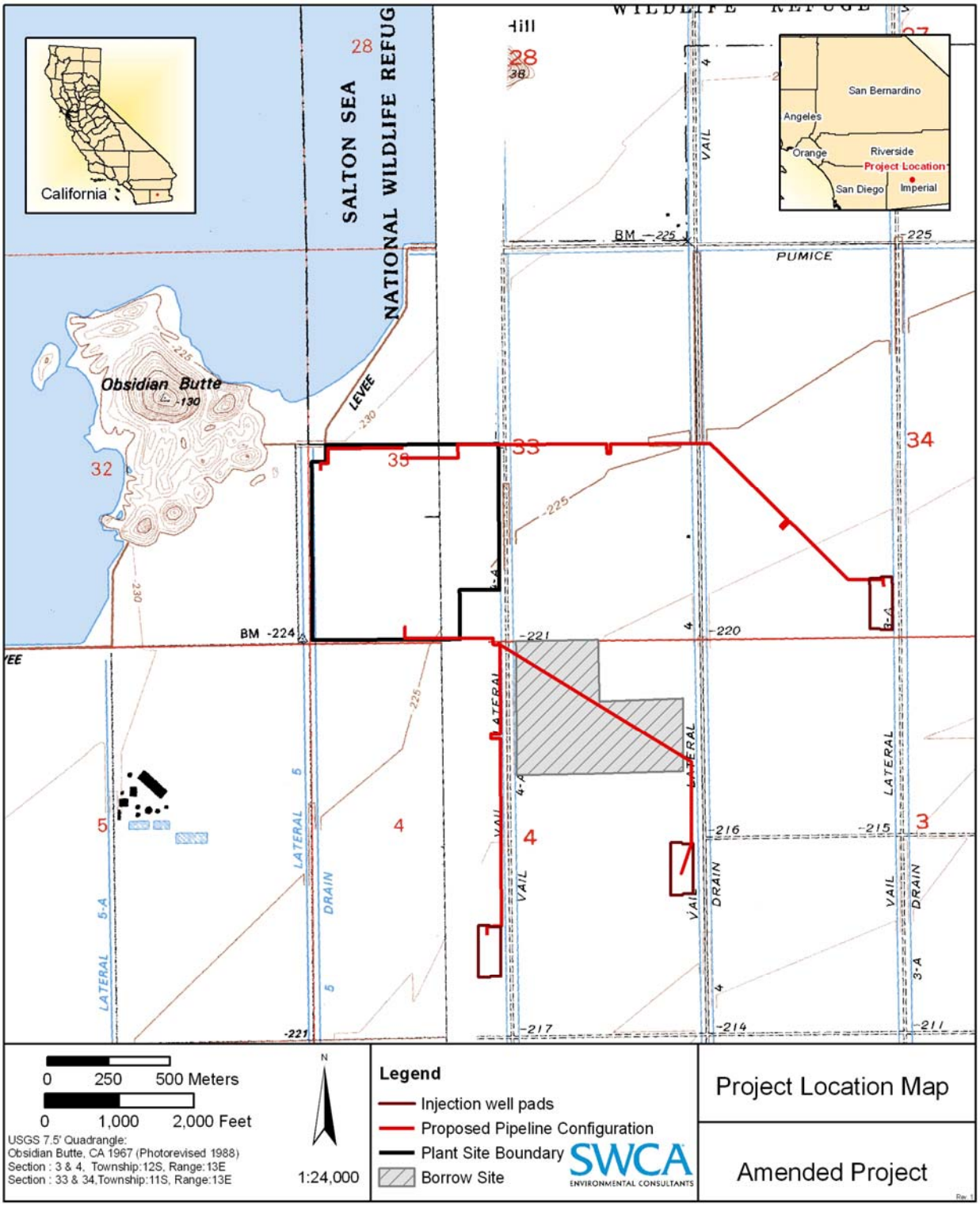

Figure 1. Project Location

FIELD SURVEY

A paleontological reconnaissance survey of the SSU6 Project area (including the proposed plant site and transmission line right-of-way [ROW]) was performed by PaleoResource Consultants on March 12 and 13, 2002 A supplemental survey of the Amended Project area (including three injection well sites, natural gas pipeline routes, and the borrow pit site) was performed by SWCA on December 11 and 12, 2008. The purpose of the fieldwork was to inspect the study area for surface fossils and exposures of potentially fossil-bearing geologic units and to determine areas in which fossil-bearing geologic units could be exposed during Project-related ground disturbances.

GEOLOGY AND PALEONTOLOGY

GEOLOGIC SETTING

California is naturally divided into the following 12 geomorphic provinces, each distinguished from one another by unique topographic features and geologic formations: (1) the Sierra Nevada, (2) the Klamath Mountains, (3) the Cascade Range, (4) the Modoc Plateau, (5) the Basin and Range, (6) the Mojave Desert, (7) the Colorado Desert, (8) the Peninsular Ranges, (9) the Transverse Ranges, (10) the Coast Ranges, (11) the Great Valley, and (12) the Offshore area. The proposed Project is located within the south-central portion of the Salton Trough geomorphic province. The Salton Trough includes the Coachella Valley, the western half of the Mexicali Valley, and the Colorado River delta in Mexico. Formed by rifting along the East Pacific Rise, the structure of the Salton Trough today is largely a product of the ongoing tectonic activity within the San Andreas fault system (Alles, 2004; Buckles et al., 2002). The strike-slip fault system runs from central to southern California and forms the eastern wall of the Salton Trough. The San Andreas fault system terminates at the Brawley seismic zone, a spreading center in the southeastern corner of the Salton Sea (Alles, 2004). This spreading center accounts for all the active seismicity in the region, is responsible for a large number of young volcanic and geothermal features, and formed pull-apart basins on both sides of the international border (Center for Los Angeles Basin Subsurface Geology [CLABSG], 2004). Forming the western wall of the Salton Trough are the highly active San Jacinto fault zone and the Elsinore fault zone. The Elsinore fault has historically been much less active than either the San Andreas or San Jacinto fault zones. Crustal extension and subsidence of the Salton Trough have resulted in the accumulation of sediments more than 5 miles thick (Alles, 2004).

The divergence along the East Pacific Rise that created the Gulf of California began in the late Miocene, between 5 and 10 million years ago (Ma). This activity coincided with an uplift of the Colorado Plateau, which strengthened the flow of the Colorado River, allowing it to carry more sediment. The Colorado River eventually dammed the entrance of the gulf and created the Salton Trough. The trough was, however, episodically inundated by marine water during the Pliocene and Pleistocene and fresh water during the Holocene, which formed Lake Cahuilla. Around the margins of the Salton Trough, at approximately 40 feet above mean seal level (msl), the ancient shoreline of Lake Cahuilla is visible. At this elevation, the water depth of Lake Cahuilla would have been approximately 300 feet. The 40-foot level of Lake Cahuilla was most likely established by the crest of the Colorado River delta. Evidence for this lake level is visible at Travertine Rock on the western margin of the Salton Trough, where 30-inch-thick travertine deposits indicate that the 40-foot water level persisted for a long period of time. Older discontinuous terrace deposits within the Salton Trough indicate the existence of large lakes that may have been connected to the Gulf of California. The Salton Sea, which occupies the center of the Salton Trough today, was created as the result of an irrigation canal accident, which diverted the full flow of the Colorado River into the Salton Trough for two years between 1905 and 1907 (Alles, 2004).

SITE-SPECIFIC GEOLOGY AND PALEONTOLOGY

As reported by PaleoResource Consultants, a large scale geologic map (such as 1:24,000) is not available for the Amended Project area. However, numerous smaller-scale maps, including those published by Jennings (1967; 1:750,000 scale), Jenkins (1938; 1:500,000 scale), Brown (1923, 1:250,000 scale), Dibblee (1954, 1:250,000 scale), Loeltz et al. (1975, 1:240,000 scale), and Morton (1977) 1:125,000 scale) are available. For this analysis, geologic mapping by Jennings (1967) was used (Figure 2) to show that the Amended Project area is immediately underlain by "Quaternary lake deposits," locally referred to as Lake Cahuilla Beds.

Lake Cahuilla Beds

The Project area is immediately underlain by early to middle Holocene-age sediments of Lake Cahuilla (Jennings, 1967). These fluvial and lacustrine Lake Cahuilla Beds comprise a thick sequence of tan and gray fossiliferous clay, silt, sand, and gravel in conjunction with alluvium (Morton, 1966; 1977). The fluvial component of the Lake Cahuilla Beds were deposited during intervening lake lowstands (Whistler et al., 1995), and are generally composed of thinly bedded, poorly sorted, fine-grained, light grayish-brown, fluvial sandstone. The lacustrine mudstone is generally sandy and silty, massive, poorly sorted, and often highly bioturbated.

Paleosalinity data derived from fossil mollusk shells indicate the last natural filling of Lake Cahuilla occurred around 1500 A.D. (Bowersox, 1974). The most abundant molluscan taxa, *Tryonia protea, Fontelicella longinqua,* and *Physa humerosa,* are characteristic of shallow water lakes in the Colorado Desert with sandy and muddy bottoms and abundant aquatic vegetation (Bowersox, 1974). Fossil remains of diatoms, land plants, sponges, ostracods, mollusks, fish, and small terrestrial vertebrates have been recovered from the Lake Cahuilla Beds (Whistler et al., 1995). In their study at La Quinta, Whistler et al. (1995) reported that the terrestrial vertebrate remains they collected included small desert animals very similar to the fauna that currently inhabit the Salton Trough. Species that required aquatic habitats, such as frogs, toads, aquatic turtles, watersnakes, waterfowl, or muskrats, among others, were absent from the sample, suggesting that at that particular time, Lake Cahuilla did not persist long enough for these species to migrate to the lake from Colorado River habitats (Whistler et al., 1995). Due to the abundant recovery of significant fossils from Lake Cahuilla Beds, this geologic unit is considered to have a high potential for paleontological resources.

Brawley Formation

As reported in the original SSU6 AFC, the SSU6 Project is underlain by the Brawley Formation both at the surface (within portions of the transmission line ROW) and at depth (throughout the project area). The Brawley Formation is composed of light gray clay, sandstone, and pebble gravel of both lacustrine and terrestrial origin. It outcrops discontinuously from the southern end of the Salton Sea to the area surrounding the Superstition Hills and Superstition Mountain. Demere and Walsh (1993) assign the Brawley Formation an early to late Pleistocene age (0.4 to 1.2 Ma). Several fossil localities in Imperial County have yielded significant vertebrate fossil remains of deer, horse, camel, and bison as well as razorback sucker, bonytail, western pond turtle, teleost fish, and iguanid lizards. In Imperial County, the Brawley Formation is determined to have a high potential for paleontological resources.

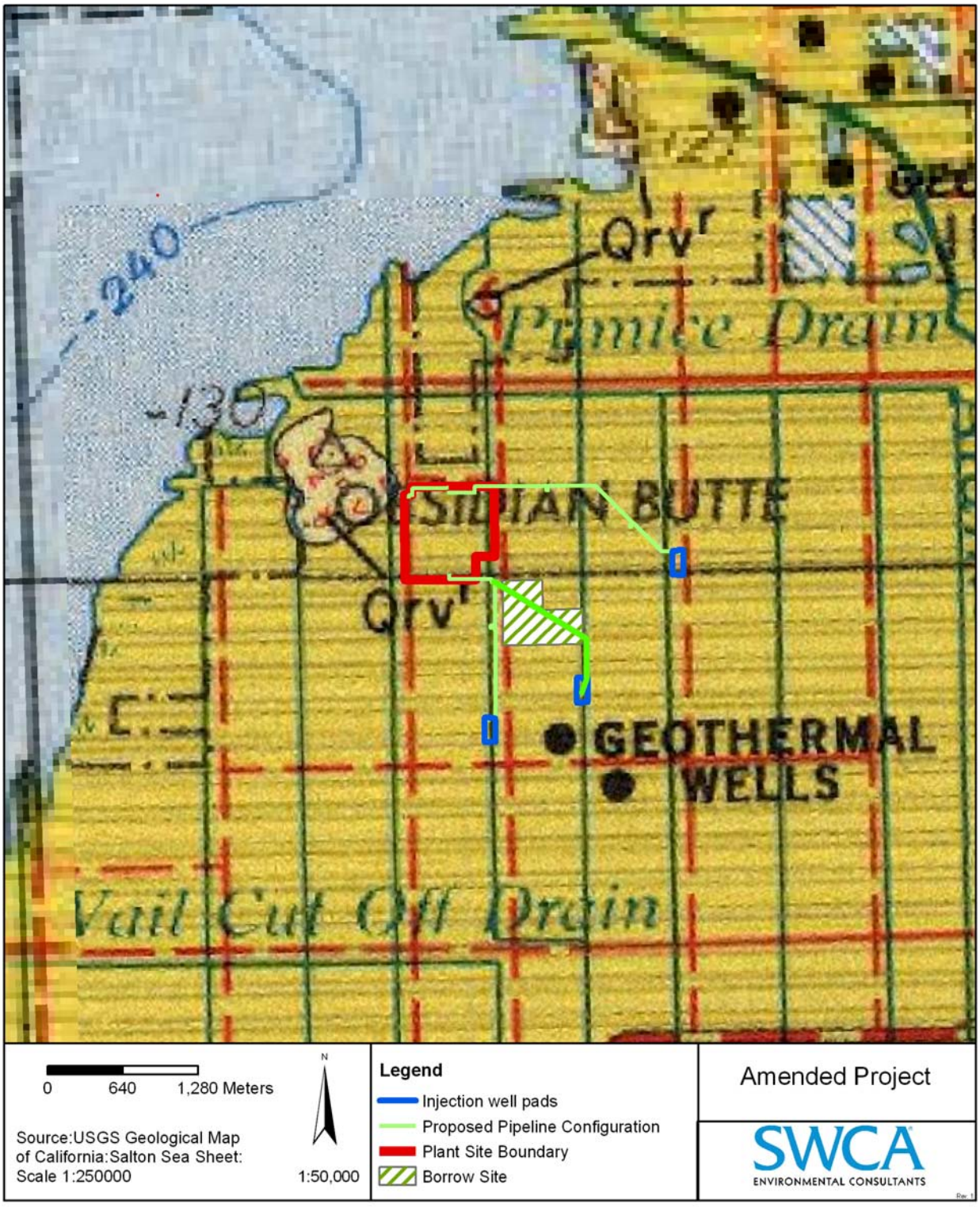

Figure 2. Amended Project

Table 2. Geologic Units within the Project Area

Age	Geologic Unit	Map Abbreviation*	Typical Fossil Types	Paleontological Resource Potential (Sensitivity)
Holocene to Latest Pleistocene	Lake Cahuilla Beds	Ql	None	High
Pleistocene	Brawley Formation	Qn	Vertebrates	High

*Source: Jennings, 1967.

ANALYSIS AND RESULTS

MUSEUM RECORDS SEARCH

A comprehensive review of museum collections records at the LACM, UCMP, and SDNHM confirmed that no fossil localities have been previously recorded within the Project site or within a 1-mile radius (Randall, 2008; McLeod, 2008; Holyrod, 2009). In addition, a museum records search performed by the San Bernardino Count Museum (SBCM) in 2002 confirmed that no fossil localities were previously recorded within the proposed plant site boundaries or transmission line ROW (See Appendix A). However, at least four scientifically significant vertebrate fossil localities have been recorded somewhat nearby (but greater than 1 mile away) and from within the same geologic sediments underlying the Amended Project area. LACM localities 6252, 6253, 6255, and 6256 yielded significant remains of freshwater fish and terrestrial vertebrates and microvertebrates, including reptiles, birds, and mammals. Localities 6252, 6253, and 6255 also yielded non-vertebrate fossils, including diatoms, land plants, clams, snails, and crustaceans.

In the interest of confidentiality, many museums and repositories provide only a general location description of fossil localities, and exact coordinates are only provided if a locality is directly within the proposed area of impact. Table 3 summarizes the results of the museum records searches and their geographic location in relation to the Project area. Since no previously recorded fossil localities are located directly in the Project boundaries, exact coordinates were not provided by each repository in the interest of confidentiality.

Table 3. Previously Recorded Fossil Localities in the Vicinity of the Project

Geological Formation	Museum Locality No. and Approximate Location	Taxon	Common Name
Lake Cahuilla Beds	LACM 6252, 6253, and 6255; northwest of the proposed project areas northwest of the current Salton Sea and near the present Lake Cahuilla	*Xyrauchen texanus*	Razorback sucker
		Gila elegans	Bonytail
		Cyprinodon macularius	Desert pupfish
		Phrynosoma platyrhinos	Desert horned lizard
		Sceloporus magister	Desert spiny lizard
		Uma inornata	Coachella Valley fringe-toed lizard
		Urosaurus graciosus	Long-tailed brush lizard
		Chionactis occipitalis	Western shovel-nosed snake
		Hypsiglena torquata	Night snake
		Pituophis melanoleucus	Gopher snake
		Sonora semiannulata	Western ground snake

Table 3. Previously Recorded Fossil Localities in the Vicinity of the Project

Geological Formation	Museum Locality No. and Approximate Location	Taxon	Common Name
		Crotalus cerastes	Sidewinder rattlesnake
		Passeriformes	Advanced land birds
		Sylvilagus	Cottontail rabbit
		Neotoma lepida	Desert wood rat
		Peromyscus sp.	White-footed mouse
		Dipodomys sp.	Kangaroo rat
		Peronathus longimembris	Pocket mouse
		Ammospermophilus leucurus	Antelope ground squirrel
		Unspecified	Land plants
		Unspecified	Clams
		Unspecified	Snails
		Unspecified	Crustaceans
	LACM 6256; northwest of the proposed project areas northwest of the current Salton Sea and near the present Lake Cahuilla	*Ovis canadensis*	Bighorn sheep

LACM = Natural History Museum of Los Angeles County

FIELD SURVEY

A paleontological reconnaissance survey of the SSU6 project area (including the proposed plant site and transmission line ROW) was performed by PaleoResource Consultants on March 12 and 13, 2002 (Appendix A). A supplemental survey of the Amended SSU6 project area (including injection well sites, natural gas pipeline routes, and the borrow site) was performed by SWCA on December 11 and 12, 2008. Because the transmission lines are already licensed and no changes are proposed to them as part of the Amended Project, the 2008 survey did not cover the transmission lines. SWCA survey methods consisted of walking parallel transects of the entire borrow pit site and each injection well site as well as a thorough walk-over of the 100-foot ROW of the natural gas pipeline alignments. Much of the project area was highly disturbed as a result of agricultural activities (various crop fields), and ground visibility was poor overall. However, the borrow site and irrigation ditches provided the surveyor the opportunity to inspect sediments of the Lake Cahuilla Beds for potential paleontological resources.

No paleontological resources were discovered in Lake Cahuilla Bed or Brawley Formation sediments during the course of the field survey for the amended project. However, a total of five nonsignificant potential fossil occurrences were noted by SWCA paleontologist Justin Strauss, M.S. Each of the five occurrences yielded several dozen to hundreds of small (dime- to quarter-sized) Asian clam shells (*Corbicula fluminea*) ranging in color from purple to yellow to brown (Photographs 1–3). All occurrences were discovered littering the ground exclusively adjacent to the multiple irrigation ditches crossing the Project area (see Photograph 2). According to Foster, et al. (2008), Asian clams were first introduced to the United States in 1938 and have been reported to occur in the vicinity of the Salton Sea. Asian clam populations are known to cause problems in various water systems, including irrigation canals where they live (Foster et al., 2008). Each clam concentration was recorded with photographs and GPS points; however, due to their very young age and lack of fossilization, they are not deemed scientifically significant.

Photograph 1. Close-up view of Nonsignificant Fossil Locality F1-081211-01.

Photograph 2. Close-up view of Nonsignificant Fossil Occurrence F1-081211-01.

Photograph 3. Nonsignificant Fossil Occurrence F1-081212-04, along Gentry Road irrigation ditch.

Photograph 4. Close-up of Nonsignificant Fossil Occurrence F1-081212-04, along Gentry Road irrigation ditch.

CONCLUSIONS

The destruction of fossils as a result of human-caused ground disturbance has a significant cumulative impact, as it makes biological records of ancient life permanently unavailable for study by scientists. Implementation of proper mitigation measures can, however, reduce the impacts to the paleontological resources to below the level of significance. Various activities on the plant site, injection well sites, pipeline routes, and borrow site will require excavations for foundations/footings and other excavations (e.g., earthen borrow materials) , related to the development of the Project. Any subsurface disturbances related to the development of the Project may result in adverse impacts to significant paleontological resources as the underlying geologic sediments are determined to have a “high” paleontological sensitivity (Figure 3).

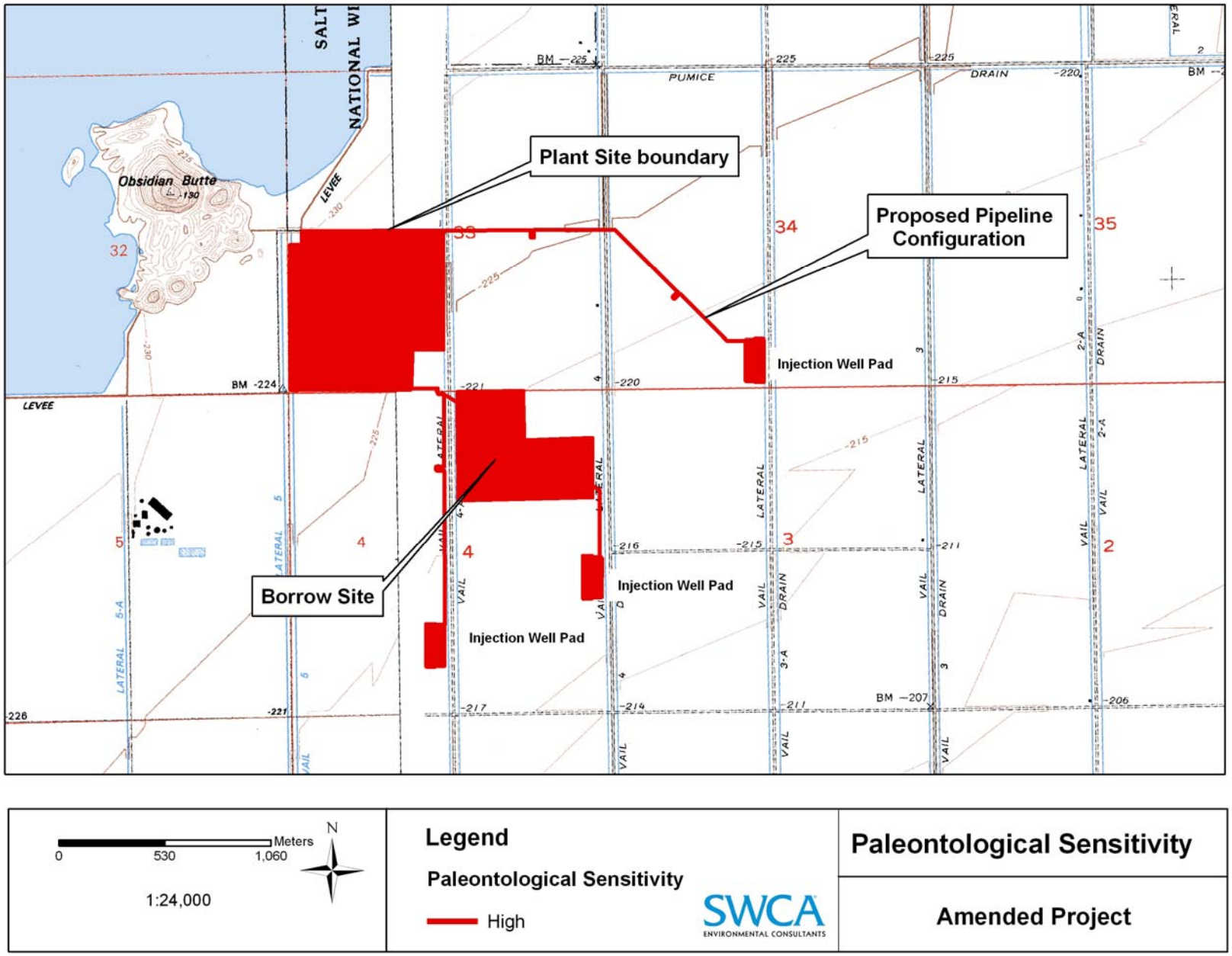

Figure 3. Paleontological Sensitivity

RECOMMENDED MITIGATION MEASURES

Ground-disturbing activities in the project area may result in adverse impacts to significant paleontological resources unless proper mitigation measures are implemented. Implementation of proper mitigation measures can, however, reduce the impacts to the paleontological resources to below the level of significance. The following mitigation measures have been developed to ensure that the potential adverse impacts of ground disturbance on paleontological resources are at a less-than-significant level during the construction of the project. The measures are based on the SVP standard guidelines (1995) and meet the requirements of CEQA and CEC. These mitigation measures have been used throughout California and have been demonstrated to be successful in protecting paleontological resources while allowing timely completion of construction projects in paleontologically sensitive areas.

PRE-CONSTRUCTION PHASE

Measure A. Prior to the start of any project related construction (defined as construction-related vegetation clearing, ground disturbance and preparation, and site excavation activities), the project owner shall ensure that the designed paleontological resource specialist approved by the CEC Compliance Project Manager (CPM) is available for field activities and prepared to implement the conditions of certification. The designated paleontological resource specialist shall be responsible for implementing all the paleontological conditions of certification and for using qualified personnel to assist in this work.

Measure B. Prior to the start of construction, a Paleontological Resource Monitoring and Mitigation Plan (PRMMP) drafted by the designated paleontological resource specialist shall be submitted to the CPM for approval. The plan shall identify general and specific measures to minimize potential impacts to sensitive paleontological resources. The project paleontological resource specialist shall implement the PRMMP as needed.

The PRMMP shall include, but not be limited to, the following elements and measures.

- A discussion of the sequence of project-related tasks, such as preconstruction surveys and salvage (if any), fieldwork, flagging or staking; construction monitoring and sampling; and if fossils are discovered, mapping and data recovery; fossil preparation and recovery; identification and inventory; preparation of final reports; and transmittal of materials for curation;
- Identification of the person(s) expected to assist with the tasks the PRMMP, and a discussion of the mitigation team leadership and organizational structure;
- Where monitoring of project construction activities is deemed necessary, the extent of the areas where monitoring is to occur;
- An explanation that the designated Paleontological Resource Specialist shall have the authority to halt or redirect construction in the immediate vicinity of a vertebrate fossil find until the significance of the find can be determined;
- A discussion of the equipment and supplies necessary for the recovery of fossil materials and any specialized equipment needed to prepare, remove, load, transport, and analyze large-sized fossils or extensive fossil deposits;
- Inventory, preparation and delivery for curation info a retrievable storage collection in a public repository or museum, which meets the Society of Vertebrate Paleontology standards and requirements for the curation of paleontological resources; and
- Identification of the institution that has agreed to receive any data and fossil materials recovered during project-related monitoring and mitigation work, discussion of any requirements of

specifications for materials delivered for curation and how they will be met, and the name and phone number of the contact person at the institution.

Measure C. Prior to the start of construction, the Paleontological Resource Specialist shall prepare a staff training program for review and approval by the CPM. The paleontological training program shall address the potential to encounter paleontological resources in the field, the sensitivity and importance of these resources, and the legal obligations to preserve and protect such resources. The training program shall also include the set of reporting procedures that workers are to follow if paleontological resources are encountered during project activities.

CONSTRUCTION PHASE

Measure D. The designated Paleontological Resource Specialist or paleontological monitor shall be present at times he or she deems appropriate to monitor construction-related grading, excavation, trenching, and/or augering in areas with a significant potential for fossil-bearing sediments to occur. All ground-disturbing activities in all project areas shall be monitoring full-time in previously undisturbed sediments. Paleontological monitoring will include inspection of exposed rock units and collection of matrix to be tested for the presence of microscopic fossils. Paleontological monitors will have authority to temporarily divert excavations or drilling away from exposed fossils in order to efficiently and professionally recover the fossil specimens and collect associated data.

POST-CONSTRUCTION PHASE

Measure E. If any significant paleontological resource materials are recovered**,** the project owner, through the designated Paleontological Resource Specialist, shall ensure recovery, preparation for analysis, analysis, identification and inventory, the preparation for curation, and the delivery for curation of all such materials encountered and collected during the monitoring, data recovery, mapping, and mitigation activities related to the project.

Measure F. The project owner shall ensure preparation of a Paleontological Resources Report by the designated paleontological resource specialist. The Paleontological Resources Report shall be completed following the analysis of the recovered fossil materials and related information. The project owner shall submit the Paleontological Resources Report to the CPM for approval. If applicable, the Paleontological Resources Report shall include, but not be limited to, a description and inventory list of recovered fossil materials; a map showing the location of paleontological resources found in the field; determinations of sensitivity and significance; and a statement by the paleontological resource specialist that project impacts to paleontological resources have been mitigated. If fossil materials were recovered, the Paleontological Resources Report shall be submitted with a request for confidentiality.

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CONFIDENTIAL Appendix A:
Paleontological Resources Technical Report