

## 5.9 Paleontological Resources

This section evaluates the potential impacts on paleontological resources of the Ridgecrest Solar Power Project (RSPP or Project). The evaluation summarizes applicable laws, ordinances, regulations and standards (LORS), discusses the paleontological sensitivity of the Project area (which includes the proposed Project site plus a 200-foot buffer and associated linear facilities plus a 100-foot buffer), evaluates potential Project-related impacts on the paleontological resources identified, and provides recommendations for mitigating potential impacts as needed. The following pages address only the paleontological resources of the Project site (plant site and linears) as currently configured. Additional paleontological resources data for areas that were considered during the course of this assessment but are no longer part of the Project are provided in Appendix H, along with additional details including the qualifications of the paleontological personnel. This paleontological assessment is based on a comprehensive literature review, museum records search, and fieldwork at the Project site. It was conducted in accordance with the professional standards of the Society of Vertebrate Paleontology (SVP) and performed by qualified paleontological professionals.

The paleontological resources discussion presented in the following pages is intended to support compliance by the California Energy Commission (CEC) with the requirements of the California Environmental Quality Act (CEQA), and by the Bureau of Land Management (BLM) with the requirements of the National Environmental Policy Act (NEPA). The two agencies are conducting a joint review of the Project and a combined CEQA/NEPA document will be prepared.

### Summary

With implementation of planned mitigation measures, the Project would have no significant impacts on paleontological resources. A comprehensive paleontological records search and literature review indicated that no fossil localities have been previously recorded in the Project area. No significant fossils were observed on the surface during the paleontological field survey that was conducted for the Project.

Geologic units underlying the Project site include areas of low sensitivity for paleontological resources, as well as areas with sensitivity that ranges from low to high with increasing depth. The planned mitigation includes a comprehensive professionally prepared monitoring and mitigation plan approved by the agencies before construction, including employee training; monitoring during excavations in locations of high paleontological sensitivity; and appropriate data recovery of fossil materials encountered, if any.

### 5.9.1 LORS Compliance

Fossils are classified as nonrenewable scientific resources and are protected by various LORS, which are summarized in Table 5.9-1, and in the text following the table. The Project will comply with all applicable Federal, State, and local LORS.

**Table 5.9-1 Summary of LORS for Paleontological Resources**

LORS	Applicability	Where Discussed in AFC
<b>Federal:</b>		
Antiquities Act of 1906 Public Law 59-206: 16 United States Code (USC) 431 et seq.	Requires protection of paleontological resources and other objects of historic or scientific interest on Federal lands.	Section 5.9.1
Paleontological Resources Preservation Act (PRPA), as provided for in Title VI of the Omnibus Public Land Management Act (OPLA) of 2009, Public Law 111-11	Codifies the practice of the BLM of requiring that rare and scientifically significant fossils be collected only by qualified researchers who obtain a permit.	Section 5.9.1
National Environmental Policy Act (NEPA): 42 USC 4321-4347	Recognizes the continuing responsibility to preserve important historic, cultural, and natural aspects of our national heritage on Federal lands.	Section 5.9.1
Federal Land Policy and Management Act (FLPMA): 43 USC 1701-1784	Recognizes significant paleontological resources as scientific resources, and requires Federal agencies to manage public lands in a manner that protects the quality of scientific resources, and, where appropriate, preserve and protect certain public lands in their natural condition. Permits on BLM lands that authorize the collection of significant fossils are authorized under FLPMA.	Section 5.9.1
National Historic Preservation Act (NHPA) of 1966: 16 USC 470	Provides for the survey, recovery, and preservation of significant paleontological data when such data may be destroyed or lost due to a Federal, federally-licensed, or federally-funded project.	Section 5.9.1
Title 43 Code of Federal Regulations (CFR) Section 8365.1-5	Prohibits collection of scientific resources, including vertebrate fossils, on Federal lands without a permit. The use of fossils found on Federal lands for commercial purposes is also prohibited.	Sections 5.9.1, 5.9.3, and 5.9.4
Department of Interior's "Assessment of Fossil Management on Federal and Indian Lands" report	Concludes that administrative and Congressional actions with respect to fossils should be governed by a set of seven basic principles.	Section 5.9.1.1
<b>State:</b>		
CEQA, Public Resources Code (PRC) Section 21000 <i>et seq.</i>	Addresses project construction that encounters paleontological resources.	Sections 5.9.1
PRC Section 5097.5	Prohibits unauthorized removal of paleontological resources from sites located on public lands.	Not applicable
<b>Local:</b>		
Kern County General Plan	Addresses the preservation of paleontological resources in accordance with CEQA guidelines and sets forth provisions for the preservation of significant paleontological resources.	Sections 5.9.3 and 5.9.4

**Table 5.9-1 Summary of LORS for Paleontological Resources**

LORS	Applicability	Where Discussed in AFC
<b>Professional Standards</b>		
Society of Vertebrate Paleontology Guidelines (1995)	Establishes standards for paleontological assessments and for mitigation of adverse impacts on paleontological resources.	Sections 5.9.1

### 5.9.1.1 Federal LORS

Federal legislative protection for paleontological resources stems from the Antiquities Act of 1906 (PL 59-209; 16 USC 431 et seq.), which requires protection of historic landmarks, historic and prehistoric structures, and other objects of historic or scientific interest on federally-administered lands, including paleontological resources. Other federal requirements and guidelines for the protection of significant paleontological resources include NEPA, FLPMA, the National Preservation Act of 1966, and Title 43 CFR. These LORS apply because the Project is to be located on federally-managed land.

In addition to the above requirements, in March 2009, the PRPA was enacted along with the OPLA of 2009. Title VI, Subtitle D: *Paleontological Resources Preservation* (OPLA-PRPA) sets forth the law pertaining to paleontological resources on all federally-administered lands. The OPLA-PRPA codifies the BLM practice of requiring that rare and scientifically significant fossils be collected only by qualified researchers who obtain a permit, and is consistent with paleontological guidelines outlined in the Paleontology Resources Management Manual and Handbook H-8270-1. As a result of the recent enactment of the OPLA-PRPA, Federal agencies will begin developing appropriate plans for the management of paleontological resources and the implementation of the PRPA. Federal protection for significant paleontological resources applies to the Project since Project construction and operations will occur on federally-owned or managed lands.

In 2000, the Secretary of the Interior submitted a report to Congress entitled "Assessment of Fossil Management on Federal and Indian Lands." This report was prepared with the assistance of eight federal agencies including the Bureau of Indian Affairs, the BLM, the Bureau of Reclamation, the United States Fish and Wildlife Service, the United States Forest Service, the National Park Service, the United States Geological Survey, and the Smithsonian Institution. The consulting agencies concluded that administrative and Congressional actions with respect to fossils should be governed by these seven basic principles:

- 1) Fossils on Federal land are a part of America's heritage.
- 2) Most vertebrate fossils are rare.
- 3) Some invertebrate and plant fossils are rare.
- 4) Penalties for fossil theft should be strengthened.
- 5) Effective stewardship requires accurate information.
- 6) Federal fossil collections should be preserved and available for research and public education.
- 7) Federal fossil management should emphasize opportunities for public involvement.

### 5.9.1.2 State LORS

The CEC environmental review under the Warren-Alquist Act is considered a CEQA-equivalent process under California law. The CEQA Guidelines define procedures, types of activities, persons, and public agencies required to comply with CEQA. Appendix G to section 15023 includes an Environmental

Checklist of questions that a lead agency should address if relevant to a project's environmental impacts, including: "Will the proposed project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature," and "Does the project have potential to eliminate important examples of the major periods of California history or pre-history?" Fossils are important examples of California pre-history.

Another State requirement for paleontological resources management is included in PRC Section 5097.5. This statute prohibits the removal of any paleontological site or feature from public lands without permission of the jurisdictional agency, defines the removal of paleontological sites or features as a misdemeanor, and requires reasonable mitigation of adverse impacts to paleontological resources from developments on public (State) lands. These protections would apply to the Project only if the State were to obtain ownership of Project lands during the term of its license.

### 5.9.1.3 Local LORS

The Land Use, Conservation, Open Plan Element of the Kern County General Plan addresses paleontological resources under "General Provision 1.10.3: Archaeological, Paleontological, Cultural, and Historical Preservation." This General Provision states as Policy 25, "the County will promote the preservation of cultural and historic resources which provide ties with the past and constitute a heritage value to residents and visitors." Implementation Measure L states that "the County shall address archaeological and historical resources for discretionary projects in accordance with CEQA." Implementation Measure M states that "in areas of known paleontological resources, the County should address the preservation of these resources where feasible."

### 5.9.1.4 Professional Standards

The SVP has established standard guidelines 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 utilize the professional standards set forth by the SVP.

As defined by the SVP, 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, 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, all identifiable vertebrate fossils are considered to have significant scientific value. This position is adhered to 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.

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 in order to prevent adverse impacts to these resources.

### 5.9.1.5 Involved Agencies

Agency contacts for Project paleontological resource issues are shown in Table 5.9-2

**Table 5.9-2 Agencies and Agency Contacts**

Agency Contact	Phone/E-mail	Permit/Issue
Donald Storm Ridgecrest Field Office Bureau of Land Management 300 S. Richmond Road Ridgecrest, CA 93555	(760-384-5422) Donald_Storm@ca.blm.gov	Field Authorization Request, under Permit No. CA-09-00-005P
Craig Murphy Supervising Planner-CEQA Compliance Environmental Impact Report Management State and Federal Regulation Monitoring Kern County Planning Department 2700 M Street, Suite 100 Bakersfield, CA 93301	661-862-8739 MurphyC@co.kern.ca.us	None required

### **5.9.1.6 Required Permits and Permit Schedule**

A BLM permit was required to conduct the paleontological resources investigation reported on in this AFC. All work on the Project is being completed under BLM Permit No. CA-09-00-005P. This permit authorizes survey, recordation, and limited collection of paleontological resources.

## **5.9.2 Affected Environment**

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. Once destroyed, a fossil can never be replaced. The following subsections discuss existing conditions with respect to paleontological resources in the Project area.

### **5.9.2.1 Records Search and Field Survey**

For this Project, museum records searches were performed by the Vertebrate Paleontology Section of the Natural History Museum of Los Angeles County and the Department of Earth Sciences at the San Bernardino County Museum. 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 in order to assess potential impacts to nonrenewable paleontological resources. 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.

A pedestrian reconnaissance survey of the Project area was performed May 19 through 22, 2009, and July 7 and 8, 2009. The field survey was lead by Project Paleontologist Justin Strauss with assistance from Staff Paleontologists Stephanie Lukowski, Gary King, and Benjamin Borkan under the direction of Paleontology Field Manager Jessica DeBusk and Principal Investigator Cara Corsetti. Ms. DeBusk conducted field visits during the course of the field survey. The purpose of the fieldwork was to inspect the Project 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.

### **5.9.2.2 Paleontological Sensitivity**

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.

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. The SVP's "Standard Guidelines for the Assessment and Mitigation of Adverse Impacts to Nonrenewable Paleontologic Resources" defines three categories of paleontological sensitivity (potential) for 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 and (b) the importance of recovered evidence for new and significant paleontological data.
- **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.

Note that metamorphic and granitic rock units generally do not yield fossils and therefore have no to low potential to yield significant nonrenewable fossiliferous resources.

### 5.9.2.3 Regional Geologic Setting

California is naturally divided into the following 12 geomorphic provinces, each distinguished 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 Project site is located in the Basin and Range geomorphic province. The Basin and Range province is bounded to the west by the Sierra Nevada crest, to the south by the Garlock Fault, and to the north by the Modoc Plateau. The Basin and Range province is more extensive to the east in the state of Nevada.

The Project site is situated within Indian Wells Valley located in the southern reaches of the Basin and Range province east of the Sierra Nevada. The Valley is bounded to the north by the Coso Range, to the south by the El Paso Mountains, to the east by the Argus Range, and to the west by the Sierra Nevada crest. Indian Wells Valley is a virtually closed basin with entirely internal drainage and is filled with alluvial deposits as much as 2,000 feet in thickness. The elevation of the center of the Valley floor is less than 2,400 feet above mean sea level. In the Pleistocene (1.8 million years ago [Ma] to 10,000 years BP), several perennial lakes occupied the valley floor. These lakes are now present-day playas, the largest being China Lake, which is located north of the study area.

### 5.9.2.4 Geologic Setting of the Project Site and Vicinity

The geology in the vicinity of the Project site has been mapped by Jennings, et al., at a scale of 1:250,000 and Moyle and Fenzel at a scale of 1:125,000. No larger-scale maps (1:24,000) were available for this analysis. A review of these published maps indicates that the Project site is underlain by the following geologic units in approximate ascending stratigraphic order: 1) Jurassic age basement complex, 2) Quaternary and Tertiary age Black Mountain Basalt, and 3) Quaternary alluvium of Holocene age. These geologic units, and their paleontological resource potential, are discussed in more detail in the following sections.

**Table 5.9-3 Geologic Units Underlying the RSPP Site and their Paleontological Sensitivity Ratings**

<b>Geologic Unit</b>	<b>Age</b>	<b>Types of Species</b>	<b>Sensitivity Rating</b>
Quaternary alluvium (Qa, Qal)	Holocene to Pleistocene	Terrestrial Vertebrates	Low to high (increases with depth)
Volcanic rocks (QTV, Qpv <sup>b</sup> )	Quaternary and Tertiary	None	Low
Basement complex/granitic rocks (pTB, gr)	Jurassic	None	Low

**Basement Complex (pTB, gr)**

The oldest geologic unit within Indian Wells Valley and the Project site is a basement complex composed of undifferentiated plutonic, hypabyssal, and metamorphic rocks that outcrop in the eastern portion of the Project site. These rocks, mapped as “pTb” and “gr,” are considered to be Jurassic in age within the vicinity of the Project site and form the structural basin which is filled with Tertiary and Quaternary age deposits discussed below. Rock units of plutonic origin and most volcanic rocks do not have the potential to contain paleontological resources and are not generally suitable for the preservation of fossils due to their molten origin. Therefore, this geologic unit is determined to have a low paleontological sensitivity rating.

**Quaternary and Tertiary Volcanics- Black Mountain Basalt (QTV, Qpv<sup>b</sup>)**

The Black Mountain Basalt, estimated to be between late Pliocene and Pleistocene in age, consists of extrusive and intrusive olivine basalt flows more than 100 feet in thickness. The basalt flows, mapped as “QTV” and “Qpvb,” were named by Baker in 1912 for their occurrence on Black Mountain, located about seven miles west of the El Paso Mountains. In the vicinity of the Project area, the basalt unconformably overlies Tertiary age continental deposits that comprise the Goler and Ricardo Formations. Most volcanic rocks have a low paleontological resource potential because fossils are only very rarely preserved within these units as they are deposited at extremely high temperatures. Therefore, the Black Mountain Basalt is determined to have a low paleontological sensitivity rating.

**Quaternary alluvium (Qa, Qal)**

The majority of the Project site is underlain by Quaternary alluvium and alluvial fan deposits of Holocene (10,000 years BP to Recent) age consisting variously of unconsolidated moderately to well-sorted gravel, sand, silt, and clay. These sediments, mapped as “Qa” and “Qal,” are derived as fan deposits from the surrounding higher elevations and in part may include fluvial deposits within local drainages. Although Holocene-aged sediments often contain the remains of modern organisms, they are too young to contain significant paleontological resources. However, paleontologically sensitive Quaternary older alluvium and/or Quaternary lake beds may be present at an unknown depth. Pleistocene-aged alluvium and lake bed deposits have proven to yield scientifically significant vertebrate fossils both within the region and throughout southern California. Therefore, Quaternary alluvium within the Project area is assigned a paleontological sensitivity ranging from low to high, increasing with age (i.e. depth).

**Sensitive Geologic Units**

The majority of the Project plant site is immediately underlain by Quaternary younger alluvium of Holocene age that is considered to have a low paleontological sensitivity. Quaternary older alluvium, which dates to the Pleistocene, is present in the subsurface throughout the Project area at an unknown but potentially shallow depth. A small outcropping of Black Mountain Basalt is located in the eastern portion of the Project plant site and a small outcrop of basement complex rocks is located in the western

portion of the plant site. Neither of these geologic units are determined to have a paleontological resource potential and are considered to have a low sensitivity. The locations of paleontologically sensitive geologic units underlying the Project plant site and linear facilities are identified on Figure 5.9-1.

### **Paleontological Resources Assessment**

A review of museum collections records at the Natural History Museum of Los Angeles County and San Bernardino County Museum confirmed that no fossil localities have been previously recorded within the Project boundaries or within a one-mile radius in any direction. However, both repositories report several previously recorded vertebrate fossil localities north of the Project area in the vicinity of China Lake. These fossil localities yielded significant Late Pleistocene faunal remains of mammoth, bison, camel, deer, horse, and duck. These specimens were recovered from Quaternary lake deposits found to be present beneath Quaternary younger alluvium. Older lake deposits may or may not be present at depth within the Project site and it should be noted that the China Lake localities were discovered at a much lower elevation. Additional details of the museum records search results are reported in the technical report provided in Appendix H.

A pedestrian reconnaissance survey of the proposed areas of disturbance within the Project site was performed to determine the surface presence of previously unknown significant vertebrate fossils and/or noteworthy occurrences of invertebrate, plant, or trace fossils. The linear surveys, including a 100-foot buffer, were accomplished via pedestrian transects. The plant site survey was accomplished using pedestrian transects and included a 200-foot buffer surrounding the perimeter of the plant site boundaries. All areas with exposed bedrock and/or intact sediments were intensively examined throughout the Project area.

The majority of the survey area was relatively flat and sparsely vegetated resulting in good ground visibility. Although the majority of the Project area is covered by younger Holocene-age alluvium, washes and road cuts provided surveyors the opportunity to inspect older alluvial and bedrock material for potential paleontological resources. No fossil specimens were discovered during the course of the field survey. Additional details and photographs taken during the field survey are reported in the technical report provided in Appendix H.

## **5.9.3 Environmental Impacts**

The following subsections address potential Project impacts during construction and operation. As discussed in Section 5.9.2.2 above, the SVP's "Standard Guidelines for the Assessment and Mitigation of Adverse Impacts to Nonrenewable Paleontologic Resources" define three categories of paleontological sensitivity (potential) for rock units: high, low, and undetermined. Potential Project impacts are assessed in terms of whether Project excavation activities would occur in areas whose underlying geology leads to a classification high, low, or undetermined sensitivity.

### **5.9.3.1 Construction**

Construction of the Project has the potential to result in the destruction of surface or sub-surface paleontological resources via breakage and crushing related to ground disturbing activities during grading for the proposed solar field, power block, and access road. Almost the entire proposed disturbance area occurs within geologic sediments determined to have a paleontological sensitivity ranging from "low to high" (Figure 5.9-1). Ground disturbance and terrain modification has the potential to adversely impact an unknown quantity of fossils that may occur on or underneath the surface in areas containing paleontologically sensitive geologic units. While no paleontological resources were identified within the Project area during the course of the field survey, implementation of mitigation measures described in Section 5.9.4 below (e.g., proper planning, employee training, professional paleontologist monitoring in areas of high paleontological sensitivity) during Project construction will ensure that fossils that may be encountered would not be adversely impacted by rendering them permanently unavailable.

### 5.9.3.2 Operation

Operational impacts to paleontological resources typically include those effects related to the continuing implementation of activities within a specific project area. They may also occur as the result of the construction of new roads in areas that were previously inaccessible, which increases public access and therefore increases the likelihood of the loss of paleontological resources through vandalism and unlawful collecting (poaching). The operation of the Project will not result in an adverse impact to paleontological resources because no new roads will be constructed that provide access to previously inaccessible areas; the proposed new 700-foot long Project site access road from Brown Road will not provide access to any other areas. Additionally, the Project plant site will be fenced, thereby decreasing public access and opportunities for the loss of paleontological resources through vandalism and unlawful collecting.

### 5.9.3.3 Cumulative Impacts

Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. In general, for scientifically significant paleontological resources that are present within the Project area, the potential for the Project to contribute to significant cumulative impacts would be low because measures will be implemented to avoid or salvage those resources. The mitigation measures below would effectively recover the value to science and society of significant fossils that otherwise would be destroyed by surface-disturbing actions. Further, other projects in the vicinity of the Project, including the proposed Wal-Mart and residential development in the City of Ridgecrest, will also be required to comply with LORS that protect paleontological resources. For these reasons, the Project's potential contribution to cumulative impacts would not be cumulatively considerable.

## 5.9.4 Mitigation Measures

Although no significant paleontological resources have been identified on the surface of the Project site that would be adversely impacted, the following mitigation measures have been developed to ensure that the potential adverse impacts to subsurface paleontological resources resulting from the construction of the Project are less than significant. The measures are based on the SVP standard guidelines and meet the requirements of CEQA. 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.

- PAL-1** 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 will ensure that the designated 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 will be responsible for implementing all paleontological mitigation measures that are established by the CEC as Conditions of Certification and for using qualified personnel to assist in this work.
- PAL-2** Prior to the start of construction, a Paleontological Resource Monitoring and Mitigation Plan (PRMMP) drafted by the designated paleontological resource specialist will be submitted to the CPM for approval. The plan will identify general and specific measures to minimize potential impacts to sensitive paleontological resources. The project paleontological resource specialist will implement the PRMMP as needed.

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

- A discussion of the sequence of project-related tasks, such as any preconstruction surveys, fieldwork, flagging or staking; construction monitoring; 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 each of the tasks identified within this condition, a discussion of the mitigation team leadership and organizational structure, and the interrelationship of tasks and responsibilities;
- Where monitoring of project construction activities is deemed necessary, the extent of the areas where monitoring is to occur and a schedule for the monitoring.
- 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 into 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 (expected to be the San Bernardino County Museum) that has agreed to receive any data and fossil materials recovered during project-related monitoring and mitigation work, discussion of any requirements or 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.

**PAL-3** Prior to the start of construction, the Paleontological Resource Specialist will prepare a staff training program for review and approval by the CPM. Prior to and throughout the project and as needed, the paleontological resource specialist will conduct training for the project owner, project managers, construction supervisors, equipment operators and all new employees in accordance with the CPM-approved training plan. Contractor briefings will also be videotaped and used for education for new employees.

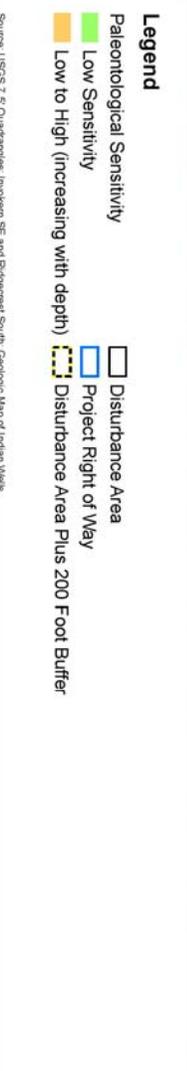
The paleontological training program will address the potential to encounter paleontological resources in the field, the sensitivity and importance of these resources, and the legal obligations to preserve and protect such resources. The training program will also include the set of reporting procedures that workers are to follow if paleontological resources are encountered during project activities. The training program will be presented by the designated paleontological resource specialist and may be combined with other training programs prepared for cultural and biological resources, hazardous materials or any other areas of interests or concerns.

**PAL-4** During construction, the designated paleontological resource specialist or paleontological monitor will monitor construction-related grading, excavation, trenching, and/or augering in areas with a significant potential for fossil-bearing sediments to occur. All ground disturbances in older Quaternary alluvium (estimated to be present at 10 feet in depth or greater) will be monitored on a full-time basis because these Pleistocene age deposits have a high paleontological sensitivity. All ground disturbances in younger alluvium deposits (less than 10 feet in depth) will be spot-checked by paleontological monitors to ensure that underlying sensitive sediments are not encountered. No paleontological monitoring is recommended in any areas mapped as Black Mountain Basalt or Basement complex, as these units have a low sensitivity. Paleontological monitoring will include inspection of exposed rock units and microscopic examination of matrix to determine if fossils are present. 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.

- PAL-5** The project owner, through the designated paleontological resource specialist, will ensure recovery, preparation for analysis, analysis, identification and inventory, preparation for curation, and delivery for curation of all significant paleontological resource materials encountered and collected during the monitoring, data recovery, mapping, and mitigation activities related to the Project.
- PAL-6** The Project owner will ensure preparation of a Paleontological Resources Report by the designated paleontological resource specialist following the analysis of the recovered fossil materials and related information. The Paleontological Resources Report will be submitted to the CPM for approval. The report will include 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.

### 5.9.5 References

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**Legend**

- Disturbance Area
- Project Right of Way
- Disturbance Area Plus 200 Foot Buffer
- Low Sensitivity
- Low to High (Increasing with depth)

Source: USGS 7.5 Quadrangles: Indian SE and Ridgecrest South; Geologic Map of Indian Wells



Ridgecrest Solar Power Project  
 Figure 5.9-1  
 Paleontological Sensitivity Map

  
  
 Date: September 2009