DOCKETED	
Docket Number:	24-OPT-03
Project Title:	Soda Mountain Solar
TN #:	259709
Document Title:	Section 3-22 Paleontological Resources
Description:	Section 3-22 was created to address CEC data requests PALEO-1 through PALEO-4. This section evaluates the potential for impacts to known and unknown paleontological resources.
Filer:	Hannah Arkin
Organization:	Resolution Environmental
Submitter Role:	Applicant Consultant
Submission Date:	10/25/2024 3:36:43 PM
Docketed Date:	10/25/2024

# 3.22 PALEONTOLOGICAL RESOURCES

This section evaluates the potential for impacts to known and unknown paleontological resources that may result directly or indirectly from the proposed project. The analysis in this section describes the applicable regulations, presents an overview of existing conditions, and lists applicant-proposed measures (APMs) that would be incorporated into the project to avoid or substantially lessen potentially significant impacts to the extent feasible. The study area relevant to paleontological resources encompasses the broader Mojave Desert region, as information on the geology and paleontology in the region informs on the paleontological potential within the project site. The analysis is based on a review of existing resources, technical data, and applicable laws, regulations, plans, and policies, as well as the following technical reports prepared for the project:

• *Paleontological Resources Technical Report* prepared by SWCA Environmental Consultants (SWCA) (2024) (Appendix H)

## 3.22.1 Regulatory Setting

### 3.22.1.1 Federal

### **ANTIQUITIES ACT OF 1906**

The Antiquities Act of 1906 states, in part, that any person who shall appropriate, excavate, injure or destroy any historic or prehistoric ruin or monument, or any object of antiquity, situated on lands owned or controlled by the Government of the United States, without the permission of the Secretary of the Department of the Government having jurisdiction over the lands on which said antiquities are situated, shall upon conviction, be fined in a sum of not more than five hundred dollars or be imprisoned for a period of not more than ninety days, or shall suffer both fine and imprisonment, in the discretion of the court.

### FEDERAL LAND POLICY AND MANAGEMENT ACT OF 1976 (AS AMENDED)

The Federal Land Policy and Management Act of 1976, as amended (FLPMA), establishes policy and goals to be followed in the administration of public lands by the Bureau of Land Management (BLM). The intent of FLPMA is to protect and administer public lands within the framework of a program of multiple use, sustained yield, and the maintenance of environmental quality. Particular emphasis is placed on the protection of the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resources, and archaeological values. Paleontological fossils are understood and recognized in policy as scientific resources.

### PALEONTOLOGICAL RESOURCES PRESERVATION ACT OF 2009

The Paleontological Resources Preservation Act (PRPA) was signed into law as part of the Omnibus Public Lands Management Act (OPLMA) of 2009. The PRPA defines paleontological resources, reaffirms that paleontological resources collected from federal lands are federal property, and states that the Secretaries of the Interior and Agriculture shall use scientific principles and expertise to manage and protect paleontological resources on federal land. It provides for the formulation of a consistent paleontological resources management framework, including defining the value of fossil resources and providing management guidelines for federal lands. The PRPA provides certain mandates for administering paleontological resource research and collecting permits and the curation of fossil specimens.

### CODE OF FEDERAL REGULATIONS, TITLE 43 PART 49

Title 43 Code of Federal Regulations (CFR) Part 49 implements provisions of the PRPA on lands under the jurisdiction of the Department of the Interior, including the Bureau of Land Management (BLM). This regulation provides for the management, preservation, and protection of paleontological resources on lands administered by the BLM, the Bureau of Reclamation, the National Park Service, and the U.S. Fish and Wildlife Service, and ensures that these federally owned resources are available for present and future generations to enjoy as part of America's national heritage. The regulation addresses the management, collection, and curation of paleontological resources from federal lands using scientific principles and expertise, including collection in accordance with permits, curation in an approved repository, and maintenance of confidentiality of specific locality data. The regulation details the processes related to the civil and criminal penalties for illegal collecting, damaging, otherwise altering or defacing, or selling paleontological resources.

### CODE OF FEDERAL REGULATIONS, TITLE 43 SECTION 8365.1-5

Under Title 43 CFR 8365.1-5, the willful defacement, disturbance, removal, or destruction of scientific resources (herein considered to include paleontological resources) on federal land is prohibited. The collection of common invertebrate or plant fossils for non-commercial purposes is permissible as provided under 43 CFR Part 49.

### DESERT RENEWABLE ENERGY CONSERVATION PLAN

In September 2016, the BLM adopted the Desert Renewable Energy Conservation Plan (DRECP) Land Use Plan Amendment (LUPA) to the California Desert Conservation Area (CDCA) Plan, Bishop Resource Management Plan, and Bakersfield Resource Management Plan. The DRECP LUPA addresses solar, wind, and geothermal energy generation and transmission projects on 10.8 million acres of BLM-administered lands in the desert regions of southern California (BLM 2016a).

The BLM DRECP LUPA establishes several land use classifications, including Development Focus Areas (DFAs), Variance Process Lands (VPLs), Recreation Management Areas, General Public Lands, and various conservation land use designations. In DFAs, renewable energy projects are incentivized and permitting is streamlined. Renewable energy projects may be implemented on VPLs, but they must first be evaluated under a variance process and then approved by the BLM to proceed through National Environmental Policy Act (NEPA) environmental review. BLM Conservation Areas include National Landscape Conservation System lands, Areas of Critical Environmental Concern (ACECs), and Wildlife Allocations. Recreation Management Areas are designated for recreation actions. This designation includes Extensive Recreation Management Areas, which entail management specifically to address recreation use and demand; and Special Recreation Management Areas, which are high-priority areas for recreation and have unique value and importance for recreation. General Public Lands are BLM-administered lands that do not have a specific land allocation or designation associated with energy development, conservation, or recreation. These lands are not needed to fulfill the DRECP biological conservation or renewable energy strategy. These areas are available to renewable energy applications but do not benefit from permit review streamlining or other incentives.

Most of the project site is on DRECP General Public Lands, and the generation-tie line (gen-tie line) route is within an ACEC. The project Record of Decision (ROD) was issued before the DRECP was adopted, and mitigation requirements for the project as described in the ROD are written as project-specific mitigation measures (MMs) rather than CMAs.

## 3.22.1.2 State

### CALIFORNIA ENVIRONMENTAL QUALITY ACT

The California Environmental Quality Act (CEQA) is the principal statute governing environmental review of projects occurring in the state and is codified at California Public Resources Code (PRC) 21000 et seq. CEQA requires lead agencies to determine whether a proposed project would have a significant effect on the environment, including significant effects on paleontological resources. Guidelines for the Implementation of CEQA define procedures, types of activities, persons, and public agencies required to comply with CEQA. Section VII(f) of the Environmental Checklist (State CEQA Guidelines: Appendix G) asks whether a project would directly or indirectly destroy a unique paleontological resource and result in impacts to the environment.

### CALIFORNIA PUBLIC RESOURCES CODE 5097.5

Requirements for paleontological resource management are included in California Public Resources Code (PRC) Division 5, Chapter 1.7, Section 5097.5, which states

no person shall knowingly and willfully excavate upon, or remove, destroy, injure or deface any historic or prehistoric ruins, burial grounds, archaeological or vertebrate paleontological site, including fossilized footprints, inscriptions made by human agency, or any other archaeological, paleontological or historical feature, situated on public lands, except with the express permission of the public agency having jurisdiction over such lands. Violation of this section is a misdemeanor.

These statutes prohibit the removal, without permission, of any paleontological site or feature from land under the jurisdiction of the state or any city, county, district, authority, or public corporation, or any agency thereof. Consequently, local agencies are required to comply with PRC 5097.5 for their own activities, including construction and maintenance, as well as for permit actions (e.g., encroachment permits) undertaken by others. PRC 5097.5 also establishes the removal of paleontological resources as a misdemeanor and requires reasonable mitigation of adverse impacts to paleontological resources from developments on public (state, county, city, and district) land.

## 3.22.1.3 Local

The project is located on federally owned land managed by the BLM. While it is not subject to County of San Bernardino land use plans and ordinances, local plans were reviewed for informational purposes.

### SAN BERNARDINO COUNTYWIDE PLAN

The San Bernardino Countywide Plan (San Bernardino County 2024), adopted by the Board of Supervisors in 2020, updates and expands the County's General Plan by addressing the physical, social, and economic issues facing the unincorporated portions of the county. The Countywide Plan consists of the Policy Plan, the Business Plan, and a communities plan. The Policy Plan, based on the former General Plan, consists of 11 elements: Land Use, Housing, Infrastructure and Utilities, Transportation and Mobility, Natural Resources, Renewable Energy and Conservation, Cultural Resources, Hazards, Personal and Property Protection, Economic Development, and Health and Wellness. The Business Plan consists of a policy-based governance element along with an implementation plan. The communities plan consists of 35 Community Action Guides that provide a framework for communities to create future character and independent identity through community actions.

The following policies identified in the Cultural Resources element of the San Bernardino Countywide Plan are relevant to this analysis (San Bernardino County 2024).

**Goal CR-2 Historic and Paleontological Resources.** Historic resources (buildings, structures, or archaeological resources) and paleontological resources that are protected and preserved for their cultural importance to local communities as well as their research and educational potential.

• **Policy CR-2.3 Paleontological and archaeological resources**. We strive to protect paleontological and archaeological resources from loss or destruction by requiring that new development include appropriate mitigation to preserve the quality and integrity of these resources. We require new development to avoid paleontological and archeological resources whenever possible. If avoidance is not possible, we require the salvage and preservation of paleontological and archeological resources.

## 3.22.2 Environmental Setting

## 3.22.2.1 Regional Setting

The project site is in the southeastern portion of the Mojave Desert geomorphic province (California Geological Survey 2002). Mojave Desert geomorphology and topography are largely controlled by fault trends and are characterized by isolated mountain ranges separated by desert plains, many draining internally and having central playas (e.g., Soda Lake). To the north and west, the boundaries of the geomorphic province are marked by major mountain ranges (e.g., the Sierra Nevada and Transverse ranges) and regional faults (e.g., the Garlock Fault and the San Andreas Fault). To the east, the geomorphic province is bounded by the Nevada and Arizona borders.

Mountains surrounding the project site are primarily composed of granitic and volcanic rocks that formed less than 65 million years ago. The surrounding mountains also include nonmarine sedimentary rocks of a similar age, older volcanic rocks (approximately 145–200 million years old), and marine sedimentary rocks that formed over 300 million years ago (Jennings et al. 1962) (Figure 3.7-1). Paleozoic strata found in the Mojave Desert are typically representative of continental margin depositional environments (Walker et al. 2002). Mesozoic rocks include marine and nonmarine sedimentary rocks, volcanics, and plutonic igneous bodies that were emplaced during the Nevadan orogeny. Cenozoic strata in the Mojave Desert are widespread and typically include both volcanic and sedimentary rock types.

Alluvial fans vary from recent (decades to millennia) to very old (tens of thousands of years), with the older deposits forming the more elevated surfaces (BLM and San Bernardino County 2015). Recent (i.e., Holocene) stream deposits originating in the Soda Mountains form wedges of alluvial sand, gravel, cobbles, and boulders as the alluvium exits mountain canyons to the valley floor. The percentage of sand and smaller-diameter gravel generally increases with distance from the mountains, as cobbles and boulders generally drop out of the water column first as the force of water flow declines in more level valley terrain. Bedrock formations in the surrounding mountains are predominantly granitic and volcanic, although older and younger sedimentary formations are present at greater distance from the project site and to the north. These bedrock formations are generally very hard and moderately to very fractured, and they form the source materials that have been transported to build the alluvial fan deposits that fill the valley (BLM and San Bernardino County 2015).



Figure 3.7-1. Geologic map of project site and vicinity.

## 3.22.2.2 Local Setting

### TOPOGRAPHY

The project site lies within a small, intermontane desert valley occupied by alluvial fan deposits and surrounded by the Soda Mountains. The main mass of the Soda Mountains lies to the west of the project site and reaches an elevation of approximately 3,625 feet above mean sea level (amsl). Lower mountains to the south and east of the project site form a discontinuous border reaching elevations of 1,850 and 2,350 feet amsl, respectively (BLM and San Bernardino County 2015). The mountains farther to the north are within these same general elevational ranges. Elevations in the project site range from approximately 1,600 feet amsl in the southwest to 1,550 feet amsl on the north and 1,250 feet amsl on the southeast.

Terrain within the project site consists of predominantly south- to east-sloping (at 2% to 4%) alluvial deposits emanating from the Soda Mountains to the west, with minor north- and west-sloping terrain at the edges of the smaller mountains on the east. Channels and washes are deeper, and clast sizes increase up to small boulders closer to the base of the surrounding mountains. The southwestern portion of the project site, east of Interstate 15 (I-15), has an elevation of roughly 1,520 feet amsl. Surface morphology within the project site varies from older, smoothly undulating and relatively flat alluvial fan surfaces to young and active drainages incised into the alluvial fan surfaces (BLM and San Bernardino County 2015). Small shrubs and desert grasses cover approximately 35% of the site, and there is very little evidence of prior disturbance or any built environment; prior ground disturbance consists of slightly graded dirt roads and modern alluvial channels.

### GEOLOGY

The geology of the Mojave Desert is complex, and rocks found in the Mojave Desert represent nearly all divisions of geologic time, from Precambrian basement rocks to modern alluvium. Geologic units within the project site consist primarily of alluvium (sedimentary deposits derived from weathering, erosion, and transport) on the flanks of the Soda Mountains and in the central valley and washes (see Figure 3.7-1). Small areas of bedrock are present in the southern and southwestern extremes of the site.

According to geologic mapping by Bedrossian et al. (2012), the surface of the project site contains late Holocene alluvial fan deposits (Qf), Holocene to late Pleistocene young alluvial fan deposits (Qyf), Holocene to late Pleistocene young eolian and dune deposits (Qye), and late to middle Pleistocene (11,700–774,000 years ago) old alluvial fan deposits (Qof) (Table 3.7-1; see Figure 3.7-1). In general, geologic units mapped at the surface near the project site (e.g., within a 0.5-mile buffer) can be a good indicator of the geologic units that may be present in the subsurface, provided that structural deformation has not altered or displaced the vertical or lateral continuity of the units and that the geologic units mare in their original geochronological order (relatively young deposits overlying relatively old deposits based on the principles of stratigraphy). Neogene (Tertiary) formations of volcanic origin (Tv), and Mesozoic and older granitic and other intrusive crystalline rocks of all ages (gr) are also mapped along the uplifted hills east and west of the project site (Bedrossian et al. 2012) and may be present at substantial depth within the project site.

# Table 3.7-1. Surface Geology and Paleontological Resource Potential of Geologic Units within Approximately 0.5 Mile of the Project Site

Geologic Unit and Map Abbreviation	Typical Fossils	Age	Provisional PFYC Ranking
Alluvial Fan Deposits (Qf)	None	Late Holocene	Class 2 – Low
Young Alluvial Fan Deposits (Qyf)	Vertebrates, invertebrates, plants, trace fossils	Holocene to late Pleistocene	Class 2 – Low overlying Class 3 – Moderate
Young Eolian and Dune Deposits (Qye)	None	Holocene to late Pleistocene	Class 1 – Very Low
Old Alluvial Fan Deposits (Qof)	Vertebrates, invertebrates, plants, trace fossils	Late to middle Pleistocene	Class 2 – Low overlying Class 3 – Moderate
Tertiary Age Formations of Volcanic Origin (Tv)	None	Tertiary	Class 1 – Very Low
Granitic and Other Intrusive Crystalline Rocks of All Ages (gr)	None	Mesozoic to Precambrian	Class 1 – Very Low

Sources: Bedrossian et al. (2012); SWCA (2024) (Appendix H).

PFYC = Potential Fossil Yield Classification system

# BUREAU OF LAND MANAGEMENT POTENTIAL FOSSIL YIELD CLASSIFICATION SYSTEM

Paleontological resources are fossilized remains, traces, or imprints of organisms, preserved in or on the Earth's crust, that provide information about the history of life on Earth. Examples of paleontological resources may include bones, teeth, shells, traces, impressions, leaves, and wood. They are considered nonrenewable resources because the organisms they represent no longer exist, and such resources, if destroyed, cannot be replaced. Paleontological resources are important scientific and educational resources that paleontologists and other scientists use in many different studies, such as to understand evolution, extinction, and speciation patterns; to reconstruct ancient environments and paleobiogeographic relationships; and to provide relative geological dates through biochronology and biostratigraphy. Paleontological resources that lack provenance or context, that lack physical integrity because of decay or natural erosion, or that are overly redundant or are otherwise not useful for research (Murphey et al. 2019).

In general, the BLM's management objectives include locating, evaluating, managing, and protecting paleontological resources (BLM 1998). To aid in these objectives, the BLM developed the Potential Fossil Yield Classification (PFYC) system to provide baseline guidance for the agency and specialists to determine the presence of and potential for paleontological resources across its jurisdiction and guide the appropriate corresponding management considerations (BLM 2022a). Using this system, the BLM has assigned a PFYC ranking (PFYC 1 to PFYC 5) to each geologic unit (formation, member, or other distinguishable units) at the most detailed, mappable level available based on the taxonomic diversity and abundance of previously recorded scientifically significant paleontological resources associated with the unit and the potential for future discoveries, with a higher-class number indicating higher potential. Additional rankings are provided for geologic units of unknown potential (PFYC U), water (PFYC W), and ice (PFYC I). Paleontological resource management concerns and mitigation efforts are related to that potential and PFYC classification. A complete discussion of the background and context for the PFYC system is provided in BLM Instructional Memorandum (IM) 2016-124 (BLM 2016b), which was updated in BLM Permanent IM No. 2022-009 (BLM 2022a). Descriptions of paleontological sensitivity class rankings, drawn directly from the BLM guidelines (BLM 2022a), are provided in Table 3.7-2. Figure 3.7-2 shows the PFYC rankings for the project site and vicinity.

PFYC	Description	Management Concerns
Class 1 – Very Low	Geological units that are not likely to contain recognizable paleontological resources, such as igneous, metamorphic, or Precambrian-age rocks.	Negligible or not applicable
Class 2 – Low	Sedimentary geological units that are not likely to contain paleontological resources, such as those younger than 10,000 years, recent eolian deposits, and those that have undergone physical or chemical changes.	Generally low
Class 3 – Moderate	Sedimentary units with variable fossil content and significance.	Moderate
Class 4 – High	Geological units with high occurrence of paleontological resources but with variable occurrence and predictability. Contained paleontological resources may be at risk from human disturbance.	Moderate to high
Class 5 – Very High	Geological units that consistently and predictably produce paleontological resources of significant scientific value that may be at risk from human disturbance.	High to very high
Class U – Unknown	Geologic units that cannot receive an informed PFYC assignment due to the unit being poorly studied.	Moderate to high until a provisional ranking is assigned
Class W – Water	Most surface water bodies do not contain paleontological resources, but shorelines should be considered for uncovered paleontological resources. Reservoirs, karst area sinkholes, cenotes, and dredged river systems may contain paleontological resources.	Low
Class I – Ice	Includes any area that is mapped as ice or snow. Receding glaciers, including exposed lateral and terminal moraines, should be considered for their potential to reveal recently exposed paleontological resources. Other considerations include melting snow fields that may contain paleontological resources with possible soft-tissue preservation.	Low to moderate

### Table 3.7-2. Potential Fossil Yield Classification Rankings and Management Concerns

Source: BLM (2022b).



Figure 3.7-2. Potential Fossil Yield Classification map of project site and vicinity.

### **EXISTING DATA ANALYSIS**

The *Paleontological Resources Technical Report* (SWCA 2024; see Appendix H) presents an analysis of available existing data pertinent to paleontological resources. This analysis includes a review of geologic maps, geotechnical information, scientific literature, results of museum records searches, and a pedestrian reconnaissance survey. The geologic mapping used in this analysis is from Bedrossian and others (2012) compiled from several quadrangles at scales of 1:100,000, and geotechnical investigation data are from Diaz Yourman & Associates (2010). Museum records search requests for fossil localities within a 1-mile buffer of the project site or within the vicinity of the project site were submitted to the Natural History Museum of Los Angeles (NHMLA) and the San Bernardino County Museum (SBCM) on April 26, 2023. The results of the museum records searches indicate that neither the NHMLA nor the SBCM possess records of paleontological resources from within the project site; however, several fossil localities have been recorded in the vicinity of the project site from Pleistocene alluvial, fluvial, and lacustrine deposits. The desktop review was supplemented by a review of the BLM's PFYC data (BLM 2016b, 2022). The desktop information and PFYC were used to determine areas subject to a pedestrian reconnaissance survey and to assign provisional PFYC rankings to geologic units within the project site.

### PEDESTRIAN FIELD SURVEY AND RESULTS

During the 2010 paleontological surveys conducted for the *Proposed Plan Amendment/ Final Environmental Impact Statement/Environmental Impact Report for the Soda Mountain Solar Project*, four fossil localities were documented immediately outside of the project site and included nonsignificant burrow and root casts, as well as unidentifiable fossil bone fragments, indicating that fossil material may be present in the general vicinity (BLM and San Bernardino County 2015). Additionally, although geologic units classified by the BLM as low potential (PFYC Class 2) are mapped at the surface throughout most of the project site, geologic units of unknown potential (PFYC Class U) are mapped by the BLM along the project site's periphery and may extend into the project site as unmapped deposits or may be present in the subsurface (BLM 2022b). Therefore, to supplement the results of the existing data analysis and to conform to the BLM's guidelines (2008a, 2022a), a pedestrian reconnaissance survey of the project site was conducted on July 5 and 6, 2023.

The purpose of the reconnaissance survey was to 1) note the sediments in the project; 2) assess the status of previously recorded paleontological localities noted in the results of the museum records searches, if any; 3) inspect exposures of previously undisturbed sediments or bedrock outcrops within the project site, if any, to assess their potential to preserve paleontological resources and to evaluate the appropriateness of the BLM's (2022b) PFYC mapping; and 4) record newly identified or previously unrecorded paleontological localities that may be present within the project site, if any. The reconnaissance survey included both pedestrian reconnaissance surveying of most areas identified as unknown potential (PFYC Class U) by the BLM (2022b), and a combined pedestrian and visual reconnaissance survey for areas noted as low potential (PFYC Class 2) by the BLM (2022b). Areas subject to pedestrian reconnaissance survey washes. Areas not subject to pedestrian reconnaissance survey were instead subject to a visual reconnaissance that included windshield drive-by survey to confirm geologic mapping, overview site reconnaissance from elevated vantage points looking across the project site.

No previously recorded fossil localities are present within the project site, although fossils are known to occur within stratigraphically correlative units elsewhere in the Mojave Desert. During the field survey, no fossils were documented within the project site, but four fossil localities were documented outside the boundaries of the project (BLM and San Bernardino County 2015). These fossils included unidentifiable bone fragments and poorly preserved burrow and root casts, none of which meet the BLM's significance criteria (BLM and San Bernardino County 2015).

## 3.22.3 Impact Analysis

### 3.22.3.1 Thresholds of Significance

The determinations of significance of project impacts are based on applicable policies, regulations, goals, and guidelines defined by the California Environmental Quality Act. Specifically, the project would be considered to have a significant effect on paleontological resources if the effects exceed the significance criteria described below:

1. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.

This threshold is discussed under Section 3.7.3.3, Impact Assessment, below.

### 3.22.3.2 Applicant-Proposed Measures

The applicant has identified and committed to implement the following applicant-proposed measures (APMs) as part of the proposed project to avoid or substantially lessen potentially significant impacts to geology and soils, to the extent feasible. The APMs, where applicable, are discussed in Section 3.7.3.3, Impact Assessment, below.

**APM GEO-7:** A Project Paleontologist listed as a Principal Investigator on a current California BLM Permit for Paleontological Investigations who meets or exceeds the standards of the BLM will be retained to oversee the execution of all paleontological mitigation measures. The Project Paleontologist shall obtain a curatorial arrangement with a qualified repository prior to construction in the event of significant paleontological resource discoveries during construction.

**APM GEO-8:** The Project Paleontologist shall develop Worker Environmental Awareness Program training to educate the project personnel on the legal requirements for preserving fossil resources, the recognition of the types of paleontological resources that could be encountered within the requested right-of-way boundary, and the procedures to be followed in the event of a fossil discovery. This training program shall be given by the Project Paleontologist or their designee to the crew before ground-disturbing work commences and shall include handouts to be given to new workers as needed.

**APM GEO-9:** The Project Paleontologist will develop a comprehensive paleontological resource monitoring and mitigation plan (PRMMP) that incorporates the latest project description, engineering plans, and project site. The PRMMP will consider the results of previous paleontological resources assessments, including but not limited to the results of the geologic map review, geotechnical investigation, scientific literature review, museum records searches, reconnaissance surveys, and the accepted provisional paleontological sensitivity classification. The PRMMP will specify locations and depth thresholds that require paleontological monitoring during ground-disturbing activities. The PRMMP will discuss paleontological monitoring of ground-disturbing activities in previously undisturbed sediments identified as having moderate or higher sensitivity, whether present at the surface or anticipated to be present at depth in the subsurface. Geologic units of low and very low paleontological sensitivity, as well as all previously disturbed sediments, regardless of depth, should not be subject to paleontological monitoring unless anticipated to be underlain by previously undisturbed geologic units of relatively higher paleontological sensitivity that could be impacted by earthwork activities at depth. Appropriate mitigation methods may include full-time paleontological monitoring, screening of sediment samples for small fossils, or additional field surveys in the event of changes to the project site boundaries.

Monitoring will be conducted by a BLM-approved paleontological monitor working under the supervision of a BLM-permitted Field Agent or BLM-permitted Principal Investigator (i.e., the Project Paleontologist) in the field, with the overall implementation of the PRMMP overseen by a BLM-

permitted Principal Investigator. If field observations of surface or subsurface geologic conditions during construction activities would indicate a differing paleontological sensitivity ranking than that previously assigned, the Project Paleontologist may consult with the BLM, other relevant overseeing agencies, and Soda Mountain Solar, LLC, to recommend adjustments to the level of monitoring in response to subsurface conditions. Full-time (or on-site) monitoring can be reduced to part-time inspections (or spot checks) or ceased entirely if this is determined adequate by the Project Paleontologist and approved by all parties. This change can be done verbally and then documented via email or another written format to the BLM, other relevant overseeing agencies, and Soda Mountain Solar, LLC. The paleontological monitor will have authority to temporarily divert activity away from exposed fossils to evaluate the significance of the find and, should the Project Paleontologist or Field Agent determine that the fossils are potentially significant, professionally and efficiently recover the fossil specimens for laboratory evaluation, and collect associated data following the procedures and guidelines of the BLM (2008a) and in accordance with the requirements stipulated in the California BLM Permit for Paleontological Investigations and Fieldwork Authorization permit(s). Nonsignificant fossils will be documented and recorded in the field but not collected. Any potentially significant fossil that is collected for further evaluation will be returned to the discovery site or retained for educational purposes if after laboratory analysis it is determined to be a nonsignificant resource. The disposal of the fossil will depend on the requirements of the agency administering the land on which the fossil was discovered. Paleontological monitors will record pertinent geologic and geographic data from any fossil localities.

**APM GEO-10:** In the event of a fossil discovery, whether by the permitted and approved paleontological field staff or a member of the construction crew, all work will cease in a 50-foot radius of the find while the Project Paleontologist or Field Agent assesses the significance of the fossil and documents its discovery. Should the Project Paleontologist or Field Agent determine that the fossil locality is potentially significant, it will be salvaged following the procedures and guidelines of the BLM (BLM 2008a) and in accordance with the requirements stipulated in the California BLM Permit for Paleontological Investigations and Fieldwork Authorization permit(s). Nonsignificant fossils will be documented and recorded in the field but not collected. Potentially significant fossils that were collected in the field that were determined to be nonsignificant after laboratory analysis will be returned to the site or retained for educational purposes (depending on the requirements of the overseeing agency administering the land on which the fossil was discovered). Significant fossils will be prepared to the point of morphological identification and/or taxonomic identification to facilitate the requirements of the curation in an accredited repository pre-approved by the BLM and/or another overseeing agency.

**APM GEO-11:** Upon conclusion of ground-disturbing activities, the Project Paleontologist will prepare a final report detailing the methods and results of implementing the PRMMP, including full documentation of scientifically significant fossils found, significance assessment of those fossils, repository details for significant fossils, and any recommendations for future work within the project site. If paleontological resources are curated, the final monitoring report and any associated data pertinent to the curated specimen(s) should be submitted to the designated repository. A copy of the final monitoring report should be filed with the BLM and/or another overseeing agency.

## 3.22.3.3 Impact Assessment

# Impact PAL-1: Would the project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature? (Less than Significant)

The project would have direct impacts on paleontological resources if it resulted in breakage or crushing of or disturbance to fossils that have eroded onto the surface or are buried in subsurface rocks and sediments. Indirect effects could result from increased access to paleontological resources by construction personnel and recreational users of public lands as the result of project-related construction, leading to vandalism and unauthorized collection (theft) of resources.

The project site is underlain by geologic units with low to moderate potential to contain paleontological resources (PFYC 1 to 3). Ground disturbances in geologic units that have very low to low paleontological sensitivity (PFYC 1 and 2) are unlikely to result in impacts to scientifically significant paleontological resources. These geologic units include late Holocene alluvial fan deposits (Qf) (PFYC 2), Holocene to late Pleistocene young eolian and dune deposits (Qye) (PFYC 1), Tertiary (Neogene) age formations of volcanic origin (Tv) (PFYC 1), and Mesozoic and older granitic and other intrusive crystalline rocks of all ages (gr) (PFYC 1).

Ground-disturbing activities in Holocene to late Pleistocene young alluvial fan deposits (Qyf) and late to middle Pleistocene old alluvial fan deposits (Qof), both of which have low to moderate paleontological potential, increasing with depth (PFYC 2 to PFYC 3, increasing with depth) may impact potentially significant paleontological resources at depth. Based on field observations and the depths at which fossils have been recovered in similar sediments elsewhere in the Mojave Desert, these older, moderate potential (PFYC 3) sediments may be present at depths as shallow as 4.5 feet bgs. Therefore, ground-disturbing activities that impact previously undisturbed sediments greater than 4.5 feet bgs in areas mapped as Qyf or Qof may result in impacts to scientifically significant paleontological resources.

APM GEO-7 through APM GEO-11 require retention of a BLM-permitted Principal Investigator (Project Paleontologist) to develop and implement a PRMMP; paleontological resource worker awareness training; adherence with unanticipated discovery protocols; paleontological monitoring in sensitive sediments; the collection, preparation, documentation, and curation of scientifically significant paleontological resources; and preparation of a final monitoring report. With the implementation of these APMs, impacts on paleontological resources would be **less than significant**.

## 3.22.4 Mitigation Measures

No mitigation measures are required.

## 3.22.5 Cumulative Impacts

#### Impact C-PAL-1: Would the impacts of the proposed project, in combination with other past, present, and reasonably foreseeable future projects, contribute to a cumulative impact related to paleontological resources? (Less than Significant)

Cumulative effects on paleontological resources involve the loss of non-renewable scientifically important fossils and associated data and the incremental loss to science and society of these resources over time. Energy development projects, as well as commercial and residential development projects, have resulted in cumulative conditions affecting paleontological resources elsewhere in the Mojave Desert. However, the implementation of paleontological APMs during surface-disturbing actions has resulted in the salvage and permanent preservation of large numbers of scientifically significant paleontological resources that would otherwise have been destroyed. This has greatly reduced the cumulative effects of such projects on paleontological resources and has resulted in the beneficial cumulative effect of making these fossils available for scientific research and education by placing them in museum collections. Therefore, the project's cumulative contribution to paleontological resource impacts would be considered **less than significant**.

## 3.22.6 Laws, Ordinances, Regulations, and Standards

Federal, state, and local Laws, Ordinances, Regulations, and Standards (LORS) applicable to paleontological resources are discussed and summarized in Table 3.7-3.

LORS	Regulatory Agency	Applicability	Compliance
Paleontological Resources Preservation Act of 2009	Department of the Interior/Bureau of Land Management	Requires the Secretary of the Interior to manage and protect paleontological resources on federal land using scientific principles and expertise and requires the BLM to develop appropriate plans for inventorying and monitoring, and the scientific and educational use of, paleontological resources, in accordance with applicable agency laws, regulations, and policies. Where possible, these plans should emphasize interagency coordination and collaborative efforts with nonfederal partners, the scientific community, and the general public.	The project will adhere to the policies of the Paleontological Resources Preservation Act of 2009 through implementation of APMs [Section 3.22.3].
Federal Land Policy and Management Act of 1976	Department of the Interior/Bureau of Land Management	Requires the Secretary of the Interior to retain and maintain public lands in a manner that protects the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric water resource, archeological and other values. FLPMA also requires the BLM to develop regulations and plans for the protection of public land areas of critical environmental concern, "which include important historic, cultural or scenic values," and to protect life and safety from natural hazards.	The project will adhere to the protection of scientific resources through implementation of APMs [Section 3.22.3].
Antiquities Act of 1906	Department of the Interior/Bureau of Land Management	Requires federal agencies that manage public lands to preserve the scientific, commemorative, and cultural values of such sites.	The project will adhere to the Antiquities Act and its policies through implementation of APMs [Section 3.22.3].
Title 43 CFR 49	Department of the Interior/Bureau of Land Management	Provides for the management, preservation, and protection of paleontological resources on lands administered by the BLM and other agencies under the Department of the Interior. The regulation addresses the collection in accordance with permits, curation in an approved repository, maintenance of confidentiality of specific locality data, and the civil and criminal penalties for illegal collecting, damaging, otherwise altering or defacing, or selling paleontological resources.	The project will adhere to the Paleontological Resources Preservation and its policies through implementation of APMs [Section 3.22.3].
Title 43 CFR 8365.1-5	Department of the Interior/Bureau of Land Management	Prohibits the destruction, damage, or removal of scientific resources on federal land.	The project will adhere to the public lands policies through implementation of APMs [Section 3.22.3].
California Environmental Quality Act	California Energy Commission	Requires state and local government agencies to inform decision makers and the public about the potential environmental impacts of the project and to reduce environmental impacts to the extent feasible.	The approval of the project would comply with CEQA, as required by the California Energy Commission's Opt- In Application process.

#### Table 3.7-3. Laws, Ordinances, Regulations, and Standards

## 3.22.7 Agencies Contacted and Permits

A list of agencies that were contacted during preparation of this application is provided in Appendix V, Table 2-1. Permits Required for Soda Mountain Solar Project. The paleontological consultant that is contracted to implement the paleontological APMs for the project will be required to hold a Paleontological Resource Use Permit issued by the BLM California state office, as well as a projectspecific Notice to Proceed permit from the BLM Barstow Field Office, for conducting paleontological monitoring and collecting paleontological resources encountered during development of the project. All permits need to be valid and current through the duration of the paleontological mitigation program, and all paleontological personnel involved will need to be permitted or otherwise authorized by the BLM. Pursuant to Assembly Bill 205 subsection 25545.1(b)(1), the CEC retains exclusive authority over permitting and supersedes any applicable local statute, ordinance, or regulation.

Regulatory Agency	Permit Required	Agency Contact	Schedule
Bureau of Land Management, State Office	Paleontological Resource Use Permit	Tony Overly, BLM California Paleontology Lead	Prior to construction
		2800 Cottage Way Sacramento, CA 95825-1886	
		916-978-4684	
		soverly@blm.gov	
Bureau of Land Management, Barstow Field Office	Notice to Proceed	Alexis Francois	Prior to construction
		2601 Barstow Road Barstow, CA 92311	
		760-252-6000	
		afrancois@blm.gov	

#### Table 3.7-4. Permits Required

## 3.22.8 References Cited

- Bedrossian, T.L., S. McCrea, M.A. Myers, and S. Utley. 2012. Geologic compilation of Quaternary surficial deposits in Southern California Soda Mountains 30' × 60' Quadrangle. 2012 Revision. California Geological Survey Special Report 217 Plate 25. Available at: https://www.conservation.ca.gov/cgs/publications/sr217. Accessed April 2024.
- Bureau of Land Management (BLM). 1998. Paleontology Resources Management Manual and Handbook. H-8270-1. Rev. ed. Washington, D.C.: U.S. Department of the Interior, Bureau of Land Management.
- ------. 2008a. Guidelines for Assessment and Mitigation of Potential Impacts to Paleontological Resources. Attachment 1 to IM 2009-011.
- 2008b. Assessment and Mitigation of Potential Impacts to Paleontological Resources. Instruction Memorandum No. 2009-011. Washington, D.C. Available at: https://www.blm.gov/policy/im-2009-011. Accessed June 2024.
- ——. 2016a. Land Use Plan Amendment Desert Renewable Energy Conservation Plan. Available at: https://eplanning.blm.gov/public\_projects/lup/66459/133474/163144/DRECP\_BLM\_LUPA.pdf. Accessed January 2024.
- 2016b. Potential Fossil Yield Classification (PFYC) System for Paleontological Resources on Public Lands. Instruction Memorandum 2016-124. Available at: https://www.blm.gov/policy/im-2016-124. Accessed June 2024.

- —. 2022b. BLM National PFYC Potential Fossil Yield Classification Geologic Formation 2022 Polygons. Available at: https://landscape.blm.gov/geoportal/catalog/search/ resource/details.page?uuid=%7B6AA9FB6C-693D-468D-95AB-F7AC8B2C0EE6%7D. Accessed June 2024.
- BLM and San Bernardino County. 2015. Soda Mountain Solar Project Proposed Plan Amendment/Final Environmental Impact Statement/Environmental Impact Report. Available at: https://eplanning.blm.gov/public\_projects/nepa/66043/80113/93126/Vol\_1\_SodaMtn\_PA-FEIS-EIR 508.pdf. Accessed January 2024.
- California Geological Survey (CGS). 2002. *California Geomorphic Provinces*, Note 36. Available at: https://www.conservation.ca.gov/cgs/Documents/Publications/CGS-Notes/CGS-Note-36.pdf. Accessed January 2024.
- 2008. Guidelines for Evaluating and Mitigating Seismic Hazards in California, Special Publication 117A. Available at: https://www.conservation.ca.gov/cgs/Documents/ Publications/Special-Publications/SP\_117a.pdf. Accessed January 2024.
- Diaz Yourman & Associates (DYA). 2010. Preliminary Geotechnical Investigation (Phase 1A) Caithness Soda Mountain Solar Facility Project, Baker, San Bernardino County, California. December 7, 2010.
- Jennings, C.W., J.L. Burnett, and B.W. Troxel. 1962. Geologic map of California: Trona Sheet. California Division of Mines and Geology, scale 1:250,000. Available at: https://www.conservation.ca.gov/cgs/Documents/Publications/Geologic-Atlas-Maps/GAM\_23-Trona-1962-Map.pdf. Accessed January 2024.
- Murphey, P.C., G.E. Knauss, L.H. Fisk, T.A. Deméré, and R.E. Reynolds. 2019. Best practices in mitigation paleontology. *Proceedings of the San Diego Society of Natural History* 47.
- San Bernardino County. 2024. Countywide Plan. Available at: https://lus.sbcounty.gov/planning-home/general-plan/. Accessed January 2024.
- SWCA Environmental Consultants (SWCA). 2024. *Paleontological Resources Technical Report*. SWCA Environmental Consultants. Pasadena, California.
- Walker, J.D., A.K. Berry, P.J. Davis, J.E. Andrew, and J.M. Mitsdarfer. 2002. Geologic map of northern Mojave Desert and southwestern Basin and Range, California: compilation and methods. *Geological Society of America Memoir* 195:295–296. Accessed January 2024.