Appendix 4.7-B – Paleontological Resources Technical Report

PALEOSERVICES
SAN DIEGO NATURAL HISTORY MUSEUM

Paleontological Resources Technical Report

LS Power Grid California (LSPGC)
Gates 500 kV Dynamic Reactive Support
Fresno County, California

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Executive Summary

This Paleontological Resources Technical Report was prepared for the proposed LS Power Grid California (LSPGC)'s Gates 500 kV Dynamic Reactive Support project (Proposed Project), located in southwestern Fresno County, California. The purpose of this report is to identify and summarize paleontological resources that potentially occur within the Proposed Project area, identify individual Proposed Project construction elements that may negatively impact paleontological resources, and provide recommendations to minimize any potential negative impacts.

The goal of the Proposed Project is to ensure the reliability of this portion of the California Independent System Operator Corporation (CAISO) controlled grid, and to accommodate maintenance and contingencies of the reactive device. The approximately 20-acre Proposed Project site is located directly north of and adjacent to the existing Pacific Gas and Electric (PG&E) owned Gates Substation, which lies at the northwest corner of the intersection of West Jayne Avenue and South Trinity Avenue. As proposed, the Project will construct an approximately +/-848 (million volt-amperes, reactive) (MVAR) dynamic reactive support facility to include a minimum of two equally sized Static Synchronous Compensator (STATCOM) units, independently connected via two single circuit 500 kV interconnection transmission lines, to the existing Pacific Gas and Electric (PG&E) owned Gates Substation 500 kV bus.

The Proposed Project site lies on the nearly level valley floor in the heavily agricultural western portion of the central San Joaquin Valley, just east of the Guijarral Hills and Anticline Ridge, and north of the Kettleman Hills. The site is underlain at the surface by primarily Holocene-age surficial sediments consisting of alluvial gravel, sand, and clay derived and transported downstream from the older geologic units exposed within the nearby breached anticlines of the Kettleman Hills and Anticline Ridge. The precise thickness of these Holocene sediments is unknown in the vicinity of the Proposed Project site. Presumably, the Holocene-age deposits transition downsection (i.e., at depth) into older, Pleistocene-age deposits. The depth of this temporal transition is conservatively estimated to occur at 15 feet or more below ground surface.

The results of the paleontological records searches and literature review indicate that fossils have not been documented from Holocene-age or Pleistocene-age sedimentary deposits within a 5-mile radius of the Proposed Project site. However, fossils are known from late Pleistocene-age sedimentary deposits at several locations elsewhere in the west-central San Joaquin Valley. These deposits have yielded fossil remains of large-bodied mammals (e.g., mammoth, ground sloth, horse, mule deer, elk, camel, pronghorn, ox, bison, American lion, fox, coyote, dire wolf, badger), as well as small mammals (e.g., rabbit, beaver, pocket gopher, vole, wood rat, heteromyid rodent, mole) and other terrestrial or freshwater vertebrates (e.g., bony fish, pond turtle, rattlesnake, loon).

Following the paleontological potential criteria developed by the Society of Vertebrate Paleontology (SVP, 2010), the sedimentary deposits that occur within the Proposed Project site are assigned a low paleontological potential at depths of less than 15 feet below ground surface (where they are assumed to be Holocene in age), and an undetermined paleontological potential at depths greater than 15 feet below ground surface (where the strata may have been deposited during the Pleistocene). As such, Project-related earthwork that would extend greater than 15 feet below ground surface has the potential to impact paleontological resources. However, as currently designed, the deepest proposed earthwork will only extend to depths of approximately 10 feet below ground surface and include six boreholes for CIDH piles to support transmission towers. Therefore, construction of the Proposed Project is not anticipated to result in impacts to paleontological resources and implementation of a paleontological mitigation program is not recommended. In the unlikely event that fossils are unearthed during construction (i.e., an inadvertent discovery), mitigation measures are provided to ensure proper collection and treatment of the fossils.

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1.0 Introduction

1.1 Proposed Project Description

LS Power Grid California, LLC (LSPGC), a wholly owned subsidiary of LS Power Associates, L.P., established to own transmission projects in California, is proposing the Gates 500 kilovolt (kV) Dynamic Reactive Support Project (Proposed Project) in unincorporated Fresno County. The Proposed Project includes an approximately +/-848 (million volt-amperes, reactive) (MVAR) dynamic reactive support facility to include a minimum of two equally sized Static Synchronous Compensator (STATCOM) units, independently connected via two single circuit 500 kV interconnection transmission lines, to the existing Pacific Gas and Electric (PG&E) owned Gates Substation 500 kV bus. The Proposed Project was approved by the California Independent System Operator Corporation (CAISO) to ensure the reliability of a major portion of the CAISO controlled grid and accommodate maintenance and contingencies of the reactive device. Specifically, the STATCOM facility would support the regional transmission system by providing voltage support and grid stability at the Gates Substation 500 kV bus. This would facilitate the reliable operation of the extra high voltage transmission system buses in the electrical proximity of the Gates Substation after the retirement of the Diablo Canyon nuclear generating units. The Proposed Project has an in-service date of June, 2024 per the CAISO functional specifications.

The approximately 20-acre Proposed Project site is located directly north of and adjacent to the existing Pacific Gas and Electric (PG&E) owned Gates Substation, which lies at the northwest corner of the intersection of West Jayne Avenue and South Trinity Avenue (Figure 1).

Proposed Project components and construction methods, as currently proposed, are outlined below:

- Two new STATCOM units will be constructed immediately north of the existing Gates Substation, and will ultimately be fenced in, occupying approximately 8.26 acres. The major associated equipment (e.g., power transformers, power circuit breakers, reactors, IGBT/Control Enclosures, and cooling equipment) will reside on shallow spread footing concrete foundations.
    - The overall site will be graded prior to sub-grade over-excavation for structure and equipment foundations, underground ducts, ground grid, and the control shelter. The foundations will be supported on at least 10 inches of engineered fill.
- Two new overhead transmission lines connecting the new STATCOM units to the existing Gates Substation will be constructed. Approximately three new poles or tower structures will be installed per transmission line, for a total of approximately six new poles/tower strutures.
    - The new poles/tower structures will be installed on cast-in-drilled-hole (CIDH) concrete pile foundations. Installation will require excavation of a minimum 12-inch-diameter and 10-foot-deep hole.
    - Temporary guard structures may be installed in ground, requiring the exacavation of an approximately 2-foot-diameter and 8-foot-deep hole.
    - Installation of the new overhead transmission lines will not require ground disturbance.
- The existing Gates Substation will be expanded to accommodate two new 500kV bus positions for the new STATCOM units.
    - Improvements to the Gates Substation will be supported on mat slab foundations, requiring over-excavation and recompaction of a minimum of 12 inches of native soils.

- Other on- and off-site improvements and/or construction elements include: new signage and lighting for the STATCOM units; access road improvements and new access road construction; construction of a stormwater detention basin, stormwater drainage, retaining wall, and conveyance system; installation of chain link and barb wire security fencity around the STATCOM units; construction of transformer oil containment basins; and use of temporary staging areas.
    - Existing access roads (Trinity Avenue and an unnamed farm road) would be widened to 24 feet and graded.
    - A new 24 foot-wide access road extending from the new STATCOM units to the new 500kV buses ta the Gates Substation will be graded, and will generally follow the new 500kV transmission lines.
    - A stormwater detention basin will be constructed and will measure approximately 70 feet by 160 feet in area, and 3.5 feet deep.
    - A temporary staging area will require limited grading.

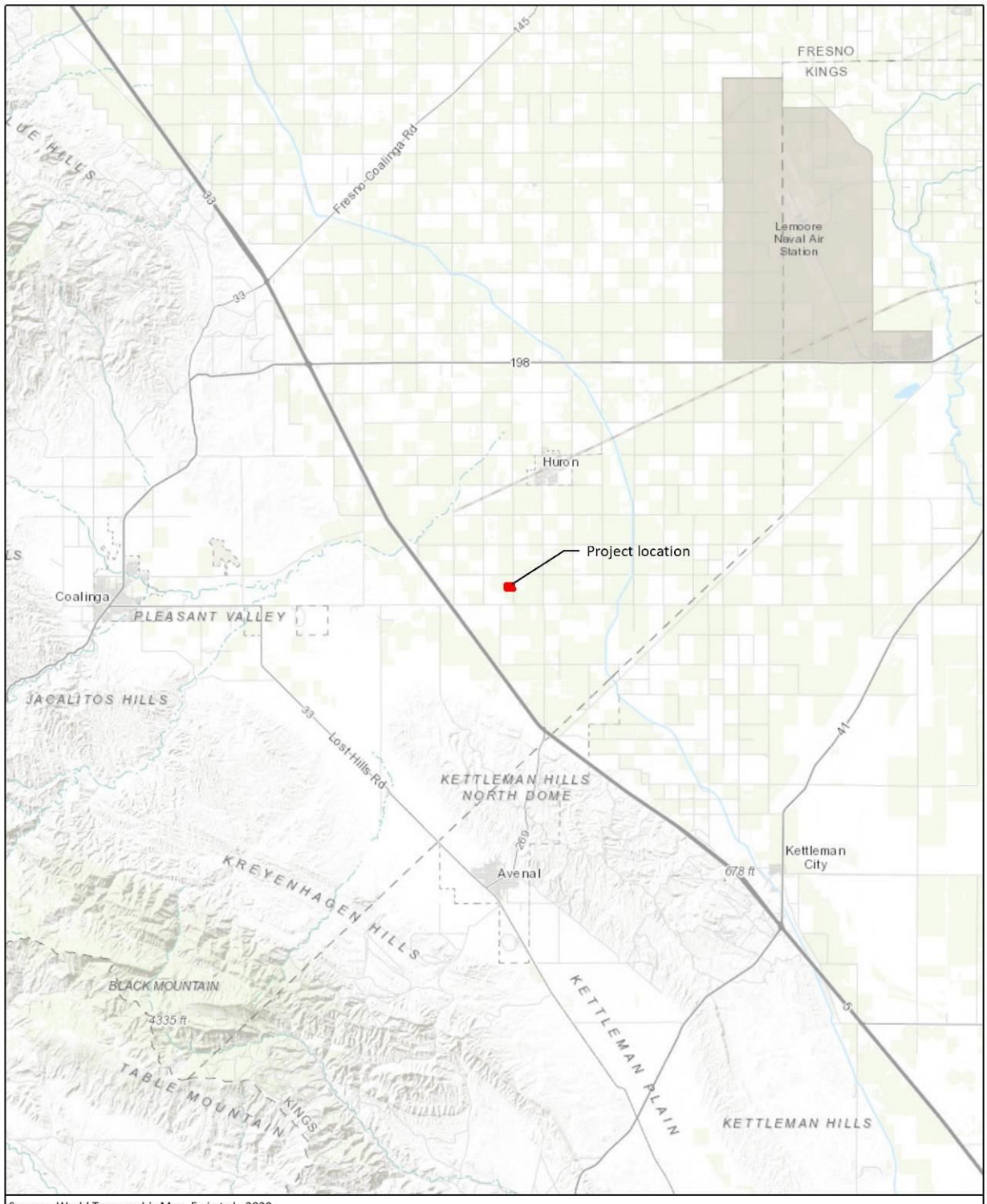
1.2 Scope of Work

The Proposed Project site is located in an area underlain by native sedimentary deposits that are undisturbed at depth. For this reason, an assessment of paleontological resources was undertaken to determine whether construction of the Proposed Project has the potential to negatively impact paleontological resources. This report is intended to summarize existing paleontological resource data in the vicinity of the Proposed Project site, discuss the significance of these resources, examine potential Proposed Project-related impacts to paleontological resources, and, if necessary, suggest mitigation measures to reduce any potential impacts to paleontological resources to less than significant levels. This report was written by Katie M. McComas and Thomas A. Deméré of the Department of PaleoServices, SDNHM.

1.3 Definition of Paleontological Resources

As defined here, paleontological resources (i.e., fossils) are the buried remains and/or traces of prehistoric organisms (i.e., animals, plants, and microbes). Body fossils such as bones, teeth, shells, leaves, and wood, as well as trace fossils such as tracks, trails, burrows, and footprints, are found in the geologic units/formations within which they were originally buried. The primary factor determining whether an object is a fossil or not is not how the organic remain or trace is preserved (e.g., “petrified”), but rather the age of the organic remain or trace. Although typically it is assumed that fossils must be older than ~11,700 years (i.e., the generally accepted end of the last glacial period of the Pleistocene Epoch), organic remains older than recorded human history and/or older than middle Holocene (about 5,000 radiocarbon years) can also be considered to represent fossils (SVP, 2010).

Fossils are considered important scientific and educational resources because they serve as direct and indirect evidence of prehistoric life and are used to understand the history of life on Earth, the nature of past environments and climates, the membership and structure of ancient ecosystems, and the pattern and process of organic evolution and extinction. In addition, fossils are considered to be non-renewable resources because typically the organisms they represent no longer exist. Thus, once destroyed, a particular fossil can never be replaced.



Sources: World Topographic Map, Esri et al., 2020

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Figure 1: Overview Map, LSPGC Gates 500 kV Dynamic Reactive Support
Fresno County, California

0 5
scale in miles

Finally, paleontological resources can be thought of as including not only the actual fossil remains and traces, but also the fossil collecting localities and the geologic units containing those localities. The locality includes both the geographic and stratigraphic context of fossils—the place on the earth and stratum (deposited during a particular time in earth's history) from which the fossils were collected. Localities themselves may persist for decades, in the case of a fossil-bearing outcrop that is protected from natural or human impacts, or may be temporarily exposed and ultimately destroyed, as is the case for fossil-bearing strata uncovered by erosion or construction. Localities are documented with a set of coordinates and a measured stratigraphic section tied to elevation detailing the lithology of the fossil-bearing stratum as well as overlying and underlying strata. This information provides essential context for any future scientific study of the recovered fossils.

1.3.1 Definition of Significant Paleontological Resources

The California Environmental Quality Act (CEQA, Public Resources Code Section 21000 et seq.) dictates that a paleontological resource is considered significant if it "has yielded, or may be likely to yield, information important in prehistory or history" (Section 15064.5, [a][3][D]). The Society of Vertebrate Paleontology (SVP) has further defined significant paleontological resources as consisting of "fossils and fossiliferous deposits[…]consisting of identifiable vertebrate fossils, large or small, uncommon invertebrate, plant, and trace fossils, and other data that provide taphonomic, taxonomic, phylogenetic, paleoecologic, stratigraphic, and/or biochronologic information" (SVP, 2010).

1.4 Regulatory Framework

Paleontological resources are considered scientifically and educationally significant nonrenewable resources; they are protected under a variety of laws, regulations, and ordinances. The Proposed Project is located within an unincorporated portion of Fresno County, California. As such, state and local regulations are applicable to the Proposed Project.

1.4.1 State: California Environmental Quality Act

The California Environmental Quality Act (CEQA, Public Resources Code Section 21000 et seq.) addresses paleontological resources in the context of an environmental review for a discretionary state or local agency action. Guidelines for the Implementation of CEQA are included in the California Code of Regulations (CCR), sections 15000 *et seq*. Within the CCR, paleontological resources are specifically addressed in the Environmental Checklist (CCR Section 15023, Appendix G): "Will the proposed project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature."

CEQA does not provide a definition for a "unique paleontological resource" in the Environmental Checklist (CCR Section 15023, Appendix G), nor does it include specific guidelines for the mitigation of paleontological resources under Section 15126.4, Consideration and Discussion of Mitigation Measures Proposed to Minimize Significant Effects. Therefore, most CEQA lead agencies follow the definitions and guidelines provided by SVP (2010), which are in line with industry standards (e.g., Murphey et al., 2014; and see Section 1.3.1). The SVP (2010) additionally provides criteria for determining the significance of paleontological resources (see sections 1.3.1 and 2.2), and for appropriate measures to minimize impacts to paleontological resources. As advised by SVP (2010), impacts to paleontological resources can be minimized to a level below the threshold of significance through: 1.) the permanent preservation of a fossil locality and its contained fossil resources or 2.) the implementation of a paleontological mitigation program that would reduce any adverse impacts to a level below the threshold of significance through the salvage and permanent storage of any salvaged fossils in an established scientific institution.

1.4.2 Local: Fresno County

Fresno County primarily addresses the management of paleontological resources through CEQA. In addition, the Fresno County General Plan (Fresno County, 2000) includes Goal OS-J and related Policy OS-J.1 that are applicable to paleontological resources:

- **Goal OS-J**: To identify, protect, and enhance Fresno County's important historical, archaeological, paleontological, geological, and cultural sites and their contributing environment.
    - **Policy OS-J.1:** The County shall require that discretionary development projects, as part of any required CEQA review, identify and protect important historical, archeological, paleontological, and cultural sites and their contributing environment from damage, destruction, and abuse to the maximum extent feasible. Project-level mitigation shall include accurate site surveys, consideration of project alternatives to preserve archeological and historic resources, and provision for resource recovery and preservation when displacement is unavoidable.

2.0 Methods

2.1 Paleontological Literature Review and Records Searches

A paleontological records search of the paleontological collections at the SDNHM was conducted in order to identify any known fossil collection localities in the vicinity of the Proposed Project site. An informal search of the online paleontological collections database at the University of California Museum of Paleontology (UCMP) was also conducted. In addition, a literature review was conducted to gain a greater understanding of the geologic history of the area surrounding the Proposed Project site, as well as to determine the types of fossils that the specific geologic units underlying the Proposed Project site have produced. The literature review included examination of relevant published geologic maps and reports, peer-reviewed papers, and other relevant literature (e.g., field trip guidebooks, unpublished theses and dissertations, archived paleontological mitigation reports). This approach was followed in recognition of the direct relationship between paleontological resources and the geologic units within which they are entombed. Knowing the geologic history of a particular area and the fossil productivity of geologic units that occur in that area, it is possible to predict where fossils may or may not be encountered.

2.2 Paleontological Resource Assessment Criteria

The Society of Vertebrate Paleontology (SVP, 2010) has developed mitigation guidelines for paleontological resources that conform with industry standards (Murphey et al., 2019) and were developed with input from a variety of federal and state land management agencies. As described in Section 1.4.1, use of the SVP (2010) guidelines is common practice by CEQA lead agencies.

The SVP (2010) guidelines recognize that significant paleontological resources are considered to include not only actual fossil remains and traces, but also the fossil collecting localities and the geologic units containing those fossils and localities, and thus evaluate paleontological potential (or paleontological sensitivity) of individual geologic units within a project area. Paleontological potential is determined based on the existence of known fossil localities within a given geologic unit, and/or the potential for future fossil discoveries, given the age and depositional environment of a particular geologic unit. The SVP guidelines include four classes of paleontological potential: High Potential, Undetermined Potential,

Low Potential, or No Potential (SVP, 2010). A summary of the criteria for each paleontological potential ranking is outlined below.

2.2.1 High Potential

Geologic units from which vertebrate or significant invertebrate, plant, or trace fossils have been recovered are considered to have a high potential for containing additional significant paleontological resources. Geologic units classified as having high potential include, but are not limited to, some volcaniclastic formations (e. g., ashes or tephras), some low-grade metamorphic rocks which contain significant paleontological resources anywhere within their geographical extent, and geologic units temporally or lithologically suitable for the preservation of fossils (e. g., deposits aged middle Holocene and older consisting of fine-grained fluvial sandstones, argillaceous and carbonate-rich paleosols, cross-bedded point bar sandstones, fine-grained marine sandstones, etc.). Paleontological potential includes both the potential for yielding abundant or significant vertebrate fossils or for yielding significant invertebrate, plant, or trace fossils, as well as the importance of recovered evidence for new and significant taxonomic, phylogenetic, paleoecologic, taphonomic, biochronologic, or stratigraphic data. Geologic units which contain potentially datable organic remains older than late Holocene, including deposits associated with animal nests or middens, and geologic units which may contain new vertebrate deposits, traces, or trackways are also classified as having high potential.

2.2.2 Undetermined Potential

The definition for undetermined potential provided by SVP (2010) has been expanded for the purposes of this report in order to add more information related specifically to the management of paleontological resources in the context of mitigation paleontology. Geologic units are assigned an undetermined potential if there is little information available concerning their paleontological content, geologic age, and depositional environment. Further field study of the specific formation is necessary to determine if these geologic units have high or low potential to contain significant paleontological resources. For planning purposes, this class of resource potential represents a conservative assessment that assumes an undetermined geologic unit is fossiliferous until proven otherwise.

In the context of mitigation paleontology, gaining additional information about a geologic unit assigned an undetermined potential in order to refine the resource potential ranking (e.g., to high potential or low potential) can be accomplished in several ways depending on the nature of the geologic unit and whether it is exposed at the surface. Field surveys (e.g., a pre-construction survey as part of a paleontological resource assessment) can be conducted when a geologic unit is well exposed at the ground surface, allowing paleontologists to physically search for fossils while also studying the stratigraphy of the unit. In cases where the geologic unit is not exposed at the surface (e.g., is covered by disturbed areas such as concrete or agricultural topsoil, or occurs in the subsurface underlying another geologic unit), strategically located excavations into subsurface stratigraphy may be conducted to gain additional information (e.g., geotechnical investigation boreholes or trenches). Paleontological monitoring of excavations into a geologic unit with an undetermined potential as part of a paleontological monitoring program may also allow for refinement of the resource potential ranking of the unit over the course of the monitoring program. In this case, the results of the monitoring program are used to routinely reevaluate the resource potential ranking of the geologic unit.

2.2.3 Low Potential

Reports in the paleontological literature or field surveys by a qualified professional paleontologist may allow determination that some geologic units have low potential for yielding significant fossils. Such geologic units will be poorly represented by fossil specimens in institutional collections, or, based on general scientific consensus, only preserve fossils in rare circumstances where the presence of fossils is

an exception not the rule, e. g. basalt flows or Recent colluvium. Geologic units with low potential typically will not require impact mitigation measures to protect fossils.

2.2.4 No Potential

Geologic units with no potential are either entirely igneous in origin and therefore do not contain fossil remains, or are moderately to highly metamorphosed and thus any contained fossil remains have been destroyed. Artificial fill materials also have no potential, because the stratigraphic and geologic context of any contained organic remains (i.e., fossils) has been lost. For projects encountering only these types of geologic units, paleontological resources can generally be eliminated as a concern, and no further action taken.

2.3 Paleontological Impact Analysis

Direct impacts to paleontological resources occur when earthwork operations cut into the geologic units within which fossils are buried and physically destroy the fossil remains. As such, only those excavations that will disturb potentially fossiliferous geologic units have the potential to significantly impact paleontological resources. As described above, potentially fossiliferous geologic units are those rated with a high potential. Taking a conservative approach, geologic units with an undetermined potential are also considered to be potentially fossiliferous until proven otherwise. Although impact avoidance is possible through relocation of a proposed action, paleontological monitoring during construction is typically recommended to reduce any negative impacts to paleontological resources to less than significant levels.

The purpose of the impact analysis is to determine which (if any) of the Proposed Project-related earthwork activities may disturb potentially fossiliferous geologic units, and where and at what depths these impacts are likely to occur. The paleontological impact analysis involved analysis of available Project documents and comparison with geological and paleontological data gathered during the records searches and literature review.

3.0 Results

3.1 Paleontological Literature Review and Records Searches

3.1.1 Geology

Geographically, the Proposed Project site lies on the nearly level valley floor in the heavily agricultural western portion of the central San Joaquin Valley, just east of the Guijarral Hills and Anticline Ridge, and north of the Kettleman Hills. As mapped by Dibblee (1971), the Proposed Project site is underlain at the surface by primarily Holocene-age surficial sediments consisting of alluvial gravel, sand, and clay (Qa; these deposits are mapped as recent alluvial fan deposits in the Great Valley [Qf] by Jennings and Strand, 1958) (Figure 2). These Holocene alluvial sediments primarily consist of poorly consolidated silts and silty sands, with less common intervals of clay (Terracon, 2019), and likely were eroded and transported by streams from the older geologic units exposed within the nearby breached anticlines (e.g., the Kettleman Hills and Anticline Ridge, where strata of the Tulare, San Joaquin, and Etchegoin formations are exposed) (Dibblee and Minch, 2006, 2007; Woodring et al., 1940). Within drainages of the Coast Ranges foothills, these deposits range in thickness from thin veneers only one foot thick to an estimated maximum thickness of about 25 feet along the eastern edges of the Kettleman Hills, where sediments have accumulated in alluvial fans (Woodring et al., 1940). Within the distal alluvial fans spreading onto the valley floor, in the vicinity of the Proposed Project site, the precise thickness of

Holocene alluvial deposits is unknown. Presumably, the Holocene-age deposits transition downsection (i.e., at depth) into older, Pleistocene-age deposits. The depth of this temporal transition is conservatively estimated here to occur at 15 feet or more below ground surface, based on the presence of mapped surface exposures of Pleistocene-age older alluvial deposits approximately 2 miles to the southwest of the Proposed Project site.

3.1.2 Paleontology

A records search of the paleontological collections at the SDNHM and an online search of the paleontological records at the UCMP found no documented fossil collection localities within a 5-mile radius of the Proposed Project site.

A review of the regional paleontological literature found no reports of fossils from the surficial Holocene deposits in the Proposed Project area. However, the review did find that there are numerous documented fossil localities from late Pleistocene-age sedimentary deposits in the west-central San Joaquin Valley. Fossil collection localities are known from several locations in Fresno County, including in the Riverdale and Tranquility areas (located approximately 25 miles northeast and 35 miles north of the Proposed Project site, respectively), and Kings County, including in the Corcoran area (30 miles east of the Proposed Project site) and at Dudley Ridge (located approximately 20 miles southeast of the Proposed Project site), where early human bone dated to the latest Pleistocene has been found alongside non-human Pleistocene fossils (Jefferson, 1991a,b). Recovered fossils from these localities include remains of bony fish, pond turtle, rattlesnake, loon, small mammals (e.g., rabbit, beaver, pocket gopher, vole, wood rat, heteromyid rodent, mole), and large mammals (e.g., mammoth, ground sloth, horse, mule deer, elk, camel, pronghorn, ox, bison, American lion, fox, coyote, dire wolf, badger).

3.2 Paleontological Resource Potential Analysis

Following the SVP (2010) critera for determining paleontological potential, as outlined in Section 2.2, the Holocene-age alluvial deposits underlying the Proposed Project site are assigned a low paleontological potential. This rating is based on the relatively young age (generally less than about 11,700 years old) of these deposits, the recognition that organic remains preserved in such deposits are conspecific with organisms living in the area today, and the lack of known, scientifically significant paleontological resources from similar Holocene-age deposits in the central San Joaquin Valley.

However, as mentioned above, the Holocene-age sediments likely transition in the subsurface into older, Pleistocene-age deposits, at depths that may be as shallow as 15 feet below ground surface (see Section 3.1.1). Pleistocene sedimentary deposits located at depth within the Proposed Project site are assigned an undetermined paleontological potential based on the occurrence of scientifically significant vertebrate fossils in similar deposits found at widely scattered localities in the west-central San Joaquin Valley.

Because the contact between Holocene-age deposits and older, Pleistocene-age deposits may be as shallow as 15 feet below ground surface, all deposits underlying the Proposed Project site are specifically assigned a low paleontological potential from 0–15 feet below ground surface, where they are assumed to be Holocene in age, and an undetermined paleontological potential at depths greater than 15 feet below ground surface, where they may be Pleistocene in age (Figure 3).

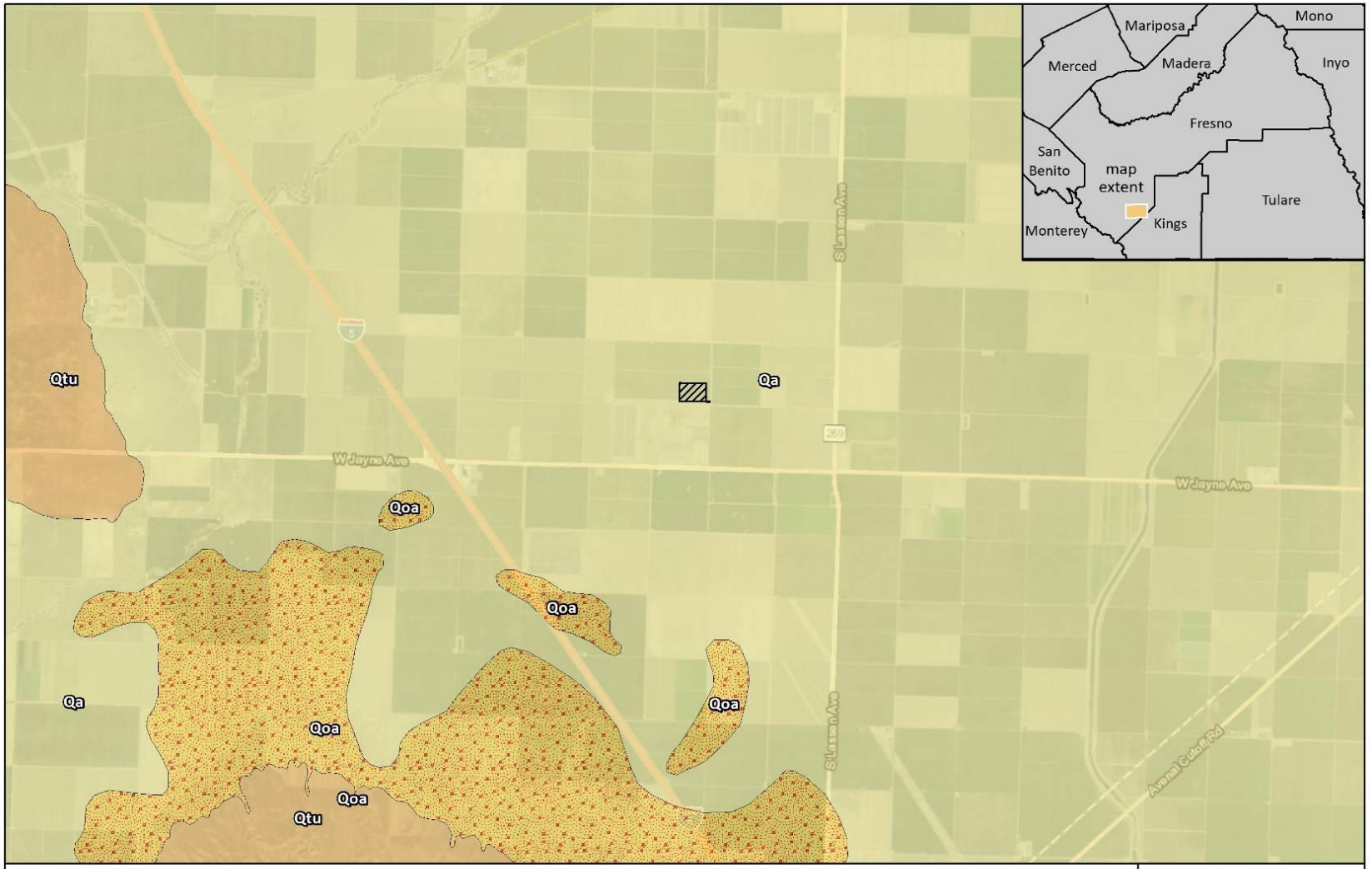

Figure 2: Geologic Map, LSPGC Gates 500 kV Dynamic Reactive Support, Fresno County, California

3.3 Paleontological Impact Analysis

As discussed above, the Proposed Project site is immediately underlain by Holocene-age alluvial deposits at the surface that likely overlie and transition in the subsurface into older, Pleistocene-age deposits. Impacts to paleontological resources may occur only during excavations that will disturb sedimentary deposits of Pleistocene-age. Therefore, shallow excavations that will likely only disturb surficial Holocene deposits do not have the potential to impact paleontological resources, while excavations that will extend greater than about 15 feet below ground surface (and will potentially disturb Pleistocene-age sedimentary deposits) have the potential to impact paleontological resources (Table 1).

Table 1. Summary of paleontological potential of the geologic units underlying the Proposed Project site and paleontological monitoring recommendations for earthwork impacting this geologic unit.

Geologic unit (map symbol)	Age (years old)	Paleontological potential	Monitoring recommended?
alluvial deposits (Qa)	Holocene (generally less than 11,700), with older Pleistocene-age deposits present in the subsurface	Low (0–15 feet); Undetermined (>15 feet)	No (0–15 feet); Yes (>15 feet)

Project components and construction methods, as currently proposed, will require varying degrees of ground disturbance, ranging from no or only superficial ground disturbance, to shallow excavation, to deeper excavation. The anticipated ground disturbance associated with each Proposed Project component and its potential to impact paleontological resources is outlined below (Table 2).

Proposed Project components requiring excavations exceeding approximately 10 feet but not deeper than 15 feet below ground surface (bgs) are limited to the installation of new transmission poles/towers to support two new 500 kV overhead transmission lines between the new STATCOM units and the Gates Substation. Six approximately 10-foot-deep boreholes will be excavated for the installation of the six new transmission poles/towers, which will be installed on CIDH concrete pile foundations. Large-diameter helical augers used for the excavation of such boreholes have the potential to bring up spoils containing unbroken fossils, and can therefore be successfully monitored for paleontological resources.

Earthwork associated with the other various Proposed Project components (e.g., overall site grading, excavation for equipment foundations, installation of temporary guard structures, excavation of stormwater detention basins/drainage systems, excavation of transformer oil containment basins, installation of security fencing and retaining walls, access road grading, and use of temporary staging areas) is anticipated to be relatively shallow, extending less than 10 feet bgs. Finally, the installation of the new overhead transmission lines and aboveground equipment will not require significant ground disturbance.

Table 2. Summary of anticipated ground disturbance associated with Proposed Project components and paleontological monitoring recommendations for this work.

Proposed Project component	Anticipated ground disturbance	Monitoring recommended?
Overall site grading	Shallow grading (<10 feet bgs)	No
Excavation for equipment foundations	Shallow over-excavation (<10 feet bgs)	No

Installation of new transmission poles/towers on CIDH concrete pile foundations	Deep augering (>10 feet but <15 feet bgs)	No
Installation of temporary guard structures	Shallow augering (<10 feet bgs)	No
Installation of new overhead transmission lines	No ground disturbance	No
Installation of aboveground equipment	No ground disturbance	No
Excavation of stormwater detention basins, stormwater drainage, and transformer oil containment basins	Shallow excavation (<10 feet bgs)	No
Installation of security fencing and retaining walls	Minimal ground disturbance (<10 feet bgs)	No
Access road improvements and new access road construction	Shallow grading (<10 feet bgs)	No
Use of temporary staging area	Shallow grading (<10 feet bgs)	No

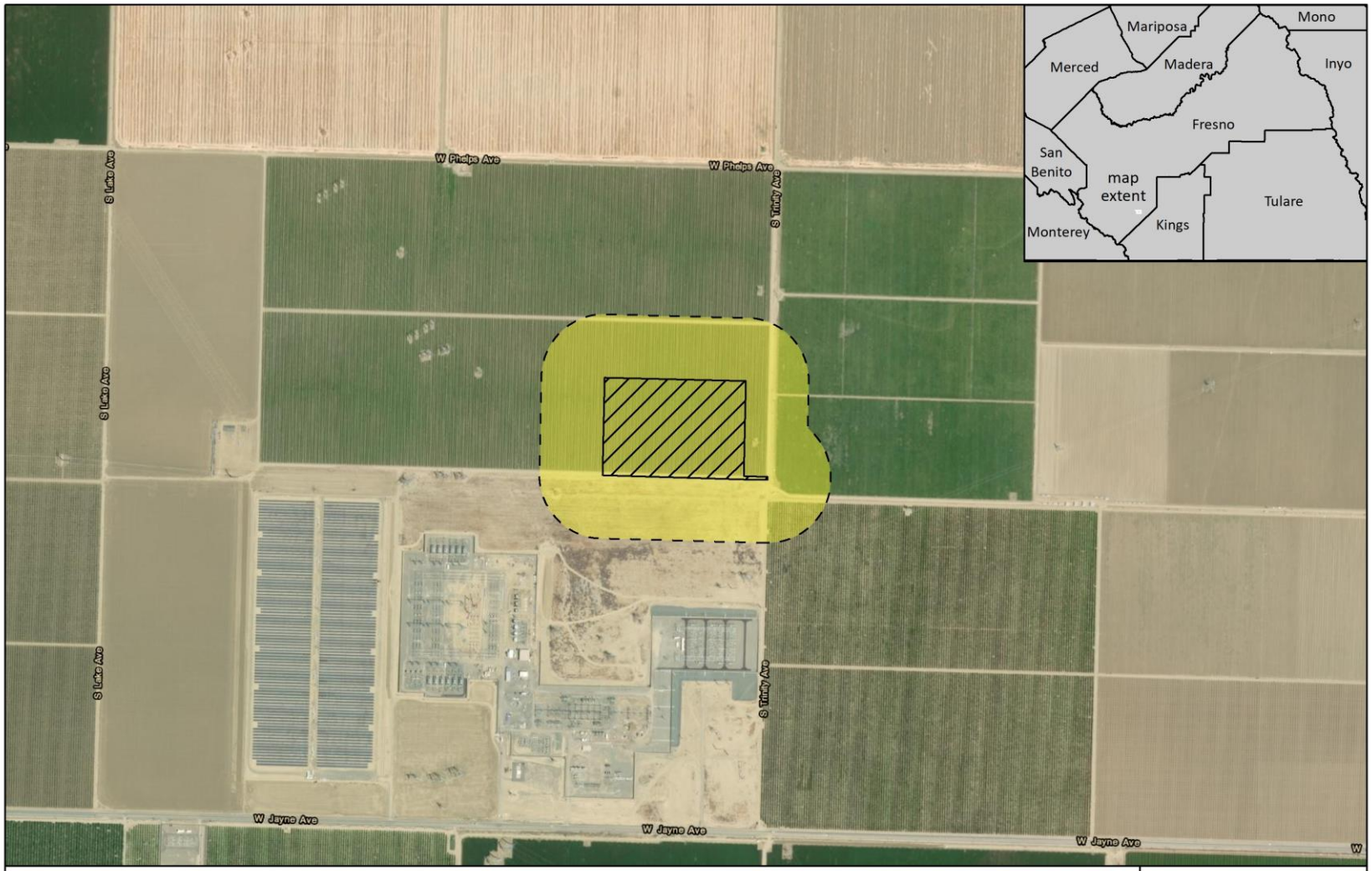

Figure 3: Paleontological Potential Map, LSPGC Gates 500 kV Dynamic Reactive Support, Fresno County, California

4.0 Recommendations & Conclusions

Implementation of a paleontological mitigation program is not recommended for the Proposed Project, as Project-related earthwork is not anticipated to negatively impact paleontological resources. However, in the unlikely event that fossils are unearthed during earthwork activities (i.e., an inadvertent discovery), the following measures should be followed:

APM PALEO-1: Upon discovery of an unearthed fossil, earthwork within the vicinity of the discovery shall immediately halt, and a qualified paleontologist should evaluate the discovery. Earthwork shall be diverted until the significance of the fossil discovery can be assessed by the qualified paleontologist. If the fossil discovery is deemed significant, the fossil shall be recovered using appropriate recovery techniques based on the type, size, and mode of preservation of the unearthed fossil. Earthwork may resume in the area of the fossil discovery once the fossil has been recovered, and the qualified paleontologist deems the site has been mitigated to the extent necessary. Additional earthwork following the fossil discovery may be monitored for paleontological resources on an as-needed basis, at the discretion of the qualified paleontologist.

APM PALEO-2: Recovered fossils shall be prepared, identified, catalogued, and stored in a recognized professional repository (e.g., San Diego Natural History Museum, University of California Museum of Paleontology) along with associated field notes, photographs, and compiled fossil locality data. Donation of the fossils should be accompanied by financial support for initial specimen curation and storage. A final summary report should be completed that outlines the results of the mitigation program. This report should include discussions of the methods used, stratigraphic section(s) exposed, fossils collected, and significance of recovered fossils. This report shall be submitted to appropriate agencies, as well as to the designated repository.

5.0 References

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