Estrella Substation and Paso Robles Area Reinforcement Project
Paleontological Resources Technical Report for the Creston Route
San Luis Obispo County, California

Prepared for

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EXECUTIVE SUMMARY

Purpose and Scope

This document is a Paleontological Resources Technical Report (PRTR) for the 70 kilovolt (kV) power line component of the Estrella Substation and Paso Robles Area Reinforcement Project (project) proposed jointly by Pacific Gas and Electric Company (PG&E) and NextEra Energy Transmission West, LLC (NEET West). PG&E proposes to construct approximately 7 miles of a new double-circuit 70 kV power line in northern San Luis Obispo County extending from Estrella Substation to Paso Robles Substation, in the city of Paso Robles. The project will reinforce the electrical grid in the Paso Robles area.

A paleontological resource study was conducted to evaluate the paleontological sensitivity of the project and assess potential power line-related impacts to paleontological resources. This report presents the results of the paleontological records search, literature review, resource assessment, and field investigation completed for the alternate 70 kV power line route, herein referred to as the Creston Route, which is a component of the larger project.

Dates of Investigation

The museum records searches were performed between April 14 and 19, 2016. The field investigation of the project area was performed on May 16 and 17, 2016. This technical report was completed in October 2016.

Results of the Investigation

Geologic mapping by Dibblee and Minch (2004a, 2004b, 2004c) indicates that the area surrounding the Creston Route is underlain by three geologic units: younger valley alluvial sands (Holocene, 0.01 million years ago [Ma]), Quaternary older alluvial sediments (Pleistocene, 0.01–2.6 Ma), and Pleistocene to latest Pliocene Paso Robles formation (2.6–3.6 Ma). Museum collections records maintained by the Natural History Museum of Los Angeles County and the University of California Museum of Paleontology indicate that one previously recorded fossil locality exists within the footprint of the Creston Route and seven fossil localities have been recorded within a 15-mile radius of the Creston Route. No fossils were discovered during the field investigation. The combined results of the museum records searches, literature review, and field investigation indicate that the Potential Fossil Yield Classifications (PFYC) of the geologic units underlying the Creston Route range from Low (PFYC 2) to High (4b) (U.S. Bureau of Land Management 2007).

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Acronyms and Abbreviations

AAC	all-aluminum conductor
BLM	U.S. Bureau of Land Management
CCR	California Code of Regulations
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
City	City of El Paso de Robles, agency
COSE	Conservation and Open Space Element
County	County of San Luis Obispo, agency
CPUC	California Public Utilities Commission
GO	General Order
kV	kilovolt
LCSLO	Land Conservancy of San Luis Obispo
LDSP	light-duty steel pole
LORS	laws, ordinances, and regulations
LST	lattice steel tower
Ma	million years ago
NEET West	NextEra Energy Transmission West, LLC
OPLA-PRP	Omnibus Public Lands Act
PFYC	Potential Fossil Yield Classification
PG&E	Pacific Gas and Electric Company
PRC	California Public Resources Code
project	Estrella Substation and Paso Robles Area Reinforcement Project
PRPA	Paleontological Resources Preservation Act
SR	State Route
SVP	Society of Vertebrate Paleontology
TPD	triangular post and dead-end
TSP	tubular steel pole
US 101	U.S. Highway 101
USFS	U.S. Forest Service

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1 INTRODUCTION

Pacific Gas and Electric Company (PG&E) proposes to construct a new approximately 7-mile double-circuit 70 kilovolt (kV) power line and several substation upgrades in the Paso Robles area of San Luis Obispo County, California (Figure 1), to reinforce the electrical grid in the Paso Robles area. PG&E is undertaking this effort as part of the larger Estrella Substation and Paso Robles Area Reinforcement Project (project) proposed jointly by PG&E and NextEra Energy Transmission West, LLC (NEET West). This paleontological resource study was prepared to evaluate the paleontological sensitivity of the 70 kV power line and assess potential power line-related impacts to paleontological resources. This study was conducted in accordance with professional guidelines established by the Society of Vertebrate Paleontology (SVP) (1995, 2010) and the U.S. Bureau of Land Management (BLM) (2007). The structure and content of this report were developed in consultation with PG&E's paleontological guidelines (2015).

Copies of this study will be submitted to PG&E and will be incorporated as part of PG&E's application for a Permit to Construct to the California Public Utilities Commission (CPUC). A similar report has been prepared for the substation component of the project, referred to as the Estrella Substation, and the results of that effort are presented under separate cover.

1.1 Project Location

The project is located in the north-central portion of San Luis Obispo County, within and around the city of Paso Robles (Figures 1 and 2). The project route begins at Estrella Substation, approximately 5 miles east of downtown Paso Robles, extends southwest for approximately 4 miles, then generally northwest for approximately 3 miles along Creston Road, Charolais Road, and South River Road, and finally ties into Paso Robles Substation in Paso Robles. Land use within the project area generally consists of agricultural and rural residential areas, with areas of urban development. The project is located on a combination of privately owned and City of El Paso de Robles (City) owned parcels, PG&E easements, and a parcel owned by the Land Conservancy of San Luis Obispo (LCSLO).

1.2 Project Description

The project will include the construction of approximately 7 miles of a new double-circuit 70 kV power line extending from Estrella Substation to Paso Robles Substation. The new 70 kV power line segment will travel generally southwest from the new 70 kV substation for approximately 4 miles spanning over agricultural lands, rural developments, and Huerhuero Creek. The new power line then extends northwest for approximately 2.2 miles along Creston Road and Charolais Road before turning north along South River Road. The new power line continues generally north along South River Road and for 0.65 mile where it terminates at Paso Robles Substation at the intersection of South River Road and Niblick Road. A more detailed description of the new double-circuit is provided in the subsections that follow.

Figure 1. General Vicinity Map

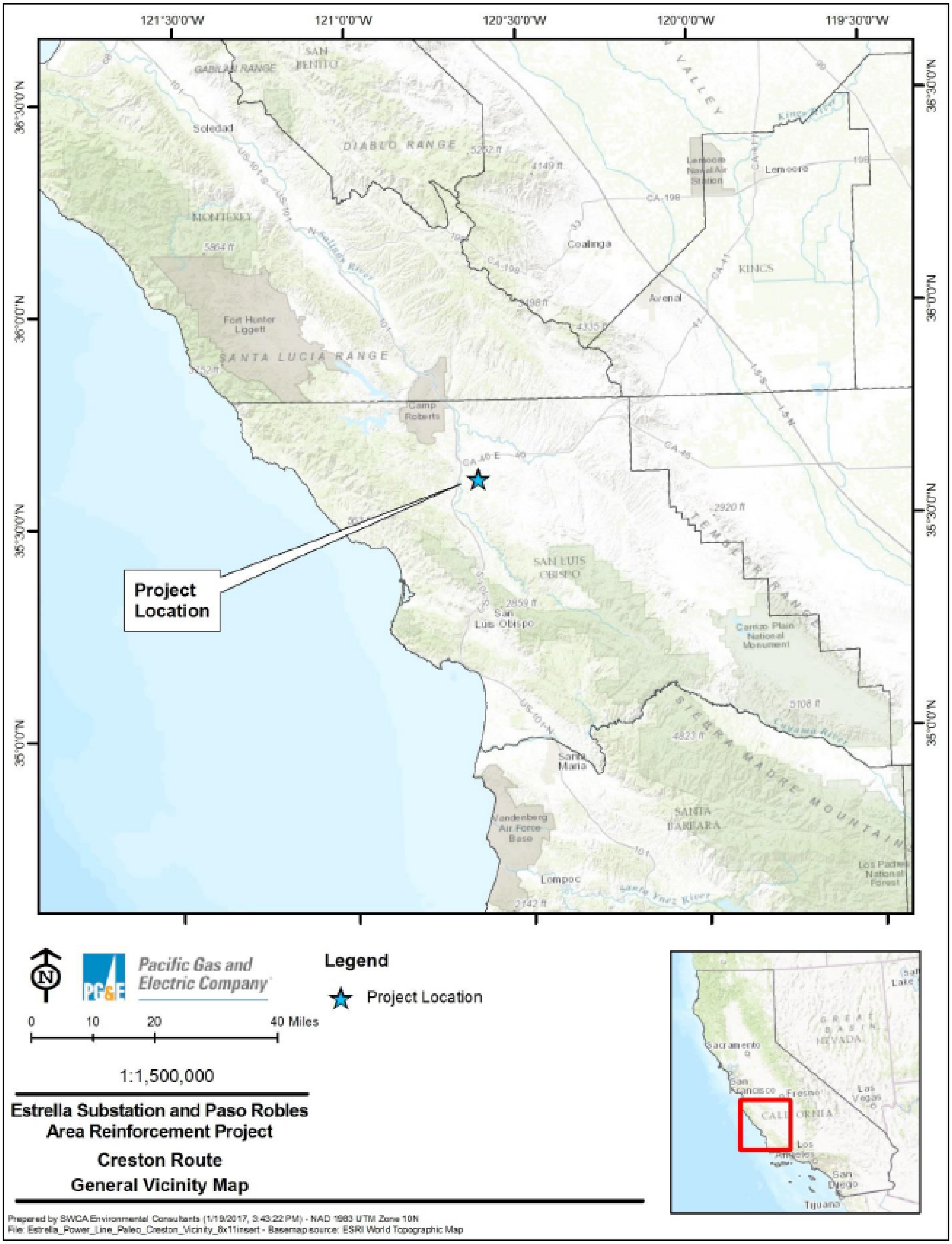
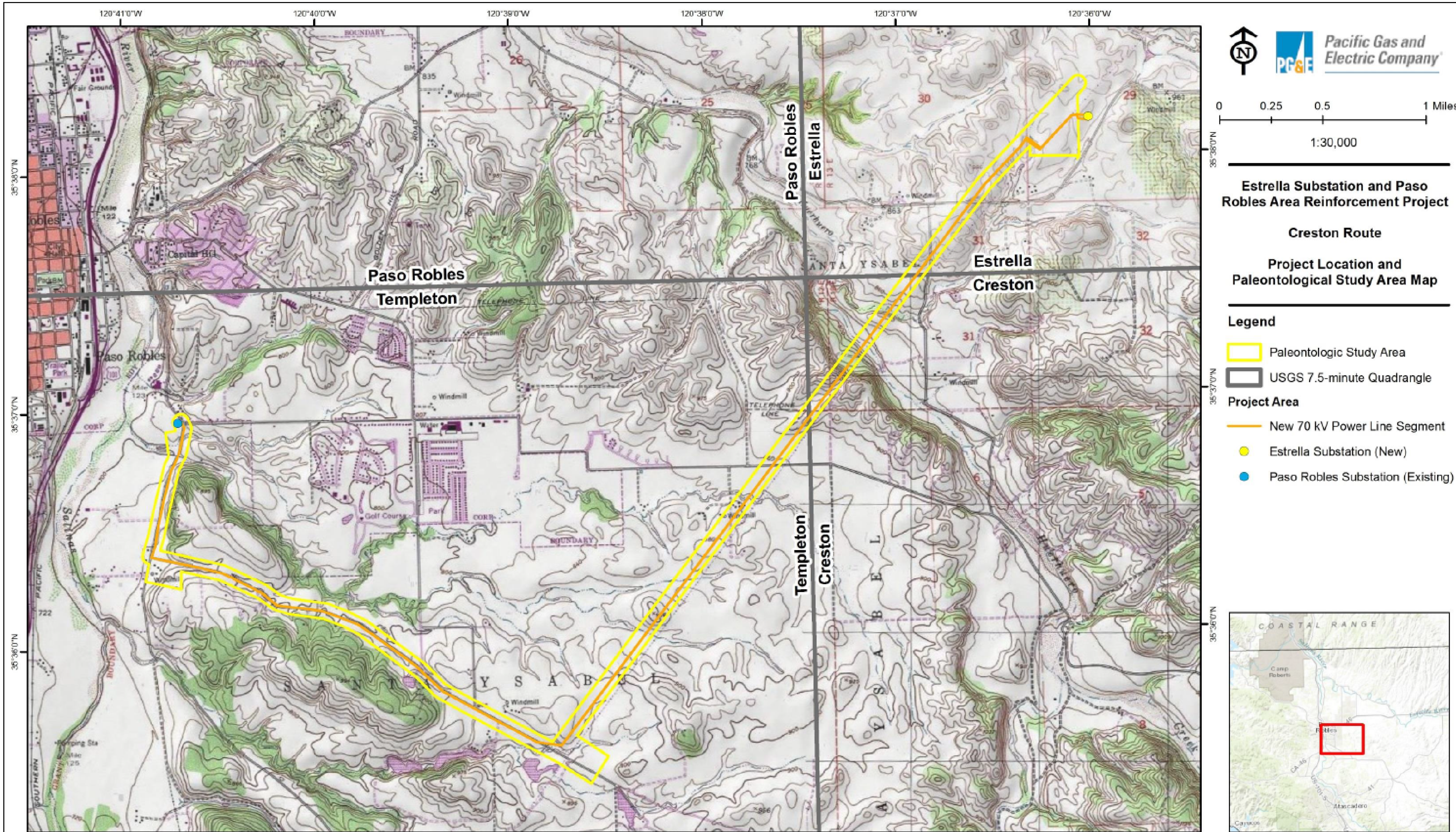


Figure 2. Project Location and Paleontological Study Area Map



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1.2.1 Structures

The new 70 kV power line segment will consist of approximately 7 miles of double-circuit 70 kV line on a combination of lattice steel towers (LSTs), tubular steel poles (TSPs), wood poles, and light-duty steel poles (LDSPs). The portion of the line that will be installed within the existing PG&E transmission corridor will utilize LSTs. The LSTs will be installed generally adjacent to the existing 500 kV towers, utilizing an average span length of approximately 1,100 feet. Each LST will be installed on four individual concrete pier foundations.

The remainder of the new 70 kV power line segment will utilize two types of poles, as follows:

- **Tubular Steel Poles:** In locations where the new 70 kV power line segment is not parallel to the existing Diablo-Gates 500 kV transmission line, TSPs will be typically installed in locations where the alignment changes direction, utilizing an average span length of approximately 300 to 500 feet.

- **Light-Duty Steel Poles:** In locations where the new 70 kV power line segment is not parallel to the existing Diablo-Gates 500 kV transmission line, LDSPs will be typically installed in locations where the alignment is generally straight, utilizing an average span length of approximately 300 to 500 feet.

1.2.2 Staging Areas

The staging areas will be the main base of operations during project construction. They will be the assembly point for project personnel, as well as the location for temporary, portable bathroom facilities; equipment storage during off-work hours and weekends; materials storage; employee parking; office trailer staging; and a meeting area, as needed, for project management.

Two staging areas will be established during project construction. Proposed staging areas examined in the BSA include: (1) an approximately 450-foot by 900-foot workspace located on the southeast corner of Charolais Road and South River Road, and (2) an approximately 800-foot by 1,000-foot workspace located at the eastern end of the project on Creston Road where the alignment turns north (Figure 2). Final staging area sizes will vary depending on negotiations with third-party property owners to establish the staging area's temporary construction easements. If not already provided, in-ground chain-link fencing will be installed around the perimeter of the staging areas for security purposes. Power to staging areas will be supplied by tapping an existing distribution line in the area.

Prior to use, the staging area will be prepared to allow for the safe operation of construction equipment and vehicles. If the selected site is not comprised of a solid earth or concrete/paved foundation, any weeds will be cleared.

1.2.3 Work Areas

Several temporary work areas will be established to facilitate construction of the project. These temporary work areas are also described in further detail in the subsections that follow. The precise locations of the temporary work areas will be determined as part of the final design and may be changed, as necessary, at the time of construction due to land use changes, unanticipated impacts, and other factors. Unless specified in the subsections that follow, all work areas will be accessed from adjacent paved roads, unpaved roads, or site-specific overland access routes. In some locations, work areas may be accessed by footpaths if conditions preclude the use of vehicles. A more detailed description of the project access is included below. Following construction, all temporary work areas will be restored to pre-construction conditions.

1.2.3.1 STRUCTURE WORK AREAS

Structure work areas will be established at each tower/pole that will be installed as part of the project. These work areas will be used to facilitate the tower/pole assembly, erection, and hardware assembly processes. They will also be used to support the conductor installation/removal processes. These work areas will typically be centered on the proposed tower/pole location, and will vary in size from 120 feet by 120 feet to 40 feet by 40 feet, depending on the type of tower/pole being installed. The final tower/pole locations will be determined when engineering is complete and, where feasible, will be adjusted to account for property owner preferences. Structure work areas may also be adjusted to accommodate the final tower/pole locations and to avoid environmental resources. These work areas may be cleared of vegetation and graded, if necessary, prior to their use. Some sites may also require tree trimming, tree removal, and/or vine removal.

1.2.3.2 CROSSING STRUCTURE WORK AREAS

Prior to the installation of new conductors, temporary crossing structures—typically consisting of either vertical wood poles with crossarms or staged construction equipment—will be installed or mobilized at crossings of energized electric lines, communication facilities, and/or major roadways to prevent the conductors from sagging onto other lines or roads during removal or installation. To accommodate the installation of a crossing structure, PG&E will establish a work area measuring approximately 40 feet by 40 feet at each proposed crossing. Preparation of the site will typically be limited to mowing vegetation, as needed, to minimize the risk of fire.

1.2.3.3 PULL AND TENSION SITES

Conductor installation activities will include pull and tension equipment staging, temporary pole anchor installation, and pulling and tensioning of the conductor. Pull sites will typically be located within the easement and can be spaced between 2 and 3 miles apart, or from heavy angle to heavy angle as required by the final design. Access may be required throughout the right-of-way, away from structure work areas and pull sites, to support pull and tension activities. In locations where pulling will be required through an angle, or at the start of a new direction of the alignment, the pull site may be located at an angle outside of the easement or off the end of an easement corner. Pull sites will typically be 70 feet wide and will range between approximately 120 and 150 feet long. The final pull site locations will be determined during final design of the project. All pull sites located outside of paved areas may require vegetation trimming/removal to minimize the risk of fire and, depending on the local terrain, some minor grading may be required to ensure a flat and safe work environment. Depending on the time of year and conditions at the time of construction, gravel may be applied to help stabilize the ground for equipment use.

1.2.3.4 LANDING ZONES

Landing zones may be used during construction for the staging, storage, refueling, and operation of helicopters during construction. The final location and size of the landing zone(s) will be determined near the time of construction due to negotiations with third-party property owners, land use changes, and other factors.

1.2.3.5 ACCESS ROADS / OVERLAND ACCESS ROUTES

Construction crews, materials, and equipment will primarily access the project site by using SR-46, and may use paved and unpaved roads such as Union Road, Penman Springs Road, Linne Road, Hanson Road, Meadowlark Lane, Beechwood Drive, Creston Road, Charolais Road, South River Road, Niblick Road, and other spur roads. In addition to using a system of existing roads, PG&E may also grade or mow new temporary unpaved roads, or travel overland to provide access to Estrella Substation and/or pole locations along the new 70 kV power line segment. Some poles may also be accessed on foot if sensitive resources preclude the use of heavy equipment. Final access routes will be determined at the time of construction due to land use changes, unanticipated impacts, and other factors. Work along the new power line will occur from the road shoulder where feasible. As a result, access roads will generally not be required in these locations.

2 REGULATORY BACKGROUND

Paleontological resources are limited, nonrenewable resources of scientific, cultural, and educational value and are afforded protection under federal (Paleontological Resources Preservation Act [PRPA]), state (California Environmental Quality Act [CEQA]; California Public Resources Code [PRC]), and county (County of San Luis Obispo General Plan) laws, ordinances, and regulations (LORS). This study satisfies project requirements in accordance with CEQA (Title 14, Division 6, Chapter 3, California Code of Regulations [CCR]: 15000 et seq.), and PRC (Chapter 1.7) Sections 5097.5 and 30244. The SVP (1995, 2010) has established professional standards for the assessment and mitigation of adverse impacts to paleontological resources. This analysis complies with these guidelines. The following sections describe specific LORS that are applicable to the new 70 kV power line segment.

2.1 Federal

A federal agency is not approving, implementing, or funding the project or any element of it; therefore, federal ordinances and regulations would not apply to this project.

2.2 State

2.2.1 California Environmental Quality Act

State guidelines for the implementation of CEQA, as amended March 29, 1999 (Title 14, Division 6, Chapter 3, CCR 15000 et seq.) define procedures, types of activities, persons, and public agencies required to comply with CEQA. The guidelines include as one of the questions to be answered in the Environmental Checklist (Appendix G, Section V, Part c) the following: "*Would the project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?*"

CEQA includes in its definition of historical resources, "any object [or] site …that has yielded or may be likely to yield information important in prehistory" (14 CCR 15064.5[3]), which is typically interpreted as including fossil materials and other paleontological resources. More specifically, destruction of a "unique paleontological resource or site or unique geologic feature constitutes a significant impact under CEQA" (State CEQA Guidelines Appendix G). CEQA does not provide an explicit definition of a "unique paleontological resource," but a definition is implied by comparable language within the act relating to archeological resources: "The procedures, types of activities, persons, and public agencies required to comply with CEQA are defined in: Guidelines for the Implementation of CEQA, as amended March 29, 1999" (Title 14, Chapter 3, CCR 15000 et seq.).

CEQA encourages the protection of all aspects of the environment by requiring state and local agencies to prepare multidisciplinary analyses of the environmental impacts of a proposed project, and to make decisions based on the findings of those analyses. Treatment of paleontological resources under CEQA is generally conducted according to guidance from the SVP or other agencies (e.g., BLM, USFS, etc.) and typically includes identification, assessment, and development of mitigation measures for potential impacts to significant or unique resources.

Appendix G (Part V) of the State CEQA Guidelines provides guidance relative to significant impacts on paleontological resources, which states, "a project will normally result in a significant impact on the environment if it will … disrupt or adversely affect a paleontological resource or site or unique geologic feature, except as part of a scientific study."

2.2.2 California Public Resources Code

The PRC (Chapter 1.7, Sections 5097.5 and 30244) includes additional state level requirements for the assessment and management of paleontological resources. These statutes require reasonable mitigation of adverse impacts to paleontological resources resulting from development on state lands, define the removal of paleontological sites or features from state lands as a misdemeanor, and prohibit the removal of any paleontological site or feature from state land without permission of the applicable jurisdictional agency.

PRC Section 30244 requires reasonable mitigation for impacts on paleontological resources that occur as a result of development on public lands. Further, California Penal Code Section 622.5 sets the penalties for damage or removal of paleontological resources.

2.3 Local

Because CPUC has exclusive jurisdiction over the siting, design, and construction of the project, the project is not subject to local discretionary regulations.

3 METHODOLOGY

3.1 Professional Standards

While there is no professional certification for the practice of mitigation paleontology, multiple agencies, professional organizations, and individual paleontologists have developed guidelines for best practices in mitigation paleontology.

The SVP is the largest professional organization of paleontologists and has established standard guidelines that outline professional protocols and practices for conducting paleontological resource assessments and surveys, monitoring and mitigation, data and fossil recovery, sampling procedures, and specimen preparation, identification, analysis, and curation (1995, 2010). Most practicing professional vertebrate paleontologists adhere closely to the SVP's assessment, mitigation, and monitoring requirements as described in the standard guidelines of the SVP. Typically, state regulatory agencies accept and use the professional standards set forth by the SVP.

BLM has also developed a comprehensive set of guidelines for the protection of fossil resources in land-use planning, analysis of potential impacts to fossil resources, development of sensitivity rankings, mitigation and monitoring, and permitting (BLM 2007). Furthermore, a small but significant body of scientific literature exists regarding best practices in paleontological mitigation (Knauss et al. 2014; Murphey et al. 2014) and case studies of successful mitigation projects (for example, see Benson 1998; Haasl et al. 2009; Dundas et al. 2013; Tommassi et al. 2015).

PG&E has compiled a variety of professional standards from some of these sources into a brief collection of guidelines regarding the assessment of paleontological sensitivity and the development of mitigation guidelines (2015).

3.2 Literature Review and Records Search

The new 70 kV power line segment was the subject of thorough background research and analysis, including geologic map and literature reviews, aerial photography, and records searches from the University of California Museum of Paleontology (Finger 2016) and the Natural History Museum of Los Angeles County (McLeod 2016). The purpose of the literature review was to evaluate the paleontological sensitivity of the Creston Route in order to identify known fossil resources within it or nearby in the same geologic formations. The records searches were requested for any previously recorded fossil localities in the power line footprint or within a 1-mile radius. Geotechnical data for the Creston Route was also available (RRC Power and Energy, LLC 2016). These data were combined to develop paleontological sensitivity rankings for the geologic units present in and around the Creston Route.

3.3 Field Inspection

The field inspection was designed to determine the presence of paleontologically sensitive geologic units along the new 70 kV power line segment, both on the land surface and, if possible, in the subsurface. Figure 2 shows the area covered by the field survey. Paleontological surveys are largely dependent on local environmental factors, including topography, erosion, vegetation cover, and human development. Typically, survey routes follow the landscape, with focus given to areas where washes and channels dissect surface deposits and expose layered strata. Because washes collect and concentrate fossils eroded from channel banks, it is more likely they will be observed in these areas, which are also generally free of the soils that may cover fossils. Therefore, the field survey was limited to areas with potential exposure of fossiliferous deposits.

The field survey was conducted by paleontologists between May 16 and 17, 2016. The surveyed area covered the new 70 kV power line segment (Figure 2), as well as potentially informative outcrops in the near vicinity, and did not discover any new paleontological localities. This survey was focused on identifying: 1) surface fossils; 2) exposures of potentially fossiliferous rock; and 3) areas in which fossiliferous rock would be exposed or otherwise impacted during construction. Due to the current agricultural and urban development over large portions of the project area, localities nearby but outside of the project footprint that exposed the surface and subsurface geology were also examined.

4 RESULTS

4.1 Literature Review

4.1.1 Geologic Setting

California comprises the following twelve geomorphic provinces, each distinguished from one another by having 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 (Norris and Webb 1990). The 70 kV power line is located within the central Coast Ranges province, which is bounded to the north by the Klamath Mountains, to the east by the Great Valley, and to the south by the Transverse Ranges (Norris and Webb 1990). The Coast Ranges occupy the Pacific Coast of California from the northern border with Oregon to a point just north of Santa Barbara, a distance of around 590 miles (Norris and Webb 1990). Mountains in the Coast Ranges vary from 2,000 to 6,000 feet above sea level and trend north-west, roughly following the San Andreas Fault (Norris and Webb 1990).

The rocks of the Coast Ranges province are a thick series of Mesozoic and Cenozoic sedimentary strata overlying either the bedrock granites in the Salinian block or the metamorphosed Franciscan complex (Harden 2004). The Franciscan subduction complex consists of metamorphosed sedimentary rocks derived from the rapid erosion of volcanic uplands and their subsequent deposition in deep marine basins during the middle Jurassic (150–165 million years ago [Ma]) (Wakabayashi 2011). The Franciscan is on average 7,600 meters thick and is exposed over an area of around 190,000 square kilometers (Norris and Webb 1990). The Salinian block represents a magmatic arc and consists of metamorphic rocks and granitic plutons varying from granodiorite and quartz monzonite to quartz diorite dating from the Late Cretaceous (69–110 Ma) (Barbeau et al. 2005). After Mesozoic deposition shifted to continental shelf origins, a thick series of Cenozoic sedimentary rocks were deposited in the Coast Ranges, the largest of which is the Miocene Monterey formation (approximately 13–15 Ma), a marine unit characterized by organic deposits (Follmi et al. 2005). During the Pliocene (2.6–5.3 Ma), the sea had withdrawn from most of the Coast Ranges and erosion of the uplands onto valley floors was prominent by the Pleistocene (2.6 Ma) and continues today (Norris and Webb 1990). Coincident with the withdrawal of the sea was the initiation of the Coast Ranges orogeny, creating the topography observed today (Harden 2004).

According to mapping by Dibblee and Minch (2004a, 2004b, 2004c), the Creston Route is underlain by three geologic units: younger alluvial gravel, sand, and clay (Holocene, 0.01 Ma); Quaternary older alluvial sediments (Pleistocene, 0.01–2.6 Ma); and the Pleistocene to latest Pliocene Paso Robles formation (2.6–3.6 Ma). These geologic units and their paleontological resource potential are shown in Figure 3 and discussed in more detail below. A summary of the geologic units present at the surface and likely present in the subsurface of the Creston Route (see discussion in Section 5.3, Potential Fossil Yield Classification System, below) is presented in Table 1.

4.1.2 Geology and Paleontology

4.1.2.1 ALLUVIAL GRAVEL, SAND, AND CLAY

The surficial geology of multiple portions of the Creston Route is made up of Holocene-aged sediments from valley deposits of gravel, sand, and clay (mapped as Qa in Figure 3)—the southwestern-most section of the route along South River Road (roughly 0.6 miles); the southern-most section of the route, along Charolais Road from approximately Otero Lane to Creston Road, and then all along Creston Road (roughly 1.8 miles); and along the central portion of the northeast-southwest portion of the line where it crosses Aaroe Road (roughly 0.4 miles) (Dibblee and Minch 2004a, 2004b, 2004c). This unit is commonly found alongside stream channels and, due to its young age, is unlikely to preserve fossils.

4.1.2.2 QUATERNARY OLDER ALLUVIAL SEDIMENTS

A small portion of the Creston Route crosses Quaternary older alluvial sediments (mapped as Qoa in Figure 3). These sediments occur at the very tip of the southwestern extent of the route (near the intersection of Niblick Road and South River Road) and toward the northeastern end of the route where it crosses Huerhuero Creek (roughly 0.4 miles). These older alluvial sediments are Pleistocene (0.01–2.6 Ma) in age and consist of dissected terraces of gravel and sand (Dibblee and Minch 2004a, 2004b, 2004c). The older alluvial sediments underlie the surficial alluvial sands and gravels (Qa and Qg) in the area, and can be difficult to distinguish from these younger sediments. A number of significant fossil finds, such as fossil horse, bison, camel, ground sloth, and several mammoth specimens, have been reported in the literature from the older alluvial sediments in San Luis Obispo County (Jefferson et al. 1992).

4.1.2.3 PASO ROBLES FORMATION

A large portion of the Creston Route is underlain by the Paso Robles formation (mapped as Qtp in Figure 3). Small patches outcrop in the southwestern portion of the project area along South River Road (roughly

0.3 miles) and Charolais Road, from its intersection with South River Road to around Otero Lane (roughly 0.4 miles). Larger portions of the northeast-southwest portion of the line (three sections of roughly 1.4, 0.5, and 1.5 miles each) are underlain by the Paso Robles formation. The Paso Robles formation dates from the Pleistocene to the latest Pliocene (3.6–2.6 Ma) and consists of weakly indurated pebble, gravel, sand, and clay and includes redeposited materials from the Monterey Shale formation (Dibblee and Minch 2004a, 2004b, 2004c). In some areas, limestone is a minor constituent as well (Woodring and Bramlette 1950). The Paso Robles formation uncomformably overlies the Monterey Shale formation and is exposed almost continuously throughout the upper Salinas Valley (Addicott and Galehouse 1973), including the area around Paso Robles where the Creston Route is located.

The Paso Robles formation contains facies of both marine and nonmarine origins (Woodring and Bramlette 1950), however detailed studies linking fossil preservation to specific facies are not available. Furthermore, as detailed below, fossils are present in both marine and nonmarine sediments of the Paso Robles. Significant fossils were first found in the Paso Robles formation in 1921 with the discovery of a marine mammal identified as an undescribed seal (pinniped) (Kellogg 1921). Additionally, a large number of marine bivalves including *Ostrea vespertina*, *O. atwoodi*, *Nettastomella rostrata*, and *Hinnites giganteus* (Addicott and Galehouse 1973) as well as smaller numbers of fresh-water gastropods and ostracodes (Woodring and Bramlette 1950) have been reported from the Paso Robles formation.

Table 1. Geologic Units within the Area of the Creston Route

Geologic Unit	Age	Lithology
Alluvial gravel, sand, and clay (Qa)	Holocene (0.1 Ma–present)	Weakly consolidated gravels, sands, and clays
Quaternary older alluvium (Qoa)	Pleistocene (2.6–0.01 Ma)	Dissected alluvial gravels and sands
Paso Robles formation (Qtp)	Pleistocene–late Pliocene (3.6–2.6 Ma)	Weakly indurated clays-gravels of marine and nonmarine origins

4.2 Records Search Results

A records search request was submitted to the University of California Museum of Paleontology and the Natural History Museum of Los Angeles County for the Creston Route and a 1-mile radius. The University of California Museum of Paleontology has one fossil locality recorded in the project area, where a baleen whale (Cetotheriidae) was collected in 1928 from what was reported as the Monterey formation. It should be noted that recent geologic mapping has not identified the Monterey formation in the surficial geology of the area (Dibblee and Minch 2004 a, 2004b, 2004c); however, it is known to underlie the Paso Robles formation (Addicott and Galehouse 1973). Within a 1-mile radius of the project area, the Natural History Museum of Los Angeles County has one fossil locality in a wash off Dry Canyon between SR-46 and Union Road preserving fossil specimens of stickleback fish (*Gasterosteus*), giant tortoise (*Geochelone*), and horse (Equidae) in the Paso Robles formation (Qtp) (McLeod 2016). Outside the search radius, but within 15 miles of the Creston Route, the Natural History Museum of Los Angeles County has two fossil localities in Quaternary older alluvium and the University of California Museum of Paleontology has four in Quaternary older alluvium and the Monterey formation.

4.3 Field Inspection and Geotechnical Data

The field inspection did not discover any paleontological resources or any paleontologically sensitive geologic formations on the ground surface along the Creston Route, due to the nearly complete coverage of the area by agricultural and urban development, as seen in Appendix C. Table 2 summarizes the results of the field survey. Additional survey locations identified along roadcuts and streambeds in the area surrounding the Creston Route footprint allowed surveyors to gather basic information about the subsurface geology. Throughout the Creston Route, the majority of the land surface is covered by agriculture, grassland, or human development, preventing the observation of the underlying geology. In general, nonsensitive geologic units such as the Holocene alluvium (Qa) and surface soils range greatly in thickness, from under 1 foot up to 6 feet. One site of note was found which allowed interpretation of the subsurface geology. This site is just to the northeast of the northeastern terminus of the Creston Route, where a cut bank in a dry streambed exposed around 30 feet of subsurface geology, showing approximately 5 to 8 feet of soil formation and younger alluvium overlying and grading into the underlying strata. Comparison of this subsurface strata to the geologic literature indicate the likely presence of Quaternary older alluvium (Qoa) overlying the Paso Robles formation (Qtp). This site is very near to the Creston Route (under 0.5 mile) and mapped as Quaternary older alluvium on the surface (Dibblee and Minch 2004c), and it is reasonable to predict a similar subsurface geology may be found in the northeastern portion of the Creston Route.

Geotechnical data derived from borings taken from a vineyard adjacent to the northeastern terminus of the Creston Route are consistent with the observations of the subsurface geology from just outside of the power line alignment. Borings identified 8 to 12 inches of topsoil overlying sands, clayey sands, clays, and silts (RRC Power and Energy, LLC 2016) that are consistent with the lithologies of the Paso Robles formation as well as Quaternary older alluvium. A more recent geotechnical study collected data from borings along the proposed 70 kV power line route and determined that sediments consistent with topsoil ranged from depths of approximately 1 foot to 5 feet and were underline by sediments consistent with the Paso Robles formation and Quaternary older alluvium (Kleinfelder 2016).

Figure 3. Geologic Map of the Creston Route

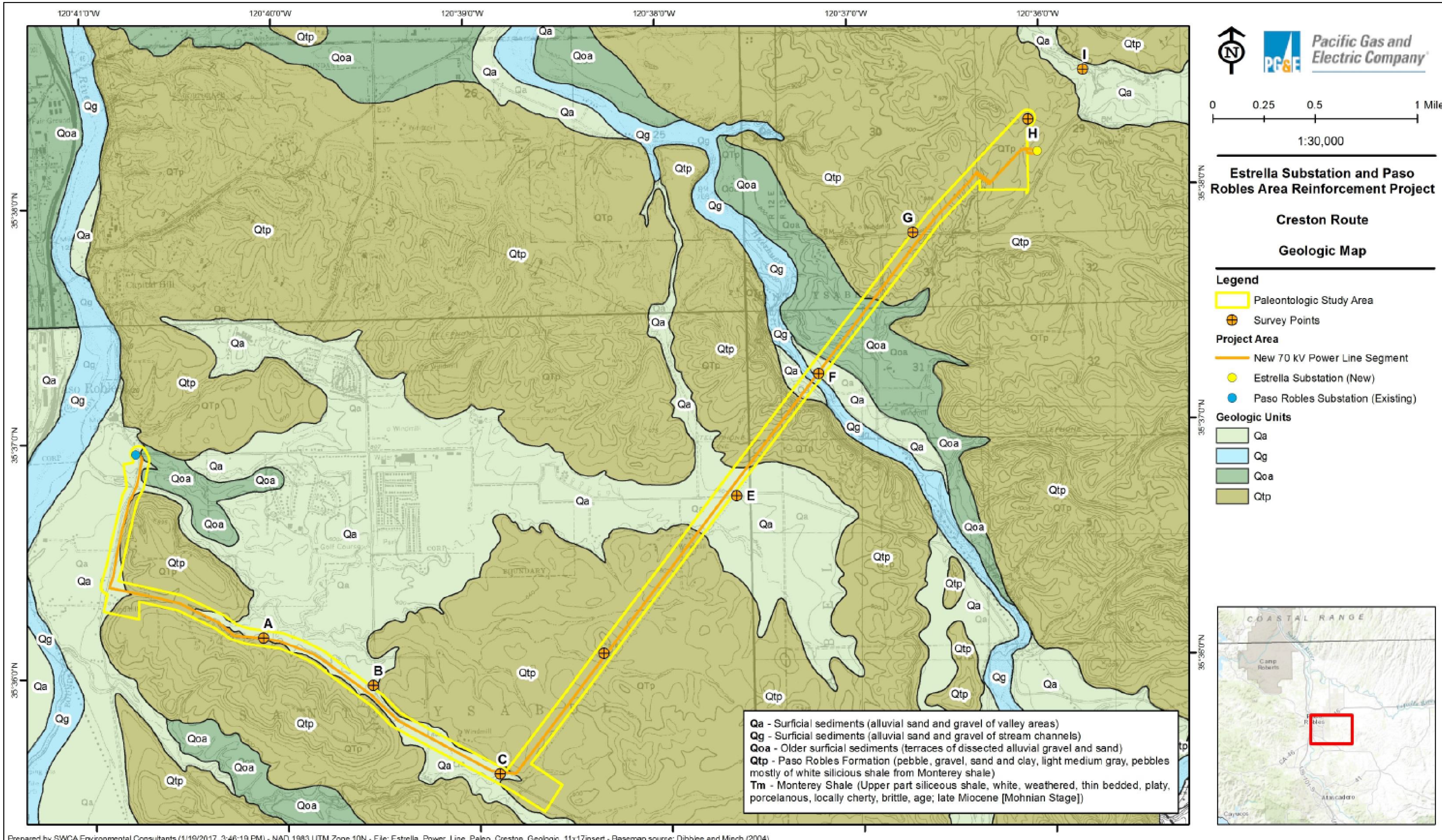

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Table 2. Paleontological Field Inspection Results

Topographic Maps:	Estrella, CA (1979), Creston (2015), and Templeton (2015) USGS 7.5-minute quadrangles
Geologic Maps:	Dibblee, T.W., and J.A. Minch. 2004a. Geologic map of the Templeton quadrangle, San Luis Obispo County, California. Dibblee Geologic Foundation. Map #DF-135. Dibblee, T.W., and J.A. Minch. 2004b. Geologic map of the Creston and Shedd Canyon quadrangles, San Luis Obispo County, California. Dibblee Geologic Foundation. Map #DF-136. Dibblee, T.W., and J.A. Minch. 2004c. Geologic map of the Estrella and Shandon quadrangles, San Luis Obispo County, California. Dibblee Geologic Foundation. Map #DF-138.
Survey Dates:	May 16–17, 2016
Survey Data Points:	
Southern portion of Creston Route, near intersection of Charolais Road and St. Andrews Circle	
Topography:	Low hills
Surface Exposure/Development:	Vineyard, houses
Geologic Description:	None available
Southern portion of Creston Route, near intersection of Charolais Road and Creston Road	
Topography:	Low hills
Surface Exposure/Development:	Roads, houses
Geologic Description:	None available
Southeastern–most point of Creston Route, where route extends NE from Creston Road	
Topography:	Mostly flat
Surface Exposure/Development:	Vineyards, houses
Geologic Description:	None available
Northeastern portion of Creston Route, near intersection of Meadowlark Road and Hanson Road	
Topography:	Rolling hills
Surface Exposure/Development:	Vineyards, vegetation
Geologic Description:	None available
Northeastern portion of Creston Route, near intersection of Aaroe Road and Priska Drive	
Topography:	Mostly flat
Surface Exposure/Development:	Vineyard, grasslands
Geologic Description:	None available
Northeastern portion of Creston Route, at Huerhuero Creek	
Topography:	Dry streambed
Surface Exposure/Development:	Houses, grasslands

Table 2. Paleontological Field Inspection Results

	Geologic Description:	None available
Northeastern portion of Creston Route, along Union Road		
	Topography:	Low hills
	Surface Exposure/Development:	Vineyards, grasslands
	Geologic Description:	None available
Northeastern-most terminus of Creston Route		
	Topography:	Mostly flat
	Surface Exposure/Development:	Vineyard
	Geologic Description:	None available
Northeast of Northeastern-most terminus of Creston Route, off-site cut bank		
	Topography:	Dry stream bed, approximately 30-foot cut bank
	Surface Exposure/Development:	Vineyard, grasses, soils
	Geologic Description:	Soil grades into reddish older alluvium (6–9 feet), overlying yellow-tan Paso Robles formation (approximately 18 feet exposed)

5 PALEONTOLOGICAL SIGNIFICANCE AND SENSITIVITY

The fossil record is the only evidence that life on earth has existed for more than 3.6 billion years. Fossils are considered non-renewable resources because the organisms they represent no longer exist and their value may be greatly diminished or lost entirely in the absence of proper management. Thus, once destroyed, a fossil can never be replaced (Murphey and Daitch 2007). Paleontological resources are objects of national significance that are worthy of preservation for the inspiration and interpretive opportunities they offer. Fossils are important scientific and educational resources and can be used to:

- study the phylogenetic relationships amongst extinct organisms, as well as their relationships to modern groups;
- elucidate the taphonomic, behavioral, temporal, and diagenetic pathways responsible for fossil preservation, including the biases inherent in the fossil record;
- reconstruct ancient environments, climate change, and paleoecological relationships;
- provide a measure of relative geologic dating which forms the basis for biochronology and biostratigraphy, and which is an independent and corroborating line of evidence for isotopic dating;
- study the geographic distribution of organisms and tectonic movements of land masses and ocean basins through time;
- study patterns and processes of evolution, extinction, and speciation; and

- identify past and potential future human-caused effects to global environments and climates (Murphey and Daitch 2007).

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 any remains, imprints, or traces of once-living organisms preserved by natural processes in the geologic record. These include mineralized or un-mineralized bones and teeth, soft tissues, shells, wood, leaf impressions, footprints, burrows, and microscopic remains. Paleontological resources include not only fossils, but also organic matter and the physical characteristics of the associated sedimentary matrix. The geologic character of the rock record preserves the ecological, geographic, and evolutionary context of past life represented by fossils. Scientific importance may be attributed to the actual fossil specimen, to fossil context (e.g., location in time and space, intimate association with other evidence of scientific significance), or to fossil preservation.

5.1 Definitions of Significance and Significance Criteria

In paleontology, the term "significance" refers to the scientific value of a particular fossil or fossil site. A number of federal and professional organizations have developed significance criteria for the evaluation of fossil finds; however, there are currently no criteria under CEQA for determining the significance of a fossil. Instead, CEQA requires consideration of whether an activity will "directly or indirectly destroy a unique paleontological resource or site or unique geologic feature" (State CEQA Guidelines, Appendix G, Section V).

In the absence of a codified definition of significance, the SVP has established working definitions that most practicing professional vertebrate paleontologists adhere to closely (1995, 2010). As defined by the SVP, significant nonrenewable paleontological resources are:

> *...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* (SVP 1995:26).

Furthermore, as defined by the SVP, significant fossiliferous deposits are:

> *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* (1995:26).

Strategies for assessing the significance of a fossil are based on the types of scientific information that can be obtained, and must involve an understanding of the known fossil record and associated research questions relating to a given rock unit or fossil assemblage. The value or importance of different fossils varies, depending on age and depositional environment of the rock unit containing the fossils, their rarity, the extent to which they have already been identified and documented, and the ability to recover similar materials under more controlled conditions (e.g., research project). A fossil must also be in a good state of preservation to be considered significant. Unlike sensitivity determinations (see Section 5.2), significance determinations are made on the fossils themselves.

An individual fossil specimen may therefore be considered unique or significant if it is identifiable and well preserved, and it meets one of the following criteria:

- a type specimen (i.e., the individual from which as species or subspecies has been described);
- a member of a rare species;
- a species that is part of a diverse assemblage (i.e., a site where more than one fossil has been discovered) wherein other species are also identifiable, and important information regarding life histories of individuals can be drawn;
- an element different from, or more complete than, those now available for its species; or,
- a complete specimen.

Some examples of the types of research to which significant fossils may be used are as follows:

- taxonomy – fossils that are scientifically judged to be important for representing rare or unknown taxa, such as defining a new species;
- evolution – fossils that are scientifically judged to represent important stages in evolutionary relationships, to fill gaps, or enhance under-represented intervals in the stratigraphic record;
- biostratigraphy – fossils that are scientifically judged to be important for determining or constraining relative geologic age, or for use in regional to interregional stratigraphic correlation;
- paleoecology – fossils that are scientifically judged to be important for reconstructing ancient organism community structure and interpretation of ancient sedimentary environment; or,
- taphonomy – fossils that are scientifically judged to be exceptionally well or unusually or uniquely preserved, or are relatively rare in the stratigraphy.

5.2 Definitions of Sensitivity and Sensitivity Criteria

Paleontological sensitivity is 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. Occurrences of paleontological resources are closely related to the geologic units in which they are contained, and the potential for finding scientifically important paleontological resources can be broadly predicted by the presence of the pertinent geologic units at or near the surface. Therefore, geologic mapping can be used as a proxy for assessing the potential for occurrences of important paleontological resources. While in some cases it may be possible to specify a smaller unit of geologic interest than the formation, for example, a certain facies or member within a formation with a higher or lower paleontological sensitivity, this is not possible in the region of the project. Neither of the sensitive units, the Paso Robles Formation or the Quaternary older alluvium, have been mapped or studied to such a degree. Furthermore, the presence of ground cover throughout the area prevents more detailed work. The paleontological sensitivities for this project are therefore discussed on a formation level, the finest unit of distinction available.

5.3 Potential Fossil Yield Classification System

BLM devised a system for evaluating the paleontological resource potential of geologic formations. The Potential Fossil Yield Classification (PFYC) system ranks deposits on a 1 to 5 scale, with 5 having the highest potential, and uses geologic mapping as a predictive tool to identify areas of paleontological sensitivity.

Although the project is not situated on BLM land, the PFYC system is meant to provide baseline guidance for predicting, assessing, and mitigating paleontological resources and can provide a useful tool for identifying the potential for impacts and developing mitigation measures, and is identified as the preferred classification system in the PG&E Paleontological Resources Standards and Procedures (2015). The PFYC system is based on the "relative abundance of vertebrate fossils or scientifically significant invertebrate or plant fossils and their sensitivity to adverse impacts, with a higher class number indicating a higher potential" (BLM 2007). This classification is applied to the geologic formation, member, or other distinguishable unit, preferably at the most detailed mappable level. PFYC classification does not reflect rare or isolated occurrences of significant fossils or individual localities, only the relative occurrence on a formation or member-wide basis. Any rare occurrences will require additional assessment and mitigation if they fall within the area of anticipated impacts.

The PFYC System is not intended to be applied to specific paleontological localities or small geographic areas within geologic units. Although significant localities may occasionally occur in a geologic unit, the existence of a few important fossils or localities widely scattered over a large area does not necessarily indicate a higher classification for the unit. The relative abundance of significant localities is intended to serve as the major determinant for the class assignment. The PFYC System is intended to provide baseline guidance for predicting, assessing, and mitigating impacts on paleontological resources.

Guidelines from the BLM describe the PFYC system as follows:

Class 1 – Very Low: Geologic units that are not likely to contain recognizable fossil remains.

- Units that are igneous or metamorphic, excluding reworked volcanic ash units.
- Units that are Precambrian in age or older.

Class 2 – Low: Sedimentary geologic units that are not likely to contain vertebrate fossils or scientifically significant nonvertebrate fossils.

- Vertebrate or significant invertebrate or plant fossils not present or very rare.
- Units that are generally younger than 10,000 years before present.
- Recent aeolian deposits.
- Sediments that exhibit significant physical and chemical changes (i.e., diagenetic alteration).

Class 3 – Moderate or Unknown: Fossiliferous sedimentary geologic units where fossil content varies in significance, abundance, and predictable occurrence; or sedimentary units of unknown fossil potential.

- Often marine in origin with sporadic known occurrences of vertebrate fossils.
- Vertebrate fossils and scientifically significant invertebrate or plant fossils known to occur intermittently; predictability known to be low.
- (or)
- Poorly studied and/or poorly documented. Potential yield cannot be assigned without ground reconnaissance.

Class 3a – Moderate: Units are known to contain vertebrate fossils or scientifically significant nonvertebrate fossils, but these occurrences are widely scattered. Common invertebrate or plant fossils may be found in the area, and opportunities may exist for hobby collecting. The potential for a project to be sited on or impact a significant fossil locality is low, but is somewhat higher for common fossils.

Class 3b – Unknown: Units exhibit geologic features and preservational conditions that suggest significant fossils could be present, but little information about the paleontological resources of the unit or the area is known. This may indicate the unit or area is poorly studied, and field surveys may uncover significant finds. The units in this Class may eventually be placed in another Class when sufficient survey and research is performed. The unknown potential of the units in this Class should be carefully considered when developing any mitigation or management actions.

Class 4 – High: Geologic units containing a high occurrence of significant fossils. Vertebrate fossils or scientifically significant invertebrate or plant fossils are known to occur and have been documented, but may vary in occurrence and predictability. Surface disturbing activities may adversely affect paleontological resources in many cases.

Class 4a: Unit is exposed with little or no soil or vegetative cover. Outcrop areas are extensive with exposed bedrock areas often larger than 2 acres. Paleontological resources may be susceptible to adverse impacts from surface disturbing actions. Illegal collecting activities may impact some areas.

Class 4b: These are areas underlain by geologic units with high potential but have lowered risks of human-caused adverse impacts and/or lowered risk of natural degradation due to moderating circumstances. The bedrock unit has high potential, but a protective layer of soil, thin alluvial material, or other conditions may lessen or prevent potential impacts to the bedrock resulting from the activity.

- Extensive soil or vegetative cover; bedrock exposures are limited or not expected to be impacted.
- Areas of exposed outcrop are smaller than 2 contiguous acres.
- Outcrops form cliffs of sufficient height and slope so that impacts are minimized by topographic conditions.
- Other characteristics are present that lower the vulnerability of both known and unidentified paleontological resources.

Class 5 – Very High: Highly fossiliferous geologic units that consistently and predictably produce vertebrate fossils or scientifically significant invertebrate or plant fossils, and that are at risk of human-caused adverse impacts or natural degradation.

Class 5a: Unit is exposed with little or no soil or vegetative cover. Outcrop areas are extensive with exposed bedrock areas often larger than 2 acres. Paleontological resources may be susceptible to adverse impacts from surface disturbing actions. Unit is frequently the focus of illegal collecting activities.

Class 5b: These are areas underlain by geologic units with high potential but have lowered risks of human-caused adverse impacts and/or lowered risk of natural degradation due to moderating circumstances. The bedrock unit has very high potential, but a protective layer of soil, thin alluvial material, or other conditions may lessen or prevent potential impacts to the bedrock resulting from the activity.

- Extensive soil or vegetative cover; bedrock exposures are limited or not expected to be impacted.
- Areas of exposed outcrop are smaller than 2 contiguous acres.
- Outcrops form cliffs of sufficient height and slope so that impacts are minimized by topographic conditions.
- Other characteristics are present that lower the vulnerability of both known and unidentified paleontological resources.

5.4 Determination of Sensitivity for Geologic Units within the Vicinity of the Creston Route

The literature and museum records searches and the field survey enable the geologic units in the vicinity of the Creston Route to be assigned PFYCs. These classifications are shown in Table 3 and their approximate locations are detailed in Table 4. The alluvial unit (Qa) is Holocene and therefore too young to preserve fossils, resulting in a PFYC ranking of Low (Class 2). Both the Quaternary older alluvium (Qoa) and the Paso Robles formation (Qtp) are known to be fossiliferous and have produced scientifically significant localities in the past. This is indicated by numerous papers published in the scientific literature on fossils from those units (e.g., Addicott and Galehouse 1973; Jefferson 1992; Kellogg 1921; Woodring and Bramlette 1950) as well as the records search results from both the University of California Museum of Paleontology (Finger 2015) and the Natural History Museum of Los Angeles County (McLeod 2015). Therefore, based on the PFYC system developed by BLM (2007), both these units should be classified as Class 4b, high with ground cover (Figure 4).

Table 3. Paleontological Sensitivity of Geologic Units in the Vicinity of the Creston Route

Geologic Unit	Age	Potential Fossil Yield Classification
Alluvial gravel, sand, and clay (Qa)	Holocene (0.1 Ma–present)	Low – Class 2
Quaternary older alluvium (Qoa)	Pleistocene (2.6–0.01 Ma)	High – Class 4b
Paso Robles formation (Qtp)	Pleistocene–late Pliocene (3.6–2.6 Ma)	High – Class 4b

Table 4. Approximate Locations of Geologic/Sensitive Units Along the Creston Route

Geologic Unit	Location in Project Area
Alluvial gravel, sand, and clay (Qa)	Sediments occur along the southwestern-most section of the route along South River Road; the southern-most section of the route, along Charolais

	Road from approximately Otero Lane to Creston Road, and along Creston Road; and along the central portion of the line where it crosses Aaroe Road
Quaternary older alluvium (Qoa)	Sediments occur at the very tip of the southwestern extent of the route (near the intersection of Niblick Road and South River Road) and toward the northeastern end of the route where it crosses Huerhuero Creek
Paso Robles formation (Qtp)	Sediments occur in the southwestern portion of the line along South River Road and Charolais Road, from its intersection with South River Road to around Otero Lane; and along the northeast to southwest portion of the line

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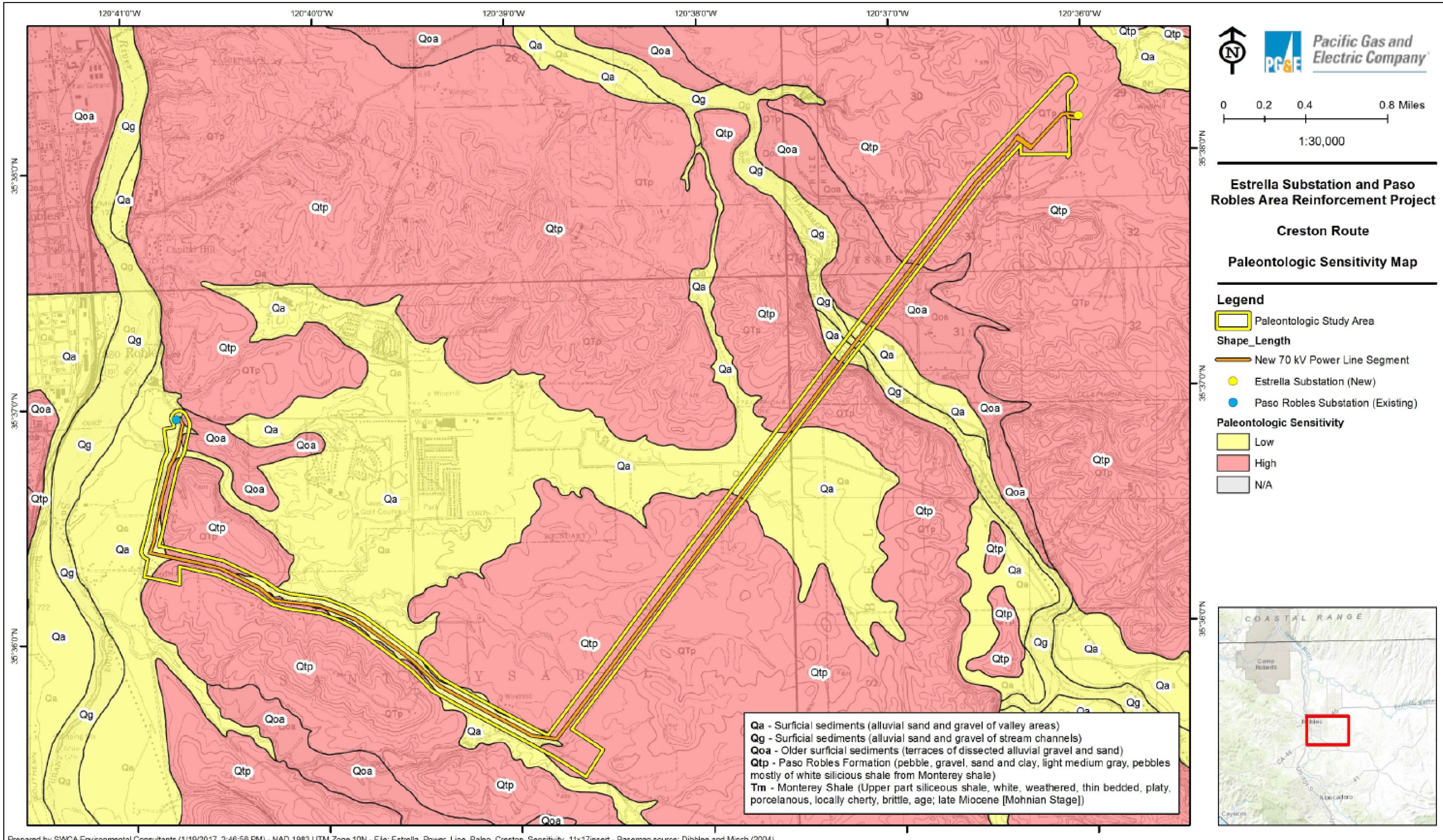
Figure 4. Paleontological Sensitivity for the Creston Route



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7 LIST OF PREPARERS

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- Amanda Tyrrell, M.S., Project Manager

Appendix A.
Records Search Results – University of California Museum of Paleontology (Confidential)

Appendix B.
Records Search Results – Natural History Museum of Los Angeles County (Confidential)

Appendix C.
Photographs

Photo 1. South-facing view of field and landscaping at Survey Point A in the southern portion of the Creston Route, along Charolais Road.

Photo 2. Northern view of a house and road at Survey Point B in the southern portion of the Creston Route, along Charolais Road.

Photo 3. Northern view of fields and a vineyard at Survey Point C in the southern portion of the Creston Route, along Creston Road.

Photo 4. Northeastern view of a vineyard and housing at Survey Point H in the northeastern portion of the Creston Route.

Photo 5. North-facing cut bank in Dry Creek showing the subsurface geology of an area less than 1 kilometer northeast of the Creston Route at Survey Point I. For scale, the individual shown is 6'2" tall. Dashed line represents the approximate boundary between the overlying alluvial sediments and the underlying Paso Robles formation.

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Appendix D. Resumes

ALYSSA BELL, PH.D., PRINCIPAL INVESTIGATOR

As a paleontological principal investigator, Dr. Bell has supervised field work, authored project reports, and provided scientific and compliance direction and quality control for SWCA's paleontological projects throughout California. Aside from her work with SWCA, Dr. Bell is a postdoctoral research assistant at the Dinosaur Institute of the Natural History Museum of Los Angeles County. There she is involved in pursuing her own research into fossil birds as well as working with the Institute's field projects and museum-wide education and outreach initiatives. Dr. Bell has accumulated a wealth of field experience, working with crews from a variety of institutions on field sites in Arizona, California, Montana, New Mexico, South Dakota, and Utah, as well as leading her own expeditions in Montana. She has published nine peer-reviewed articles or book chapters and given numerous presentations at scientific conferences on both her paleontological and microbiological research.

YEARS OF EXPERIENCE

8

EXPERTISE

Vertebrate Paleontology – field and lab work

Environmental microbiology – pollutant source tracking

EDUCATION

Ph.D., Vertebrate Paleontology; University of Southern California; 2013

M.S., Environmental Microbiology; University of Tennessee; 2007

B.A. with honors, Ecology and Systematics; William JewellCollege&Homerton College, Cambridge University; 2004

SELECTED PROJECT EXPERIENCE (* denotes project experience prior to SWCA)

SCE CWA 948 CRNR Kernville Service Center Project; Kern County, California; Southern California Edison Company. *Role: Principal Investigator. Authored the paleontological resources analysis for the Kernville Service Center development.*

Shafter Wasco Irrigation District Natural and Cultural Resource Evaluations and Air Quality; Kern County, California; Provost & Pritchard Consulting Group. *Role: Principal Investigator. Reviewed and edited the paleontological evaluation report.*

Valentine Solar Project Environmental Impact Report; Kern County, California; Quincy Engineering. SWCA is providing comprehensive biological, cultural, and paleontological surveys to support the preparation of an EIR and other permitting requirements for a proposed 2,000 acre solar project located in the Antelope Valley portion of Kern County, California. *Role: Principal Investigator. Reviewed and edited the paleontological evaluation report.*

Valentine Solar EIR 115MW Supplemental Reports; Kern County, California; Provost & Pritchard Consulting Group. *Role: Principal Investigator.*

SCE CWA 1020 Circle City Substation and Mira Loma-Jefferson Subtransmission Line Project; Riverside and San Bernardino Counties, California; Southern California Edison Company. *Role: Principal Investigator.*

SCE CWA 629 Fogarty Substation Getaway Install Archaeological and Paleontological Monitoring, Riverside County; Riverside County, California; Southern California Edison Company. *Role: Principal Investigator.*

El Camino Real Bridge Replacement Environmental Services; San Luis Obispo County, California; Quincy Engineering. SWCA is providing environmental services, including preparation of all CEQA/NEPA documentation, technical studies, and permitting, for the replacement of the El Camino Real bridge over Santa Margarita Creek in Atascadero. *Role: Principal Investigator. Reviewed and edited the paleontological evaluation report.*

Shasta Project Baseline Studies-Paleontology; White Pine County, Nevada; NOV Wellbore Technologies. *Role: Principal Investigator.*

Blythe Solar Power Project, Units 1 & 2; Blythe, Riverside County, California: AECOM Technical Services and Dudek. SWCA is conducting paleontological monitoring of preconstruction activities for a solar photo-voltaic cell power-generating facility outside the City of Blythe. *Role: Project paleontologist. Oversight and management of paleontological monitors and development of final monitoring report.*

City of Colton Industrial Project Environmental Impact Report; San Bernardino County, California; PlaceWorks. A 6-acre industrial project at the southwest corner of Agua Mansa Road and Rancho Avenue in the City of Colton. SWCA provided historic, cultural resources, and paleontological resources study for the project site. *Role: Principal Investigator.*

City of Hope Specific Plan and Environmental Impact Report; Duarte, Los Angeles County, California; PlaceWorks. *Role: Principal Investigator.*

SCE CWA 174 ACTR/Natural Sub 29 Bores; Los Angeles County, California; Southern California Edison Company. *Role: Principal Investigator.*

Natural and Cultural Support for the Gordon Mull Subdivision Environmental Impact Report; Glendora, Los Angeles County, California; Terry A. Hayes Associates, LLC. SWCA was selected to prepare an EIR for in Support of Environmental Impact Report for the Gordon Mull Subdivision, City of Glendora, Los Angeles County, California. The project is proposing to redevelop a 71-acre, 19-lot located in the San Gabriel Foothills. Under the current contract, SWCA biology and cultural resources staff are collecting data to prepare respective resources and mitigation sections for an EIR overseen by TAHA staff. *Role: Principal Investigator.*

ICHA Area 10 (PA 10-2 & 10-4) Archeological and Paleontological Monitoring; Irvine, Orange County, California: California Pacific Homes. SWCA is conducting archaeological and paleontological monitoring of preconstruction activities in support of a housing development project at the University of California, Irvine. *Role: Principal Investigator. Management of the curatorial process for the fossils collected during monitoring and author of final reporting.*

Lake Elsinore Lakeshore Town Center Permitting; Riverside County, California; Mebo Properties Development LLC. *Role: Principal Investigator.*

Mojave Solar Project Paleontological Reporting; San Bernardino County, California; CH2M Hill. SWCA is providing environmental services, including paleontological monitoring of construction activities in support of a solar field development project. *Role: Principal Investigator. Reviewed and edited the paleontological resources report.*

NAVFAC SW TO3 Barstow ICRMP Update; Barstow, San Bernardino County, California; NAVFAC SW. SWCA completed 7 ELINs related to update of the Barstow ICRMP. These services include historic resources survey and evaluation, archaeology, and reporting. *Role: Principal Investigator.*

Coachella Flats Wind Energy Repower Environmental Surveys; Palm Springs, Riverside County, California; New Dimension Energy Company. *Role: Principal Investigator.*

OTO Hotels Santa Monica Archaeological and Paleontological Services; Santa Monica, Los Angeles County, California; OTO Development, LLC. SWCA provided paleontological monitoring and mitigation services during construction excavations and grading. Services included implementation of a paleontological mitigation monitoring program and reporting. *Role: Principal Investigator.*

San Pedro Plaza Park - Phase III Archaeological Monitor; Los Angeles, Los Angeles County, California; City of Los Angeles. *Role: Principal Investigator.*

Sixth & Bixel Paleontological Monitoring Services Project; Los Angeles, Los Angeles County, California; Holland Partners. SWCA is conducting paleontological monitoring of construction activities in support of a development project encompassing two parcels in downtown Los Angeles. Monitors identified and recovered numerous significant vertebrate fossils. *Role: Principal Investigator. Supervised the excavation of fossilized whale remains discovered onsite, managed curatorial process for all fossils collected during monitoring, author of final reporting.*

Suncrest Project Environmental Planning and Compliance Services; Contra Costa County, California; NextEra Energy Transmission LLC. *Role: Principal Investigator.*

Tesla-Newark 230kV Path; Newark, County, California; Confidential. CONFIDENTIAL *Role: Principal Investigator.*

PA 10-3 Archaeological Monitoring; Irvine, Orange County, California; California Pacific Homes. *Role: Principal Investigator.*

Washington National Archaeological and Paleontological Monitoring (Access Culver City); Culver City, Los Angeles County, California; GDCV Culver City, LLC. SWCA implemented an archaeological and paleontological mitigation monitoring program during project grading, as well as archaeological feature and artifact identification, recordation, and recovery; laboratory preparation, identification, analysis, and curation preparation of archaeological materials; and reporting. *Role: Principal Investigator.*

Web-based Countywide Plan and Environmental Impact Report; San Bernardino County, California; PlaceWorks. *Role: Principal Investigator.*