8.16 Paleontological Resources

8.16.1 Introduction

The Eastshore Energy Center (Eastshore) will be a nominal 115.5-megawatt (MW) intermediate/peaking load facility operating up to 4,000 hours per year using natural gas-fired reciprocating engine technology. The Eastshore facility will be located at 25101 Clawiter Road in the City of Hayward, Alameda County, California, on a 6.22 acre parcel owned by Eastshore Energy, LLC, the project owner. Major features of the Eastshore project include the following:

- Demolition of the existing site building, foundations and paved surface,
- Grading of site and installation of new foundations, piping and utility connections,
- Fourteen (14) nominal 8.4 MW (gross) Wartsila model 20V34SG natural gas-fired reciprocating engine – generator sets,
- Fourteen (14) state-of-the-art air pollution control systems representing Best Available Control Technology (BACT), one system per each of the 14 engines, consisting of a selective catalytic reduction (SCR) unit for oxides of nitrogen (NOx) control and an oxidation catalyst unit for carbon monoxide (CO) and precursor organic compounds (POC) control,
- Fourteen (14) approximately 70-foot tall stacks, each with a separate continuous emissions monitoring system (CEMS),
- Acoustically-engineered main building enclosing all 14 engines,
- Closed loop cooling system consisting of multiple fan-cooled radiator assemblies outside of the main engine building,
- Two 10,000 gallon (each) aqueous (19% by weight) ammonia storage tanks and handling system serving the SCR units,
- One raw water storage tank, approximately 35,000 gallons,
- One nominal 225–kW diesel-fired emergency black start generator,
- One (1) either electric or 7.15 MMBtu/hr natural gas-fired heater (BAAQMD exempt), used for heating of the natural gas fuel to the reciprocating engines,
- Miscellaneous ancillary equipment,
- Pre-existing onsite water and wastewater service interconnections,
- Onsite 115 kV switchyard including switchgear and step-up voltage transformers,
- Approximately 1.1-mile 115 kV single-circuit transmission line interconnecting to PG&E's Eastshore Substation,
- Approximately 200-foot offsite natural gas line connection to PG&E Line 153,

- Chain-link security fencing enclosing the facility with a secured entrance on Clawiter Road, and
- 4.65-acre temporary construction laydown and parking area located immediately across Clawiter Road from the Eastshore site.

Paleontological resources (fossils) are the remains or traces of prehistoric animals and plants. This section assesses the potential that earth-moving activities associated with construction and operation of the proposed Eastshore Energy Center (Eastshore) and associated linear facilities will impact scientifically important fossil remains. Section 8.16.1 provides the introduction, and Section 8.16.2 presents applicable laws, ordinances, regulations and standards (LORS) relating to paleontological resources. Section 8.16.3 discusses the affected environment, and Section 8.16.4 potential environmental impacts of construction and operation. Section 8.16.5 addresses potential impacts from project closure/abandonment. Section 8.16.6 addresses cumulative impacts while Section 8.16.7 describes proposed mitigation measures. Section 8.16.8 references agency contacts. Section 8.16.9 presents permit requirements and schedules. Section 8.16.10 contains a list of references cited.

The analysis presented in this section meets all requirements of the California Energy Commission Appendix B Section (g)(16) and incorporates the Society of Vertebrate Paleontology (SVP, 1995, 1996) standard measures for mitigating adverse construction-related environmental impacts on paleontological resources.

8.16.2 Laws, Ordinances, Regulations, and Standards (LORS)

Paleontological resources are non-renewable scientific resources and are protected by several federal and state statutes, most notably by the 1906 Federal Antiquities Act and other subsequent federal legislation and policies and by the State of California's environmental regulations (CEQA, Section 15064.5). Professional standards for assessment and mitigation of adverse impacts on paleontological resources have been prescribed for vertebrate fossils by the SVP (1995, 1996). Design, construction, and operation of Eastshore, including pipelines, transmission line and ancillary facilities, will be conducted in accordance with all LORS applicable to paleontological resources. Federal and state LORS applicable to paleontological resources are summarized in Table 8.8-1 and discussed briefly below, along with SVP professional standards.

TABLE 8.16-1
Applicable LORS Regarding Paleontological Resources

LORS	Applicability	AFC Reference	Project Conformity
Antiquities Act of 1906	Not applicable	-	-
CEQA, Appendix G	Fossil remains may be encountered by earth-moving activities	Section 8.16.2 and 8.16.4	Yes
Public Resources Code, Sections 5097.5/5097.9	Would apply only if project required land owned by the state	-	-

8.16.2.1 Federal LORS

Federal protection of paleontological resources would apply to Eastshore if any construction or other related project impacts were to take place on federally-managed lands, or if certain federal entitlements were required. Federal legislative protection for paleontological resources stems from the Antiquities Act of 1906 (PL 59-209; 16 United States Code 431 et seq.; 34 Stat. 225), which calls for protection of historic landmarks, historic and prehistoric structures, and other objects of historic or scientific interest on federal land. The project does not cross such lands, and no federal entitlement is required that would involve paleontological resources mitigation requirements. Federal requirements would apply if a Federal agency obtained ownership of project lands during the term of the project license.

8.16.2.2 State LORS

Paleontological resources are a limited, nonrenewable sensitive scientific and educational resource and, in California, are afforded protection under state environmental legislation, specifically the California Environmental Quality Act (CEQA; California Office of Historic Preservation, 1983). CEQA (Public Resources Code: 21000 et seq.) requires public agencies and private interests to identify the environmental consequences of their proposed projects on any object or site significant to the scientific annals of California (Division I, Public Resources Code: 5020.1[b]).

Guidelines for the Implementation of CEQA, as amended March 29, 1999 (Title 14, Chapter 3, California Code of Regulations: 15000 et seq.) defines procedures, types of activities, persons, and public agencies required to comply with CEQA and includes definitions of significant impacts on a fossil site (Section 15023, Appendix G [5.c]).

Public Resources Code, Section 5097.5 (Stats. 1965, c. 1136, p. 2792) defines any unauthorized disturbance or removal of fossil site or remains on public land as a misdemeanor.

Warren-Alquist Act (Public Resources Code 25000 et seq.) requires CEC to evaluate energy facility siting in areas of scientific concern (Section 25527).

In response to CEQA and subsequent acts, many agencies in California, including the CEC (2000), have developed environmental guidelines for protecting paleontological resources in areas under their respective jurisdictions. Under its guidelines, the CEC requires a paleontological resource inventory/impact assessment of an area to be adversely impacted by a discretionary project deemed nonexempt under its guidelines. As part of such an assessment, an inventory of fossil-bearing rock units and previously recorded fossil sites in the area to be affected is made by a qualified paleontologist. This is followed by an evaluation of the scientific importance of these resources, a determination of the adverse environmental impacts that might arise from the project, and formulation of measures to mitigate these impacts to an insignificant level. Such an assessment was conducted for the nearby Russell City Energy Center (RCEC) Application for Certification (AFC) because of the potential for earth-moving activities associated with project construction to result in impacts to fossil remains there. The results of the *Paleontological Resource Inventory/Impact Assessment Technical Report* prepared for the RCEC project (CBJD, 2001) were reviewed for this AFC, and are incorporated as appropriate into this study (e.g., Section 8.16.3).

This AFC, including the mitigation measures presented herein, complies with CEC (2000) guidelines for addressing impacts to paleontological resources. They are also consistent with SVP (1995 and 1996) standard measures for assessing the scientific importance of paleontological resources in an area of potential environmental effect, mitigating significant adverse construction-related environmental impacts on these resources, and with conditions for acceptance of an impact mitigation program fossil collection by a museum repository.

8.16.2.3 Local LORS

There are no Alameda County or City of Hayward LORS that would apply to paleontological resources. However, it is appropriate to note that the County is host to the University of California Museum of Paleontology at Berkeley (UCMP), the state's premier repository for paleontological specimens and data in central and northern California.

8.16.3 Affected Environment

8.16.3.1 Geographic Location and Physiographic Setting

The results of the *Paleontological Resource Inventory/Impact Assessment Technical Report* prepared for the RCEC project (CBJD, 2001) were reviewed for this AFC. Because this site lies only one-half mile to the southwest and is in the same geological setting, the results of this AFC provide the majority of information relied upon in the Affected Environment (8.16.3) section of this report. In addition, a project-specific review was conducted of the paleontological sites recorded in this area using the UCMP's on-line search tool.

The Eastshore project area is located on a gently sloping alluvial fan about 1.5 miles east of the southeastern shore of San Francisco Bay. Physiographically it is centrally located within the Coast Ranges province, in west-central California. The Bay itself fills a northwest trending structural depression in the central Coast Ranges, lying between the San Andreas Fault to the southwest, and the Hayward Fault to the northwest. The project area is bounded on the east by the foothills of the Diablo Range which is divided into two separate blocks, with the Berkeley Hills forming the western most ridges. On the west and southwest, the project area is bounded by the Bay and, historically, the sloughs and tidal channels associated with the mouths of Alameda and Mt. Eden Creeks.

The alluvial fan toes and flood basins surrounding the Bay have frequently been referred to as the Bay plain (Robinson, 1956). Some authors have used the term Bay plain to include all the area that lies between the Bay tidal flats and the foothills of Berkeley Hills. However, the Bay plain as defined by Finlayson et al. (1967) is "that area surrounding San Francisco Bay which has an elevation between lower low tide and higher high tide." Simply defined, the Bay plain is intertidal and distinct from adjacent areas of higher relief which are not affected by the tides.

There are two major physiographic units in the immediate area: tidally influenced Bay plain and the adjacent terrestrial environment of the alluvial fans extending down from the highlands to the east. The project facilities are on the toe of the Ward Creek alluvial fan. Additionally, the project area is north of the Alameda Creek alluvial fan which is also referred to as the "Niles Cone" (Finlayson et al., 1967, 1968). In this report the terms "Ward Creek alluvial fan," "Niles Cone," and "Alameda Creek alluvial fan" apply to all the area

that lies between the Bay tidal flats and the foothills of the Berkeley Hills, sometimes also called the East Bay Hills.

8.16.3.2 Regional and Local Geologic Setting

Regional surficial geologic mapping of the project site and vicinity is provided by Graymer (2000) at a scale of 1:50,000. This mapping indicates that the entire project site is underlain by unconsolidated Holocene age alluvial fan deposits equivalent to Lawson's (1914) Temescal Formation, which also includes recent Bay muds and "salt-marsh deposits" (Trask and Rolston, 1951, Atwater et al., 1977). Older, Pleistocene-age alluvial fan and mud deposits called the Alameda Formation underlay the Temescal formation at the project site. In some areas the transition between the Temescal and the older Alameda formation occurs at a depth of approximately 12 to 15 feet (Atwater et al., 1977).

The distinction between the Bay plain fill and the alluvial fans is based on tidal influence according to Finlayson and others (1967; 1968). The north and south boundaries of the Ward Creek alluvial fan are marked by topographic lows that separate the alluvial fan from the alluvial fans of Alameda Creek and San Lorenzo Creek. The sediments of the toe of the Ward Creek alluvial fan consists of medium to fine grained clastics eroded primarily from the Berkeley Hills. These are poorly sorted, lenticular, alluvial sand, silt, and gravel that range from Pleistocene to Holocene in age (CBJD, 2001). The Bay plain sediments consist of poorly consolidated estuarine sands and muds, and are entirely of Holocene age, the post-glacial rising sea level not reaching this area until after 10,000 B.P. (years before present; Atwater et al., 1977).

8.16.3.3 Stratigraphic and Paleontological Resource Inventory

A stratigraphic inventory and a paleontological site inventory were completed to develop a baseline paleontological resource inventory of the project site and surrounding area, and to assess the potential paleontological productivity of each rock unit. Research methods included a review of published and unpublished literature (including previous environmental impact review documents) and supplemented by an archival search using the UCMP database and on-line search tool on June 27, 2006. These tasks complied with CEC (2000) and SVP (1995) guidelines.

Geological maps and reports covering the geology of the project site and area were reviewed to determine rock units present and to determine their respective distributions in the project area. Published and unpublished geological and paleontological literature was reviewed to document the number and locations of previously recorded fossil sites from rock units exposed in and near the project site and surrounding area, and the types of fossil remains each rock unit has produced. The results of the record search conducted using the UCMP website, as well as information from the *Paleontological Resource Inventory/Impact Assessment Technical Report* prepared for the RCEC project (CBJD, 2001), are incorporated herein.

8.16.3.3.1 Paleontological Resource Assessment Criteria. The paleontological sensitivity of the project area is assessed by determining the paleontological potential of stratigraphic units within the project area through records search and literature review. Since the distribution of stratigraphic units can be identified through geologic mapping, parts of the project area that have varying paleontological sensitivity (high, moderate, low, or no sensitivity) for

paleontological resources can be delineated and appropriate impact assessments and mitigation recommendations formulated based on these determinations.

A paleontologically sensitive stratigraphic unit is a sedimentary deposit or sedimentary rock that has a high or moderate potential to yield fossils that may be unique and/or scientifically important. The paleontological sensitivity of a stratigraphic unit is based on the abundance or density of fossil specimens previously recovered from that unit, and the proximity of those records to the project site. In this context it is important to note that well-researched and documented fossil-bearing units may still yield unique and scientifically important paleontological resources because fossil assemblages frequently consist of many rare taxa, as well as a few common ones.

Paleontological survey or field reconnaissance can inform these assessments where geological exposures are available for inspection. However, a field survey would not contribute to an assessment of paleontological sensitivity in the case of the Eastshore project, because the area is thoroughly urbanized and therefore the ground surface is largely obscured, or consists of disturbed fill of uncertain provenance.

An individual fossil specimen may be considered unique or scientifically significant if it is 1) identifiable, 2) complete, 3) well preserved, 4) age diagnostic, 5) useful in paleoenvironmental reconstruction, 6) a type or topotypic specimen, 7) a member of a rare species, and/or (8) a skeletal element different from, or a specimen more complete than, those now available for its species. For example, identifiable vertebrate marine and terrestrial fossils are generally considered scientifically important because they are relatively rare. The value or importance of different fossil groups varies, depending on the age and depositional environment of the rock unit that contains 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 such as part of a research project. For example, microfossils such as pollen, radiolarians, dinoflagelates, and diatoms may be important to specialized paleoenvironmental studies, but as isolated samples they are generally not considered a unique or significant paleontological resource.

8.16.3.4 Paleontological Resource Inventory Results

Regional surficial geologic mapping of the project site and vicinity is provided by Goldman (1969) and Finlayson et al. (1967). Atwater et al. (1977) created three separate 1:250,000 cross-sectional maps across the San Francisco Bay. Larger scale mapping of the project site (1:24,000 to 1:62,500 scale) is provided by Lawson (1914), Robinson (1956), Helley et al. (1979), Dibblee (1980), Helley and Miller (1992), and Graymer (2000).

8.16.3.4.1 Stratigraphic Inventory. The Berkeley Hills to the east have a complex and well-studied geology that includes both Mesozoic and Tertiary marine and continental rocks. However, the Eastshore project site and its laterals are more than 3 miles from these outcrops at the toe of the alluvial fan that extends away from the hills. Consequently, the younger Quaternary (Pleistocene and Holocene) stratigraphic record is the relevant portion of the geologic column for this area (see also CDJG, 2001). The Quaternary sediments in this area have yielded a rich fossil record of both the older (early and middle Pleistocene) Irvingtonian and the younger (late Pleistocene) Rancholabrean Land Mammal Ages (LMA).

For example, the project vicinity is only about 10 miles northwest of the type fossil locality for the Irvingtonian LMA (Savage, 1951; Kurten and Anderson, 1980).

The Eastshore project site is located on disturbed fill overlying unconsolidated, Holocene-age alluvial fan deposits, equivalent to Lawson's (1914) Temescal Formation. These younger fan deposits can be considered the terrestrial facies of the units known as young Bay mud and "salt-marsh deposits" of Trask and Rolston (1951) and Atwater and others (1977). They in turn overlie older, Pleistocene-age alluvial fan and mud deposits that, in the vicinity of the project site, can be as shallow as 12 feet below ground surface (bgs; Atwater et al., 1977).

Lawson (1914) mapped a complex of Late Tertiary and Quaternary formations along the eastern shore of San Francisco Bay. From oldest to youngest the formations are: Alameda Formation, San Antonio Formation, Merritt Sand, and Temescal Formation. Later geologic mapping (Helley et al., 1979, Dibblee, 1980, and Helley and Miller, 1992) was done with the benefit of chronometric and stratigraphic controls not available in the early 1900s, and reflects a much more complex geology. Many of the units mapped are gradational with the alluvial fans grading into the alluvial plains which in turn grade imperceptibly into Bay muds (Helley et al., 1979 and Helley and Miller, 1992). To compound this complexity, sediments in the southern portion of the San Francisco Bay area have been variously named and subdivided by geologists (see Table 8.16-2). Formal formation names have been applied to the Pleistocene to recent sedimentary sequence by some authors (e.g. Lawson, 1914). However, many geologists working in the San Francisco Bay area have used informal designations, such as "old bay mud," "sand deposits," and "young bay mud," in part reflecting uncertainty about the geographic extent as well as limiting geologic ages of the formally recognized stratigraphic units.

8.16.3.4.2 Paleontological Inventory. An inventory of the paleontological resources associated with the Quaternary alluvial and fluvial sediments of the southern San Francisco Bay area is presented below and the paleontological importance of these resources is assessed. As noted above, these are based chiefly on the results of this project specific records search, as well as the summarized records of the *Paleontological Resource Inventory/Impact Assessment Technical Report* prepared for the RCEC project (CBJD, 2001).

A literature review and search of the University of California Museum of Paleontology (UCMP) fossil site data base was conducted and three documented fossil localities are recorded within three miles of the project area (the proposed plant site as well as off site laterals). No fossil sites are located 3 to 5 miles from the site but more than 10 additional sites are located 5 to 10 miles from the project area.

Fossil remains of land animals have been found at a number of sites in younger alluvial deposits referable to the Temescal and Alameda formations (Hay, 1927; Louderback, 1951; Savage, 1951; Jefferson, 1991b). Jefferson (1991a, b) compiled a database of California Late Pleistocene (Rancholabrean) vertebrate fossils from published records, technical reports, unpublished manuscripts, information from colleagues, and inspection of museum paleontological collections at over 40 public and private institutions. He listed more than 50 fossil sites in Alameda County that have yielded Rancholabrean vertebrate fossils, including several localities near the Eastshore project area.

TABLE 8.16-2
Stratigraphic Nomenclature and Age Assignments for Different Stratigraphic Units in the Project Area.

Epoch	Glacial Age/ Marine Isotope Stage		Jones and Stokes, 2004	Trask & Rolston, 1951	Sloan, 1992		URS, 2001[1]	CRWQCB, 2004	Fisk, 2004	Clifton and Leithold, 1991
Holocene	Current Interglacial	Mid to Late Stage 1	n.d.	Bay Mud	n.d.		Young Bay Mud	Artificial fill	Artificial fill	n.d.
								? *hiatus* ?	Temescal Formation	
		Latest Stage 2 to Stage 1	Young Bay Mud					Temescal Formation		
Late Pleistocene	Wisconsin Glacial Age (Stages 4-2)		San Antonio Fm	Posey Sand & Merritt Fm	San Antonio Fm.	n.d.	Upper Alluvial/Marine Sediments or San Antonio Fm	Alameda Formation		
				San Antonio Formation						
	Last Interglacial (Stage 5)		Old Bay Mud			Yerba Buena mud	Old Bay Mud or Yerba Buena Fm.		Merritt Sand & Colma Fm[2]	Colma Formation
Early to Middle Pleistocene	Previous glacial-interglacial cycles		? *hiatus* ?	Alameda Formation	n.d.		Lower Alluvial/ Marine Sediments (Alameda Fm)- marine facies	? *hiatus* ?	San Antonio Formation	Merced Formation
			Alameda Fm (1.0 to 0.5 my)					Santa Clara Formation		
			Hiatus				Lower Alluvial/ Marine Sediments (Alameda Fm)- continental facies			n.d.
Major Unconformity										
Late Mesozoic	N/A		Franciscan Complex	Franciscan Complex	n.d.		Franciscan Complex	n.d.	Franciscan Complex	n.d.

N/A, not applicable; n.d., not described. Dashed lines are used to designate gradational boundaries.
[1] Stratigraphic superposition, geology and nomenclature described, but no age assignments provided for most units.
[2] Age estimate for this unit not provided.

Approximately 2 miles to the northwest of the Eastshore project, located near Interstate 880 Freeway in the City of Hayward, excavations have yielded the remains of *Bison latifrons* that are Rancholabrean in age. In addition, UCMP listed two additional fossil localities located approximately 3.5 miles from the Eastshore site. The Hayward Gravel Pit (V-5928) and the Hayward Motel (V-6304) fossil sites have produced horse fossils from the Late Pleistocene. These fossils have been identified as Rancholabrean fauna referable to the Temescal formation (CBJD, 2001).

Other Rancholabrean mammal remains found on the eastern side of San Francisco Bay include UCMP sites V-2841, -3613, -4045, -6227, -6420, -6644, -7073, and -67194, and have yielded fossil remains of mammoth, bison, camel, bear, horse, sea otter, and ground sloth. The presence of multiple fossil sites near the project area suggests a high probability of uncovering fossil remains during the earth-moving activates related to construction of those areas of the project site underlain by sediments of the Temescal Formation (CBJD, 2001). In addition, while no fossils have been reported from the site itself, marine fossils have been reported from boreholes in San Francisco Bay within 2 miles of the site (Atwater et al., 1977).

Lawson (1914) noted the Alameda Formation contained marine shells, and Trask and Rolston (1951) noted the presence of plant fragments in several horizons, particularly in the upper portions of the Alameda Formation. With the abundance of previously recorded fossil sites near the project area, there is a high probability that fossil remains will be encountered if earth-moving excavations were to exceed approximately 6 feet bgs.

8.16.4 Environmental Consequences

The potential environmental effects from construction and operation of the Eastshore project, including off-site laterals, on paleontological resources are presented in the following subsections.

8.16.4.1 Significance Criteria

In its standard guidelines for assessment and mitigation of adverse impacts to paleontological resources, the SVP (1995) established three categories of sensitivity for rocks potentially containing paleontological resources: high, low, and undetermined. To these categories is usually added the categories of “moderate” and “no” sensitivity. The former is applied to those sedimentary units of unproven paleontological sensitivity that, nevertheless, have physical characteristics that suggest that they might contain scientifically significant fossils. “No sensitivity” is applied to such rock units as granite or basalt that, due to their igneous (molten) origin, never contain fossils as well as to imported or artificial fill.

Areas where fossils have been previously found are considered to have a high sensitivity and a high potential to produce fossils. In areas of high sensitivity that are likely to yield unique paleontological resources, full-time monitoring is typically recommended during any project-related disturbance of those sediments. Strata that have not produced fossils in the past, but that may do so due to their geologic history, typically are considered to have moderate sensitivity. Monitoring and the development of a discovery plan is normally recommended to accompany excavations in these sediments.

Strata that have not been known to produce fossils in the past, and that are unlikely to do so due to their geologic history, typically are considered to have low sensitivity. Monitoring is

not recommended during project construction, although spot checks by the project paleontologist may be recommended to confirm that excavations continue in low-sensitivity sediments.

Appendix G of CEQA addresses significance criteria with respect to paleontological resources (Public Resources Code Sections 21000 et seq.). Appendix G(V)(c) asks if the project will "directly or indirectly destroy a unique paleontological resource or site or unique geologic feature."

8.16.4.2 Project Assessment

The occurrence of fossil sites near the project area within similar geologic environments indicates a potential for additional similar, scientifically important fossil remains being encountered by earth-moving activities during this project. The Eastshore project is situated on alluvial deposits that are at least in part equivalent to the Temescal Formation. The potential of encountering sediments of high paleontological sensitivity is likely, *when* these activities extend to a depth sufficient to encounter undisturbed sediment of Rancholabrean age.

8.16.4.2.1 Construction. This section identifies the potential adverse impacts on the paleontological resources resulting from construction phase effects of each portion of the Eastshore project. Construction-related activities that would impact paleontological resources include those operations that would disturb previously undisturbed sediment of high paleontological potential; excavation activities such as trenching and grading, as well as drilling, tunneling, and boring. Construction activities that would result in no sediment disturbance, from laying foundations to construction of the superstructure, would not affect paleontological resources.

Depth to paleontologically sensitive sediments is an important factor in this impact assessment since fossils relating to the ancestral San Francisco Bay area are scientifically significant and the depth to paleontologically sensitive sediment is relatively shallow. In the absence of additional data, this depth is assumed to be 6 feet bgs. The depth to paleontologically sensitive sediments has been assigned based on data provided Atwater et al. (1977).

Therefore, excavations within 6 feet of the current surface would affect sediment that has been previously disturbed; therefore, is of low paleontological sensitivity. Subsequent refinement of the extent and depth of disturbed sediment, as a tool to more precisely constrain areas that may require mitigation monitoring, is recommended.

Power Plant Site. The power plant is slated to be constructed on an approximate 6.22 acre site about 14 miles southeast of downtown Oakland. The project site is zoned industrial and is currently occupied by a vacant warehouse and parking lot. The existing building and foundation will be removed. Site grading and shallow excavation for new spread-type foundations will occur during construction. An approximately 200-foot natural gas line will also be constructed using the jack-and-bore method from the Eastshore site to an interconnection point in the parking lot located immediately across Clawiter Road. Excavations to depths exceeding 6 feet bgs would impact Holocene alluvium deposits equivalent to the Temescal Formation, which can be expected to have a high paleontological

sensitivity. In the absence of mitigation, this would be an adverse impact to paleontological resources.

Transmission Line Route. The proposed transmission line route (approximately 1.1 miles long) would connect to the Eastshore substation to the proposed location of Calpine's 600 MW Russell City Energy Center. The proposed route will cross over Clawiter and follow Clawiter Road south for about 3,400 feet. Approximately 200 feet of the line will be used to cross over SR 92. The transmission line will then continue south for about 1,900 feet along Production Avenue and across Investment Boulevard to continue up to the north fence line of the Eastshore Station. It is estimated that another 700 feet of transmission line will be installed within the Eastshore Substation to interconnect with the 115 kV bus.

To the extent that excavations for transmission tower footings disturb previously undisturbed alluvium at depths exceeding 6 feet, and not previously disturbed sediment or fill, the potential exists for adverse impact in the absence of mitigation.

8.16.4.2.2 Operation. Project operation will not cause additional ground disturbance and will not affect paleontological resources.

8.16.5 Abandonment/Closure Impacts

No paleontological resource impact would be involved during abandonment/closure of the Eastshore project if there were no earth-moving activity in previously undisturbed strata; however, if earth-moving activities were to occur during abandonment/closure, the paleontologist would implement appropriate mitigation measures, if necessary.

8.16.6 Cumulative Impacts

If paleontological resources were encountered during Eastshore-related ground disturbance, the potential cumulative effect on paleontological resources will be low, as long as the proposed mitigation measures are implemented to recover any significant paleontological resources. When properly implemented, these mitigation measures will effectively recover the scientific value of significant fossils encountered during the construction phase of the Eastshore project. Thus, the proposed Eastshore project will not cause or contribute to significant adverse cumulative impacts to paleontological resources. Additionally, scientifically controlled recovery of paleontological resources from this and other projects contributes to a beneficial cumulative impact through the realization of increased scientific knowledge of the paleontology of the San Francisco Bay area and southern California in general.

8.16.7 Proposed Mitigation Measures

This section describes measures proposed to reduce or mitigate potential project-related adverse impacts to significant paleontological resources, should any such resources be discovered during construction. No impact to paleontological resources would occur as a consequence of operation, so no mitigation is proposed for the operational phase of the project.

- **Paleontological Resources Monitoring and Mitigation Plan (PRMMP)—**The PRMMP would provide the detailed protocol for a paleontological resource mitigation program

to include the preparation of monitoring and discovery plans for construction. Procedures would be provided for preconstruction coordination, discovery procedures, sampling and data recovery, reporting, and museum curation for specimens and data recovered.

- **Paleontological Monitoring**—Before construction, the project proponent will retain a qualified paleontologist to design and implement the PRMMP during project-related, earth-moving activities for deep excavation at the power plant site and for construction of the off-site laterals. Qualified paleontological monitors will be present during excavations where it will disturb previously undisturbed sediment. Monitoring will not take place in areas where the ground has been previously disturbed, in areas underlain by artificial fill, or in areas where undisturbed sediment will be buried, but will not otherwise be disturbed.
- **Construction Personnel Education**—Before starting construction, personnel involved with earth-moving activities will be informed of the possibility of encountering fossils, how to recognize them, and proper notification procedures. This worker training will be developed in a formal module to be included and presented.

Implementation of these mitigation measures will reduce the severity of impacts of project earth-moving activities on paleontological resources to an insignificant level by allowing for the recovery of fossil remains and associated specimen data and corresponding geologic and geographic site data that otherwise might have been destroyed by construction and unauthorized fossil collecting.

8.16.8 Involved Agencies and Agency Contacts

Because the proposed Eastshore Energy Center will not be located on federal land and will not receive federal funding, there are no applicable federal LORS and no federal agencies with jurisdiction to enforce LORS related to paleontological resources; therefore, no federal agency contacts were included in the Application for Certification.

State LORS include the Warren-Alquist Act, the Public Resources Code, and CEQA. The agency with jurisdiction over these LORS is the CEC. With the exception of the CEC, there are no state or local agencies that have responsibility for administering LORS related to paleontological resources.

8.16.9 Permits Required and Permit Schedule

No state or county agency requires a paleontological collecting permit to recover fossil remains discovered by construction-related earth-moving on either state or private land in the project site. The project does not cross or occupy federal land.

8.16.10 References

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