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5.11 Soils

This section describes the potential affect the construction and operation of the Advanced Compressed Air Energy Storage (A-CAES) facility at the Pecho Energy Storage Center (PESC) may have on soil resources at and in the vicinity of the project site. The information presented is based on readily available resources provided online and is limited to surficial soils only. Construction of the PESC project involves the excavation of deep vertical shafts on the order of 2,000 feet deep below the existing ground surface, the excavation of underground caverns, and the construction and filling of a hydrostatic compensation surface reservoir. The project includes building berms approximately 40 feet in height for the compensation surface reservoir and placement of topsoil stripped from the approximate top two feet of the project site and relocated to an area north of Chorro Creek for incorporation into the ongoing farming.

A site-specific geotechnical exploration has not been performed at the PESC project location to characterize the site-specific surface and subsurface conditions. A mitigation measure has been incorporated to ensure a subsurface geotechnical exploration will be performed as part of the design of the project. The following sections address potential construction and operation impacts to surficial soils only.

5.11.1 Affected Environment

The PESC project site is located in the unincorporated territory just outside of Morro Bay in San Luis Obispo County, California. The PESC project location is currently zoned for agriculture and is currently under row cropping. The site is bordered on to the north by Chorro Creek. The Cabrillo Highway (CA 1) runs east-west just to the north of the site and Morro Bay State Park is located about 0.2 miles southwest.

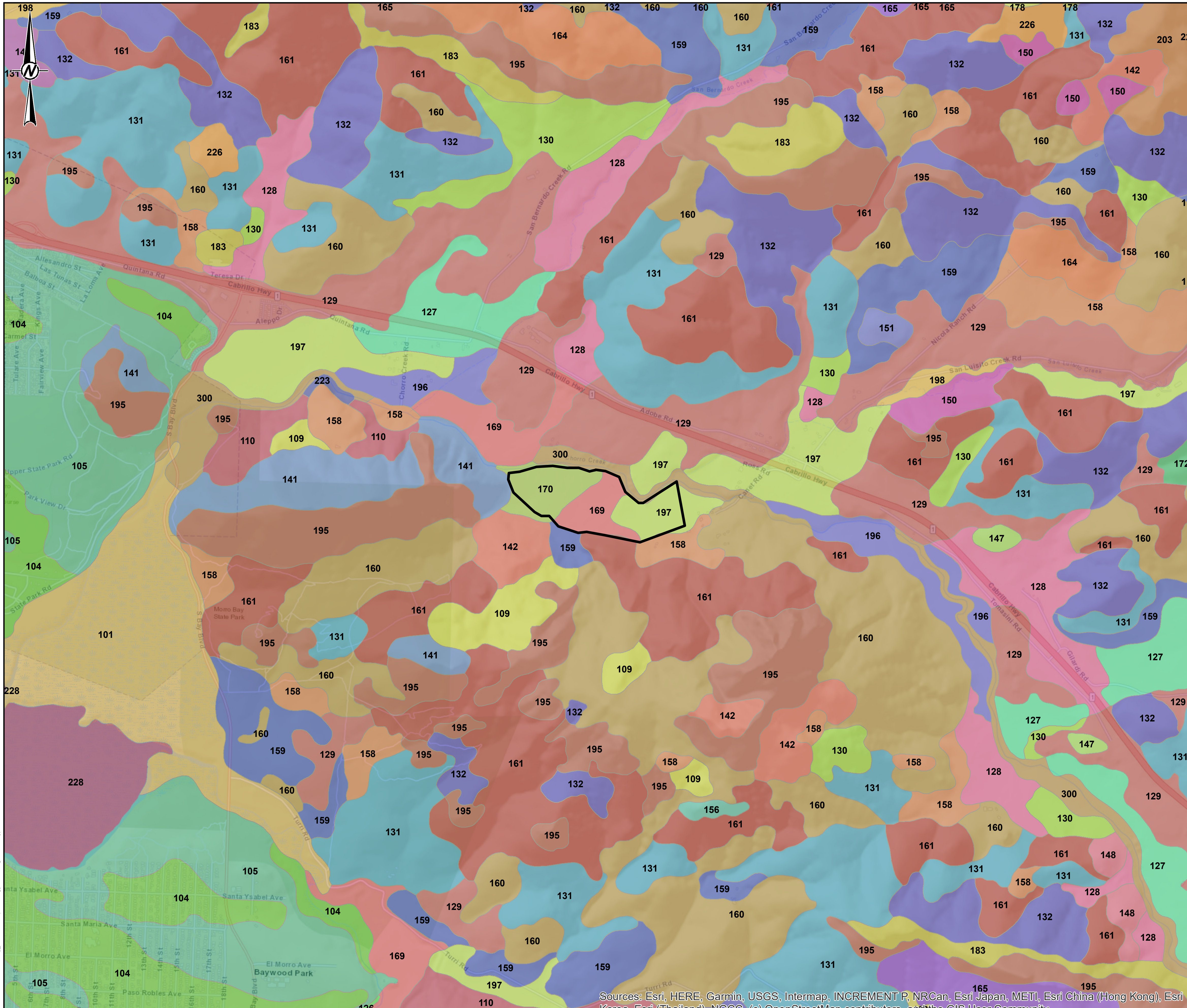
A description of the surficial soils within the PESC project area was developed using the Natural Resources Conservation Service (NRCS) Web Soil Survey for San Luis Obispo County, California, Coastal Part (NRCS 2021a). Descriptions of the soil map units were developed from the soil survey information and the NRCS Official Soil Series Descriptions database (NRCS 2021b).

The NRCS Web Soil Survey identifies soil map units for the PESC project area, and also includes soil map unit characteristics for the area that may be potentially affected by the construction and operation of the A-CAES. The project boundaries in relation to the soil map units are shown in Figure 5.11-1. A summary of the depth, texture, drainage, permeability, run-off, and other characteristics of the NRCS soil map units within the PESC site boundaries is shown in Table 5.11-1.

Table 5.11-1: NRCS Soil Map Unit Descriptions

<table>
<tr><th>Map Unit[1]</th><th colspan="2">Description</th></tr>
<tr><td rowspan="10">169
170</td><td colspan="2">Marimel Sandy Clay Loam, occasionally flooded
Marimel Silty Clay Loam, drained</td></tr>
<tr><td>Landform:</td><td>Alluvial fans, valleys, floodplains</td></tr>
<tr><td>Parent material:</td><td>Alluvium derived from sedimentary rock</td></tr>
<tr><td>Typical profile:</td><td>Sandy clay loam over stratified loam to clay loam to silty clay loam [169]
Silty clay loam over stratified loam to clay loam to silty clay loam [170]</td></tr>
<tr><td>Depths:</td><td>More than 80 inches to restrictive feature</td></tr>
<tr><td>Drainage:</td><td>Somewhat poorly drained [169]
Well-drained [170]</td></tr>
<tr><td>Permeability:</td><td>Moderately high</td></tr>
<tr><td>Run-off class:</td><td>High [169]
Medium [170]</td></tr>
<tr><td>Capability class:</td><td>3w (irrigated), 3w (non-irrigated) [169]
1 (irrigated), 3c (non-irrigated) [170]</td></tr>
<tr><td>Taxonomic class:</td><td>Fine-loamy, mixed, superactive, thermic Cumulic Haploxerolls</td></tr>
<tr><td rowspan="10">197</td><td colspan="2">Salinas Silty Clay Loam</td></tr>
<tr><td>Landform:</td><td>Flood plains, terraces, alluvial fans, alluvial flats</td></tr>
<tr><td>Parent material:</td><td>Alluvium derived from sedimentary rock</td></tr>
<tr><td>Typical profile:</td><td>Silty clay loam over very fine sandy loam over silty clay loam</td></tr>
<tr><td>Depths:</td><td>More than 80 inches to restrictive feature</td></tr>
<tr><td>Drainage:</td><td>Well-drained</td></tr>
<tr><td>Permeability:</td><td>Moderately low</td></tr>
<tr><td>Run-off class:</td><td>Negligible</td></tr>
<tr><td>Capability class:</td><td>1 (irrigated), 3c (non-irrigated)</td></tr>
<tr><td>Taxonomic class:</td><td>Fine-loamy, mixed, superactive, thermic Pachic Haploxerolls</td></tr>
</table>

Note(s): Map units of the same soil series are grouped in the table above.



LEGEND

PECHO SITE

NRCS MAP UNIT

- 101--Aquolls, saline
- 104--Baywood fine sand, 2 to 9 percent slopes
- 105--Baywood fine sand, 9 to 15 percent slopes
- 109--Briones-Pismo loamy sands, 9 to 30 percent slopes
- 110--Briones-Tierra complex, 15 to 50 percent slopes
- 126--Corralitos variant loamy sand
- 127--Cropley clay, 0 to 2 percent slopes, MLRA 14
- 128--Cropley clay, 2 to 9 percent slopes, MLRA 14
- 129--Diablo clay, 5 to 9 percent slopes, MLRA 15
- 130--Diablo and Cibo clays, 9 to 15 percent slopes
- 131--Diablo and Cibo clays, 15 to 30 percent slopes
- 132--Diablo and Cibo clays, 30 to 50 percent slopes
- 141--Gaviota sandy loam, 50 to 75 percent slopes, MLRA 15
- 142--Gaviota fine sandy loam, 15 to 50 percent slopes
- 147--Lodo clay loam, 5 to 15 percent slopes
- 148--Lodo clay loam, 15 to 30 percent slopes
- 149--Lodo clay loam, 30 to 50 percent slopes, MLRA 15
- 150--Lodo clay loam, 50 to 75 percent slopes, MLRA 15
- 151--Lodo-Rock outcrop complex, 9 to 30 percent slopes
- 156--Lopez very shaly clay loam, 30 to 75 percent slopes
- 158--Los Osos loam, 5 to 9 percent slopes
- 159--Los Osos loam, 9 to 15 percent slopes
- 160--Los Osos loam, 15 to 30 percent slopes
- 161--Los Osos loam, 30 to 50 percent slopes
- 163--Los Osos-Diablo complex, 9 to 15 percent slopes
- 164--Los Osos-Diablo complex, 15 to 30 percent slopes
- 165--Los Osos-Diablo complex, 30 to 50 percent slopes
- 169--Marimel sandy clay loam, occasionally flooded
- 170--Marimel silty clay loam, drained
- 172--Millsap-Rock outcrop complex, 30 to 75 percent slopes
- 178--Nacimiento silty clay loam, 30 to 50 percent slopes, MLRA 15
- 183--Obispo-Rock outcrop complex, 15 to 75 percent slopes
- 195--Rock outcrop-Lithic Haploxerolls complex, 30 to 75 percent slopes
- 196--Salinas loam, 0 to 2 percent slopes, MLRA 14
- 197--Salinas silty clay loam, 0 to 2 percent slopes, MLRA 14
- 198--Salinas silty clay loam, 2 to 9 percent slopes, MLRA 14
- 203--Santa Lucia channery clay loam, 30 to 50 percent slopes, MLRA 15
- 223--Xerorthents, escarpment
- 226--Zaca clay, 30 to 50 percent slopes
- 228--Water
- 300--Corducci and Typic Xerofluvents, 0 to 5 percent slopes, occasionally flooded, MLRA 14

NOTES

SOURCE DATA: HTTPS://MAPS.CONSERVATION.CA.GOV/

1:24,000

0 — 1 Miles

REFERENCE

COORDINATE SYSTEM: NAD 1983 STATEPLANE CALIFORNIA V FIPS 0405 FEET

CLIENT
HYDROSTOR INC.

PROJECT
PECHO ENERGY STORAGE CENTER

TITLE
NRCS SOIL MAP

CONSULTANT

GOLDER MEMBER OF WSP

YYYY-MM-DD	2021-08-13
PREPARED	MR
DESIGN	MR
REVIEW	JB
APPROVED	RPCE

PROJECT No.	CONTROL	Rev.	FIGURE
21465954	---	---	5-11-1

5.11.1.1 Agricultural Use

The PESC project site is rural, and is within an unincorporated territory outside Morro Bay, California. As identified by NRCS 2021a soils within the Marimel and Salinas loam designations can be classified with a land capability class of 1 when irrigated. This would indicate that the soils within these series could be used as farmland. However, when non-irrigated, these same soils exhibit a land capability class of 3, which indicates the soils have severe limitations that reduce the choice of plants, require special conservation practices, or both. The other soil types located on site are classified as 3 or higher, which would suggest the soils are not easily used for all agricultural purposes.

Section 5.6, Land Use notes the PESC project site is designated as agricultural land and is currently supporting row cropping. The project site is irrigated at present.

5.11.1.2 Wetlands

There are wetland and non-wetland waters of the US within the vicinity of the PESC project areas detailed in Section 5.2. Chorro Creek runs east-west and borders the site to the north. Also near the site are three smaller drainages which are tributaries of Chorro Creek. One tributary is located south of the project site with multiple branches, and two are located to the north of the project site. Section 5.2, Biological Resources provides additional information on jurisdictional wetland and non-wetland waters of the US.

5.11.1.3 NRCS Soil Map Units

As shown in Figure 5.11-1 and Table 5.11-1, the PESC site is associated with three main soil map units: Marimel Sand Clay Loam, occasionally flooded (169), Marimel Silty Clay Loam, drained (170), and Salinas Silty Clay Loam (197). The Marimel sandy clay and silty clay loams are alluvium derived from the sedimentary rock parent material. These units typically form in floodplains, alluvial fans, and valleys throughout the San Luis Obispo coast. Soils in the upper profile of these units generally experience sandy or silty clay loam to stratified loam textures.

The Salinas silty clay loam unit forms in floodplains, alluvial fans, and alluvial flats throughout the Coast, Transverse, and Peninsular Range California Geomorphic Provinces. Soils in the upper profile generally experience silty clay loam and very fine sandy loam.

5.11.1.4 Potential for Soil Loss and Erosion

Soil loss and erosion potential are greatly affected by the presence of vegetation, slope grades, soil composition and gradation, and weather patterns. Regions with sparse to no vegetation exhibit erosion more readily than areas with grasses, shrubbery, and other plants as they help in slowing the overland flow and holding the soil together. Areas with steeper slopes typically experience higher rates of erosion and soil loss than level slopes due to the higher flow velocity at which the stormwater run-off will travel.

The PESC project area has relatively gentle slopes throughout. These flat areas around the facility are presently cultivated for food production with some grass coverage around the perimeter but very little other vegetation. However, just south of the site is Morro Bay State Park, which has steeper mountain slopes that may direct stormwater towards the site. Trees and other vegetation surround Chorro Creek on the northern border of the site and the mountain face along the southern border.

The Marimel soils likely have a moderate potential for soil loss and erosion due to their typically sandy or silty clay profile and medium to high run-off classification. The Salinas silty clay loam, however, likely has a greater potential for soil loss and erosion due to its typically silty clay loam profile and negligible run-off class.

The PESC project site is about 3 miles from the coast, it is likely to experience high winds, which could increase the potential for soil loss and wind erosion. Silty and sandy textured soils, which are present in the Marimel and Salinas series, are normally susceptible to wind erosion if unvegetated or poorly vegetated.

Although the PESC project site is fairly flat, its construction will likely include concrete and asphalt paved finished grades that will not be susceptible to erosion. Unpaved areas can be graded, surfaced with aggregate, and/or revegetated to mitigate erosion potential to less than significant. The surface reservoir embankments will be stabilized with rock or vegetated to reduce erosion potential.

5.11.1.5 Other Significant Soil Characteristics

Other significant soil characteristics that could affect the project site include shrink-swell potential, liquefaction risk, the potential for shallow groundwater, organic soils potential, and the risk of soil contamination. On-site geotechnical investigations have not been performed at this time to further classify the soils within the PESC project limits. A mitigation measure has been incorporated to ensure a subsurface geotechnical exploration will be performed as part of the design of the project.

5.11.1.5.1 Expansive Soils

Expansive soils have the potential to shrink and swell with variations in saturation, which could cause ground instability in the form of differential settlement. Expansive soils are typically clay-rich or clay-dominant soils. Table 18-1-B of the 1994 Uniform Building Code (UBC) (International Code Council 1994) describes the standards for classifying expansive soils based on expansion index, determined using ASTM D4829.

Because a site-specific geotechnical exploration has not been performed, information regarding plasticity index, soil gradation and particle sizes, and expansion index are not available.

Information gathered from the NRCS Web Soil Survey, cross-referenced with the NRCS Soil Texture Triangle, suggests that the Marimel sandy clay loam, can have up to a 35 percent clay composition, and the Marimel and Salinas silty clay loams can have up to a 40 percent clay composition. These three soil units may have at least a low shrink-swell potential due to their clay fraction. Actual expansive soil susceptibility will depend on the actual characteristics of the materials on site. For the PESC project and its features, the presence of expansive soils would only be a possible concern to buildings and foundations. A site-specific geotechnical exploration has not been conducted to confirm the presence of expansive soils. However, if present, expansive soils can be mitigated to less than significant through the use of soil amendments or by removal and replacement with non-expansive soils, or by designing buildings and foundations to withstand the expansive soil.

5.11.1.5.2 Liquefaction Risk

Liquefaction is a phenomenon in which the strength and stiffness of a typically loose, cohesionless (i.e., sand) saturated soil is reduced by earthquake shaking or other rapid loading. Based on the available information regarding the grain size of the site soils provided by the NRCS, the Marimel sandy clay loam, Marimel silty clay loam, and Salinas silty clay loam each consist of varying amounts of sand, silt, and clay. Based on the NRCS Soil Texture Triangle, these units may consist of 35 percent to 40 percent clay but may be susceptible to liquefaction depending on the plasticity of the clay fraction as well as the amount of sand. However, the NRCS data is very limited and cannot be solely relied on to determine liquefaction susceptibility.

Liquefaction is also a function of the presence of groundwater. As described in Section 5.11.1.5.3, shallow groundwater is expected at the PESC project site and therefore may be present within the alluvium.

Additionally, the California Geological Service (CGS) Seismic Hazards Program: Liquefaction Zones map (CGS 2017) was reviewed and shows that mapping has not been performed within the PESC project area limits. This does not preclude the possibility of liquefaction potential within the PESC project limits.

A site-specific geotechnical exploration has not been performed at the time this was prepared to characterize the site-specific surface and subsurface soils and depth to groundwater. Based on the NRCS data, the surficial soils are likely susceptible to liquefaction, additional information is required to evaluate the risk of liquefaction at greater depths. Section 5.4, Geological Hazards and Resources, provides additional information on liquefaction potential. Through the site-specific study, the liquefaction risk will be parameterized, and structures and foundations will be designed to reduce the liquefaction potential and risk to less than significant.

5.11.1.5.3 Potential for Shallow Groundwater

Groundwater levels in the vicinity of the site were evaluated by Fugro Consultants, Inc. (Fugro) during their 2012 hydrologic assessments of the nearby Ashurst and Romero well field areas (Fugro, 2012a, 2012b.) The Romero well field, located about 0.15 miles east of the PESC project area, exhibits a typical groundwater level of roughly 50 feet above mean sea level (MSL), which is about 10 feet below the ground surface (bgs). The historical groundwater low in this area is reported at elevation 35 MSL, or 25 feet bgs. The Ashurst well field, located about 0.5 miles to the northwestern of PESC project area, exhibits a typical groundwater level of roughly 20 feet MSL, which is about 10 feet bgs. The historical groundwater low in this area is reported at elevation -16 MSL during a period of drought, or 46 feet bgs.

Additionally, the closest identified USGS monitoring well to the project site is Well No. 345921120381601, which is located about 26 miles to the south of the PESC project location at a ground surface elevation of 72 feet MSL. The most recent reported groundwater depth measurement was 7.07 feet bgs on November 19, 2020 (USGS 2021).

Shallow groundwater is expected at the PESC project site; however, a site-specific geotechnical exploration has not been performed at the time this was prepared to determine the depth to groundwater at the PESC project location. Through the site-specific geotechnical study, the shallow groundwater profile will be established, and the groundwater risks will be made managed using best management practices (BMPs) to a less than significant risk through appropriate construction techniques and foundation design.

5.11.1.5.4 Potential for Organic Soils

According to the NRCS Official Soil Series Descriptions, both series that are present on-site exhibit organic matter towards the surface, including fine roots and tubular pores. The Marimel series typically experiences organics from the surface down to a depth of 60 inches, which was the full extent of the samples taken during the NRCS investigation. The Salinas series also contained fine roots to an approximate depth of 49 inches. Additionally, the PESC project site is on land that currently supports row cropping and is known to consist of organic soils. Organic rich soils are typically prone to settlement because they are generally compressible as well as harbor organic material that can decompose over time. Organic surficial soils can be over excavated and replaced with more competent soils to mitigate the impact of organic soils to less than significant. A site-specific geotechnical exploration will be performed to determine organic matter concentrations and extent at the PESC project location. Organic surficial soils will be relocated on properties to the north of Chorro Creek consistent with the site plan.

5.11.1.5.5 Potential for Soil Contamination

Existing site conditions were captured in a Phase I Environmental Site Assessment (ESA) conducted in July 2021 by Golder Associates Inc. The assessment revealed no evidence of recognized environmental conditions in connection with the property. Section 5.14, Waste Management provides further information.

The State Water Resources Control Board (SWRCB) GeoTracker database was searched for evidence of known contamination within the vicinity of the PESC project. The closest identified cleanup site is located about 1.8 miles northwest of the project boundary near the intersection of Morro Bay Boulevard and Highway 1. The cleanup site status is completed, and the case is closed (SWRCB 2021).

5.11.2 Environmental Analysis

The following sections describe the potential environmental effects on soils near the project site during the construction and operation of the PESC.

5.11.2.1 Significance Criteria

The potential for impacts to soil resources and their uses (such as agriculture) were evaluated using the criteria described in Appendix G of the California Environmental Quality Act (CEQA) Guidelines (sections 15000-15387, Title 14, California Code of Regulations, Chapter 3). A project would have a significant environmental impact in terms of soils if it would do the following:

- Involve other changes in the existing environment which, because of their location or nature, could result in the conversion of farmland to nonagricultural use.
- Have a substantial adverse effect on state or federally protected wetlands.
- Result in substantial soil erosion or the loss of topsoil.
- Be located on expansive soil, as defined in Table 18-1-B of the UBC (International Code Council 1994), creating substantial direct or indirect risks to life or property.

The following subsections describe the anticipated environmental impacts on agricultural production and soils during project construction and operation.

5.11.2.2 Farmland Conversion

The PESC will be located on land that is currently supporting row cropping. The California Department of Conservation maps the PESC project site as Prime Farmland and Farmland of Local Potential. Therefore, the construction and operation of PESC will result in the conversion of designated agricultural lands to other land use. The PESC project will not affect the surrounding parcels' agricultural land use designation. Additionally, Title 22 and 23 of the San Luis Obispo County Code requires that development within unincorporated San Luis Obispo County comply with the County's General Plan for lands zoned as agriculture, as discussed in the Land Use section (Section 5.6).

5.11.2.3 Jurisdictional Wetlands

According to an environmental constraints analysis performed by Rincon Consultants, Inc. (Rincon), there are multiple jurisdictional wetlands within the vicinity of the PESC project area, however the PESC project area does not encroach within the wetlands with the exception of two bridge crossings over Chorro Creek. Chorro Creek runs east-west and borders the site to the north (Rincon 2020). Also near the site are three smaller drainages which are tributaries of Chorro Creek. One tributary is located south of the project site with multiple branches, and two are located to the north of the project site. Section 5.2, Biological Resources provides additional information on jurisdictional wetlands.

5.11.2.4 Soil Erosion during Construction

Possible impacts on soil resources during project construction can include an increase in soil erosion due to both water and wind. Soil erosion can cause the loss of topsoil and can impact the amount of sediment received by nearby bodies of water downstream of the project site. The magnitude of construction impacts on soil resources depends on the soil erodibility, construction methods and schedule, and construction proximity to nearby sensitive receptors.

5.11.2.4.1 Water Erosion

For the duration of construction, best management practices (BMPs) will be implemented following a site-specific stormwater pollution prevention plan (SWPPP) The California Energy Commission (CEC) also requires that project owners implement a drainage, erosion, and sediment control plan (DESCP) to reduce the impact of run-off from construction sites. Site monitoring will involve inspections to ensure that the BMPs in the SWPPP and DESCP are properly maintained. Therefore, impacts related to water erosion can be mitigated to less than significant.

5.11.2.4.2 Wind Erosion

Soils with sandy textures, such as the Marimel sandy clay loam and possibly the Salinas silty clay loam, have the potential for at least low wind erosion. Wind erosion potential is greatest when dry, fine sandy material is left exposed.

The potential for wind erosion will be mitigated to less than significant by implementing the soil BMPs during construction following San Luis Obispo County Air Pollution Control District (SLO County APCD) CEQA Air Quality Handbook (SLO County APCD 2012). Section 5.11.4 describes possible mitigation measures.

The quantification of soil loss due to wind erosion is provided in Section 5.1, Air Quality.

5.11.2.5 Other Significant Soil Properties

Section 5.11.1.5 describes the soil units within the PESC project area. They are expected to:

- Possibly have at least a low shrink-swell potential, so expansive soils may be a concern at the project site.
- Possibly be susceptible to liquefaction.
- Have organics at and near the surface.
- Be free of contamination.

A site-specific geotechnical exploration will be performed at the project location to characterize the site soils and subsurface conditions.

5.11.2.5.1 Compaction during Construction and Operation

Construction of the PESC and the use of heavy equipment around the site will result in soil compaction. Compacting the soil will increase the soil density, as well as reducing the ability of the soil to absorb precipitation.

Surface water run-off, erosion, and sedimentation could increase as a result. The use of BMPs during the construction phase, following the SWPPP and DESCP guidelines, will mitigate the effects of soil compaction.

Because the PESC will be constructed in a rural area that will be graded and/or paved during and after construction, the expected effects of compaction during construction are considered less than significant.

The operation of the PESC is not expected to cause compaction-related impacts on the soil. Routine vehicle traffic will be limited to designated roads, and standard operational activities will not involve disruption of the soil. Therefore, impacts on soil from project operations are expected to be less than significant.

5.11.2.6 Effects of Emissions on Soil-Vegetation Systems

Emissions from a generating facility could adversely affect soil vegetation systems. This is principally a concern where environments that are highly sensitive to nutrients or salts are downwind of the project. There are no habitats in or surrounding the project area that is known to be especially sensitive to the effects of nitrogen deposition. The potential addition of small amounts of nitrogen to the area will result in a less-than-significant impact on soil vegetation systems. Additional discussion regarding impacts to biological resources in the area can be found in Section 5.2, Biological Resources.

5.11.3 Cumulative Effects

A cumulative impact refers to a project’s incremental effect together with other closely related past, present, and reasonably foreseeable future projects whose impacts may compound or increase the incremental effect of the project (Public Resources Code §21083; Title 14, California Code of Regulations, §15064[h], 15065[c], 15130, and 15355).

The impacts of the PESC project are expected to be less than or mitigated to be less than significant. However, we do not have any information on or knowledge of other projects within the vicinity of the PESC project and, therefore, do not have a basis to evaluate the cumulative effects of the PESC project.

5.11.4 Mitigation Measures

The following mitigation measures will reduce potential impacts related to soils to less than significant during construction and operation of the PESC project:

- Perform a site-specific geotechnical exploration to collect geotechnical data to:
  - Confirm surface and subsurface soil types and characteristics.
  - Determine the depth to groundwater.
  - Evaluate liquefaction susceptibility and potential and provide recommendations to mitigate impacts if necessary.
  - Determine if expansive soils are present and provide recommendations to mitigate impacts if necessary.
  - Determine the extent of organic soils.
  - Support the design of the foundations.
- Verify the recommendations provided in the geotechnical report are followed during the construction and operation of the PESC project.

- Develop and implement an SWPPP and DESCP that follow BMPs to mitigate water and wind erosion.
- Implement BMPs described in the SWPPP and DESCP.
- Time construction activities as best as practicable to reduce water and wind erosion.
- Design finished grades to maintain positive drainage to control surface water run-off to the desired collection and/or discharge locations.
- Pave or hardscape frequently used roads and areas to prevent water and wind erosion.
- Grade and/or revegetate unpaved areas to reduce water and wind erosion.
- Temporarily cease clearing, grading, earthmoving, and excavation activities when winds generate excess fugitive dust.
- Implement dust suppression measures (i.e., spraying with water, applying a tackifier) to control dust generation and minimize wind-blown soil loss.
- Revegetate and/or armor permanent slope faces and channels to reduce water and wind erosion.
- Use sediment barriers (i.e., straw wattles, silt fences) to slow run-off.
- Design buildings and foundations to withstand expansive soil (i.e., deeper foundations, use pre-stressed concrete).
- Remove near-surface organic soils from beneath buildings and the hydrostatic compensation surface reservoir.
- Water or cover stockpiles of soil or other fine loose material to prevent wind-blown fugitive dust.
- Use soil amendments to stabilize expansive soil or over-excavate and replace it with engineered fill.
- Over-excavate and replace liquefiable soils, or implement a ground improvement technique (i.e., compaction grouting, deep soil mixing) if practical.
- Rip any unpaved areas that become over-compacted during construction.

5.11.5 Laws, Ordinances, Regulations, and Standards

Federal, state, county, and local Laws, Ordinances, Regulations, and Standards (LORS) applicable to soils are discussed below and summarized in Table 5.11-2.

Table 5.11-2: Laws, Ordinances, Regulations, and Standards for Soils

LORS	Requirements/Applicability	Administering Agency	Application for Certification Section Explaining Conformance
Federal			
CWA/Water Pollution Control Act. 1972, amended by Water Quality Act of 1987 P.L. 100-4	Regulates stormwater and non-stormwater discharges from construction and industrial activities	RWQCB – Central Coast Region (3), SWRCB	Section 5.11.5.1
NRCS (1983), *National Engineering Handbook*, Sections 2, and 3	Standards for soil conservation	NRCS	Section 5.11.5.1
State			
Porter-Cologne Water Quality Control Act	Regulates discharges of waste to state waters and land	RWQCB – Central Coast (3), SWRCB	Section 5.11.5.2
Table 18-1-B of the Uniform Building Code (International Code Council 1994)	Sets standards for defining expansive soils	California Building Standards Commission	Section 5.11.5.2
Local			
San Luis Obispo County General Plan	Requirements for Site Plan Reviews and Environmental Assessments including requirements for building on native soils	San Luis Obispo County, Department of Planning and Building (SLOC DOPB 1999)	Section 5.11.5.3
San Luis Obispo County Municipal Code	Standards for grading and water quality, including permit requirements	San Luis Obispo County, Department of Planning and Building (SLOC DOPB 1999)	Section 5.11.5.3

5.11.5.1 Federal LORS

5.11.5.1.1 Federal Clean Water Act

Discharges of wastewater and stormwater into surface and ground waters are regulated by SWRCB and RWQCBs under the Clean Water Act (CWA) of 1987 and the Water Pollution Control Act of 1972. Relevant National Pollutant Discharge Elimination System (NPDES) permits for stormwater quality management are discussed in Water Resources Section 5.15.

5.11.5.1.2 U.S. Department of Agriculture Engineering Standards

Sections 2 and 3 of the U.S. Department of Agriculture NRCS National Engineering Handbook provide standards for soil conservation during planning, design, and construction activities (NRCS 1983).

5.11.5.2 State LORS

5.11.5.2.1 California Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act (California Water Code, Division 7) is the state law governing the water quality of all state waters, including both surface water and groundwater. The SWRCB has the ultimate authority over water quality policy on a state-wide level, and the Central Coast RWQCB regulates water quality in the project area. Water Resources Section 5.15 provides further information.

5.11.5.2.2 Uniform Building Code

Table 18-1-B of the Uniform Building Code (1994) defines the criteria for classifying expansive soils.

5.11.5.3 Local LORS

The San Luis Obispo County General Plan includes requirements for building on native soils, as required by State Law. The General Plan, Chapter 5, requires a review of soils and geologic conditions for hazard identification (San Luis Obispo County 1999).

The San Luis Obispo County Municipal Code requires that plans meet standards for grading and water quality. Municipal Code Section 19.12.030 requires the construction of new nonresidential development projects to obtain a grading permit. Section 19.12.050 explains grading permit requirements. Municipal Code Section 19.12.140 provides additional details on erosion control and water quality (San Luis Obispo County 2021).

5.11.6 Agencies and Agency Contacts

Applicable permits and agency contacts for soils are shown in Table 5.11-3 below.

Table 5.11-3: Permits and Agency Contacts for Soils

Permit or Approval	Agency Contact	Applicability
San Luis Obispo County Grading Permit	San Luis Obispo County Public Works Department Department of Planning & Building 976 Osos Street, Room 200 San Luis Obispo, CA 93408 (805) 781-5600	Building and grading permits
NPDES Permit	Central Coast Regional Water Quality Control Board 895 Aerovista Place, Suite 101 San Luis Obispo, CA 93401 (805) 549-3147	Surface water and groundwater compliance
NPDES Permit	State Water Resources Control Board 1001 I Street Sacramento, CA 95814 (916) 341-5250	Surface water and groundwater compliance

5.11.7 Permits and Permit Schedule

It is expected that all the required permits for grading and building can be secured, given that completed applications are provided to the appropriate agency before construction. The grading and building permits will be started after receiving approval from the planning department for the project. Other permits that relate to soils, such as the NPDES permit, are evaluated in other sections (see Section 5.15, Water Resources).

5.11.8 References

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