3.4 Geology and Soils

3.4.1 Introduction

This section of the SEIR describes the geology and soil conditions of the proposed Project site and general vicinity. The section also analyzes issues such as the potential geologic and seismic hazards such as earthquakes, expansion, landform alteration, erosion, and liquefaction that could occur with implementation of the project. This analysis is based on a review of statutory law, local planning documents, and a review of geotechnical investigations in the area and the Seismic and Public Safety Element from the Imperial County General Plan. Information contained in this section is summarized from the *Preliminary Geotechnical Investigation Report, Centinela Solar Energy Facility and Gen-tie Line* prepared by Landmark Consultants, Inc. (Landmark, 2011) and *Final Geotechnical Report Centinela Solar Energy Facility* (Group Delta Consultants, Inc., 2012). These documents are included in Appendix E of the Technical Appendices of this SEIR.

3.4.2 Environmental Setting

3.4.2.1 Geology

The environmental setting with regards to geology and soil conditions has remained similar to those described in the 2011 FEIR. The Project site is located in the Imperial Valley, a part of the Salton Trough in the Colorado Desert physiographic province of California. With surface elevations as low as 275 feet below sea level, the Salton Trough formed as a structural depression resulting from tectonic boundary adjustment between the Pacific and the North American plates. The Salton Trough is bounded on the east and northeast by the San Andreas Fault and on the west by the San Jacinto fault zone. This structural trough is filled with more than 15,000 feet of Miocene and younger, marine and non-marine sediments capped by approximately 100 feet of Pleistocene and later lacustrine deposits that have been deposited by intermittent filling of the fresh-water Lake Cahuilla. The Salton Trough represents the northward extension of the Gulf of California, containing both marine and non-marine sediments since the Miocene Epoch. Tectonic activity that formed the trough continues at a high rate as evidenced by deformed young sedimentary deposits and high levels of seismicity.

As described in the 2011 FEIR, Holocene Cahuilla Lake sediments, consisting of interbedded sand, silt, and clay, directly underlie the Project site. The Holocene period dates back approximately 11,000 year ago. Holocene Lake deposits are considered to be less than 100-. The topography of the Imperial Valley is relatively flat, with few amounts of find sand and few significant land features. As indicated in the 2011

FEIR, the valley floor slopes slightly to the north (less than 0.5 percent) from an elevation of sea level at Calexico to approximately 225 feet below sea level at the Salton.

3.4.2.2 Seismicity

Much of the western United States is a region of moderate to intense seismicity related to movement of crustal masses (plate tectonics). The most active regions, outside of Alaska, are in the vicinity of the San Andreas Fault system of California. Magnitude and intensity measure different characteristics of earthquakes. Magnitude measures the energy released at the source of the earthquake. Magnitude is determined from measurements on seismographs. Intensity measures the strength of shaking produced by the earthquake at a certain location. Intensity is determined from effects on people, structures, and the natural environment. Table 3.4-1 below illustrates intensities that are typically observed at locations near the epicenter of earthquakes of different magnitudes.

Table 3.4-1: Modified Mercalli Intensity Scale for Earthquakes

Richter Magnitude Scale	Modified Mercalli Scale	Effects of Intensity
0.1–0.9	I	Not felt except by a very few under especially favorable conditions.
1.0–2.9	II	Felt only by a few persons at rest, especially on upper floors of buildings.
3.0–3.9	III	Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize it as an earthquake. Standing motorcars may rock slightly. Vibrations similar to the passing of a truck. Duration estimated.
4.0–4.5	IV	Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motorcars rocked noticeably.
4.6–4.9	V	Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.
5.0–5.5	VI	Felt by all, many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight.
5.6–6.4	VII	Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken.
6.5–6.9	VIII	Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, and walls. Heavy furniture overturned.

Richter Magnitude Scale	Modified Mercalli Scale	Effects of Intensity
7.0–7.4	IX	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.
7.5–7.9	X	Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent.
8.0–8.4	XI	Few, if any (masonry) structures remain standing. Bridges destroyed. Rails bent greatly.
8.5+	XII	Damage total. Lines of sight and level are distorted. Objects thrown into the air.

Source: USGS, 2019

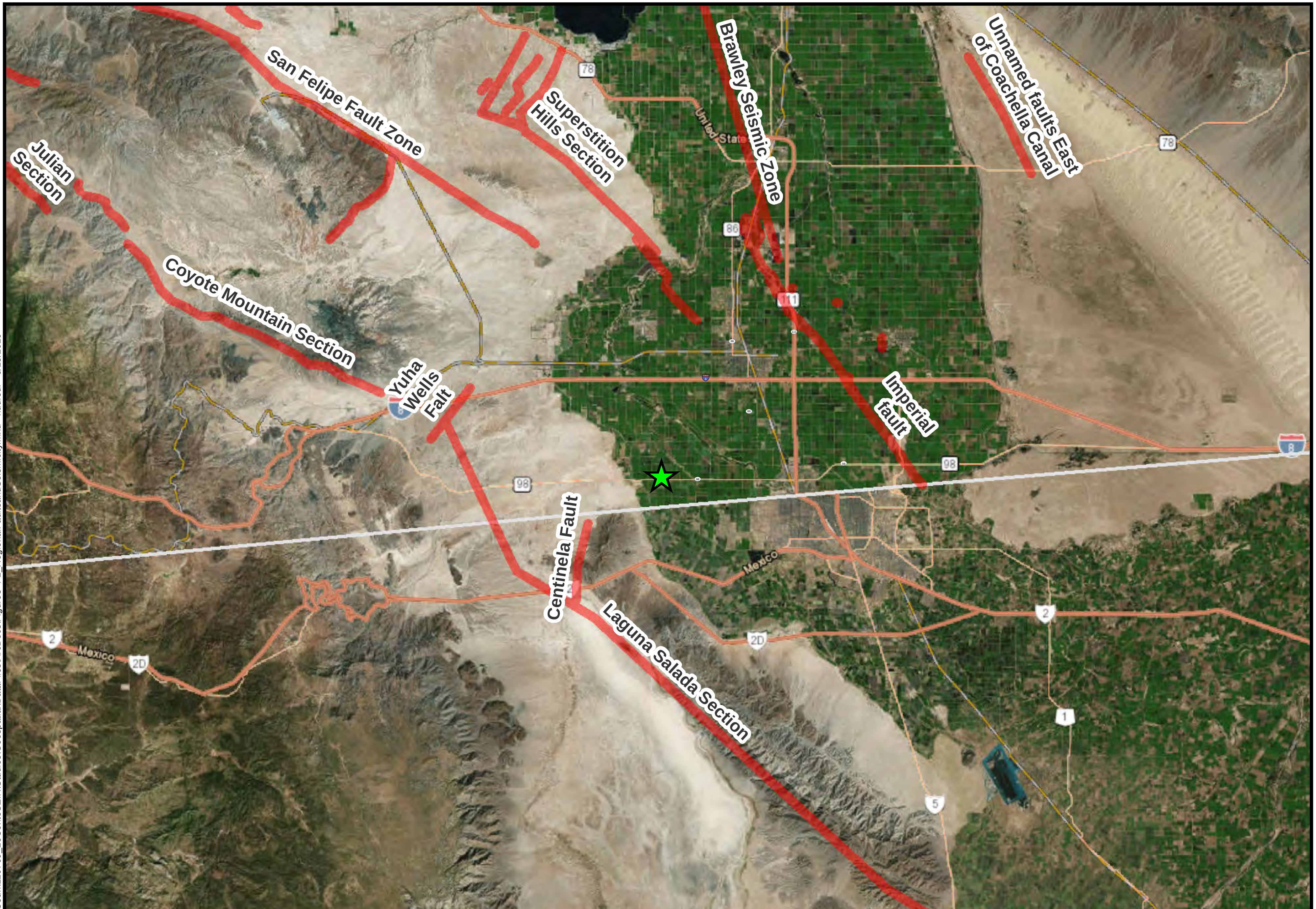
The proposed Project site is located within a seismically active region. Within the region, associated faults include the Imperial Valley faults and faults in the San Andreas Fault system, the San Jacinto Fault system, and the Elsinore Fault system. The seismic fault nearest to the Project site is the Superstition Hills Fault located approximately 9.5 miles north. The Imperial Fault is located approximately thirteen miles northeast of the project site (GS Lyon, 2010a, 2010b, 2011a, and 2011b). Other nearby active faults include the Imperial Fault, and Laguna Salada Fault. **Figure 3.4-1** depicts the location of regional active faults. Potential hazards that occur from seismic activities include ground shaking, surface rupture, liquefaction, and landslides. Earthquakes can also cause abrupt elevation changes in excess of one foot across fault lines. Known faults or seismic zones within a 100-kilometer (62-mile) radius of the project site are shown in summarized in Table 3.4-2.

Table 3.4-2: Summary of Earthquake Faults and Activity in the Vicinity of the Project Site

Fault Name or Seismic Zone	Distance (miles) & Direction from Site	Fault Length in Miles	Maximum Magnitude	Date of Last Rupture) (year)	Largest Historic Event	
					>5.5m	Year
Imperial Valley Faults						
Imperial	13 NE	38.5	7.0	1979	7.0	1940
Brawley	14 NE	8.7	7.0	1979	5.8	1979
Cerro Preito	17 SE	72.1	7.2	1980	7.1	1934
Brawley Seismic Zone	18 NNE	26.1	6.4		5.9	1981
East Highline Canal	29 NE	13.7	6.3			

Fault Name or Seismic Zone	Distance (miles) & Direction from Site	Fault Length in Miles	Maximum Magnitude	Date of Last Rupture) (year)	Largest Historic Event	
					>5.5m	Year
San Jacinto Fault System						
Superstition Hills	9.7 NNE	13.7	6.6	1987	6.5	1987
Superstition Mtn.	14 N	14.3	6.6	1440+/-		
Elmore Ranch	26 NNW	18.0	6.6	1987	5.9	1987
Borrego Mtn.	30 NW	18.0	6.6		6.5	1942
Anza Segment	48 NW	55.9	7.2	1918	6.8	1918
Coyote Creek	50 NW	24.9	6.8	1968	6.5	1968
Hot Springs-buck Ridge	63 NW	43.5	6.5		6.3	1937
Whole Zone	14 N	15.2	7.5			
Elsinore Fault System						
Laguna Salada	10 SW	41.6	7.0		7.0	1891
Coyote Segment	23 WNW	23.6	6.8			
Julian Segment	50 WNW	46.6	7.1			
Earthquake Valley	52 WNW	12.4	6.5			
Whole Zone	23 WNW	155.3	7.5			
San Andreas Fault System						
Coachella Valley	46 N	59.0	7.4	1690+/-	6.5	1948
Whole S. California Zone	46 N	284.6	7.9	1857	7.8	1857
Algodones	42 ENE	46.0	7.0			

Source: Landmark, 2011
N = North, NE = Northeast, NNE = North Northeast, WNW = West Northwest, SE = Southeast, NNW = North Northwest, ENE = East Northeast, SW = Southwest



Centinela Solar Site

Quaternary Faults

Mexico and US Border

N

10 0 10

Miles

BURNS McDONNELL

Figure 3.4-1
Regional Faults and Seismicity
Imperial County, California

Issued: 6/13/2019

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3.4.2.3 Ground Shaking

One of the seismic hazards most likely to impact the Project site is strong ground shaking during an earthquake (Landmark, 2011). Ground shaking from seismic events could reach the Project site if certain seismic factors (e.g., Richter magnitude, focal depth, distance from the causative fault, source mechanism, duration of shaking, high rock accelerations, type of surficial deposits or bedrock, degree of consolidation of surficial deposits, etc.) occur nearby. A soils map of the Project site and surrounding area was prepared using geographic information systems as show on **Figure 3.4-2**.

This map indicates that surficial deposits at the project site and surrounding area consist predominantly of silty clays and silty clay loams of the Imperial, Glenbar, Meloland, Holtville and Badlands soils groups. These clays and loams were formed in sediment and alluvium of mixed origin (Colorado River overflows and freshwater lakebed sediments) (GS Lyon, 2010a, 2010b, 2011a, 2011b).

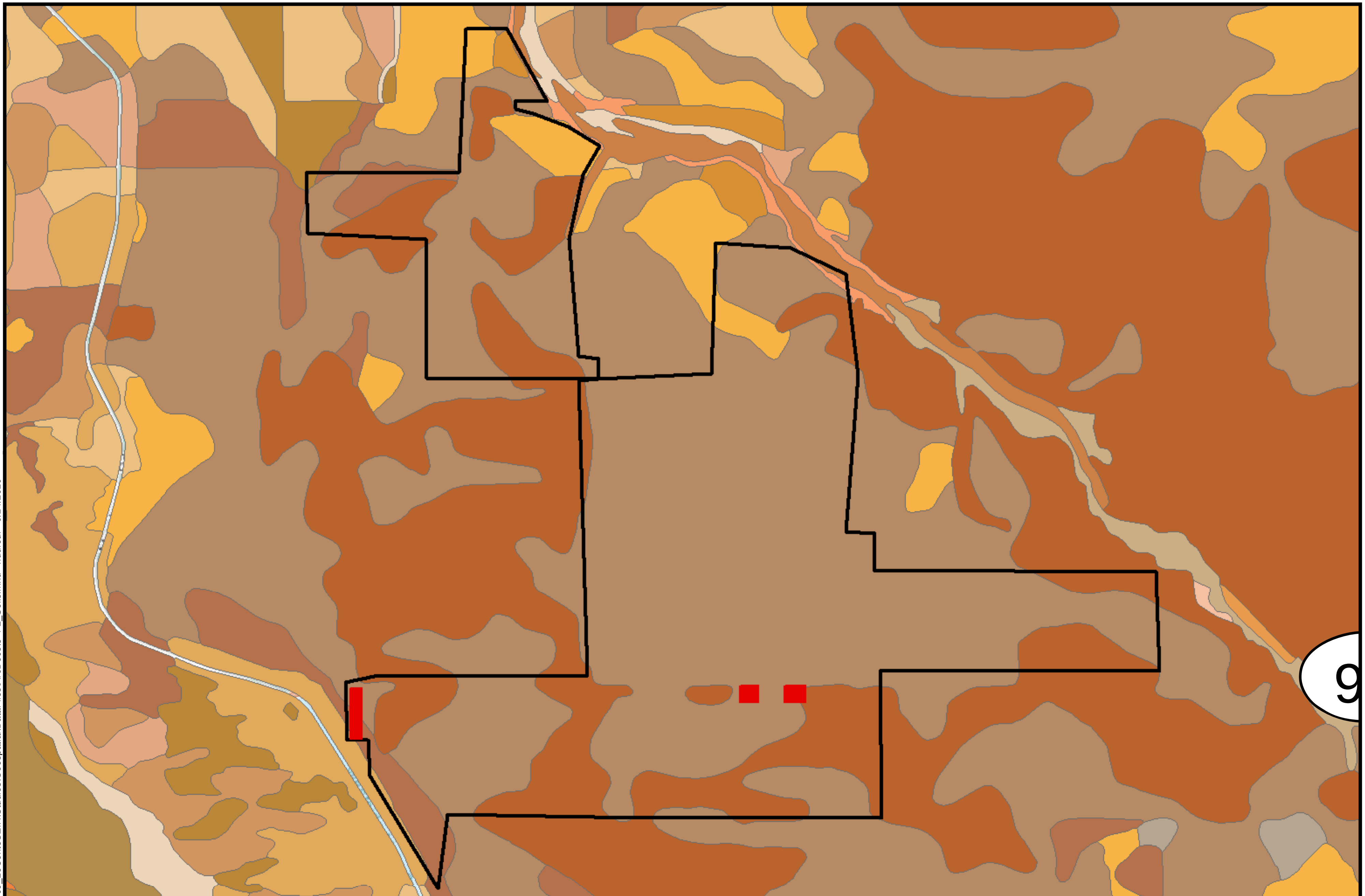
3.4.2.4 Surface Rupture

Surface rupture is an offset of the ground surface when fault rupture extends to the Earth's surface. Normal- and reverse- (collectively called dip-slip) faulting surface ruptures feature vertical offsets while strike-slip faulting produces lateral offsets. Many earthquake surface ruptures are combinations of both. Surface rupture represents a primary or direct potential hazard to structures built on an active fault zone. However, the project site is not located in an Alquist-Priolo Earthquake Fault Zone that is prone to surface rupture. No faults are known to align through the Project site.

The closest major faults are Elsinore Fault Zone, San Jacinto Fault Zone, Brawley Seismic Zone, Imperial fault and San Andreas Fault Zone located at distances of 10 to 46 miles from the Project site. These faults are capable of generating earthquakes with magnitude ranging from 6.6 to 7.9. Due to distance from the known faults, fault rupture is not a significant hazard at the Project site (Group Delta Consultants, Inc., 2012).

3.4.2.5 Liquefaction

Liquefaction occurs when granular soil below the water table is subjected to vibratory motions, such as produced by earthquakes. With strong ground shaking, an increase in pore water pressure develops as the soil tends to reduce in volume. If the increase in pore water pressure is sufficient to reduce the vertical effective stress (suspending the soil particles in water), the soil strength decreases and the soil behaves as a liquid (similar to quicksand). Liquefaction can produce excessive settlement, ground rupture, lateral spreading, or failure of shallow bearing foundations. Four conditions are generally required for liquefaction to occur (Landmark, 2012, p. 12):



- Proposed BESS Project Site and Alternative Locations
- Centinela Solar Site
- Badland
- Carsitas gravelly sand, 0 to 5 percent slopes
- Fluvaquents, saline
- Glenbar clay loam, wet
- Holtville silty clay
- Holtville silty clay, wet
- Imperial silty clay
- Imperial silty clay, wet
- Imperial-Glenbar silty clay loams, 2 to 5 percent slope s
- Imperial-Glenbar silty clay loams, wet, 0 to 2 percent slopes
- Indio loam, wet
- Indio-Vint complex
- Meloland and Holtville loams, wet
- Meloland very fine sandy loam, wet
- Rositas fine sand, 0 to 2 percent slopes
- Rositas fine sand, wet, 0 to 2 percent slopes
- Rositas sand, 0 to 2 percent slopes
- Vint and Indio very fine sandy loams, wet
- Vint loamy very fine sand, wet

N

1,500 0 1,500

Feet

BURNS McDONNELL

Figure 3.4-2
Soils Map
Imperial County, California

Issued: 6/14/2019

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1. the soil must be saturated (relatively shallow groundwater);
2. the soil must be loosely packed (low to medium relative density);
3. the soil must be relatively cohesionless (not clayey); and
4. groundshaking of sufficient intensity must occur to function as a trigger mechanism.

All these conditions exist to some degree at the site.

3.4.2.6 Subsidence

Land subsidence is a gradual caving or sinking of an area of land that can occur as a result of tectonic deformations (e.g., earthquakes) or anthropogenic causes such as mining or groundwater extraction. According to the Imperial County, Seismic and Public Safety Element, subsidence from earthquakes and other activities, including geothermal resources development, can disrupt drainage systems and cause localized flooding. Subsidence was not identified as an issue on the project site by the Preliminary Geotechnical Investigation Report (Landmark, 2011).

3.4.2.7 Groundwater

As detailed in the 2011 FEIR, Groundwater was encountered approximately 6 to 20 feet below ground surface during reconnaissance conducted in association with the Phase I Environmental Assessments (GS Lyon, 2010a, 2010b, 2011a, 2011b). Depth to groundwater may fluctuate due to localized geologic conditions, precipitation, irrigation, drainage and construction practices in the region. Based on the regional topography, groundwater flow is assumed to be generally towards the north but may vary across the project site. Groundwater in the area of the project site is brackish (containing a high salt content).

3.4.2.8 Landslides

Landslides, or slope failures, include many phenomena that involve the downslope displacement and movement of material, either triggered by static (i.e., gravity) or dynamic (i.e., earthquake) forces. A slope failure is a mass of rock, soil, and debris displaced downslope by sliding, flowing, or falling. Exposed rock slopes undergo rockfalls, rockslides, or rock avalanches, while soil slopes experience shallow soil slides, rapid debris flows, and deep-seated rotational slides. Landslides may occur on slopes of 15 percent or less; however, the probability is greater on steeper slopes that exhibit old landslide features such as scarps, slanted vegetation, and transverse ridges. The Project site is relatively flat with little to no potential for experiencing slope failures.

3.4.2.9 Soils

Soil conditions have remained similar to those described in the 2011 FEIR. As described in the 2011 FEIR, eleven soil map units are mapped on the Project site. Various characteristics of the soils are summarized in Table 3.4-3 below and depicted in **Figure 3.4-2**.

Badland soils - steep to very steep barren land soils dissected by drainage ways in local steep topography. Texture is clay to gravelly sand. Surface runoff is rapid or very rapid, and the hazard of erosion is high.

Fluvaquant soils - very deep, nearly level hydric soils on floodplains and alluvial basin floors. Surface runoff on Fluvaquant soils is slow to ponded, and the hazard or erosion is slight. Flooding is a hazard in some areas.

Holtville series - very deep, well drained stratified soils on flood plains, terraces, and alluvial basin floors. Permeability is slow in the clayey layer and moderately rapid below this layer. Available water capacity is high to very high. The soil is non-saline or slightly saline. Surface runoff is slow, and the hazard of erosion is slight.

Imperial series - very deep on flood plains and in basins and lakebeds. It is formed in clayey sediment from mixed sources. Permeability is slow, and available water capacity is very high. The soil is slightly saline. Surface runoff is slow, and the hazard of erosion is slight.

Indio-Vint complex - nearly level on flood plans and alluvial basin floors and are so intricately mixed that they were not separated on the soil map. The Indio series is very deep and well drained. Permeability of the Indio series is moderate, and available water capacity is high to very high. Surface runoff is slow, and the hazard of erosion is slight. The hazard of soil blowing is moderate. The Vint soil is very deep and well drained. Permeability of the Vint soil is moderately rapid, and available water capacity is moderate. Surface runoff is slow, and the hazard of erosion is slight. The hazard of soil blowing is high.

Table 3.4-3: Summary of Project Site Soil Map Units

Soil	Texture[1]	Depth of Surface Layer[1]	Wind Erodibility Group[2]	Erosion (K) Factor[3]	Erosion Hazard Paths and Trails[4]	Permeability Inches Per Hour[3]
Badland	Gravely Sand	10	N/A	N/A	N/A	N/A
Fluvaquants	N/A	N/A	N/A	N/A	N/A	N/A

Soil	Texture[1]	Depth of Surface Layer[1]	Wind Erodibility Group[2]	Erosion (K) Factor[3]	Erosion Hazard Paths and Trails[4]	Permeability Inches Per Hour[3]
Holtville	Silty Clay	17	5	.32	Moderate: Too clayey	.06 - .20
Imperial	Silty Clay Loam	10	5	.43	Moderate: Too clayey	.06 - .20
Imperial-Glenbar silty clay loams (2 to 5% slopes)	Silty Clay Loam	12	5	.43	Moderate: Too clayey	.06 - .20
Indio-Vint Complex	Loam	12	5	.55	Slight	0.6-2.0
Meloland very fine sandy loam, wet	Very Fine Sandy Loam	12	5	.43	Moderate:Wetness	0.6-2.0
Meloland and Holtville loam, wet	Sand	27	1	.20	Severe: Soil blowing	6.0-20.0
Rositas sand, (0 to 2% slopes)	Fine Sand	9	1	.2	Severe: Too sandy	6.0-20.0
Vint loamy very fine sand, wet	Loamy Very Fine Sand	10	3	.32	Moderate: Too sandy	2.0 – 6.0
Vint-Indio very sandy loams, wet	Loamy Very Fine Sand	10	3	.32	Slight	2.0 – 6.0

Source: : U.S. Department of Agricultural Soil Conservation Service, 1981,
Notes: N/A = not applicable or not available
1-Taken from Table 11, Engineering Index Properties.
2-Wind erodibility groups range from 1 to 8, with 1 being highly erodible and 8 having low erodibility. Taken from Table 12, Physical and Chemical Properties of Soils.

3-This is an index of erodibility for standard condition and includes susceptibility of soil to erosion and rate of runoff. Low K values (below 0.15) indicate low erosion potential. High K. values (above 0.4) are highly erodible. Taken from Table 12, Physical and Chemical Properties of Soils
4-Qualitative descriptors of erosion hazard: Slight = little or no erosion is anticipated, Moderate = some erosion anticipated, Severe = significant erosion potential exists. Taken from Table 9, Recreational Development (Paths and Trails).

Meloland series- very deep, nearly level and found on flood plains and alluvial basin floors. Permeability is slow, and available water capacity is high to very high. Surface runoff is slow, and the hazard of erosion is slight.

3.4.2.10 Expansive Soils

Expansive soils are characterized by their potential "shrink-swell" behavior. Shrink-swell is the cyclic change in volume (expansion and contraction) that occurs in certain fine-grained clay sediments from the process of wetting and drying. Clay minerals such as smectite, bentonite, montmorillonite, beidellite, vermiculite and others are known to expand with changes in moisture content. The higher the percentage of expansive minerals present in near surface soils, the higher the potential for significant expansion. The greatest effects occur when there are significant or repeated moisture content changes. Expansions of ten percent or more in volume are not uncommon. This change in volume can exert enough force on a building or other structure to cause cracked foundations, floors and basement walls. Damage to structures can also occur when movement in the foundation is significant. Structural damage typically occurs over a long period of time, usually the result of inadequate soil and foundation engineering or the placement of structures directly on expansive soils. Deposits that underly the project sites are considered to have a moderate to high potential for expansion United States Department of Agriculture (USDA, 1975).

3.4.2.11 Soil Erosion

Soil erosion is the displacement of the upper layer of soil, one form of soil degradation. Erosion, whether it is by water, wind or tillage, involves three distinct actions – soil detachment, movement and deposition. Soil erosion can be a slow process that continues relatively unnoticed or can occur at an alarming rate, causing serious loss of topsoil. Soil compaction, low organic matter, loss of soil structure, poor internal drainage, salinisation and soil acidity problems are other serious soil degradation conditions that can accelerate the soil erosion process. Excessive soil erosion can eventually lead to damage of building foundations and roadways. Typically, the soil erosion potential is reduced once the soil is graded and covered with improvements or vegetation.

3.4.2.12 Settlement

Settlement can occur from immediate settlement, consolidation, shrinkage of expansive soil, and liquefaction. Immediate settlement occurs when a load from a structure or placement of new fill material is applied, causing distortion in the underlying materials. This settlement occurs quickly and is typically complete after placement of the final load. Consolidation settlement occurs in saturated clay from the volume change caused by squeezing out water from the pore spaces. Consolidation occurs over a period of time and is followed by secondary compression, which is a continued change in void ratio under the continued application of the load. Soils tend to settle at different rates and by varying amounts depending on the load weight or changes in properties over an area, which is referred to as differential settlement.

3.4.2.13 Paleontological Resources

As described in the 2011 FEIR, the Project site is located in the Imperial Valley portion of the Salton Trough physiographic province of Southern California. The Project site and surrounding Imperial Valley is directly underlain by geologic units comprised of quaternary lake deposits of the ancient Lake Cahuilla. Lakebed deposits of ancient Lake Cahuilla have yielded fossil remains from numerous localities in Imperial Valley. These include extensive freshwater shell beds, fish, seeds, pollen, diatoms, foraminifera, sponges, and wood. Lake Cahuilla deposits have also yielded vertebrate fossils, including teeth and bones of birds, horses, bighorn sheep, and reptiles. The oldest sedimentary rocks in the vicinity of the Project site consist of fossil-rich marine mudstones and siltstones of the Imperial Group that formed on the submerged marine portions of the ancestral Colorado River delta.

3.4.3 Regulatory Setting

3.4.3.1 Federal

3.4.3.1.1 Federal Earthquake Hazards Reduction Act

This Act is also cited as the “National Earthquake Hazards Reduction Program Reauthorization Act of 2004.” The purpose of this Act is to reduce the risks to life and property from future earthquakes in the United States through the establishment and maintenance of an effective earthquake hazards reduction program. Loss of life, injury, destruction of property, and economic and social disruption can be substantially reduced through the development and implementation of earthquake hazard reduction measures. To accomplish this, the Act established the National Earthquake Hazards Reduction Program (NEHRPA). This program was significantly amended in November 1990 by the National Earthquake Hazards Reduction Program Act, which refined the description of agency responsibilities, program goals, and objectives. The NEHRPA designates the Federal Emergency Management Agency (FEMA) as the lead agency of the program and assigns it several planning, coordinating, and reporting responsibilities. Other NEHRPA agencies include the National Institute of Standards and Technology, National Science Foundation, and USGS (National Earthquake Hazards Reduction Program, 2004).

3.4.3.1.2 International Building Code

Published by the International Code Council, the scope of this code covers major aspects of construction and design of structures and buildings, except for detached one- and two-family dwellings and townhouses not more than three stories in height. The International Building Code (IBC) contains provisions for structural engineering design. Published every 3 years (most recently in 2015) by the International Code Council, the IBC addresses the design and installation of structures and building systems through requirements emphasizing performance. The IBC includes codes governing structural strength (including seismic loads and wind loads) as well as fire- and life-safety provisions covering accessibility, egress, occupancy, and roofs.

3.4.3.2 State

3.4.3.2.1 The Alquist-Priolo Earthquake Fault Zoning Act of 1972

The Alquist-Priolo Earthquake Fault Zoning Act was passed in 1972 to mitigate the hazard of surface faulting to structures for human occupancy. The Alquist-Priolo Earthquake Fault Zoning Act's main purpose is to prevent the construction of buildings used for human occupancy on the surface trace of active faults. The Act only addresses the hazard of surface fault rupture and is not directed toward other earthquake hazards.

The law requires the State Geologist to establish regulatory zones (known as Earthquake Fault Zones or, prior to January 1, 1994, Special Studies Zones) around the surface traces of active faults and to issue appropriate maps. The maps are distributed to all affected cities, counties, and State agencies for their use in planning and controlling new or renewed construction. Local agencies must regulate most development projects within the zones. Projects include all land divisions and most structures for human occupancy.

Before a project can be permitted for construction, cities and counties must require a geologic investigation to demonstrate that proposed buildings will not be constructed across active faults. An evaluation and written report of a specific site must be prepared by a licensed geologist. If an active fault is found, a structure for human occupancy cannot be placed over the trace of the fault and must be set back from the fault (California Department of Conservation, 2016). As determined in the *Final Geotechnical Report Centinela Solar Energy Facility* (Group Delta Consultants, Inc., 2012), the site is not located within an Alquist-Priolo earthquake fault zone.

3.4.3.2.2 The Seismic Hazards Mapping Act of 1990

The Seismic Hazards Mapping Act of 1990 (7.8 PRC2690-2699.6) directs the Department of Conservation, California Geological Survey to identify and map areas prone to earthquake hazards of liquefaction, earthquake-induced landslides, and amplified ground shaking. The purpose of this Act is to reduce the threat to public safety and minimize the loss of life and property by identifying and mitigating these seismic hazards. The Seismic Hazard Zone maps identify where a site investigation is required, and the site investigation determines whether structural design or modification of the Project site is necessary for safer development. The Seismic Hazards Mapping Act requires site-specific geotechnical investigations identifying the seismic hazard and formulating mitigation measures, when needed, prior to permitting most developments designed for human occupancy within the Zones of Required Investigation (California Department of Conservation, 2016).

3.4.3.2.3 California Building Code (2010)

Development within California is required at a minimum to adhere to the provisions of the Uniform Building Code (UBC). The UBC establishes minimum standards related to development, seismic design, building siting, and grading. The purpose of the UBC is to provide minimum standards to preserve public peace, health, and safety by regulating the design, construction, quality of materials, certain equipment, location, grading, use, occupancy, and maintenance of all buildings and structures. UBC standards address foundation design, shear wall strength, and other structural related conditions. Upon incorporation, the City adopted the 1997 edition of the UBC.

3.4.3.2.4 Public Resources Code, Chapter 1.7, Sections 5097.5

Several sections of the California Public Resources Code protect paleontological resources. Section 5097.5 prohibits “knowing and willful” excavation, removal, destruction, injury, and defacement of any paleontological feature on state lands (lands under state, county, city, district, or public authority jurisdiction, or the jurisdiction of a public corporation), except where the agency with jurisdiction has granted express permission.

3.4.3.3 Local

3.4.3.3.1 County of Imperial Grading Ordinance

The Purpose of Title 9, the Land Use Ordinance for the County of Imperial, is to provide comprehensive land use regulations for all unincorporated areas of the County of Imperial. These regulations are adopted to promote and protect the public health, safety, and general welfare through the orderly regulation of land uses throughout the unincorporated areas of the County. Title 9 Division 15 (Geological Hazards) of the County Land Use Ordinance has established procedures and standards for development within earthquake fault zones. Per County regulations, the construction of buildings intended for human occupancy which are located across the trace of an active fault are prohibited. An exception exists when such buildings located near the fault or within a designated Special Studies Zone are demonstrated through a geotechnical analysis and report not to expose a person to undue hazard created by the construction. The proposed Project does not include any residential structures.

3.4.3.3.2 County of Imperial General Plan

Relevant Imperial County General Plan policies related to geology, soils, and seismicity are provided below. Table 3.4-4 discusses the proposed Project's consistency with the County's General Plan policies. While this EIR analyzes the project's consistency with the General Plan pursuant to CEQA Guidelines Section 151250, the Imperial County Board of Supervisors ultimately determines consistency with the General Plan. The Imperial County General Plan does not specify any goals or objectives for paleontological resources. However, paleontological resources are a sub-category of cultural resources. The Conservation and Open Space Element of the General Plan contains a goal and objective to preserve cultural resources.

Table 3.4-4: Imperial County General Plan Consistency Analysis

General Plan Policies	Consistency with General Plan	Analysis
Land Use Planning and Public Safety		
Goal 1: Include public health and safety considerations in land use planning.	Yes	The proposed Project is located within the fence line of an existing solar site which is located in a rural portion of Imperial County. Public health and safety would not be affected in association with development of a battery energy storage system in this area based on its remote location away from population centers. Therefore, the proposed Project is consistent with this goal.

General Plan Policies	Consistency with General Plan	Analysis
Objective 1.4 Require, where possessing the authority, that avoidable seismic risks be avoided; and that measures, commensurate with risks, be taken to reduce injury, loss of life, destruction of property, and disruption of service.	Yes	The proposed Project is sited in an area subject to seismic shaking. However, the Project site is not located within an Alquist-Priolo (AP) earthquake fault zone. The closest major faults are Elsinore Fault Zone, San Jacinto Fault Zone, Brawley Seismic Zone, Imperial fault and San Andreas Fault Zone located at distances of 10 to 46 miles from the site. These faults are capable of generating earthquakes with magnitude ranging from 6.6 to 7.9. Due to distance from the known faults, fault rupture is not a significant hazard at the Project site (Group Delta Consultants, Inc., 2012). The proposed Project could experience strong ground shaking during an earthquake. However, no habitable structures are proposed and the Project would be designed in accordance with all applicable federal, State and local building codes as well as the recommendations included in the Geotechnical (Group Delta Consultants, Inc., 2012). Damage to proposed structures can be mitigated through engineering and compliance with building standards (refer to Mitigation Measure GEO-1) Therefore, the proposed Project is consistent with this objective.
Objective 1.7 Require developers to provide information related to geologic and seismic hazards when siting a proposed project.	Yes	A Geotechnical Evaluation Report has been prepared by Group Delta Consultants for the proposed Battery Energy Storage System. The Report was used in the analysis of geology and soils. The Report included recommendations to address potential geologic or seismic hazards that may be associated with the Project site. These standard building requirements and recommendations have been identified in this section as Mitigation Measures GEO-2 through GEO-11. Therefore, the proposed Project is consistent with this objective.

General Plan Policies	Consistency with General Plan	Analysis
Emergency Preparedness		
Objective 2.8 Prevent and reduce death, injuries, property damage, and economic and social dislocation resulting from natural hazards including flooding, land subsidence, earthquakes, other geologic phenomena, levee or dam failure, urban and wildland fires and building collapse by appropriate planning and emergency measures.	Yes	The Project site is located in a seismically active area. The Geotechnical Evaluation Report prepared for the Project includes recommendations that all structures be designed in accordance with the CBC. Recommendations, including those from the Report, have been included as Mitigation Measures GEO-1 through GEO-11 to reduce risks associated with seismic hazards. Therefore, the proposed Project is consistent with this objective.
Seismic/Geologic Hazards		
Policy 4 Ensure that no structure for human occupancy, other than one-story wood frame structures, shall be permitted within fifty feet of an active fault trace as designated on under the Alquist-Priolo Geologic Hazards Zone Act.	Yes	The proposed Project does not include any habitable structures and is not located within fifty feet of an active fault. Therefore, the proposed Project is consistent with this policy.

General Plan Policies	Consistency with General Plan	Analysis
Conservation and Open Space		
Preservation of Cultural Resources		
Goal 3: Important prehistoric and historic resources shall be preserved to advance scientific knowledge and maintain the traditional historic element of the Imperial Valley landscape.	Yes	The proposed Project has the potential to result in impacts to prehistoric resources based on the Project's location in an area containing a high probability for the discovery of fossils. The *Addendum Paleontological Resource Assessment Centinela Solar Energy, LLC, Imperial County, California* (SDNHM, 2011) prepared for the Project area identified the need for mitigation or field surveys to reduce potential for impacts to fossils. Mitigation Measure GEO-12 would include monitoring during construction and protocols should paleontological resources be discovered. Thus, the proposed Project is consistent with this goal.
Objective 3.1 Protect and preserve sites of archaeological, ecological, historical, and scientific value, and/or cultural significance.	Yes	The proposed Project, would be subject to implementing field surveys or mitigation monitoring. The proposed Project is consistent with this objective.

3.4.4 Environmental Consequences

3.4.4.1 Thresholds of Significance

The Project would result in a significant impact related to geology, soils, or mineral resources if it were to:

a) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury or death involving:

   i. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault

   ii. Strong seismic ground shaking

iii. Seismic-related ground failure including liquefaction

iv. Landslides

b) Result in substantial soil erosion or the loss of topsoil

c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or offsite landslide, lateral spreading, subsidence, liquefaction or collapse

d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property

e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of wastewater

f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature

3.4.4.2 Issues Scoped Out

Appendix Criterion "a (iv)" and "e" were scoped out as part of the CEQA Appendix G Environmental Checklist Form. Criterion "a (iv)" was scoped out because the Project sites do not contain any steep slopes and is not considered to be at risk for landslides. The Geotechnical Evaluation Report (Group Delta Consultants, Inc., 2012) states that the Project site has no known history of subsidence. The Project site is generally level and no post-construction slopes are planned. Therefore, slope stability is not a hazard at the Project site. Criterion "e" was scoped out because operation of the Project will not require staff at the Project site. The Project does not propose the construction of any on-site septic systems or alternative wastewater disposal systems. Therefore, no impact is identified for these issue areas.

3.4.4.3 Project Impacts

The following subsections evaluate the significance of various potential Project impacts with respect to the criteria outlined above.

Impact 3.4-1: Would the Project directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury or death involving:

i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault?

Construction, Operation and Decommissioning Impacts

Imperial County is historically known as being a very active seismic area. The San Andreas fault southern extension is under the Salton Sea and north of the Project location, and the impact of a major quake to the area is unknown. However, the Project site is not located within an Alquist-Priolo (AP) earthquake fault zone. The closest major faults are Elsinore Fault Zone, San Jacinto Fault Zone, Brawley Seismic Zone, Imperial fault and San Andreas Fault Zone located at distances of 10 to 46 miles from the site (**Figure 3.4-1**). These faults are capable of generating earthquakes with magnitude ranging from 6.6 to 7.9. The Project will not include full-time regular employees on-site; however, regular maintenance visits will be required where people will be exposed to potential seismic activity. Due to distance from the known faults, fault rupture is not a significant hazard at the Project site.

Mitigation Measures

None required.

Significance After Mitigation

Not applicable.

ii) Strong seismic ground shaking?

Construction, Operation and Decommissioning Impacts

The proposed Project site is located in Imperial Valley, a seismically active area of California. According to the Geotechnical Report, strong shaking should be anticipated during the design life of the Project due to potential fault movements, along the Imperial Fault, Superstition Hills Fault and Laguna Salada Fault. Nearby active faults are illustrated in **Figure 3.4-1**. Imperial County is classified as Seismic Zone 4 by the Uniform Building Code (UBC) (Sections 1626 through 1635). Developments within in Seismic Zone 4 (highest risk on a scale of 0 to 4) are required to incorporate the most stringent earthquake resistant measures. While the Project would not include habitable structures, the BESS itself could be damaged by strong seismic shaking. Thus, impacts associated with strong seismic shaking are considered potentially significant during construction, operation and decommissioning of the proposed Project.

During operation, the proposed Project site would not require any regular on-site workers that could be exposed to seismic hazards other than during occasional maintenance procedures. Additionally, structural damage to overhead transmission lines and other associated BESS equipment could occur but these would only injure workers at the Project site if an event coincided with a maintenance event which would be highly speculative. However, all proposed construction would be required to adhere to the seismic and structural standards of the CBC. Further, decommissioning activities would not be expected to result in any impact given that all Project components will be removed, and the land will be restored to its current agricultural use and the decommissioning and restoration activities would be undertaken consistent with local, state, and federal laws and regulations applicable at the time of decommissioning. While completely avoiding damage may not be possible, adherence to these codes would be effective in minimizing the potential hazards. Mitigation Measure GEO-1 requires structures to be designed in compliance with CBC standards, recommendations provided in the Geotechnical Investigation Report (Group Delta Consultants, Inc., 2012), and any subsequent geotechnical investigations on the final project design. Implementation of Mitigation Measure GEO-1 would reduce impacts associated with ground shaking to less than significant under CEQA.

Mitigation Measures

MM GEO-1: The Project shall be designed in accordance with California Building Code, Uniform Building Code or the standards of care established by the Structural Engineers Association of California and the County of Imperial building requirements. Standards subsequent geotechnical investigations on the final project design.

Level of Significance After Mitigation

Implementation of Mitigation Measure GEO-1 would reduce potential structural damage caused by impacts would be less than significant.

iii) Seismic-related ground failure including liquefaction?

Construction, Operation and Decommissioning Impacts

As discussed above the Project site is located within a seismically active region that is well known for active faulting and historic seismicity. Based on the soil types and presence of shallow groundwater at the project sites, there is generally a potential for liquefiable materials to be present beneath the sites. According to the 2011 FEIR, soils within the CSE facility site include saturated silts and silty sands that could liquefy. As indicated in the Geotechnical Investigation Report (Landmark 2012), the soil encountered at the points of exploration included saturated silts and silt sands that could liquefy during a California Building Code Design Basis Earthquake. Liquefaction can occur within several isolated silt and sand layers between depths of 5 to 42.5 feet. The likely triggering mechanism for liquefaction appears to be strong ground shaking associated with the rupture of the Laguna Salada, Borrego, Pescadores, Superstition Hills, and

Cerro Prieto Faults. Clay soils (CL) of medium to high expansion predominate the area of the proposed Project site. Groundwater depth is approximately 3.5 feet below existing ground surface. The geotechnical investigation included (Landmark, 2012, page 13, Plate A-2) the following boring log for locations on the proposed Project site, as indicated in Table 3.4-5.

Table 3.4-5: Summary of Liquefaction Analyses

Boring Location	Depth to First Liquefiable Zone (ft)	Potential Induced Settlement (in)
B-3	23.0	1.5
B-4	26.0	1.5
B-5	8.0	2
CPT-1	5.0	2.25
CPT-2	5.5	1.25
CPT-3	9.5	2.25

Source: Landmark, 2012

Based on the findings, it was determined that there is a potential for up to 1.5 inches of liquefaction induced differential settlement at the switchyard location (adjacent to the proposed Project site) over a horizontal distance of 100 feet. Liquefaction induced lateral spreading is not expected to occur at the Wormwood Canal embankment adjacent to the Project site due to the depth of the liquefiable layer (Landmark, 2012). Consequently, the Project could be subject to potential adverse effects from ground failure associated with liquefaction during a strong seismic event. Structural damage to structures and other associated equipment or facilities could occur and also potentially injure workers at the Project site if not designed appropriately. The proposed Project site would have no onsite staff, and as a result, potential damage to these on-site structures would have a very limited potential to cause injury or death. Adherence to all applicable requirements of the California Building Code (CBC), which incorporates measures to help mitigate any potential impacts associated with liquefaction or associated ground failure at the Project site, would be required for the proposed improvements. In addition, based on the relatively simple structure of the proposed BESS facility, reparations to any potential damage that may occur as a result of liquefaction would likely be feasible and relatively easily accomplished.

All proposed construction would be required to adhere to the seismic and structural standards of the California Building Code. While completely avoiding damage may not be possible, adherence to these codes would be effective in minimizing the potential hazards from liquefaction. In addition, the proposed Project will be designed in accordance with a Final Geotechnical Evaluation Report that will be prepared by a licensed professional engineer during the final design phase. This Final Geotechnical Evaluation report will be submitted to the Imperial County Public Works Department, Engineering Division and the Imperial County Planning and Development Services Department for review and approval prior to obtaining building permits as required by the Imperial County requirements. Compliance with these measures, as well as Mitigation Measures GEO-2 through GEO-11 would reduce potential impacts associated with seismic hazards and unstable soils to less than significant levels under CEQA.

Mitigation Measures

MM GEO-2: The Project contractor shall implement ground improvement measures prior to construction, such as deep soil mixing (cement), vibro-compaction, vibro-replacement, geopiers, stone columns, compaction grouting, or deep dynamic compaction.

MM GEO-3: Concrete mixes shall have a maximum water cement ratio of 0.45 and a minimum compressive strength of 5,000 psi (minimum of 7 sacks Type II/V cement per cubic yard).

MM GEO-4: All concrete placement and curing operations shall follow the American Concrete Institute manual recommendations. Improper curing techniques and/or high slump (high water-cement ratio) could cause excessive shrinkage, cracking or curling. Concrete slabs shall be allowed to cure adequately before placing vinyl or other moisture sensitive floor covering.

MM GEO-5: The final design of the Project foundation shall include proper drainage to inhibit water infiltration into foundation soils. Drainage shall also be properly managed during construction to avoid water infiltration from any source.

MM GEO-6: Foundations shall be designed to withstand liquefaction during a seismic event, including foundations that use grade-beam footings to tie floor slabs and isolated columns to continuous footings (conventional or post-tensioned) or structural flat-plate mats, either conventionally reinforced or tied with post tensioned tendons.

MM GEO-7: Designs for thin slabs-on-grade shall mitigate expansive soil conditions by removal and replacement of upper 3.0 feet of clay soils with non-expansive sands or by special foundation designs (waffle-style slabs).

MM GEO-8: All reinforcing bars, anchor bolts and hold down bolts shall have a minimum concrete cover of 3.0 inches unless epoxy coated (ASTM D3963/A934).

MM GEO-9: All footings shall be reinforced to reduce the potential for distress caused by differential foundation movements.

MM GEO-10: In areas where sidewalks or paving do not immediately adjoin the structures of the proposed Project, protective slopes shall be provided with an outfall of 5 percent for at least 10 feet from perimeter walls. Backfill against footings, exterior walls, and in utility trenches shall be well-compacted and free of all construction debris to minimize the possibility of moisture infiltration.

MM GEO-11: The geotechnical engineer or geotechnical engineer's representative shall observe the footing excavations prior to placing reinforcing steel and pouring concrete foundations to assess whether the soils exposed are similar to those anticipated for support of the footings. Any soft, loose, or unacceptable soils shall be undercut to suitable materials and backfilled with approved fill materials or lean concrete. Soil backfill shall be properly compacted.

Level of Significance After Mitigation

Implementation of Mitigation Measures GEO-2 through GEO-11 would reduce the potential effects of liquefaction-induced settlements by making the structures more able to withstand differential settlement. Impacts would be less than significant.

Impact 3.4-2: Would the Project result in substantial soil erosion or the loss of topsoil?

Construction, Operation and Decommissioning Impacts

Disturbance associated with site preparation activities leaves soils vulnerable to detachment by wind, resulting in net loss, or displacement. Construction soil erosion impacts are considered potentially significant short-term impacts under CEQA. Erosion is the detachment and movement of soil materials through natural processes (primarily wind or water) or human activities. Rates of erosion can generally vary according to the soil resource's capacity to drain water, slope angle and length, extent of groundcover, and human influence.

Grading and excavation would be required at the Project site to create a foundation for the BESS facility and other required Project components. Electrical conduits and electrical wiring would be installed and buried in designated areas throughout the Project site. However, since the existing site was previously leveled at the time the CSE facility was developed, only minor grading would be needed.

However, in compliance with federal Clean Water Act and regulations of the State Water Resource Control Board, the proposed Project would require implementation of a construction Stormwater Pollution Prevention Plan (SWPPP), including site-specific BMPs for erosion and sediment control. The SWPPP would require BMPs be adopted for the specific conditions at the Project site and would minimize any risk for substantial erosion during construction. In addition,

County standards would include preparation, review and approval of a grading plan by the County Engineer and implementation of a Dust Control Plan (Rule 801) (discussed further in Section 4.1, Air Quality). An NPDES Construction General Permit will be required for the Project because more than one acre would be disturbed.

Given the relatively flat nature of the project area and low precipitation in the area, it is unlikely that soil erosion from runoff would occur; however, with implementation of the BMPs contained in the required SWPPP, the potential impacts would be less than significant.

Mitigation Measure

None required.

Level of Significance After Mitigation

Not applicable.

Impact 3.4-3: Would the Project be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or offsite landslide, lateral spreading, subsidence, liquefaction or collapse?

Construction, Operation and Decommissioning Impacts

Construction of the proposed Project elements could present new loading for near surface soils that might eventually cause damage to Project facilities from subsidence over time. However, the proposed improvements would be required to adhere to all applicable California Building Standards Code and would help to mitigate any potential impacts associated with subsidence or any other potentially hazardous condition associated with the ability of underlying materials to adequately support the proposed improvements. Subsidence or collapse can also occur through the rapid removal of fluids such as groundwater or petroleum from the subsurface. The Project does not include the extraction of any groundwater or petroleum.

The existing CSE site is within a topographically flat area. As indicated in the 2011 FEIR, soils on the existing CSE facility site predominately consist of clays with imbedded silts and sandy silts. The native surface clays within the agricultural lands exhibit high to very high swell potential when tested according to the Uniform Building Code Standard 18-2 methods. The clay is expansive when wetted and can shrink with moisture loss (drying). Causes for soil saturation include landscape irrigation, broken utility lines, or capillary rise in moisture upon sealing the ground surface to evaporation. Moisture losses can occur with lack of landscape watering, lose proximity of structures to downslopes and root system moisture extraction from deep rooted shrubs and trees placed near the foundations. The Project area could be subject to direct impacts resulting from potential swelling forces and reduction in soil strength resulting from saturation.

Mitigation measure to replace expansive soils or condition soils to minimize expansion were implemented during project construction of the existing CSE facility to reduce direct impacts associated with expansive soils. Further, adherence to applicable building code requirements and industry standard geotechnical site preparations would reduce the potential impact from unstable soils. As the proposed Project will be developed within the boundary of the existing CSE facility, this issue is considered to be less than significant.

Mitigation Measure

None required.

Level of Significance After Mitigation

Not applicable.

Impact 3.4-4: Would the Project be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?

Construction, Operation and Decommissioning Impacts

Expansive soils possess a shrink-swell characteristic that can result in structural damage over a long period of time. Expansive soils are largely comprised of silicate clays, which expand in volume when water is absorbed and shrink when dried. Highly expansive soils can cause damage to foundations and roads. As indicated in the 2011 FEIR, soils on the existing CSE facility site predominately consist of clays with imbedded silts and sandy silts. The native surface clays within the agricultural lands exhibit high to very high swell potential when tested according to the Uniform Building Code Standard 18-2 methods. The clay is expansive when wetted and can shrink with moisture loss (drying). Causes for soil saturation include landscape irrigation, broken utility lines, or capillary rise in moisture upon sealing the ground surface to evaporation. Moisture losses can occur with lack of landscape watering, lose proximity of structures to downslopes and root system moisture extraction from deep rooted shrubs and trees placed near the foundations.

The Project area could be subject to direct impacts resulting from potential swelling forces and reduction in soil strength resulting from saturation. However, mitigation measure to replace expansive soils or condition soils to minimize expansion were implemented during project construction of the existing CSE facility to reduce direct impacts associated with expansive soils. As the proposed Project will be developed within the boundary of the existing CSE facility, this issue is considered to be less than significant. Once construction is completed no employees will be based at the Project site. Primary security–related monitoring for the Project site will be done remotely, security personnel will conduct routine unscheduled security rounds, and will be dispatched to the site in response to a fence breach or other alarm. Site maintenance workers will access the Project site periodically to maintain the equipment and Project area. The public will not have access to the facility. Access to the Project area will be infrequent and limited to authorized personnel.

Mitigation Measure

None required.

Level of Significance After Mitigation

Not applicable.

Impact 3.4-5: Would the Project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

Construction, Operation and Decommissioning Impacts

Construction activities on the Project site would occur on a previously developed solar field. As described in the 2011 FEIR, the CSE facility was developed over a large area that had been previously disturbed by agricultural activities. Deposits near the ground surface (approximately five feet in depth) were subject to disking, tilling, and planting for years, effectively compromising any fossil deposits that may have once been present. No direct impacts to paleontological resources are anticipated in association with operation and maintenance of the Project. Indirect impacts to paleontological resources during operation and maintenance would be low because no major ground disturbing activities or excavations would be anticipated as part of routine maintenance. When the Project reaches the end of its operational life, Project components would be decommissioned and deconstructed. Concrete foundations would be removed to a depth of at least four feet below ground level and demolished; driven piles would be removed from the ground. Other concrete foundations, such as those for buildings, would be demolished and removed or used onsite for fill as needed. Excavation areas (e.g., foundation removal) would be backfilled and restored to an appropriate contour. Areas subject to decommissioning would have been disturbed during construction. Mitigation Measures GEO-12 would be implemented during construction to address construction-related impacts to paleontological resources. With implementation of Mitigation GEO-12, direct and indirect impacts to paleontological resources during construction, operation and decommissioning of the proposed Project would be reduced to less than significant.

Mitigation Measure

MM GEO-12: Ground-disturbing shall be monitored by a qualified paleontological monitor. The paleontological monitor shall be prepared to salvage fossils should these resources be unearthed and to remove samples of sediments that are likely to contain the remains of small fossil invertebrates and vertebrates. Monitors are empowered to temporarily halt or divert equipment to allow removal of abundant or large specimens. Recovered specimens shall be prepared to a point of identification and permanent preservation, including washing of sediments to recover small invertebrates and vertebrates. Fossil specimens shall be curated by accessioning them into an established, accredited museum repository with permanent retrievable paleontological storage. A report of findings with an appended itemized inventory of specimens shall be prepared. The report and inventory, when submitted to the Imperial County Department of Planning and Development Services, along with confirmation of the curation of recovered specimens into an established, accredited museum repository, shall signify completion of the program to mitigate impacts to paleontological resources.

Level of Significance After Mitigation

Implementation of Mitigation Measure GEO-12 would reduce the potential paleontological resources. Impacts would be less than significant.