5.11 Soils

This section describes the potential effects of the construction and operation of the Huntington Beach Energy Project (HBEP) on soil resources and is organized as follows: Section 5.11.1 is the introduction, Section 5.11.2 describes the environmental setting, including soil types and their use; Section 5.11.3 presents the environmental analysis of project development; Section 5.11.4 discusses cumulative effects; Section 5.11.5 presents mitigation measures; Section 5.11.6 provides agency contacts for involved agencies; Section 5.11.7 describes permits required for the project; Section 5.11.8 presents the laws, ordinances, regulations, and standards (LORS) applicable to soils and their use; and Section 5.11.9 provides the references used to develop this section.

5.11.1 Setting

The HBEP site is located in an industrial area of Huntington Beach at 21730 Newland Street, just north of the intersection of the Pacific Coast Highway (Highway 1) and Newland Street. The project is located on the site of the existing Huntington Beach Generating Station, an operating power plant. The HBEP site is bounded on the west by a manufactured home/recreational vehicle park, on the north by a tank farm, on the north and east by the Huntington Beach Channel and residential areas, on the southeast by the Huntington Beach Wetland Preserve / Magnolia Marsh wetlands, and to the south and southwest by the Huntington Beach State Park and the Pacific Ocean. The site is located on a gently sloping coastal plain.

HBEP is a 939-megawatt combined-cycle power plant, consisting of two power blocks. Each power block is composed of three combustion turbines with supplemental fired heat recovery steam generators, a steam turbine generator, an air-cooled condenser, and ancillary facilities. HBEP will reuse existing onsite potable water, natural gas, stormwater, process wastewater, and sanitary pipelines and electrical transmission facilities. No offsite linear developments are proposed as part of the project.

The project will use potable water, provided by the City of Huntington Beach, for construction and operational process and sanitary uses. During operation, stormwater and process wastewater will be discharged to a retention basin and then ultimately to the Pacific Ocean via an existing outfall. Sanitary wastewater will be conveyed to the Orange County Sanitation District via the existing City of Huntington Beach sewer connection. Two 230-kilovolt (kV) transmission interconnections will connect HBEP Power Blocks 1 and 2 to the existing onsite Southern California Edison 230-kV switchyard.

HBEP construction will require the removal of the existing Huntington Beach Generating Station Units 1, 2, and 5. Demolition of Unit 5, scheduled to occur between the fourth quarter of 2014 and the end of 2015, will provide the space for the construction of HBEP Block 1. Construction of Blocks 1 and 2 are each expected to take approximately 42 and 30 months, respectively, with Block 1 construction scheduled to occur from the first quarter of 2015 through the second quarter of 2018, and Block 2 construction scheduled to occur from the first quarter of 2018 through the second quarter of 2020. Removal/demolition of existing Huntington Beach Generating Station Units 1 and 2 is scheduled to occur from the fourth quarter of 2020 through the third quarter of 2022.

Existing Huntington Beach Generating Station Units 3 and 4 were licensed through the California Energy Commission (00-AFC-13C) and demolition of these units is authorized under that license and will proceed irrespective of the HBEP. Therefore, demolition of existing Huntington Beach Generating Station Units 3 and 4 is not part of the HBEP project definition. However, to ensure a comprehensive review of potential project impacts, the demolition of existing Huntington Beach Generating Station Units 3 and 4 is included in the cumulative impact assessment. Removal/demolition of existing Huntington Beach Generating Station Units 3 and 4 will be in advance of the construction of HBEP Block 2.

HBEP construction will require both onsite and offsite laydown and construction parking areas. Approximately 22 acres of construction laydown will be required, with approximately 6 acres at the Huntington Beach Generating Station used for a combination of laydown and construction parking, and 16 acres at the AES Alamitos Generating Station (AGS) used for construction laydown (component storage only/no assembly of components at AGS). During HBEP construction, the large components will be hauled from the construction laydown area at the AGS site to the HBEP site as they are ready for installation.

Construction worker parking for HBEP and the demolition of the existing units at the Huntington Beach Generating Station will be provided by a combination of onsite and offsite parking. A maximum of 330 parking spaces will be required during construction and demolition activities. As shown on Figure 2.3-3 in Section 2.0, Project Description, construction/demolition worker parking will be provided at the following locations:

- Approximately 1.5 acres onsite at the Huntington Beach Generating Station (approximately 130 parking stalls)
- Approximately 3 acres of existing paved/graveled parking located adjacent to HBEP across Newland Street (approximately 300 parking stalls)
- Approximately 2.5 acres of existing paved parking located at the corner of Pacific Coast Highway and Beach Boulevard (approximately 215 parking stalls)
- 225 parking stalls at the City of Huntington Beach shore parking west of the project site.
- Approximately 1.9 acres at the Plains All American Tank Farm located on Magnolia Street (approximately 170 parking stalls)

The Huntington Beach Generating Station has existing utility appurtenances that will be used for HBEP, including the natural gas supply pipeline, the potable (municipal) water and sanitary sewer connections. Other infrastructure, such as the fire water distribution and process water distribution will also be reused to the extent possible.

A description of the soils in the HBEP site area was developed using the online and published (printed) versions of the Soil Survey of Orange County and Part of Riverside County, California (Natural Resources Conservation Service [NRCS], 2008, 1978) and the US General Soil Map for California (STATSGO2; NRCS, 2006). Descriptions of the soil mapping units were developed from the soil survey information and the online soil series descriptions (Soil Survey Staff, 2012).

Soil map units for the project area are identified in Figure 5.11-1. The characteristics for the soil map units that could be potentially affected by HBEP construction are summarized in Table 5.11-1. The project area includes the project site and offsite laydown and parking areas. Table 5.11-1 summarizes depth, texture, drainage, permeability, water runoff, and items related to revegetation potential. Actual soil conditions in the project area could differ from what is described in the generalized soil descriptions because of the potential for previous grading or other earthmoving activities at the developed industrial/urban site.

5.11.1.1 Agricultural Use

Based on a review of aerial photography, there appears to be no agricultural production within 1 mile of the HBEP site. The soils mapped at the project site and surrounding areas have been developed for industrial, commercial, and urban residential uses or are associated with undeveloped natural areas. Given the current and historical land use, these areas are now likely unsuitable for commercial crop production.

5.11.1.2 Wetlands

The project site is bordered on the southeast by the Huntington Beach Wetland Preserve / Magnolia Marsh wetlands. Construction and operation of the HBEP will not affect this feature. Wetland features are discussed in more detail in Section 5.2, Biological Resources.

5.11.1.3 Soil Mapping Units

Table 5.11-1 describes the properties of the soil mapping units that are found in the vicinity of the project site. As shown in Figure 5.11-1, the majority of the project site is made up of the Tidal Flats map unit (211). These soils formed in nearly level areas adjacent to bays and lagoons along the coast and are made up of stratified clay to sandy deposits (NRCS, 1978).

TABLE 5.11-1
Soil Mapping Unit Descriptions and Characteristics

Map Unit	Description
Project Site - Soil Survey of Orange County and Part of Riverside County, California	
122	**Bolsa silt loam:** This soil unit comprises a small portion of the northeast corner HBEP site and one unpaved offsite construction worker parking area at Plains All American Tank Farm. Formation: Mixed alluvium on alluvial fans Typical profile: Silt loam over silt loam or silty clay loam Shrink-swell capacity: Moderate Depth and drainage: Very deep (>60 inches); somewhat poorly drained Permeability: Moderately slow Runoff: Slow Capability class: 2w (irrigated), 3w (nonirrigated) Taxonomic class: Fine-silty, mixed (calcareous), thermic Aquic Xerofluvents
211	**Tidal Flats:** This soil unit comprises the majority of the HBEP site as well as two offsite construction worker parking areas (one graveled area at Newlands and one paved area at the intersection of Beach Boulevard and Pacific Coast Highway). Formation: Tidal flats Typical profile: Stratified clayey to sandy deposits Shrink-swell capacity: Variable Depth and drainage: Depth not reported; poorly drained Permeability: Very slow Runoff: Ponds on surface Capability class: 8w Taxonomic class: Aquents
Offsite Laydown Area – US General Soil Map for California	
s1026	**Urban land-Sorrento-Hanford:** The offsite construction parking area at the AES Alamitos Generating Station is made up of this soil unit. Given the heavily developed nature of the offsite construction parking area, it is expected that local soil conditions are characterized primarily as “Urban land.” Urban land is not associated with specific soil characteristics because they are highly variable because of imported fill and historical mixing with local soil materials.
115	**Beaches:** This soil unit comprises a single paved offsite construction parking area that is owned by the City of Huntington Beach and is located to the southwest of the Pacific Coast Highway. Formation: Beaches Typical profile: Sand over coarse sand, sand, and fine sand Shrink-swell capacity: Negligible Depth and drainage: Deep (>60 inches); poorly drained Permeability: High to very high Runoff: Slow Capability class: 8w (nonirrigated) Taxonomic class: No reported; presumed Aquic Xerofluvents

Note: Soil characteristics are based on soil mapping descriptions provided in the online soil survey reports (Soil Survey Staff, 2011), official soil series descriptions (NRCS, 2006; 2008), and published soil survey data (NRCS, 1978). Soil descriptions provided above are limited to those soil units that could be potentially affected by the project.

Other soil mapping units, which are outside of the project area but occur in the project vicinity, are shown on Figure 5.11-1 and include: 123 – Bolsa silt loam, drained; 139 – Chino silty clay loam; and 158 – Hueneme fine sandy loam, drained.

5.11.1.4 Potential for Soil Loss and Erosion

The factors that have the largest effect on soil loss include: steep slopes, lack of vegetation, and erodible soils composed of large proportions of silt and fine sands. No steep slopes occur in the vicinity of the HBEP site. The estimated average slope of the site is less than two percent, partly because of the developed nature of the property. The HBEP site consists mostly of buildings, paved roads, and small areas with landscape vegetation.

In general, the soils at the project site have a medium to fine texture, although textures are likely to be highly variable because of the stratified nature of the major soil unit, Tidal Flats. In addition, developed soils within the Tidal Flat mapping unit (such as the HBEP site) are expected to have significant amounts of imported, compacted fill that would not conform to the mapped soils conditions. The construction fill in areas developed for industrial uses are expected to have been graded nearly level (allowing for some slope to facilitate site drainage). Given the nearly-level topography, low runoff potential, and poorly drained soil conditions, the NRCS considers these soils to have a slight water erosion hazard rating. However, it should be recognized that uncovered or excavated soils within the developed Tidal Flat areas could have a relatively high potential for wind erosion. Increased wind erosion potential would be related to the relative amount of fine textured materials that could be present in the previously filled materials. It is expected that the offsite and on site construction laydown areas, and the offsite construction/demolition worker parking areas that are not already graveled or paved will be covered by gravel or paving immediately after site preparation to prevent subsequent wind erosion losses.

5.11.1.5 Other Significant Soil Characteristics

Corrosive Soils—Most soils at the project site are classified by the NRCS as having a high potential for corrosion of concrete and steel. This is supported by testing completed during the preliminary geotechnical investigation (Ninyo and Moore, 2011). Corrosive soil conditions may cause premature deterioration to underground structures, foundations, and pipelines. Specific measures to reduce the potential effects of corrosive soils will be developed during the project design phase.

Liquefaction Risk—The geotechnical investigation of the site noted “scattered saturated sandy alluvial layers located between depths of approximately 5 and 40 feet” at the project site (Ninyo and Moore, 2011). These layers were determined to be potentially subject to liquefaction during an earthquake event.

Soil Contamination—According to the *Phase I Environmental Site Assessment for the Huntington Beach Electrical Power Plant* (EMS, 2012), potential areas of concern for soil contamination occur in the general area of the HBEP site. Recognized Environmental Conditions of interest on the project site include:

- **One plugged oil and gas well, and several other plugged wells:** Piping and old tank locations may have been affected by previous oil and gas releases. Contaminated soils may be discovered during construction and demolition.
- **Aboveground storage tanks (AST), old pipelines, jet fuel AST:** Known contamination (petroleum hydrocarbons) below existing onsite ASTs, and the presence of fuel oil and jet fuel pipelines on and beneath the project site will be addressed by having a contingency plan to account for contaminated soils should they be encountered during construction or demolition.
- **Contaminated groundwater beneath site**: Groundwater beneath the project site is known to be impacted by metals, volatile organic compounds (VOC), and 1,4-dioxane. Groundwater is monitored as a part of ongoing subsurface investigations at the site. A contingency plan will provide for adequate planning and response in the event groundwater is encountered during construction or demolition.
- **Several spills noted at the site:** Documented spills involved petroleum products, fuel oil, and distillate fuel. These spills were reported to have been investigated and cleaned up; however, residual contamination reportedly exists in the subsurface at spill locations. This residual contamination might not be discovered until equipment is decommissioned and removed. A contingency plan will provide for adequate response and planning should contaminated soils be encountered during construction.

- **Concrete degreasing pit**: Complete soil and groundwater assessment data for the areas surrounding the concrete degreasing pits is not available. Potentially hazardous chemicals that were used for degreasing, such as perchloroethylene (PCE) and trichloroethylene (TCE), may be encountered in this area. A contingency plan will be prepared to describe the response that will be initiated if these contaminants are encountered during demolition and construction.
- **Polycyclic chlorinated biphenyl (PCB)-oil contamination from old transformers:** While not currently being used, PCBs were encountered in the soil during previous subsurface borings associated with past operations. However, no sampling or testing has been performed to delineate these contaminants, which could reasonably be encountered during HBEP construction and demolition activities.
- **Old underground storage tanks:** Closure documents imply no further cleanup is needed; however, residual contaminants may potentially exist.

Other potential environmental concerns:

- **Lead-based paint.** Because the project site is near the ocean, it is assumed that lead-based paint was used to minimize corrosion on exposed metal (rails, pipes, etc.). Sandblasting to prepare for repainting of existing facilities at the Huntington Beach Generating Station could have resulted in “green sand” overspray and subsequent soil contamination with high levels of lead and other metals (including zinc and chromium).

As described previously, the potential for recognizing and dealing with contaminated soils and groundwater will be addressed in a contingency plan. This contingency plan will describe potential soil contamination hazards onsite (locations, expected concentrations, monitoring and testing requirement) and provide guidance for soil handling during intrusive activities if contamination is discovered. The contingency plan will provide guidelines for monitoring soil disturbance and removal activities taking place within suspected contamination areas and will contain recommendations for health and safety requirements to protect workers at the site.

5.11.2 Environmental Analysis

The following sections describe the potential environmental effects on soils during the project’s construction, demolition and operation phases.

5.11.2.1 Significance Criteria

The potential for impacts on soil resources and their uses (such as agriculture) were evaluated with respect to the criteria described in Appendix G of the California Environmental Quality Act (CEQA) Guidelines (§15000–15387, California Code of Regulations [CCR] Title 14, Chapter 3). An impact is considered potentially significant if it would:

- Involve other changes in the existing environment which, because of their location or nature, could result in conversion of farmland to non-agricultural use
- Impact jurisdictional wetlands
- Result in substantial soil erosion
- Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (International Code Council, 1997), creating substantial risks to life or property

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

5.11.2.2 Farmland Conversion

The HBEP site is not located on or near any farmland and is not located within or near any areas zoned for agricultural use or areas having a Williamson Act contract. The project will not result in the conversion of any agricultural land to a non-agricultural use.

5.11.2.3 Jurisdictional Wetlands

Based on the previously developed nature of the HBEP area, no wetlands are present within the HBEP site or the offsite laydown/parking areas. Therefore, the HBEP will not impact jurisdictional wetlands or "waters of the United States". The Huntington Beach Wetland Preserve / Magnolia Marsh wetlands are located southeast of the project site. The regulatory status of these wetlands, if applicable, is discussed in Section 5.2, Biological Resources.

5.11.2.4 Soil Erosion during Construction/Demolition

Impacts on soil resources during HBEP construction and demolition can include increased soil erosion and soil compaction. Soil erosion causes the loss of topsoil and can increase the sediment load in surface water bodies near the construction site. The magnitude, extent, and duration of construction-related impacts depend on the erodibility of the soil; the proximity of the construction activity to the receiving water; and the construction methods, duration, and season.

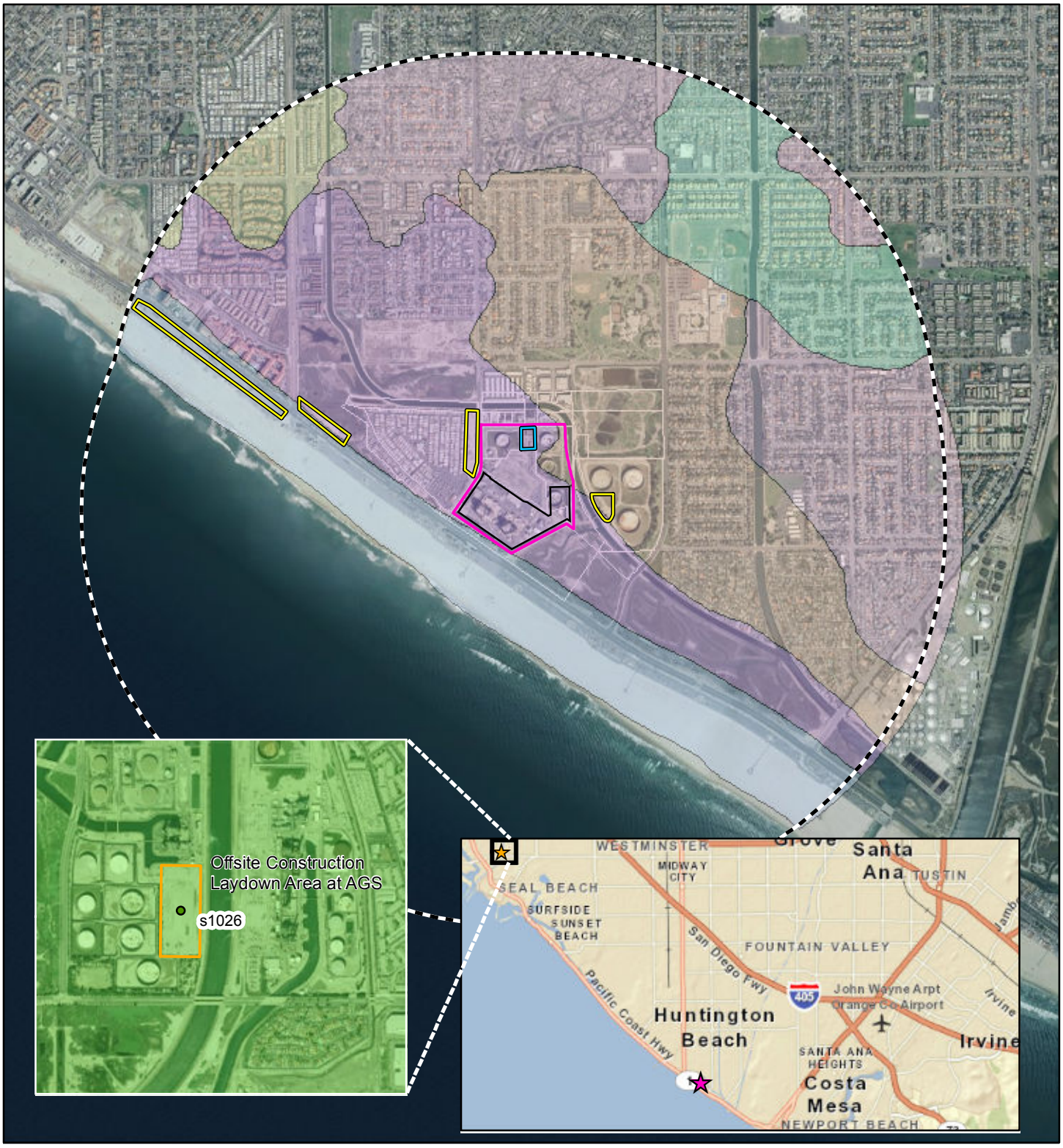
Because conditions that could lead to excessive soil erosion via water are not present at the HBEP site, relatively little soil erosion from rain events is expected during the construction period. Additionally, construction best management practices (BMP) will be implemented during HBEP construction and demolition in accordance with a site-specific Stormwater Pollution Prevention Plan (SWPPP) that is required under the Clean Water Act for all construction projects over 1 acre in size. The CEC also requires project owners to develop and implement a drainage, erosion, and sediment control plan (DESCP) to reduce the impact of runoff from the construction site. Monitoring will involve inspections to ensure that the BMPs described in the SWPPP and DESCP are properly implemented and effective. Therefore, impacts from soil erosion via water are expected to be less than significant.

The stratified soils of the Tidal Flats soil mapping unit could potentially have a high wind erosion potential. Wind erosion potential will depend on the texture of the stratified layer that is exposed at the soil surface during each stage of site preparation and construction. As described above, BMPs will be implemented to reduce the amount of soil loss due to erosion. Estimates of erosion by water and wind are provided in the following sections.

5.11.2.4.1 Water Erosion

Table 5.11-2 provides an estimate of soil loss due to water erosion during HBEP construction. Detailed calculations and assumptions for the soil loss estimates are provided in Appendix 5.11A. This estimate was developed using the Revised Universal Soil Loss Equation (RUSLE2) program using the following assumptions:

- The HBEP construction site totals 25.63 acres (not including offsite parking and laydown areas). As discussed in Section 5.11.2, HBEP construction will require the removal of the existing Huntington Beach Generating Station Units 1, 2 and 5 during the construction process. The demolition of Unit 5, scheduled to occur between the fourth quarter of 2014 and the end of 2015, will provide space for the construction of HBEP Block 1. Construction of Blocks 1 and 2 are expected to take approximately 42 and 30 months, respectively, with Block 1 construction scheduled to occur between the first quarter of 2015 through the second quarter of 2018, and Block 2 construction scheduled to occur between the first quarter of 2018 through second quarter of 2020. Removal/demolition of existing Huntington Beach Generating Station Units 3 and 4 is scheduled to occur between the third quarter of 2015 and the second quarter 2017. Removal/demolition of existing Huntington Beach Generating Station Units 1 and 2 is scheduled to occur between the fourth quarter of 2020 through the third quarter of 2022. Therefore, the duration of project-related demolition and construction is as follows:
  - Demolition of existing units:
    - Unit 5 = 15 months
    - Units 3 and 4 = 24 months
    - Units 1 and 2 = 24 months
  - Construction of new units:
    - Block 1 = 42 months
    - Block 2 = 30 months



Township 6S,Range 11W, Section 13
Township 6S,Range 11W, Section 24
Quad Name: Newport Beach

0 1,000 2,000 Feet

Source:Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. Soil Survey Geographic (SSURGO) Database for Orange County and Part of Riverside County, California. Available online at http://soildatamart.nrcs.usda.gov . Accessed March/13/20112. Esri, i-cubed, USDA, USGS, AEX, GeoEye, Getmapping, Aerogrid, IGN, IGP, and the GIS User Community

Legend

- AES Huntington Beach Generating Station
- AES Huntington Beach Energy Project
- Offsite Construction Parking
- Onsite Construction Parking
- 1-Mile Radius From Project Site
- s1026 - Urban land-Sorrento-Hanford
- 115 - Beaches
- 122 - Bolsa Silt Loam
- 123 - Bolsa Silt Loam, Drained
- 139 - Chino Silty Clay Loam
- 158 - Hueneme fine Sandy Loam, Drained
- 211 -Tidal Flats

N

FIGURE 5.11-1
Soil Types Within One Mile of HBEP Site
AES Huntington Beach Energy Project
Huntington Beach, California

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- Active soil grading will occur over a 4-month period within each unit after demolition. The soil in this area would then be exposed for an additional 38-month construction period, after which the majority of the site will be paved or covered with the new HBEP Block 1 and 2 facilities. It is estimated that approximately a quarter of the project site will have bare soil exposure during the construction period.
- Estimates of soil loss (in tons) were made for the site-specific soil mapping unit characteristics that were available within the RUSLE2 database.
- RUSLE2 rainfall erosivity conditions were estimated for the HBEP site using the site-specific rainfall estimate for the 2-year, 6-hour storm from online National Weather Service data (NOAA, 2011).
- A 100-foot slope length was assumed for all soil units. The median of each soil unit slope class was used for the RUSLE2 calculations. For this project, an average slope of 1 percent (that is, mid-point of 0 to 2 percent slope class) was assumed for map unit 122 – Bolsa silt loam.
- NRCS soil loss information was not available for map unit 211 – Tidal Flats because of its highly variable nature. Map unit 122 – Bolsa silt loam was used in lieu of 211 – Tidal Flats in order to calculate potential erosion at the project site.

Soil losses are estimated using the following RUSLE2 conditions:

- Construction and demolition soil losses were approximated using Management as “bare ground, smooth surface;” Contouring: Rows up and down hill; Diversion/terracing: None; and Strips and Barriers: None.
- Active grading soil losses were approximated using Management as “bare ground, rough surface;” Contouring: Rows up and down hill; Diversion/terracing: None; and Strips and Barriers: None.
- Construction soil losses with implementation of construction BMPs was approximated using Management as “Silt fence;” Contouring: Perfect, no row grade; Diversion/terracing: None; and Strips and Barriers: two silt fences, one at end of slope.
- A “No Project” soil loss estimate was also approximated using Management as “Dense grass – not harvested;” Contouring: Rows up and down hill; Diversion/terracing: None; and Strips and Barriers: None.

TABLE 5.11-2
Estimated Soil Loss During Construction/Demolition from Water Erosion

Feature (acreage)	Activity	Duration (months)	Soil Loss without BMPs (tons)	Soil Loss with BMPs (tons)	Soil Loss No Project (tons/yr)
Site (25.63 acres)	Demolition	24			
	Grading	4	44.0	0.14	0.284
	Construction	38	48.8	1.35	—
Offsite Laydown Area	Grading	0	0.0	0.0	0.0
	Construction	36	0.0	0.0	—
Offsite Parking Area(s)	Grading	0	0.0	0.0	0.0
	Construction	36	0.0	0.0	—
Project Soil Loss Estimates	All activities listed above	42	**92.75**	**1.49**	**0.28**

Notes:
Soil losses (tons/acre/year) are estimated using RUSLE2 software (available online [http://fargo.nserl.purdue.edu/rusle2_dataweb/RUSLE2_Program.htm].
-The soil characteristics were estimated using RUSLE2 soil profiles corresponding to the mapped soil unit.
-Soil loss (R-factors) were estimated using 2-year, 6-hour point precipitation frequency amount for the HBEP site (NOAA, 2011).
-Estimates of actual soil losses use the RUSLE2 soil loss multiplied by the duration and the affected area. The No Project Alternative estimate does not have a specific duration so loss is given as tons/year.

With the implementation of appropriate construction BMPs as described in the SWPPP as required under the National Pollutant Discharge Elimination System (NPDES) permit and the DESCP as required by CEC, and as described in Section 5.11.5, the total estimated project soil loss of 1.49 tons is considered to be a minimal amount and would not constitute a significant impact. It also should be recognized that the estimate of accelerated soil loss by water is very conservative (tends to overestimate soil loss) because it assumes only a single BMP, silt fencing, whereas the SWPPP will include multiple soil erosion and sediment control measures. Implementation of BMPs will be designed to prevent transported sediment from entering the nearby wetland area.

5.11.2.4.2 Wind Erosion

The potential for wind erosion of surface material was estimated by calculating the total suspended particulates (TSP) that could be emitted as a result of grading and the wind erosion of exposed soil. The total site area and grading duration were multiplied by emission factors to estimate the TSP matter emitted from the site. Fugitive dust from site grading was calculated using the default particulate matter less than 10 microns in equivalent diameter (PM_{10}) emission factor used in URBEMIS2007 (Jones and Stokes Associates, 2007) and the ratio of fugitive TSP to PM_{10} published by the South Coast Air Quality Management District (SCAQMD, 1993). Fugitive dust resulting from the wind erosion of exposed soil was calculated using the emission factor in AP-42 (U.S. Environmental Protection Agency, 1995; also in Table 11.9-4 in BAAQMD, 2005).

Table 5.11-3 summarizes the mitigated TSP estimated to be emitted from the project site from grading and wind erosion of exposed soil. Without mitigation, the maximum predicted wind erosion from the project site is estimated at 30.26 tons over the course of HBEP construction and demolition. This estimate; however, is reduced to approximately 10.59 tons by implementing basic mitigation measures such as water application (see Section 5.11.5). These estimates are conservative because they make use of emission rates for a generalized soil rather than site-specific soil properties. With full implementation of BMPs and mitigation measures described in Section 5.11.5, the amount of wind erosion should be significantly less than estimated amounts, so the expected impacts due to soil erosion from wind are considered to be less than significant.

TABLE 5.11-3
Estimated Soil Loss During Construction/Demolition from Grading and Wind Erosion

Emission Source	Affected Acreage	Duration (months)	Unmitigated TSP (tons)	Mitigated TSP (tons)
Grading Dust:				
Project Site	25.63	4	22.55	7.89
Offsite Laydown Area	unknown	0	0.0	0.0
Offsite Parking Area(s)	unknown	0	0.0	0.0
Wind Blown Dust:				
Project Site	6.41	38	7.71	2.70
Offsite Laydown Area	unknown	36	0.0	0.0
Offsite Parking Area(s)	unknown	36	0.0	0.0
Estimated Total		**42**	**30.26**	**10.59**

Note: Assumptions for these calculations are provided in Appendix 5.11A.

5.11.2.5 Expansive Soils

An important characteristic of the HBEP site is the potential for soils with a moderate shrink-swell potential. The presence of moderately expansive clays in the soil may affect the suitability of the soil as a bearing surface for foundations because expansive clays have the potential to heave or collapse with changing moisture content.

Most of the HBEP will be built upon soil map 122 – Bolsa silt loam, which is classified by the NRCS as having a moderate shrink-swell potential. This soil condition was confirmed by the preliminary geotechnical investigation,

which found layers of clay, sandy silt, and clayey silt with the potential for moderate expansiveness (Ninyo and Moore, 2011). The geotechnical report recommended that the site-specific potential for expansive soils at the HBEP site be evaluated during the project design phase to provide recommendations on how the potential impacts of expansive soils can be mitigated. With geotechnical evaluation and mitigation (if required), the presence of expansive soils is not expected to create a substantial risk to life or property. For this reason, the potential for an adverse impact related to expansive soils is considered to be reduced to a less-than-significant level.

5.11.2.6 Erosion of or Exposure to Contaminated Soil Materials during Construction

Certain areas of the HBEP site have been identified as having the potential for soil contamination based on previous activities and spills. A contingency plan to recognize and manage contaminated soil will be developed to provide guidelines for activities that may result in contact with or disturbance of the soil. The following types of activities will be covered by the contingency plan:

- Soil excavation activities that require a grading permit
- Soil removal or relocation activities if the volume of soil removed or relocated will be greater than 50 cubic yards
- Soil removal activities where soils will be transported offsite

Possible contaminants at the site include oil, gas, jet fuel, distillate fuel, petroleum hydrocarbons, metals, VOCs, 1,4-dioxane, chlorinated solvents (such as PCE and TCE), and PCBs.

Additional site requirements will be outlined in the contingency plan and may include requiring health and safety training and certifications (such as HAZWOPER) for onsite workers. It may also require other risk mitigations such as additional site security and access restrictions, dust control, personal protective equipment requirements, air monitoring, decontamination procedures, soil transport requirements, and others.

5.11.2.7 Compaction during Construction and Operation

HBEP construction will result in soil compaction during the construction of foundations and paved roadway and parking areas. Soil compaction increases soil density by reducing soil pore space. Compaction also reduces the ability of the soil to absorb precipitation and transmit gases for respiration of soil microfauna. Soil compaction can result in increased runoff, erosion, and sedimentation. The incorporation of BMPs in accordance with the SWPPP/DESCP guidelines during HBEP construction, is expected to reduce the adverse impacts due to soil compaction to a less-than-significant level.

Because HBEP will be constructed in a previously developed industrial area that will be repaved or otherwise protected during and after construction, the overall anticipated effects of compaction during construction are considered to be less than significant.

HBEP operation will not result in impacts on the soil from erosion or compaction. Routine vehicle traffic during plant operation will be limited to existing roads, all of which will be paved, and standard operational activities would not involve the disruption of soil. Therefore, impacts on soil from project operations would be less than significant.

5.11.2.8 Effects of Emissions on Soil-Vegetation Systems

Air emissions from the combustion turbine exhaust stacks include but are not limited to nitrogen oxides (NO_x) and particulates (PM_{10}). Nitrogen oxide gases (NO and NO_2) convert to nitrate particulates in a form that is suitable for uptake by most plants and could promote plant growth and primary productivity. Coastal salt marshes are the most common natural habitats in the vicinity of the HBEP site where nitrogen deposition may occur. The critical load for atmospheric nitrogen deposition into coastal wetlands is difficult to establish because wetlands subject to tidal exchange have open nutrient cycles. Additionally, nitrogen loading in coastal wetlands is often strongly affected by sources other than atmospheric deposition (Morris, 1991). Various studies that have examined nitrogen loading in

intertidal salt marsh wetlands have found critical loads to range between 63 and 400 kg N ha^{-1} yr^{-1} (Caffrey et al., 2007; Wingand et al., 2003).

A few vestiges of salt marsh wetlands occur in the vicinity of the HBEP site; however, given the predominant easterly wind direction, it is expected that actual aerial deposition of NO_x emissions would occur at a considerable distance to the east of HBEP and would; therefore, not likely affect the nearby salt marsh areas. In addition, HBEP will use a selective catalytic reduction system to help control NO_x emissions and an oxidation catalyst system to control carbon monoxide and VOC emissions. The HBEP site is currently used for power generation by the Huntington Beach Generating Station, which has greater emissions per kilowatt generated than the proposed HBEP facilities. For these reasons, the aerial deposition of nitrogen to the area from HBEP emissions are expected to result in a less-than–significant impact to soil-vegetation systems.

5.11.3 Cumulative Effects

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

Existing Huntington Beach Generating Station Units 3 and 4 are scheduled to be demolished during the same time period when Unit 5 will be demolished and HBEP Block 1 will be constructed. Although impacts associated with the demolition of the existing Units 3 and 4 are not part of HBEP's direct impacts (Units 3 and 4 were previously licensed by the CEC, as discussed previously), the effects will be cumulative because of the projects' proximity and overlapping schedules. The soil conditions associated with the HBEP site are reported to have only a slight water erosion hazard. Given the previous industrial development of the soils in the project area, construction fills are already expected to be relatively compact and stable. Furthermore, by applying construction BMPs that are typically required as part of the permitting process, it is expected that the effect on soils of the combined demolition and construction activities will be minimal.

During HBEP operation, periodic maintenance activities will not result in ground-disturbance, and stormwater runoff will be managed under an industrial NPDES permit. For these reasons, soil impacts associated with HBEP operation will be negligible and less than significant.

As previously described, HBEP will have no effect on agriculture because no agricultural uses occur nearby. HBEP's effects on soil erosion, sedimentation, and compaction are expected to be minor to negligible, especially with the application of construction BMPs. The HBEP site and surrounding area are already highly developed for urban and industrial uses and re-development on a site that has outdated energy generating facilities is not expected to contribute significantly to soil loss and erosion. Other planned or permitted projects in the study area are also expected to be subject to similar levels of review and protections. For these reasons, the cumulative impact of HBEP combined with other projects on soil-agricultural systems is expected to be less-than-significant.

5.11.4 Mitigation Measures

Erosion control BMPs developed in accordance with the SWPPP and DESCP will be used to minimize erosion at the site during HBEP construction and demolition activities. These erosion-control measures are required to maintain water quality, protect property from erosion damage, and prevent accelerated soil erosion or dust generation that destroys soil productivity and soil capacity. Typically, these measures include mulching, physical stabilization, dust suppression, berms, ditches, and sediment barriers. Water erosion will be mitigated through the use of sediment barriers, and wind erosion potential will be reduced significantly by keeping soil moist or by covering and/or hydroseeding soil stockpiles. Upon completion of HBEP construction and demolition activities, land surfaces will be permanently stabilized. The HBEP site will be paved or covered with structures or pervious ground cover (for example, gravel or landscape). Therefore, soil erosion losses resulting from the HBEP construction and demolition activities are expected to be less than significant.

5.11.4.1 Temporary Erosion Control Measures

Erosion control BMPs will be implemented during construction in accordance with the SWPPP required by the State's General Construction Stormwater NPDES Permit for construction projects over 1 acre in size. Additionally, the CEC requires that project owners develop and implement a DESCP to reduce the impact of runoff from the construction site.

Temporary erosion control measures required for the SWPPP and DESCP will be implemented before construction begins, and will be evaluated and maintained during project construction and demolition. These measures typically include but are not limited to: revegetation, mulching, physical stabilization, dust suppression, berms, ditches, and sediment barriers. These measures will be removed from the site at the completion of HBEP construction/demolition activities.

During HBEP construction and demolition, dust erosion control measures will be implemented to minimize the wind-blown loss of soil from the site. Water of a quality equal to or better than existing surface runoff will be sprayed on the soil in construction areas to control dust prior to completion of permanent control measures.

Sediment barriers, which slow runoff and trap sediment, will be incorporated as discussed below. Sediment barriers include straw bales, sand bags, straw wattles, and silt fences. These features are generally placed below disturbed areas, at the base of exposed slopes, and along streets and property lines below the disturbed area. Sediment barriers are often placed around sensitive areas to prevent contamination by sediment-laden water near areas such as wetlands, creeks, or storm drains.

The HBEP site will be constructed on relatively level ground; therefore, it is not considered necessary to place sediment barriers around the entire project boundary. However, barriers may be placed in locations where offsite drainage could occur to prevent sediment from leaving the site. If used, sediment barriers will be properly installed (for example, staked and keyed), then removed or used as mulch after construction. Runoff detention basins, drainage diversions, and other large-scale sediment traps are likely not necessary because of the HBEP site's small size, level topography, and surrounding paved areas. Sediment barriers would be installed around the base of soil stockpiles, and stockpiles would be stabilized and covered.

Mitigation measures, such as watering exposed surfaces, are used to reduce PM_{10} emissions during construction activities. The PM_{10} reduction efficiencies are taken from the South Coast Air Quality Management District (SCAQMD) CEQA Handbook (1993) and were used to estimate the effectiveness of the mitigation measures. Table 5.11-4 summarizes the mitigation measures and PM_{10} reduction efficiencies.

TABLE 5.11-4
Mitigation Measures for Fugitive Dust Emissions

Mitigation Measure	PM_{10} Emission Reduction Efficiency (%)
Water active sites at least twice daily	34–68
Enclose, cover, water twice daily, or apply non-toxic soil binders, according to manufacturer's specifications, to exposed piles (gravel, sand, dirt) with 5 percent or greater silt content	30–74

Source: SCAQMD CEQA Handbook, Table 11-4 (1993)

5.11.4.2 Permanent Erosion Control Measures

Permanent erosion-control measures on the HBEP site will include gravel, paving, landscaping, and drainage systems.

5.11.4.3 Geotechnical Soil Investigation

A preliminary geotechnical soil investigation was performed to evaluate the engineering characteristics of project site soils and determine remedial measures to address impacts related to soil properties. Recommendations provided in the geotechnical report will be followed to mitigate potential impacts related to soil texture and

shrink-swell potential. The preliminary geotechnical report is provided in Appendix 2G. A final geotechnical investigation will be conducted to support final design.

5.11.5 Agencies and Agency Contacts

Applicable agency contacts for soils are shown in Table 5.11-5.

TABLE 5.11-5
Permits and Agency Contacts for Soils

Issue	Agency	Persons Contacted
City of Huntington Beach Grading Permit	Huntington Beach Public Works Department	Debbie DeBow, Principal Civil Engineer City of Huntington Beach Public Works Department 2000 Main Street Huntington Beach, California (714) 536-5528 ddebow@surfcity-hb.org

5.11.6 Permits and Permit Schedule

No additional permits are required for compliance with soils LORS. Other permits that relate to soils, such as the NPDES permit, are evaluated in other sections (See Section 5.15, Water Resources).

5.11.7 Laws, Ordinances, Regulations and Standards

Federal, state, county, and local LORS applicable to soils are discussed below and summarized in Table 5.11-6.

5.11.7.1 Federal LORS

5.11.7.1.1 Federal Clean Water Act

The 1972 Amendments to the Federal Water Pollution Control Act, commonly referred to as the Clean Water Act, establish requirements for discharges of stormwater or wastewater from any point source that would affect the beneficial uses of waters of the United States. The Clean Water Act effectively prohibits discharges of stormwater from construction sites unless the discharge is in compliance with an NPDES permit. The State Water Resources Control Board (SWRCB) is the permitting authority in California and has adopted a statewide general permit for stormwater discharges associated with construction activity (General Construction Permit; SWRCB, 2009) that applies to projects resulting in 1 or more acres of soil disturbance. The proposed project would result in disturbance of more than 1 acre of soil. Therefore, the project will be covered under the General Construction Permit and will develop and implement a site-specific SWPPP to meet permit requirements. Requirements are described in greater detail in Section 5.15, Water Resources.

The Clean Water Act's primary requirement for soils in the project area consists of control of soil erosion and sedimentation during construction, including the preparation and execution of erosion- and sedimentation-control plans and measures for any soil disturbance during construction.

TABLE 5.11-6
Laws, Ordinances, Regulations, and Standards for Soils

LORS	Requirements/Applicability	Administering Agency	AFC Section Explaining Conformance
Federal			
Federal Water Pollution Control Act of 1972: Clean Water Act of 1977 (including 1987 amendments).	Regulates stormwater discharge from construction and industrial activities	Regional Water Quality Control Board (RWQCB) – Santa Ana Region (8) under State Water Resources Control Board. The U.S. Environmental Protection Agency may retain jurisdiction at its discretion.	Section 5.11.7.1.1
Natural Resources Conservation Service (1983), *National Engineering Handbook*, Sections 2 and 3	Standards for soil conservation	Natural Resources Conservation Service	Section 5.11.7.1.2
State			
Porter-Cologne Water Quality Control Act	Regulates stormwater discharge	SWRCB and Santa Ana RWQCB	Section 5.11.2.4.1. and Section 5.11.7.2.1
Table 18-1-B of the Uniform Building Code (International Code Council, 1997)	Sets standards for defining expansive soils	California Energy Commission	Section 5.11.3.1
Local			
City of Huntington Beach Municipal Code – Grading and Excavation Code	Requirements for grading activities, and erosion control and water quality management	City of Huntington Beach Public Works Department	Section 5.11.7.3.1
City of Huntington Beach Municipal Code – Methane Districts	Requirements for development within Methane Districts	City of Huntington Beach Fire Department	Section 5.11.7.3.1
City of Huntington Beach General Plan – Particulate Emissions	Outlines policies for the reduction of particulate emissions	City of Huntington Beach Planning Department	Section 5.11.7.3.2

5.11.7.1.2 U.S. Department of Agriculture Engineering Standards

Sections 2 and 3 of the U.S. Department of Agriculture, Natural Resources Conservation Service National Engineering Handbook (NRCS, 1983) provide standards for soil conservation during planning, design, and construction activities. Adherence to these standards during construction of the proposed HBEP should reduce soil erosion from grading and construction activities.

5.11.7.2 State LORS

5.11.7.2.1 California Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act of 1972 (California Water Code, Division 7) is the state equivalent of the federal Clean Water Act, and its effect on HBEP would be similar. The California Water Code requires protection of water quality by appropriate design, sizing, and construction of erosion and sediment controls. The discharge of soil into surface waters resulting from land disturbance may require filing a report of waste discharge (see Water Code Section 13260a). The Santa Ana RWQCB, which controls surface water discharges in the proposed project area, may become involved indirectly if soil erosion threatens water quality. As discussed in Section 5.11.2.4.1, HBEP will comply with the Porter-Cologne Water Quality Control Act.

5.11.7.3 Local LORS

5.11.7.3.1 City of Huntington Beach Municipal Code

The City of Huntington Beach Municipal Code (17.05.050; City of Huntington Beach, 2011) includes requirements for grading within the city limits. It also outlines the allowable timing and duration of grading operations, as well as the requirements for activities involving the import and export of earth materials. The grading code also outlines requirements for erosion control and water quality management systems (17.05.310). These requirements include standards for erosion control and water quality management, and outline requirements for erosion control plans. Also included are standards for erosion control maintenance during grading operations.

The City of Huntington Beach Municipal Code also outlines requirements for development within Methane Districts (17.04.085). Requirements include testing and mitigation for new construction within the defined methane overlay districts. The HBEP site likely falls within Methane District Two, therefore, development plans may have to be reviewed by the Fire Department, and the Fire Chief may require testing of the site soils for the presence of methane gas. In cases where high levels of methane gas are discovered in the near surface or subsurface soil layers, mitigation may be required before any grading, development, or building can occur.

5.11.7.3.2 City of Huntington Beach General Plan

The Air Quality Element of the City of Huntington Beach General Plan (City of Huntington Beach, 1996) outlines policies for the reduction of particulate emissions. Policies of interest to which HBEP will comply include:

- AQ 1.8.2 – Require installation of temporary construction facilities (such as wheel washers) and implementation of construction practices that minimize dirt and soil transfer onto public roadways.
- AQ 1.8.3 – Encourage developers to maintain the natural topography, to the maximum extent possible, and limit the amount of land clearing, blasting, grading, and ground excavation operations needed for development.

5.11.7.3.3 City of Long Beach

The offsite construction laydown at AES's Alamitos Generating Station falls within the jurisdiction of the City of Long Beach; however, the site was previously stabilized. Because of this, soil disturbance will not occur during use as a laydown area, and soil-related permits are not expected to be required.

5.11.8 References

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