5.11 Soils

This section describes the potential effects of the construction and operation of the Chula Vista Energy Upgrade Project (CVEUP) on soil resources and is organized as follows. Section 5.11.1 describes the existing environment that could be affected, including soil types and their use (such as agriculture); Section 5.11.2 identifies potential environmental effects, if any, from project development; Section 5.11.3 discusses cumulative effects; Section 5.11.4 presents mitigation measures; Section 5.11.5 presents the laws, ordinances, regulations, and standards LORS applicable to soils and their use; Section 5.11.6 describes the required permits and provides agency contacts; Section 5.11.7 provides a schedule for obtaining permits; and Section 5.11.8 provides the references used to develop this section.

5.11.1 Affected Environment

The CVEUP is situated on the margin of a densely developed industrial and residential area approximately 3.7 miles south-southeast of downtown Chula Vista. The project site lies within an area that is zoned for industrial use. It is bordered on the north, east, west and southeast sides by commercial and industrial properties. The CVEUP will be constructed on the undeveloped northern portion of a property, the southern portion of which has already been developed for the Chula Vista Power Plant (CVPP).

The CVEUP property is bordered on the south side by an undeveloped natural area (Otay Valley Regional Park) through which the Otay River flows. The Otay River is a dryland, ephemeral wash that drains from east to west into the southern portion of San Diego Bay. The Otay River valley is confined on the south side by the Otay Mesa, which forms an elevated ridge. The Otay Mesa is densely developed with single-family residences.

Surrounding land uses include industrial uses (e.g., a large, tilt-up warehouse) to the west and commercial office space buildings to the east. A pallet manufacturing facility is located just southeast of the CVEUP property. There are some residential properties in the CVEUP area, with the nearest residential properties located approximately 450 feet west of the site along Alvoca Street. Other nearby residential areas are found approximately 950 feet due north from the site on the north side of Main Street and approximately 1,750 feet due south on Otay Mesa across the Otay River Valley.

There are no agricultural land uses in the proposed CVEUP site or vicinity. The natural gas, water supply (fire suppression, recycled water, potable water), water discharge (sanitary and non-recyclable water), and electrical connections will be made to existing facilities within the site.

A description of the soils in the proposed project area, as shown on Figure 5.11-1, was developed from the *Soil Survey, San Diego Area, California* (National Resources Conservation Service [NRCS], 1973). Descriptions of the soil mapping units were developed from the soil survey.

Soil types for the project area are identified on Figure 5.11-1. The characteristics of soil mapping units identified on Figure 5.11-1 in the areas that will be potentially affected by project construction are summarized in Table 5.11-1. The project area includes the CVEUP project site and a laydown area (one of two alternative sites). The table 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 local grading and imported fill in heavily developed, urban areas.

TABLE 5.11-1
Soil Mapping Unit Descriptions and Characteristics

Map Unit	Description
GP	**Gravel Pits:** This soil unit comprises the southwest corner of the northern portion and the majority of the southern portion of the CVEUP site; it also comprises the entire Alternative 1 Laydown Area located just southeast of the CVEUP site. No specific descriptions of this soil mapping unit are provided in the NRCS Soil Survey (1973). Due to the proximity to the Otay River, the Gravel Pit native soils are presumed to be similar to the [**Rm**] **Riverwash** soils described below. It should be noted that the actual soil conditions are expected to be different due to the likelihood of imported fill that would have been necessary for the development of the existing CVPP on the southern portion of the CVEUP property, as well as on the adjacent developed properties.
HrC	**Huerhuero loam, 2 to 9 percent slopes:** This soil comprises the majority of the northern portion and the northeast corner of the southern portion of the CVEUP property: Formation: In sandy marine sediments between 10 and 400 feet above sea level Typical profile: Loam surface and clay subsoil Shrink-swell capacity: Not given; expected as moderate to high due to presence of expansive clays Depth and drainage: Deep (over 60 inches deep) and moderately well-drained Permeability: Very slow Runoff: Medium to very high Inherent fertility: Low to medium Capability class: IIIe-3, relatively unproductive clayey subsoils Taxonomic class: Fine, montmorillonitic, thermic Haplic Natrixeralfs
Rm	**Riverwash:** This soil comprises the entire Alternative 2 Laydown area: Formation: Occurs in intermittent stream channels Typical profile: Sandy, gravelly or cobbly throughout, typically bedded in layers Shrink-swell capacity: None Depth and drainage: Deep (over 60 inches deep) and excessively-drained Permeability: Rapid Runoff: Medium to very high Inherent fertility: Very low Capability class: VIIIw-4, limited by frequent overflow and very coarse, textured material Taxonomic class: None given

Soil characteristics are based on soil mapping descriptions provided in the published soil survey (NRCS, 1973).

Soil descriptions provided above are limited to those soil units that could be affected by the CVEUP. Other soil mapping units, which are well outside of the project area but shown on Figure 5.11-1, include the following: **DoE** – Diablo-Olivenhain complex (9 to 30 percent slopes); **GaE** – Gaviota fine sandy loam (9 to 30 percent slopes); **HrC2** – Huerhuero loam (5 to 9 percent slopes, eroded); **HrD** – Huerhuero loam (9 to 15 percent slopes; **HrD2** – Huerhuero loam (9 to 15 percent slopes, eroded); **HrE2** – Huerhuero loam (15 to 30 percent slopes, eroded); **HuC** – Huerhuero-Urban land complex (2 to 9 percent slopes); **HuE** – Huerhuero-Urban land complex (9 to 30 percent slopes); **OhC** – Olivenhain cobbly loam (2 to 9 percent slopes); **OhE** – Olivenhain cobbly loam (9 to 30 percent slopes); **OkC** – Olivenhain-Urban land complex (2 to 9 percent slopes); **OkE** – Olivenhain-Urban land complex (9 to 30 percent slopes); **RkB** – Reiff fine sandy loam (2 to 5 percent slopes); **RkC** – Reiff fine sandy loam (5 to 9 percent slopes); **SbA** – Salinas clay loam (0 to 2 percent slopes); **SbC** – Salinas clay loam (2 to 9 percent slopes); **TeF** – Terrace escarpments; **VaB** – Visalia sandy loam (2 to 5 percent slopes); and **VbB** – Visalia gravelly sandy loam (2 to 5 percent slopes).

5.11.1.1 Agricultural Use

Agricultural production within 1 mile of the CVEUP site consists of a strawberry-growing area located immediately south of Main Street and west of 4th Avenue approximately 0.6 miles west of the project site. This open field is surrounded by urban uses and is the only agricultural use within a mile of the project site. The soils mapped in the CVEUP and surrounding areas have been developed for industrial, commercial, and urban residential uses or are associated with an undeveloped, natural area (i.e., the Otay Valley Regional Park to the south). Given the current land use, these areas are now unsuitable for commercial crop production.

5.11.1.2 Soil Types

Table 5.11-1 describes the properties of the soil mapping units that are found in the vicinity of the CVEUP site and proposed laydown areas. As indicated, the soil mapping units in the project area are developed soils formed in sandy marine deposits in the northern portion and on alluvial deposits in the southern portion along the Otay River. These soils are all well-drained to excessively-drained. Due to the developed nature of the project area and vicinity, it is expected that soil conditions would vary significantly from those mapped. Urban development often entails significant mixing of local soils from grading and the import of construction fill soils beneath foundations and roadways. These imported soils would necessarily have to be suitable for compaction to support structures and roadways, so they are expected to consist of a mixture with a wide range of coarse-textured particle sizes (from silt to gravel sizes). They would not be expected to contain unsuitable materials such as organic debris or expansive clays.

On Figure 5.11-1, nearly all of the proposed CVEUP site (i.e., northern portion of the existing CVPP property), lies within soil mapping unit [**HrC**] – Huerhuero loam (2 to 9 percent slopes). The southern portion of the CVEUP property and the Alternative 1 laydown area lies within soil mapping unit [**GP**] – Gravel Pits. It is likely that much of this soil unit has been replaced by imported fill prior to its previous development for the CVPP facilities.

The Alternative 2 laydown area is approximately 3.1 miles to the east of the CVEUP property. It is located entirely within the soil mapping unit [**Rm**] – Riverwash.

5.11.1.3 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 with a large proportion of fine sands. The soils found in the CVEUP are not steep (the estimated average slope of the site is less than two percent based on the developed nature of the property). The northern portion of the property is mostly unpaved and only has sparse vegetative cover while the southern portion of the property is almost entirely paved or covered by the existing CVPP facilities. In general, the CVEUP soil types, as indicated by the NRCS mapping (1973), are relatively coarse grained (loam to sand). These soils are expected to have relatively low water erosion potential and a moderately high wind erosion potential for the following reasons:

- There are nearly level conditions at the site and laydown areas and the soils are expected to have a rapid permeability (and consequently, low runoff)

- The loamy and fine sandy surface materials are expected to be readily transported by wind
- The site is almost entirely surrounded by other developed properties and buildings that will limit locally significant ground-level winds that could lead to excessive wind erosion

5.11.1.4 Other Significant Soil Characteristics

A significant soil characteristic concerning the proposed project site is the potential for soils with a moderate to high shrink-swell potential, especially near the northern portion of the CVEUP site. While this soil property was not explicitly described in the soil survey (NRCS, 1973), the presence of montmorillonitic clay (an expansive clay) in the subsoil of the Huerhuero mapping unit subsurface soils, indicates a potential for these soils to be unsuitable for use as bearing surfaces for foundations and pipelines. Expansive clays have the potential to heave or collapse with changing moisture content.

5.11.2 Environmental Consequences

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

5.11.2.1 Significance Criteria

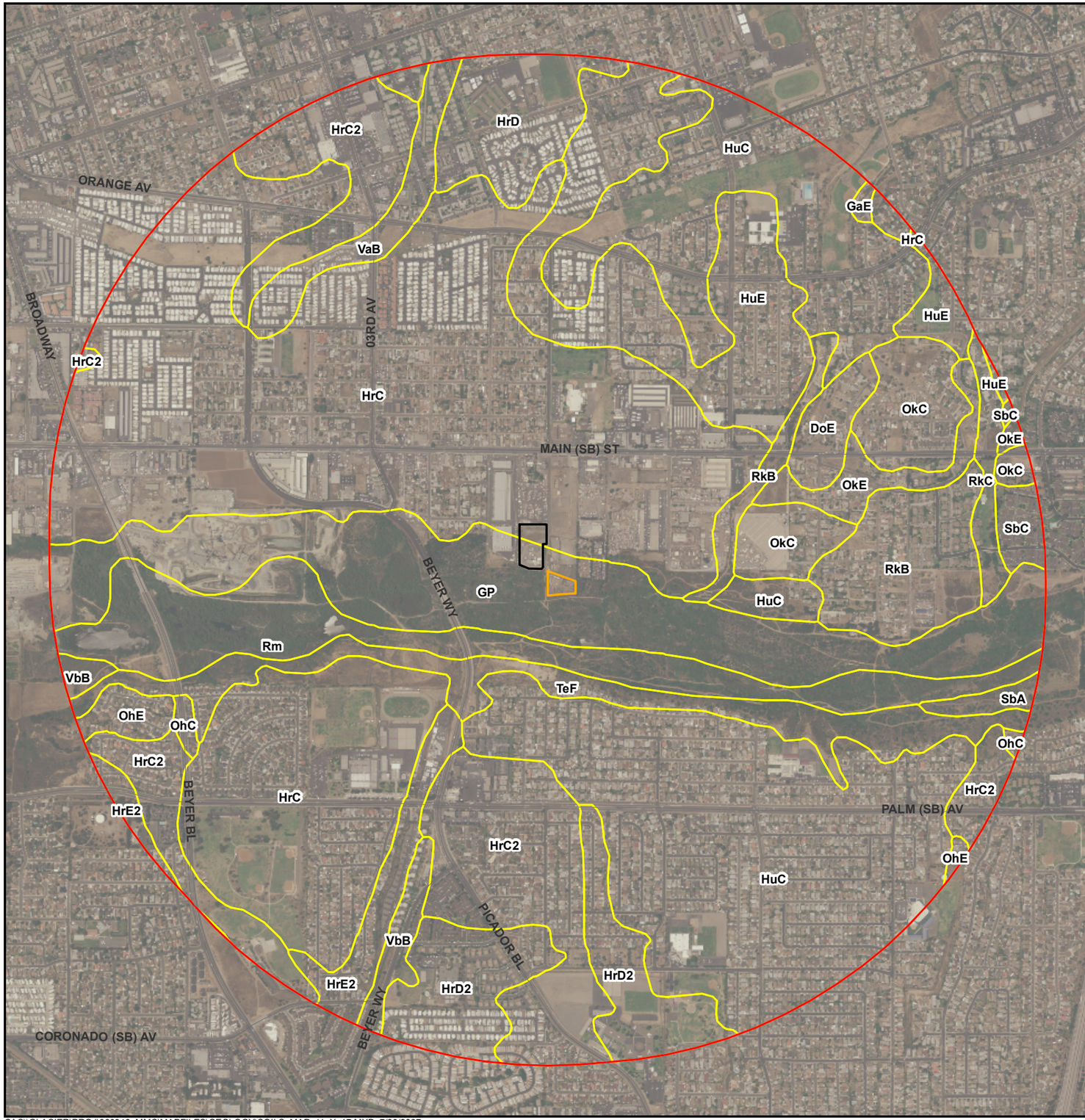
The potential for impacts to soils resources and their uses (such as agriculture) were evaluated with respect to the criteria described in the Appendix G checklist of the California Environmental Quality Act (CEQA). An impact is considered potentially significant if it would:

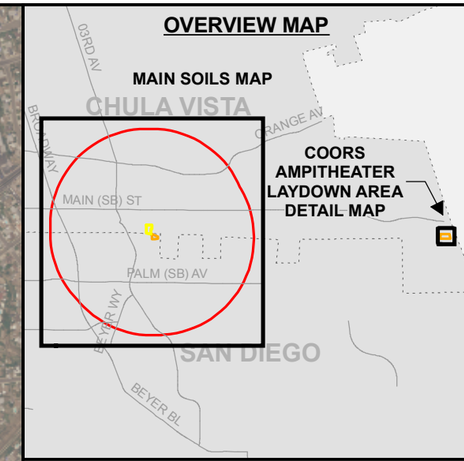
- Involve other changes in the existing environment which, because of their location or nature, could result in conversion of farmland to non-agricultural use
- Impact jurisdictional wetlands
- Result in substantial soil erosion
- Be located on expansive soil, as defined in Table 18-1-B of the Uniform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

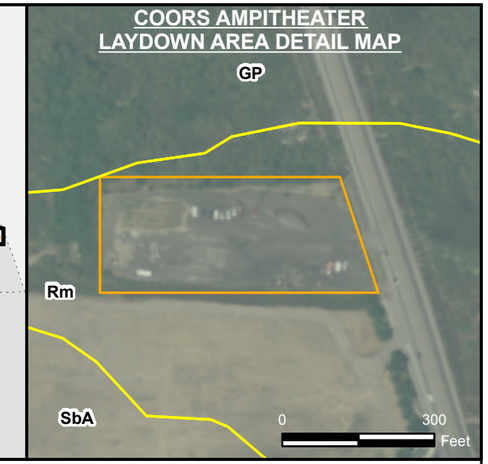
The following sections describe the anticipated environmental impacts on agricultural production and soils during project construction and operation.

5.11.2.2 Farmland Conversions

The CVEUP 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.







SYMBOL	DESCRIPTION
DoE	Diablo-Olivenhain complex, 9 to 30 percent slopes
GaE	Gaviota fine sandy loam, 9 to 30 percent slopes
GP	Gravel pits
HrC	Huerhuero loam, 2 to 9 percent slopes
HrC2	Huerhuero loam, 5 to 9 percent slopes, eroded
HrD	Huerhuero loam, 9 to 15 percent slopes
HrD2	Huerhuero loam, 9 to 15 percent slopes, eroded
HrE2	Huerhuero loam, 15 to 30 percent slopes, eroded
HuC	Huerhuero-Urban land complex, 2 to 9 percent slopes
HuE	Huerhuero-Urban land complex, 9 to 30 percent slopes
OhC	Olivenhain cobbly loam, 2 to 9 percent slopes
OhE	Olivenhain cobbly loam, 9 to 30 percent slopes
OkC	Olivenhain-Urban land complex, 2 to 9 percent slopes
OkE	Olivenhain-Urban land complex, 9 to 30 percent slopes
RkB	Reiff fine sandy loam, 2 to 5 percent slopes
RkC	Reiff fine sandy loam, 5 to 9 percent slopes
Rm	Riverw ash
SbA	Salinas clay loam, 0 to 2 percent slopes
SbC	Salinas clay loam, 2 to 9 percent slopes
TeF	Terrace escarpments
VaB	Visalia sandy loam, 2 to 5 percent slopes
VbB	Visalia gravelly sandy loam, 2 to 5 percent slopes

LEGEND

- Soil Unit Boundary
- CVEUP Project Location
- CVEUP Proposed Laydown Area
- 1-Mile Buffer of CVEEUP Project Location and Laydown Area

N

0 625 1,250 Feet

1:15,000

FIGURE 5.11-1
SOIL UNITS IN THE PROJECT AREA

CHULA VISTA ENERGY UPGRADE PROJECT
CHULA VISTA, CALIFORNIA

CH2MHILL

SAC\\GLACIER\PROJ\360346_MMC\MAPFILES\GEOLOGY\SOILS_MAP_11_X_17.MXD 7/30/2007

5.11.2.3 Jurisdictional Wetlands

There are no wetlands present on the CVEUP property. The nearest jurisdictional wetlands or "waters of the United States" are associated with the Otay River to the south of the project site. However, there will be no direct or indirect impacts to the Otay River from activities at the CVEUP site or at either one of the two proposed laydown areas. For this reason, the proposed CVEUP would not impact jurisdictional wetlands or "waters of the United States".

5.11.2.4 Soil Erosion During Construction

Construction impacts on soil resources can include increased soil erosion and soil compaction. Soil erosion causes the loss of topsoil and can increase the sediment load in surface receiving waters downstream of the construction site. The magnitude, extent, and duration of construction-related impact depends on the erodibility of the soil; the proximity of the construction activity to the receiving water; and the construction methods, duration, and season.

Because the conditions that could lead to excessive soil erosion are not present at the site and laydown area, very little soil erosion is expected during the construction period. In addition, Best Management Practices (BMPs) will be implemented during construction in accordance with the stormwater pollution prevention plan (SWPPP) required for all construction projects over 1 acre by the Regional Water Quality Control Board (RWQCB). The California Energy Commission (CEC) also requires that project owners develop and implement a drainage, erosion, and sediment control plan (DESCP) to reduce the impact of runoff from the construction site. Therefore, impacts from soil erosion are expected to be less than significant. Monitoring will involve inspections to ensure that the BMPs described in the SWPPP/DESCP are properly implemented and effective.

Despite the low potential for soil erosion in the CVEUP area, estimates of erosion by water and wind are provided in the following sections.

5.11.2.4.1 Water Erosion

An estimate of soil loss during construction by water erosion is found in Table 5.11-2. This estimate was developed using the Revised Universal Soil Loss Equation (RUSLE2) program using the following assumptions:

- The CVEUP construction site (i.e., northern portion of property) totals 1.42 acres. Active soil grading would occur over a 1-month period within the project site. The soil in this area would then be exposed for an additional 7-month construction period, after which the majority of the site will be paved or covered with CVEUP facilities. Since the southern portion of the property is already mostly paved, there would be no need for any grading activities. Furthermore, the dismantling of the existing power plant structures is not expected to expose or disturb any soils. Either of the two alternative laydown areas would require some minimal grading (estimated at two weeks) before covering the laydown area with gravel to permit wet season use so that soils losses beyond this point would be negligible.
- Estimates of soil loss (in tons) were made for the site-specific soil mapping units characteristic that were all available within the RUSLE2 database.

- RUSLE2 rainfall erosivity conditions were estimated for the CVEUP site coordinates using site-specific rainfall estimates from online National Weather Service data (NOAA Atlas 2) at [http://hdss.nws.noaa.gov/cgi-bin/hdsc/na2.perl?qlat=33.9978 $qlon=-118.2221 & Submit=submit].
- There will be a 100-foot slope length with a 5.5-percent slope (i.e., mid-point of 2 to 9 percent slope class) for the Huerhuero soil unit. An average slope of 2.0 percent was estimated for the Gravel Pit soil unit comprising the southern portion of the CVEUP site and the Alternative 1 laydown area, and the Riverwash soil unit comprising the Alternative 2 laydown area.

Soil losses are estimated using the following RUSLE2 conditions:

Construction and demolition soil losses were approximated using Management as 'bare ground, smooth surface;' Contouring: None, 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' soil conditions; Contouring: None, 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 fences, one at end of RUSLE2 slope.

A **'No Project'** soil loss estimate was also approximated using Management as 'Dense grass – not harvested; Contouring: None, rows up and down hill; Diversion/terracing: None; and Strips and Barriers: None.

With the implementation of appropriate BMPs that will be required under the National Pollutant Discharge Elimination System (NPDES) permit, the total project soil loss of 0.18 ton is a minimal amount and would not constitute a significant impact. It should also be recognized that the estimate of accelerated soil loss by water is very conservative (overestimate of soil loss) because of it assumes only a single BMP (i.e., silt fencing), whereas a SWPPP will require multiple soil erosion control measures.

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 URBEMIS2002 and the ratio of fugitive TSP to PM_{10} published by the Bay Area Air Quality Management District (BAAQMD, 2005). Fugitive dust resulting from the wind erosion of exposed soil was calculated using the emission factor in AP-42 (USEPA, 1995; also in Table 11.9-4 in BAAQMD, 2005).

TABLE 5.11-2
Estimate of Soil Loss by Water Erosion Using Revised Universal Soil Loss Equation (RUSLE2)

			Estimates Using Revised Universal Soil Loss Equation*		
Feature (acreage)	**Activity**	**Duration/Area (months/acres)**	**Soil Loss (tons) without BMPs**	**Soil Loss (tons) with BMPs**	**Soil Loss (tons/year) No Project**
CVEUP Site (i.e., northern portion only)	Grading	1/1.42	1.7	0.022	0.0664
	Construction	7/1.42	5.5	0.152	—
Alternative 1 Laydown Area	Grading	0.5/1.47	0.020	0.00025	0.0018
Alternative 2 Laydown Area	Grading	0.5/2.75	0.17	0.0022	0.0173
Project Soil Loss Estimates	All activities	8/—	**7.22 to 7.37**	**0.174 to 0.176**	**0.068 to 0.084**

Notes:

* Soil losses (tons/acre/year) are estimated using RUSLE2 software available on line [http://fargo.nserl.purdue.edu/rusle2_dataweb/RUSLE2_index.htm] as the RUSLE2 soil loss times the duration and the affected area. The No Project Alternative estimate does not have a specific duration so loss is given as tons/year.

- 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 site coordinates using National Weather Service database [on line at http://hdsc.nws.noaa.gov/hdsc/pfds/sa/sca_pfds.html].

Project Assumptions as follows:

- Approximately 100% of the northern portion of the CVEUP property site will be disturbed but none of the southern portion soils will be disturbed.
- It is assumed that grading for either laydown area will take 2 weeks then the area will be covered with gravel for wet season use after which, soil losses will become negligible.

RUSLE2 Assumptions as follows:

100-foot slope length. Estimated soil unit slope is the midpoint of the minimum and maximum of the unit slope class (**HrC** soil units) or 2 percent for the laydown areas (**GP** or **Rm** soil units).

Construction soil losses assume the following inputs: Management - Bare ground; Contouring - None, rows up and down hill;

Diversion/terracing - None; Strips and Barriers - None.

Grading soil losses assume the following inputs: Management - Bare ground/rough surface; Contouring - None, rows up and down hill;

Diversion/terracing - None; Strips and Barriers - None.

Construction with BMP soil losses assume the following inputs: Management - Silt fence; Contouring - Perfect, no row grade;

Diversion/terracing - None; Strips and Barriers - 2 fences, 1 at end of RUSLE slope.

No Project soil losses assume the following inputs: Management - Dense grass, not harvested; Contouring - None, rows up and down hill;

Diversion/terracing - None; Strips and Barriers - None.

Table 5.11-3 summarizes the mitigated TSP predicted to be emitted from the site from grading and the wind erosion of exposed soil. Without mitigation, the maximum predicted erosion of material from the site is estimated at 0.166 ton over the course of the project construction cycle. This estimate is reduced to approximately 0.058 ton by implementing basic mitigation measures such as water application (see mitigation measures, below). These estimates are conservative because they make use of emission rates for a generalized soil rather than site-specific soil properties.

TABLE 5.11-3
Total Suspended Particulate Emitted from Grading and Wind Erosion with and without Mitigation

Emission Source	Duration (months)	Unmitigated TSP (tons)[a]	Mitigated TSP (tons)[b]
Grading Dust:			
Site Area (1.42 acres)	1	0.024	0.009
Alternative 1 Laydown Area (1.47 acres)	0.5	0.013	0.004
Alternative 2 Laydown Area (2.75 acre)	0.5	0.024	0.008
Wind-Blown Dust:			
Site Area (1.42 acres)	7	0.105	0.037
Total (Alternative 1 to Alternative 2)		**0.142 to 0.153**	**0.050 to 0.054**

Notes:

[a] Emission Factor Source: URBEMIS2002 User's Guide, May 2003 (Jones & Stokes, 2003). The PM_{10} emission factor for grading dust is 0.11 ton/acre/month and the TSP emission factor for wind-blown dust is 0.38 ton/acre/year.

It is assumed that active site grading will last approximately 1 month for the project site and two weeks for either laydown area.

The assumptions for wind erosion on bare soil surfaces are that erosion would occur on one-third of the project site for the duration of plant construction (estimated at 7 months). It was further assumed that the laydown area chosen would be covered with gravel immediately after grading for wet season use so that soils losses would become negligible.

[b] According to the South Coast Air Quality Management District (SCAQMD) CEQA Handbook, Table 11-4 (1993), the range in reduction of PM_{10} with standard mitigation measures (water spraying, etc.) applied is 30 to 74 percent. This analysis assumes an average efficiency of 50 percent, applied to TSP.

5.11.2.5 Expansive Soils

Soils of the Huerhuero series at the project site have montmorillonitic clays in the subsoil. This is considered to be an expansive clay (i.e., could have a relatively high shrink-swell potential). These soils are mapped as the majority of the northern portion of the CVEUP property and could affect the foundation and roadways for the proposed facility. Therefore, the project could potentially be affected by hazards posed by expansive soils. The geotechnical investigation undertaken for the CVEUP project, however, tested soils on the project site for expansiveness and determined that these soils have low expansiveness potential (Ninyo & Moore, 2006). Therefore, expansive soils are unlikely to cause a significant problem for construction of foundations or piping.

5.11.2.6 Compaction During Construction and Operation

Construction of the proposed project would result in soil compaction during the construction of foundations and paved roadway and parking areas. Soil compaction would also result from vehicle traffic along temporary access roads and in the equipment staging (laydown) area. Soil compaction increases soil density by reducing soil pore space. This, in turn, 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 construction, will result in less-than-significant impacts from soil compaction.

Prior to use as the construction laydown area, minimal grading is expected because the site and proposed laydown areas are relatively flat. After grading, runoff from the site and laydown area will either occur as overland flow or percolate to groundwater. However, the laydown area will likely be graveled to allow for wet season use and further minimize soil erosion potential. Heavy equipment stored onsite will be placed on dunnage to protect it from ground moisture. Once construction is completed, the gravel will either be removed from the site or incorporated into the site paving.

Since the CVEUP will be constructed in previously developed areas that will be repaved or otherwise protected after construction, the overall anticipated effects of compaction during construction are considered to be less than significant.

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

5.11.2.7 Effects of Emissions on Soil-Vegetation Systems

There is a concern in some areas that emissions from a generating facility, principally oxides of nitrogen from the combustors or drift from the cooling towers, would have an adverse effect on soil-vegetation systems in the project vicinity. This is principally a concern where environments that are highly sensitive to nutrients or salts, such as serpentine habitats, are downwind of the project.

In this case, the dominant land use around the project is urban and the serpentine habitats in the project area are all developed for industrial, commercial, or residential uses. The addition of small amounts of nitrogen to the industrial and commercial areas would be insignificant because of the paucity of vegetation in these areas. Within the more vegetated residential areas, the addition of small amounts of nitrogen would be insignificant within the context of fertilizers, herbicides, and pesticides typically used by homeowners.

5.11.3 Cumulative Effects

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

Applications for 26 proposed projects have been filed in the City of Chula Vista. These are mostly residential development projects, with some commercial developments, and one warehouse development and one manufacturing development. One of these projects, a proposed sewing manufacturing and wholesale sales business, is located within 1,000 feet of the CVEUP.

As previously described, the project would have no effect on agriculture, because there are no agricultural uses nearby. The project's effects on soil erosion, sedimentation, and compaction would be minor to negligible and insignificant, particularly with the application of onsite BMPs. The site and surrounding area is developed for urban and industrial uses. Further development is not expected to contribute significantly to soil loss and erosion. Therefore, the potential for cumulative impacts of the proposed CVEUP combined with other projects would be insignificant.

5.11.4 Mitigation Measures

BMPs, in accordance with the SWPPP and DESCP, will be used to minimize erosion at the site during construction. These erosion-control measures would be required to help 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 soil piles with mulch or other wind-protection barriers. These temporary measures would be removed from the site after the completion of construction and the site will paved or completely covered with facilities or other types of ground cover (e.g., gravel or landscape). Therefore, soil erosion losses after construction are expected to be negligible.

5.11.4.1 Temporary Erosion Control Measures

Temporary erosion control measures would be implemented before construction begins, and would be evaluated and maintained during construction. These measures typically include revegetation, mulching, physical stabilization, dust suppression, berms, ditches, and sediment barriers. These measures would be removed from the site after the completion of construction.

During construction of the project, dust erosion control measures would 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 would be sprayed on the soil in construction areas to control dust prior to completion of permanent control measures.

Sediment barriers slow runoff and trap sediment. Sediment barriers include straw bales, sand bags, straw wattles, and silt levees. They 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 site will be constructed on relatively level ground; therefore, it is not considered necessary to place barriers around the property boundary. However, some barriers would be placed in locations where offsite drainage could occur to prevent sediment from leaving

the site. If used, sediment barriers would be properly installed (staked and keyed), then removed or used as mulch after construction. Runoff detention basins, drainage diversions, and other large-scale sediment traps are not considered necessary due to the small site size, level topography, and surrounding paved areas. Any soil stockpiles, including sediment barriers around the base of the 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 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 (i.e., 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 site will include graveling, paving, and drainage systems.

5.11.5 Applicable Laws, Ordinances, Regulations, and Standards

Federal, state, county, and local LORS applicable to soils are discussed below and summarized in Table 5.11-5.

5.11.5.1 Federal LORS

5.11.5.1.1 Federal Water Pollution Control Act of 1972 and the Clean Water Act of 1977

The Federal Water Pollution Control Act of 1972, commonly referred to as the Clean Water Act (CWA) following an amendment in 1977, establishes requirements for discharges of stormwater or wastewater from any point source that would affect the beneficial uses of waters of the United States. The CWA effectively prohibits discharges of stormwater from construction sites unless the discharge is in compliance with a 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, 1999) that applies to projects resulting in one or more acres of soil disturbance. The proposed project would result in disturbance of more than one acre of soil. Therefore, the project will require the preparation of a stormwater management plan. The requirements are described in greater detail in Section 5.15, Water Resources.

The CWA's primary effect on agriculture and soils within 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.

5.11.5.1.2 U.S. Department of Agriculture Engineering Standards

The U.S. Department of Agriculture, NRCS, *National Engineering Handbook*, 1983, Sections 2 and 3, provides standards for soil conservation during planning, design, and construction activities. The project would need to conform to these standards during grading and construction to limit soil erosion.

5.11.5.2 State LORS

5.11.5.2.1 California Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act of 1972 is the state equivalent of the federal CWA, and its effect on the CVEUP 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 RWQCB, which controls surface water discharges, may become involved indirectly if soil erosion threatens water quality.

5.11.5.3 Local LORS

The City of Chula Vista has established ordinances for grading, encroachment, erosion, and sediment control (Evetovich, 2007, personal communication). These ordinances establish permitting requirements and exemptions for general earthwork operations, sediment transport, and erosion control activities that can cause the discharge of pollutants into stormwater systems or watercourses. Mitigation measures for drainage will be included in a site landscaping plan that is approved by the City. A soil investigation report is also required prior to construction on expansive soils, and special design and building considerations may be required. The City of Chula Vista Planning and Building Department and the Planning Division reviews construction plans along with these reports and issues the grading permit for pre-construction and encroachment permits for work within public rights-of-way. The estimated lead time to obtain these permits is 2 to 6 months.

5.11.5.3.1 City of Chula Vista General Plan

The City of Chula Vista General Plan presents policies that provide for guidance and implementation of land use controls in and around the City's sphere of influence. Included in the General Plan are provisions for controlling open space land uses, ranging from parks to agriculture. With urban development of primary importance within the City, the General Plan includes policies that protect and encourage developments consistent with city landscapes and preservation of existing biota. The City of Chula Vista General Plan was modeled to support the Draft San Diego County General Plan 2020 (San Diego County, 2002) and to protect important natural resources where possible. The primary land use goal of the San Diego County General Plan 2020 is for "A built environment that is compatible with and sensitive to its natural setting."

5.11.5.3.2 City of Chula Vista Municipal Code

Prior to construction of the proposed site, a grading permit will be required in accordance with City of Chula Vista Municipal Code (CVMC 15.04.015). The primary purpose of the code is to "protect life and property and promote the general welfare; enhance and improve

the physical environment of the community; and preserve, subject to economic feasibility, the natural scenic character of the city."

To obtain the grading permit, a Preliminary Soils Investigation Report must be submitted that evaluates the presence and effects of expansive soils in construction areas. This report must be completed by a California-certified civil or geotechnical engineer to address the site soil conditions, groundwater conditions and needs for dewatering, and geotechnical design requirements for construction on expansive soils. The conclusions and recommendations for grading procedures and soil stabilization techniques will be provided, as needed. These recommendations must be included in grading plans and building designs. The soils engineer must ensure that proper bedding materials are used and that adequate soil compaction is achieved for building foundations (Evetovich, pers.com. 2007).

Encroachment permits in the public rights-of-way are authorized by the Chula Vista City Council, following submission of recommendations from the city engineer. The council may, at that time, choose to delegate this task to the city engineer.

An Erosion Control Plan that documents soil conditions and proposed erosion control measures during construction activities is also required by the City prior to issuing a grading permit. A copy of the SWPPP and RWQCB approval are also included in this submittal, which is part of the documentation for the Grading Plan (CVMC 15.04.270, Part 11).

A Landscaping and Irrigation Plan must be approved by the City landscape architect and the Director of Planning and Building. This plan indicates onsite cut and fill slope revegetation and drainage patterns that are consistent with the City Landscape Manual. This plan is also submitted as part of the documentation for the Grading Plan (CVMC 15.04.270 Part 9). Replanting and irrigation is required immediately after grading if slopes are present. Replanting and irrigation can only be delayed until post construction if the landscape is flat.

It is necessary to submit a report to the city engineer documenting the completion of work following final grading. This report must include the as-built engineers report and any issues related to expansive soils or problems encountered which, if not corrected, would lead to structural defects in buildings to be constructed. This report is required prior to construction of site facilities.

TABLE 5.11-5
Laws, Ordinances, Regulations, and Standards for Agricultural and Soil Resources

Jurisdiction	LORS	Purpose	Regulating Agency	Applicability (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	RWQCB San Diego Region, Region 9 under State Water Resources Control Board. USEPA may retain jurisdiction at its discretion.	Section 5.11.5.1.1

TABLE 5.11-5
Laws, Ordinances, Regulations, and Standards for Agricultural and Soil Resources

Jurisdiction	LORS	Purpose	Regulating Agency	Applicability (AFC Section Explaining Conformance)
	Natural Resources Conservation Service (1983), *National Engineering Handbook*, Sections 2 and 3	Standards for soil conservation	Natural Resources Conservation Commission	Section 5.11.5.1.2
State	Porter-Cologne Water Quality Control Act of 1972; Cal. Water Code 13260-13269: 23 CCR Chapter 9	Regulates stormwater discharge	CEC and the San Diego Region, under State Water Resources Control Board	Section 5.11.5.2.1
Local	City of Chula Vista General Plan, rev. 2005	Describes local policies for agricultural and soil resources	City of Chula Vista	Section 5.11.5.3
	Excavation, Grading, Clearing, Grubbing and Fills Ord. 3005 § 1, 2005; Ord. 1797 § 1,1978; CVMC 15.04.015	Regulates grading, erosion and sediment control for construction projects within city limits	Planning & Building Department Planning Division City of Chula Vista	Section 5.11.5.3
	Encroachment Ord. 1240 § 3, Ord. 2011 § 1, 1982; Ord. 1205 § 2, 1969; prior code § 27.302; CVMC 12.40	Work within public rights-of-way	Planning & Building Department Planning Division City of Chula Vista	Section 5.11.5.3
	Construction on Expansive Soils Ord. 3005 § 1, 2005; Ord. 1797 § 1, 1978; CVMC 15.04.140 and 15.04.270(B)	A special foundation design may be required where expansive soils are present	Planning & Building Department Planning Division City of Chula Vista	Section 5.11.5.3
	Landscaping Plans Ord. 3005 § 1, 2005; Ord. 2678 § 2, 1996; Ord. 2128 § 3, 1985; Ord. 1797 § 1, 1978; CVMC 15.04.040	Regulates onsite cover and drainage offsite	Planning & Building Department Planning Division City of Chula Vista	Section 5.11.5.3

5.11.6 Permits and Agency Contacts

Permits from different agencies that are required for the project along with the agency contacts are shown in Table 5.11-6. A grading plan approval and driveway construction permit will be obtained from the City of Chula Vista before construction begins. An encroachment permit and permit for construction on expansive soils will also be obtained, if

needed. Stormwater discharge and NPDES permits will also be obtained from the San Diego RWQCB. Other required permits include an Industrial Wastewater Discharge Permit, as discussed in Section 5.15, Water Resources.

TABLE 5.11-6
Permits and Agency Contacts for Agriculture and Soils

Permit or Approval	Agency Contact	Applicability
Approval of Grading Plan Encroachment Permit Driveway Construction Permit Construction on Expansive Soils	Sylvester Evetovich, Principal Engineer Chula Vista Planning & Building Dept. Land Development Section 276 Fourth Avenue Chula Vista, CA 91910 619-691-5115 SEvetovich@ci.chula-vista.ca.us	Grading of site surface Work in public right-of-way Driveways from City right-of-way Report approval required as part of grading permit
Landscaping Plans	Gary Williams, Landscape Architect Chula Vista Planning & Building Department Planning Division 276 Fourth Avenue Chula Vista, CA 91910 619-691-5098 GWilliams@ci.chula-vista.ca.us	Compliance with City landscaping manual for revegetation and site drainage. Required as part of grading permit.
Construction Activity, Stormwater and NPDES Permit	David Gibson Senior Environmental Scientist San Diego RWQCB 9174 Sky Park Court, Suite 100 San Diego, CA 92123 858-467-4387 DGibson@waterboards.ca.gov Or Brian Kelley Senior WRC Engineer San Diego RWQCB 9174 Sky Park Court, Suite 100 San Diego, CA 92123 858-467-4254 BKelley@waterboards.ca.gov	Regulation of stormwater discharge from site facilities during construction

5.11.7 Permit Schedule

It is anticipated that all the required permits for grading can be secured as long as completed applications are provided to the appropriate agency a minimum of six months prior to construction.

5.11.8 References

Bay Area Air Quality Management District (BAAQMD). 2005. http://www.baaqmd.gov/pmt/handbook/s12c03fr.htm.

Evetovich, Sylvester. 2007. Principal Engineer, Planning and Building Department, City of Chula Vista, California. Personal communication with CH2M HILL personnel on June 26, 2006.

International Code Council. 1997. Uniform Building Code (International Building Code), 75th ed., published by the International Conference of Building Officials, April.

Jones and Stokes. 2003. *Software User's Guide: URBEMIS2002 for Windows with Enhanced Construction Module.* May.

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Ninyo & Moore. 2006. Geotechnical Evaluation, Chula Vista Power Plant Modernization, Chula Vista, California. Prepared for DLA Piper US, LLP, November 28, Revised January 30, 2007.

San Diego County. 2002. General Plan 2020. Draft Goals and Policies. http://www.sdcounty.ca.gov/cnty/cntydepts/landuse/planning/GP2020/.

South Coast Air Quality Management District. 1993. *CEQA Air Quality Handbook*. November.

State Water Resources Control Board (SWRCB). 1999. General Construction Permit.

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