8.12 SOILS

8.12.1 INTRODUCTION

This section describes the potential direct, indirect, and cumulative effects on soils from the proposed Kings River Conservation District Community Power Plant (KRCD CPP). The affected environment section provides a discussion of the existing environment and provides a description of the soil types found in the KRCD CPP project area (i.e., an area defined as one-mile from the project site and one-quarter mile on each side of all offsite linear facilities). A discussion of potential impacts to soils associated with construction, operation and maintenance (O&M) of the proposed KRCD CPP is also included. The section also includes a discussion of all applicable federal, state and local laws, ordinances, regulations and standards (LORS), presents possible mitigation measures and identifies appropriate agency contacts and permits that will be required for construction and O&M.

8.12.2 AFFECTED ENVIRONMENT

8.12.2.1 Project Description

KRCD is proposing to develop the KRCD CPP, a nominal 565-megawatt (MW) natural gas-fired combined-cycle base load power plant. The plant will be located near the City of Parlier, in Fresno County on an approximately 32-acre project site. The project site, construction staging area and associated off-site linear facilities as described below are shown on Figure 8.12-1, Soils. The project site is located in an area currently zoned for agriculture and currently being used predominately for agricultural purposes (vineyards). Existing structures on the project site include a vacant rural dwelling, detached garage and barn. These structures will be removed prior to construction. A parcel to the immediate south of the project site will be used for temporary staging and parking during construction. Only the western 15 acres of the 40-acre parcel to the south will be used during project construction. This area of the 40-acre parcel is currently being used for agricultural purposes (vineyards).

Natural gas for the KRCD CPP will be provided by a new approximately 26-mile long 20-inch underground pipeline interconnection to the Southern California Gas Company (SCG) Line 7000 near the City of Visalia, California. The new gas pipeline will primarily follow existing roads and be located in public right-of-way. Five construction staging areas have also been identified for use during construction of the gas pipeline, each with an approximate size of 200 feet by 200 feet.

The KRCD CPP will deliver electric power to the Pacific Gas & Electric Company (PG&E) transmission grid through a new approximately five mile-long 230-kilovolt (kV) radial

transmission line between the on-site 230-kV switchyard site and PG&E's McCall Substation. The transmission line will cross both private property and public right-of-way.

The primary source of process makeup water for the KRCD CPP will be recycled water delivered by new underground pipeline interconnections to the Parlier Wastewater Treatment Plant (WWTP) and the Sanger WWTP effluent percolation and evaporation ponds located on Lincoln Avenue (i.e., Lincoln Ponds). The Parlier WWTP is located adjacent to the north of the plant site, and the interconnection will be located at the northern plant site boundary. The proposed interconnection to the Sanger Lincoln ponds is approximately five miles north and will be located primarily along existing roadways. Currently, two options are being considered for the water pipeline interconnection to Lincoln Ponds (i.e., Water Supply Pipeline Option 1 and Option 2). Up to four new shallow wells recovering percolated effluent will provide a back-up cooling water supply.

Potable water for domestic use will be supplied by a new groundwater well to be installed on the project site. There is no offsite linear associated with the potable water supply. Domestic wastewater will be discharged to the Parlier WWTP. The sewer interconnection is located on the northern boundary of the project site with no offsite linear.

8.12.2.2 Potentially Affected Soils

Mapped Soil Chemical, Erosion, Hydrologic, Physical, and Land Use Properties

Potentially affected soil resources have been described using information from the Eastern Fresno Soil Survey (United States Department of Agriculture (USDA) Soil Conservation Service (SCS), 1971) and the Soil Survey of Tulare County, CA-Western Part (USDA, 2007). Seventeen soils series, represented by 32 soil map units occur within one mile of the proposed KRCD CPP project site and construction staging area, or within one-quarter mile of one or more of the proposed offsite linear facilities as shown on Figure 8.12-1. The soil types are defined on the soil key, which is included with Figure 8.12-1.

Project Site and Construction Staging Area

Five map units occur on the project site and construction staging area, including Delhi sand, Delhi loamy sand (0 to 3 and 3 to 9 percent slope units) Hanford sandy loam, and Hanford fine sandy loam. These five map units will be directly affected by construction and O&M activities, including soil clearing/stripping, stockpiling, and related cut and fill activities. Delhi sand, located on the eastern side of the construction site, has a very loose and incoherent surface layer that results in a moderate or high hazard of blowing and wind erosion; hence its Wind Erodibility Group (WEG) rating of one. Because it is sand, it is somewhat excessively drained, and the water erosion hazard is slight to moderate (K factor of 0.37). The Land Capability Classification

(see Appendix 8.12-1) of the Delhi soils is IVs-4; severe limitations for agricultural production and management limitations associated with low available moisture capacity. Sandy textures throughout the soil profile also limit nutrient recycling as indicated by the 2006 revision of the Natural Resources Conservation Service (NRCS) Series description, which converted the surface horizon designation from an historic "Ap" horizon to a surface "C1" horizon more similar in characteristics to underlying sands.

The eastern portion of the project site and construction staging area includes Delhi loamy sand, three to nine percent slopes, which has only slightly greater available moisture capacity, and is slightly less susceptible to wind erosion (WEG 2). Storie Index ratings for the Delhi soils range from 51 in the Delhi sand to 72 for the Delhi loamy sand. The Storie Index rating system is explained in Appendix 8.12-2, and is indicative of the capability of the soil to support sustained agricultural production and nutrient recycling.

The central and western portions of the project site and construction staging area are dominated by Hanford sandy loam and fine sandy loam. Hanford fine sandy loam has a Land Capability Classification of I-1; few limitations restricting its use. Hanford sandy loam has a Land Capability Classification of IIs-4; moderate limitations reducing the choice of agricultural crops due to relatively lower available water capacity. Hanford soils are WEG 3 soils, and therefore, less susceptible to wind erosion than the adjacent Delhi soils. The Storie Index for the Hanford soil map units range from 95 to 100.

Linear Facilities

Table 8.12-1 summarizes important soils resources data for each of the potentially affected 32 map units occurring at either the site, adjacent construction staging area, or along one or more of the offsite linear facilities, which include the natural gas pipeline and is associated staging areas, the water pipeline and the electric transmission interconnection. Map units are indexed to either their alphabetic (Eastern Fresno Soil Survey) or numeric (Soil Survey of Tulare County, CA-Western Part) map unit symbols.

Table 8.12-1
Summary of Soil Map Units and Series Properties Within the Project Area
KRCD CPP

Map Unit Symbol	Soil Series	Site, Site Vicinity, or Linear	Depth (ft) to Bedrock, Hardpan, or Seasonal Water Table	Texture	Permeability (inches/hr)	Drainage	Erosion Potential		Land Capability Class	Storie Index	pH	USCS Classification	Salinity (mmhos/cm)
							Slope %	Water Erosion Hazard K Factor/ WEG					
Eastern Fresno Soil Survey													
DeA	Delhi	Site, SV, WL, TL, GL	5+	sand	>20	Somewhat excessively	0-3	0.37/1	IVs-4 (17)	51	6.1-7.3	SW	<1
DeB	Delhi	SV, WL, TL, GL	5+	sand	>20	Somewhat excessively	3-9	0.371	IVs-4 (17)	49	6.1-7.3	SW	<1
DhA	Delhi	Site, SV, WL, TL, GL	5+	loamy sand	5.0-10.0	Somewhat excessively	0-3	0.37/2	IIIs-4 (17)	72	6.1-7.3	SM	<1
DhB	Delhi	SV, TL, GL	5+	loamy sand	5.0-10.0	Somewhat excessively	3-9	0.37/2	IIIs-4 (17)	68	6.1-7.3	SM	<1
DIA	Delhi	TL	5+	loamy sand	5.0-10.0	Somewhat excessively	0-3	0.37/2	IIIs-4 (17)	77	6.1-7.3	SM	<1
Dm	Dello	SV, WL, TL, GL	5+	loamy sand	>20	Very poorly	0-2	0.37/2	IIIw-4 (17)	58	6.1-8.4	SM	0-4[b]
Es	Exeter	WL	3-4	sandy loam	2.5-5.0	Moderately Well	0-9	0.32/5	IIIs-8 (17)	42	6.1-7.8	CL-ML, ML	<1
Ex	Exeter	SV, WL, GL	3-4	loam	2.5-5.0	Moderately Well	0-9	0.32/5	IIIs-8 (17)	45	6.1-7.8	CL-ML, ML	<1
Gd	Grangeville	TL	5+	sandy loam	2.5-5.0	Somewhat poorly	0-2	0.32/3	IIs-6 (17)	51	6.1-9.0	SM	<1
Hc	Hanford	Site, SV, WL, TL, GL	5+	sandy loam	2.5-5.0	Well	0-15	0.32/3	IIs-4 (17)	95	6.1-7.3	SM	<1
Hm	Hanford	Site, SV, WL, TM, GL	5+	fine sandy loam	2.5-5.0	Well	0-15	0.32/3	I-1 (17, 18)	100	6.1-7.3	SM	<1
Ho	Hanford	SV	5+	fine sandy loam	2.5-5.0	Well	0-15	0.32/3	IIs-3 (17)	95	6.1-7.3	SM	<1

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KRCD CPP

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							Slope %	Water Erosion Hazard K Factor/ WEG					
Hse	Hesperia	TL	5+	sandy loam	2.5-5.0 0.2-0.8[a]	Well	0-9	0.32/3	IIs-6 (17)	71	6.1-7.3 7.3-9.0[a]	SM	<4[b]
Hsr	Hesperia	SV, WL, GL	5+	fine sandy loam	2.5-5.0 0.2-0.8[a]	Well	0-9	0.32/3	I-1 (17, 18)	100	6.1-7.3 7.3-9.0	SM	<4[c]
Hst	Hesperia	GL	5+	fine sandy loam	2.5-5.0 0.2-0.8[a]	Well	0-9	0.32/3	IIs-3 (17)	95	6.1-7.3 7.3-9.0	SM	<4[c]
PmB	Pollasky	GL	3-4	sandy loam	2.5-5.0	Well	2-9	0.32/3	IIIe-8 (17)	57	6.1-7.3	SM	<1
PmC	Pollasky	GL	3-4	sandy loam	2.5-5.0	Well	9-15	0.32/3	IVe-3 (17)	53	6.1-7.3	SM	<1
TzbA	Tujunga	SV, WL, TL, GL	5+	loamy sand	5.0-10.0	Somewhat excessively	0-3	0.20/2	IIIs-4 (17)	76	6.1-7.3	SM	<1
TzbB	Tujunga	SV, WL, TL	5+	loamy sand	5.0-10.0	Somewhat excessively	3-9	0.20/2	IIIs-4 (17)	68	6.1-7.3	SM	<1
Tulare County Soil Survey – Western Part													
101	Akers-Akers, Saline Sodic complex	GL	5+	fine sandy loam	0.6-2.00	Well	0-2	0.37/3	IIs-6 (17)	90	7.4-9.0	ML, SM	0-4
105	Calgro-Calgro, Saline-sodic complex	GL	5+	sandy loam	0.6-2.00	Moderately well	0-2	0.20/3	IVs-6 (17)	34	7.9-11.0	SC-SM	0-4
108	Colpien	GL	5+	loam	0.20-0.60	Moderately well	0-2	0.37/5	I-1 (17)	85	6.6-8.4	CL-ML, ML	
109	Crosscreek-Kai Assoc.	GL	5+	loam	0.20-0.60	Well	0-2	0.37/4L-5	IIIs-6 (17)	13	6.6-11.0	CL-ML, ML	1-12

Table 8.12-1
Summary of Soil Map Units and Series Properties Within the Project Area
KRCD CPP

Map Unit Symbol	Soil Series	Site, Site Vicinity, or Linear	Depth (ft) to Bedrock, Hardpan, or Seasonal Water Table	Texture	Permeability (inches/hr)	Drainage	Erosion Potential		Land Capability Class	Storie Index	pH	USCS Classification	Salinity (mmhos/cm)
							Slope %	Water Erosion Hazard K Factor/ WEG					
110	Delhi	GL	5+	sandy loam	6.00-20.00	Somewhat excessively	0-2	0.37/2	IIIs-1 (17)	72	6.1-7.8	SM	<1
122	Grangeville	GL	5+	sandy loam	2.00-6.00	Somewhat poorly	0-2	0.32/3	I-1 (17)	72	6.1-9.0	SM	<1
124	Hanford	GL	5+	sandy loam	2.00-6.00	Well	0-2	0.32/3	I-1 (17)	95	5.6-7.8	SM	<1
130	Nord	GL	5+	fine sandy loam	0.60-2.00	Well	0-2	0.28/3	I-1 (17)	95	6.6-8.4	ML, SM	0-2
133	Remnoy	GL	5+	silt loam	0.06-0.20	Somewhat poorly	0-2	0.43/4L	IVs-8 (17)	11	8.5-11.0	ML	2-16
138	Tujunga	GL	5+	loamy sand	6.00-20.00	Somewhat excessively	0-2	0.17/2	IIIs-1 (17)	57	6.1-7.3	SM	<1
143	Yettem	GL	5+	sandy loam	2.00-6.00	Well	0-2	0.24/3	I-1 (17)	95	5.6-8.4	SM	<1
143tw	Yettem	GL	5+	sandy loam	2.00-6.00	Well	0-2	0.24/3	I-1 (17)	95	5.6-8.4	SM	<1
144	Youd	GL	5+	loam	0.20-0.60	Somewhat poorly	0-1	0.43/4L	IVs-8 (17)	14	5.6-9.0	CL-ML, ML	>4

Definitions and Acronyms:
Site: Soils located on the proposed KRCD CPP project site
SV: Soils located within one mile of the proposed KRCD CPP project site
GL: Soils located within one quarter mile of the proposed gas supply pipeline
TL: Soils located within one quarter mile of the proposed transmission interconnection
WL: Soils located within one quarter mile of the proposed water pipeline (Option 1 and Option 2)
mmhos/cm: millimhos per centimeter

Notes:
a - Underlying compacted silt layer contributes to reduced permeability and increased pH at depth.
b - Salinity can range from 4 to 15 mmhos/cm in some places.
c - Salinity can range from 4 to 8 mmhos/cm in some places.

Table 8.12-1
Summary of Soil Map Units and Series Properties Within the Project Area
KRCD CPP

Map Unit Symbol	Soil Series	Site, Site Vicinity, or Linear	Depth (ft) to Bedrock, Hardpan, or Seasonal Water Table	Texture	Permeability (inches/hr)	Drainage	Erosion Potential		Land Capability Class	Storie Index	pH	USCS Classification	Salinity (mmhos/cm)
							Slope %	Water Erosion Hazard K Factor/ WEG					

Water Erosion Hazard is shown as the K factor. Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) and the Revised Universal Soil Loss Equation (RUSLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter and on soil structure and permeability. Values of K range from 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water.

WEGs are made up of soils that have similar properties affecting their susceptibility to wind erosion in cultivated areas. The soils assigned to group 1 are the most susceptible to wind erosion, and those assigned to group 8 are the least susceptible. The groups are as follows:

1. Coarse sands, sands, fine sands, and very fine sands.
2. Loamy coarse sands, loamy sands, loamy fine sands, loamy very fine sands, ash material, and sapric soil material.
3. Coarse sandy loams, sandy loams, fine sandy loams, and very fine sandy loams.

4L. Calcareous loams, silt loams, clay loams, and silty clay loams.

4. Clays, silty clays, noncalcareous clay loams, and silty clay loams that are more than 35 percent clay.
5. Noncalcareous loams and silt loams that are less than 20 percent clay and sandy clay loams, sandy clays, and hemic soil material.
6. Noncalcareous loams and silt loams that are more than 20 percent clay and noncalcareous clay loams that are less than 35 percent clay.
7. Silts, noncalcareous silty clay loams that are less than 35 percent clay, and fibric soil material.
8. Soils that are not subject to wind erosion because of coarse fragments on the surface or because of surface wetness.

Information provided in Table 8.12-1 includes depth, texture, permeability, drainage, slope percentage, water erosion hazard (expressed as the soil 'K' factor), wind erosion hazard (expressed as wind erodibility group number), land capability classification, Storie Index, soil pH (i.e., Reaction), Unified Soil Classification System (USCS), and salinity. Explanations of the symbols and/or rating/classification systems used by the SCS/NRCS are provided in the Notes to Table 8.12-1 or other documents referenced in this section. Table 8.12-2 provides additional information on the USCS, including explanations of symbols and names.

Table 8.12-2
Unified Soil Classification System
KRCD CPP

Major Divisions			**Group Symbol***	**Typical Names**
Course-Grained Soils More than 50% retained on the 0.075 millimeter (mm) (No. 200) sieve	Gravels 50% or more of course fraction retained on the 4.75 mm (No. 4) sieve	Clean Gravels	GW	Well-graded gravels and gravel-sand mixtures, little or no fines.
			GP	Poorly graded gravels and gravel-sand mixtures, little or no fines.
		Gravels with Fines	GM	Silty gravels, gravel-sand-silt mixtures.
			GC	Clayey gravels, gravel-sand-clay mixtures.
	Sands 50% or more of course fraction passes the 4.75 (No. 4) sieve	Clean Sands	SW	Well-graded sands and gravelly sands, little or no fines.
			SP	Poorly graded sands and gravelly sands, little or no fines.
		Sands with Fines	SM	Silty sands, sand-silt mixtures.
			SC	Clayey sands, sand-clay mixtures.
Fine-Grained Soils More than 50% passes the 0.075 mm (No. 200) sieve	Silts and Clays Liquid Limit 50% or less		ML	Inorganic silts, very fine sands, rock four, silty or clayey fine sands.
			CL	Inorganic clays of low to medium plasticity, gravelly/sandy/silty/lean clays.
			OL	Organic silts and organic silty clays of low plasticity.
	Silts and Clays Liquid Limit greater than 50%		MH	Inorganic silts, micaceous or diatomaceous fine sands or silts, elastic silts.
			CH	Inorganic clays or high plasticity, fat clays.
			OH	Organic clays of medium to high plasticity.
Highly Organic Soils			PT	Peat, muck, and other highly organic soils.

Source: from American Society for Testing and Materials (ASTM) D 2487

*Group Symbol:
Prefix: G = Gravel, S = Sand, M = Silt, C = Clay, O = Organic
Suffix: W = Well Graded, P = Poorly Graded, M = Silty, L = Clay, LL < 50%, H = Clay, LL > 50%

Based on available soil data in Table 8.12-1, the potential for wind erosion at the project site and construction staging area may be moderate to high, the hazard of water erosion is slight to moderate and the permeability is rapid. Surface runoff potential is low because of the relatively flat project site and construction staging area.

8.12.2.3 Potentially Affected Contaminated Soils

Phase I Environmental Site Assessment

A Phase I Environmental Assessment of the KRCD CPP project site was prepared in accordance with American Society for Testing and Materials (ASTM) "Standard Practice for Environmental Site Assessments: Phase I Environmental Assessment Process" (Standard Designation E 1527-05), published November 2005. The Phase I Environmental Site Assessment (Twining Laboratories, 2006) included the following references to potentially affected contaminated soils:

- A farming operation was formerly located at the proposed project site. One 500- gallon gasoline underground storage tank (UST) was installed at some unknown date. The farms operation manager for the site stated that the former UST has been sitting on the ground for at least the past 15 years, and the condition of the subsurface soils beneath the tank is unknown.
- One 350-gallon UST is located 878 feet west of the proposed project site. It is located cross-hydrologic-gradient from the site, and poses a low level threat of release and migration to the site.
- Because the proposed project site has historically been in agricultural use, it is possible that site soils may have been impacted by environmentally persistent agricultural chemicals. The extent of impact to the site is unknown without the collection and analysis of soil samples.

The Phase I Environmental Assessment is discussed further in Section 8.9, Waste Management and is also included as Appendix 8.9-1.

Phase II Environmental Assessment

In response to some of the recommendations in the Phase I Environmental Assessment, a limited soil investigation was conducted at the project site. Results of the soil investigation are summarized in a Phase II Environmental Assessment (Twining Laboratories, 2007). The purpose of the soil investigation was to collect soil samples for analysis of persistent agricultural chemicals as a preliminary screen to assess whether or not surface soils at the site have been impacted by former agricultural activities. As part of the investigation, soil samples were taken at six composite locations (24 samples in all) across the project site at approximate depths of one-half foot. The samples were then analyzed for persistent agricultural chemicals including

organochlorine pesticides. Results of this preliminary soil screening showed no detectible concentrations of organochlorine pesticides. Additional recommendations of the Phase I Environmental Assessment, will be implemented as appropriate. The Phase II Environmental Assessment is discussed further in Section 8.9, Waste Management and is also included as Appendix 8.9-2.

According to the results of the Phase I Environmental Assessment, there is the potential that subsurface soils were impacted by petroleum hydrocarbons due to the presence of a UST which has been sitting on the soil surface for many years. Therefore, there is the potential that contaminated soils may have to be removed from the site. Results of the limited Phase II soil analysis show that it does not appear that agricultural chemicals have impacted onsite soils.

EDR DataMap Corridor Study

Environmental Data Resources (EDR) conducted a Corridor Study of the KRCD CPP project area in January 2007. EDR searched 56 online databases (24 federal, 28 state and local, three tribal, and one proprietary) that document potentially relevant hazardous materials records. The corridor study found 99 sites listed within one or more of 18 federal database records, and 227 state and local records indicating some requirements related to hazardous materials generation, transport, storage, treatment, or disposal. Appendix 8.12-3 includes a summary of the results from EDR Corridor Study. Due to the large number of pages, individual records have not been provided. As displayed on the figure in Appendix 8.12-3, the affected sites within the project area include:

- Two sites, which after United States Environmental Protection Agency (USEPA) assessment, are not judged to be potential National Priorities List sites (Map IDs/Site numbers 89 and 91). Sites 89 and 91 are also listed as Resource Conservation and Recovery Act (RCRA) small quantity generators (SQGs) of hazardous waste, and appear on the Facility Index System "FINDS" database;
- Sites 60 and 85 appear on the Emergency Response Notification System (ERNS) for reported releases of oil and hazardous substances;
- Site 82 has been subject to pesticide enforcement actions;
- Sites 60, 79, 86, 89, 91, 95, and 97 appear in the "FINDS" database with "pointers" to 15 other hazardous waste-related sources of information, some of which include information on surface impoundments, the Federal Insecticide, Fungicide, and Rodenticide Act, etc.;
- Site 79 is being evaluated by the California Department of Toxic Substances Control for possible hazardous materials contamination;
- Site 43 is a solid waste facility/landfill;

- Sites 54, 89, and 95 operate under waste discharge requirements;
- Sites 54 and 81 are classified as waste management units;
- Sites 15, 55, 61, 80, and 83 have public drinking water wells with detectable levels of contamination associated with UST leaks and tank closure activities;
- Sites 89 and 90 appear on records indicating active and inactive UST locations;
- The study indicated that 90 properties covered in the study included records of USTs, and three properties with aboveground storage tanks
- Thirteen sites appear on the Fresno County Certified Unified Program Agency (CUPA) list of businesses that deal with hazardous materials, operate underground or aboveground storage tanks;
- Site 54 is the one California Hazardous Material Incident Report System site on record as having an accidental release or spill of hazardous waste; and
- Sites 79 and 81 are under investigation or have known contamination.

None of the corridor study records indicate the location or extent of contaminated soils on each site. Many sites appear in the study because of other applicable regulations for the generation, storage, and transport of hazardous materials. Due to the large number of pages in the EDR Corridor Study Report, individual records have not been provided.

8.12.3 ENVIRONMENTAL CONSEQUENCES

The greatest potential direct impacts to soil resources are associated with wind and water erosion during stripping, excavation, cutting, and filling activities at the proposed power plant site. Additional, localized wind and water erosion impacts may be associated with construction activities at the 15-acre construction staging area and the five additional 0.92-acre laydown areas along the proposed natural gas pipeline (See Figure 8.12-1).

8.12.3.1 Significance Criteria and Methodology

Significance criteria are adapted from Appendix G of the California Environmental Quality Act (CEQA) Guidelines. Significant effect on the environment means a substantial, or potentially substantial, adverse change in the physical conditions within the area affected by the project. Based on the scope of this definition, and the data required for adequately assessing these impacts on soil resources, impacts are significant if the project would:

- Result in substantial soil erosion or the loss of topsoil;

- Be located on a soil that is unstable, or would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse;
- Be located on an expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property; and
- Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would possibly create a significant hazard to the public or the environment

Erosion and the loss of topsoil can result from water and wind-related forces. Site stability and expansive soils are addressed in project engineering design and compliance with applicable building codes (see Chapter 2, Project Description and Chapter 3, Engineering). The identification of potential hazardous materials sites and related hazards to soils, the public, and the environment relies on the information provided in the corridor study included as Appendix 8.12-3, and the effects of construction activities.

8.12.3.2 Construction Impacts

Project Site and Construction Staging Area

Table 8.12-3 summarizes the volumes of soils impacts on the project site. Appendix 8.12-4, Cut and Fill Calculations, includes the supporting soil stripping, excavation, and related foundation and fill depths and volumes for these volume estimates. Approximately 23 acres of Delhi and Hanford soils will be removed through plant construction stripping and excavation activities. Soils will not be excavated on the adjacent 15-acre construction staging area.

Table 8.12-3
Site Soil Volumes Stripped, Excavated, Imported, and Stockpiled
KRCD CPP

Type of Soil Materials	Volume in Cubic Feet	Volume in Cubic Yards
Topsoil Stripped – Clearing	503,506	18,648
Underlying Soils Excavated	544,075	20,151
Suitable Fill Imported	331,180	12,266

Site preparation will begin with the stripping of the top six inches of the soil and associated organic and inorganic debris on the area of the site to be disturbed for construction. The 18,648 cubic yards of topsoil will be stockpiled separately on the eastern “buffer” portion of the plant site where no facilities are planned for construction (see Chapter 2, Project Description and associated figures). Underlying soils will then be excavated to an additional three-foot depth, resulting in the need to separately stockpile an additional 20,151 cubic yards of soil on the eastern “buffer” portion of the project site. The exposed project site will consist of 23 acres of exposed loamy sands and similar materials.

Soils impacts at the power plant site will include the exposure of 23 acres of site sub-soils and 38,799 cubic yards of on-site stockpiled soils to water and wind erosion for several months. Soils on the adjacent construction staging area will be disturbed and compacted through the site's use for construction equipment storage and related construction traffic. Changes in the physical characteristics of the soil will occur due to mechanical compaction required to provide suitable foundation support for structures associated with the KRCD CPP. Mechanical compaction could increase the density of the soil and reduce its porosity and permeability.

A Geotechnical Report was prepared for the project site and is included as Appendix 2-7, Geotechnical Design Criteria, in Chapter 2, Project Description (Twining Laboratories, 2007; § 8.4.4). The Geotechnical Report recommends that backfilling using onsite native and imported engineered fill soils be placed in loose lifts approximately eight inches thick, moisture-conditioned to within optimum to three percent above the optimum moisture content, and compacted to a dry density of at least 95 percent of the maximum dry density as determined by ASTM Test Method D1557.

Based on the Geotechnical Report, it is assumed that the estimated 12,266 cubic yards of required engineered fill will be imported and placed immediately thereafter on the project site, and will not require substantial area or time for stockpiling. Fill material will be procured from a local supplier and transported to the site. Two potential fill procurement sites include:

Stoney's Sand and Gravel
9181 Highway 41
Lemoore, CA 93245-9604

RMC Pacific Materials
13475 N Friant Rd
Fresno, CA 93720

The overall potential for soil loss from water erosion is minimal since proposed activities will occur within previously developed and disturbed areas. In addition, all construction activities will employ mitigation and sedimentation/erosion control measures consistent with construction best management practices (BMPs), as described below, to minimize the potential for wind and water erosion. Because of the relatively flat nature of the project site and the soil types, problems with offsite movement are not anticipated, provided adequate wind erosion protection is provided for exposed soils.

Additional detail regarding contractor specifications for site preparation, engineered fill, shallow spread foundations for buildings, mat foundations for heavily loaded structures, drilled shaft

foundation design, and related geotechnical considerations are included in the Geotechnical Report (see Appendix 2-7).

A portion of the project site will also be graded and paved, which will reduce surface infiltration and increase surface runoff. Surface runoff will be directed to the project storm water basin, as described in Chapter 2, Project Description and as shown on Figure 2-1, General Arrangement. Measures to minimize the potential from impacts associated with surface runoff will be addressed in the KRCD CPP Construction Storm Water Pollution Prevention Plan (SWPPP). A draft outline of the Construction SWPPP is included as Appendix 8.5-3 in Section 8.5, Water Resources.

If contaminated soils are encountered onsite, they will be managed in accordance with applicable LORS and will be characterized to determine appropriate soil handling and disposition protocols. The soil may then be recycled or disposed of as a non-hazardous waste at a Class II landfill or soil recycling facility or disposed of as a hazardous waste at a Class I landfill (see Table 8.9-2 in Section 8.9, Waste Management).

Linear Facilities and Associated Natural Gas Pipeline Staging Areas

Soils impacts along the gas, transmission, and water linear facilities are expected to be less than significant because the majority of excavation, storage, and backfilling of soils materials will occur in developed road rights of way where trenching and development for roadways and existing infrastructure and lines have resulted in the existing soil material being highly disturbed and unproductive for most other purposes. Potentially affected map units are indicated in Table 8.12-1 ("Site, Site Vicinity, or Linear"). Areas disturbed for linear installation will be returned to original condition and compacted as necessary to prevent surface settling. Much of the proposed routes will occur within existing road rights-of-way. No significant impacts have been identified associated with the construction of these interconnections.

Because all activities will occur in existing rights of way, there will be no impacts to native soils resources from the construction and O&M of the water pipeline.

Impacts associated with the construction of the transmission interconnection will include minor, insignificant soil compaction and disturbance associated with temporary, short-term use of some undeveloped sites within the interconnection right of way. Temporary disturbances will occur in bare soil areas immediately surrounding each pole location during construction. After installation, the ground surface surrounding each pole will be restored to its original condition and any excess soil will be removed to prevent subsequent erosion and sedimentation. Any soils disturbed by poles constructed at otherwise developed pole locations or in paved areas will also

be restored to pre-construction conditions. No significant impacts to soil resources have been identified associated with the construction of the transmission line due to the low potential for water and wind erosion and since much of the route will be constructed within existing road right-of-ways.

The natural gas pipeline will include five approximately 200 feet by 200 feet staging areas indicated on Figure 8.12-1. The five staging locations are planned for the following locations:

- West side of the Kings River, near Kamm Avenue (for installation of the gas pipeline under the Kings River);
- West of Road 40 just south of Avenue 404;
- East side of Road 36; north of Avenue 368;
- West side of Road 60 and Highway 99, approximately 2.5 miles south of Avenue 352; and
- East side of Road 64 between Avenue 304 and 308 in the vicinity of the SCG Line 7000 interconnection.

Construction staging areas are intended to be temporary locations set aside for construction equipment. It is expected that the temporary construction staging area for the Kings River crossing will serve as the site for trucks, drilling equipment, possible welding equipment and possibly as an area to hold pipeline sections to be eventually placed in the horizontal directional drill hole under the river.

Each of these staging areas will temporarily impact 0.92 acres each of map units 101, 105, 110, 133, and 143 (see Table 8.12-1). Because of the limited acreage affected, the temporary duration of staging activities, and other use limitations associated with one or more of these map units, these impacts are considered less than significant.

If contaminated soils are encountered during excavation for linear facilities, they will be managed in accordance with applicable LORS and will be characterized to determine appropriate soil handling and disposition protocols. The soil may then be recycled or disposed of as a non-hazardous waste at a Class II landfill or soil recycling facility or disposed of as a hazardous waste at a Class I landfill (see Table 8.9-2 in Section 8.9, Waste Management).

8.12.3.3 Operation and Maintenance Impacts

There will be no adverse impacts to soils resources associated with ongoing O&M of the KRCD CPP. Mitigation measures provided below in Section 8.12.3.5, will address potential short-term

construction and long-term O&M impacts associated with soil erosion, stability, engineering integrity, and potential contamination at the construction site, along the linear facilities, and at all staging/laydown areas. In addition, the KRCD CPP will implement a landscape plan after construction. A conceptual landscape plan is included as Figure 8.3-11 in Section 8.3, Visual Resources.

All access roads and parking areas will be paved and remaining areas will be covered with crushed rock or will be landscaped with plants or trees, as necessary. Measures to minimize the potential from impacts associated with surface runoff will also be addressed in the Operations SWPPP, which will be prepared prior to operation.

There is the potential that emissions from the proposed KRCD CPP, principally the nitrogen oxide (NOx) from the combustion turbines or the drift from the cooling towers will have an adverse impact on soil-vegetation systems in the project area. This is particularly a concern where soil-vegetation systems that are highly sensitive are located nearby. There are no highly sensitive soil-vegetation systems located in the immediate area of the proposed plant. Therefore, NOx emissions and cooling tower drift from the KRCD CPP will not result in a significant impact to soils.

8.12.3.4 Cumulative Impacts

The permanent removal of approximately 23 acres of Hanford and Delhi soils, when combined with past, present, and reasonably foreseeable projects continues an ongoing trend of irreversibly committing agricultural soils to developed uses. Mitigation associated with the loss of productive agricultural soils and Prime Farmland is discussed in Section 8.4, Land Use and Agriculture.

8.12.3.5 Mitigation Measures

BMPs will be imposed during and after construction to minimize the potential for soil erosion and sedimentation associated with construction of the KRCD CPP. These BMPs will be implemented to prevent erosion and sedimentation from exposed soil areas during precipitation and high-wind events to minimize the potential for significant offsite soil movement. These BMPs will be further described in the project's draft construction SWPPP. All construction activities will be conducted in accordance with the General Construction Permit (as described below). Typical BMP activities will include:

- Dust control on exposed site soils and soil stockpiles throughout the duration of soil storage through hydro-seeding, mulching, and stabilization with a native seed cover

approved by a qualified biologist and KRCD to effectively reduce wind erosion to minimal levels;

- Covering the adjacent 15-acre adjacent staging with vegetation or gravel, as necessary, to minimize the potential for wind and water erosion after construction; and
- Stabilizing surface soils through the use of jute netting and fiber erosion control rolls and mats to increase site infiltration and direct surface runoff and sedimentation into areas approved in the SWPPP.

Short-term and permanent erosion control measures will be addressed in greater detail for all construction and operational activities as part of the KRCD CPP SWPPP. This plan will be developed in conjunction with the CEC to set any applicable performance standards to monitor the effectiveness of mitigation measures.

KRCD will manage soil stockpiles to control erosion and minimize soil movement on- and off-site. Stockpiled soils will be re-applied on site to support berm construction and revegetation, with topsoil materials subsequently re-applied as revegetation topsoil to provide nutrients and available water capacity for landscape plantings (see Section 8.3, Visual Resources and Figure 8.3-11 Conceptual Landscape Plan). Adequate soil volumes will be available for these purposes, and for post-construction site rehabilitation and stabilization as necessary. Upon completion of site landscaping and soil stabilization activities, KRCD will dispose of excess stockpiled soils consistent with applicable LORS. The soil may then be recycled or disposed of as a non-hazardous waste at a Class II landfill.

If contaminated soils are encountered onsite or during linear facility excavation/construction, they will be managed in accordance with applicable LORS and will be characterized to determine appropriate soil handling and disposition protocols. The soil may then be recycled or disposed of as a non-hazardous waste at a Class II landfill or soil recycling facility or disposed of as a hazardous waste at a Class I landfill (see Table 8.9-2 in Section 8.9, Waste Management).

8.12.4 LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

The following LORS are applicable to the protection of soils resources and potentially affected surface water quality from project-related erosion impacts. The proposed KRCD CPP will be constructed and operated in accordance with applicable LORs. These LORS are also summarized below in Table 8.12-4.

Table 8.12-4 Soil LORS KRCD CPP		
Regulation/Program	**Description**	**Project Applicability and Section Reference**
Federal		
Clean Water Act	Establishes requirements for discharges of storm water or wastewater from any point source that would affect the beneficial uses of waters of the United States.	In the case of the KRCD CPP, compliance will be implemented and enforced by the Central Valley Regional Water Quality Control Board (CVRWQCB) Fresno Office. The KRCD CPP will be subject to the requirements of the General Construction Permit. See Section 8.12.4.1.
USDA Engineering Standards	Provides standards for soil conservation during planning, design and construction activities.	The proposed KRCD CPP will conform to applicable standards in the National Engineering Handbook, including Section 3 (Sedimentation) to ensure that the project will not cause soil loss through accelerated erosion. See Section 8.12.4.1 and Chapter 2, Project Description and appendices.
State		
Porter-Cologne Water Quality Control Act California Water Code. California Code of Regulations, (CCR) Title 23	Controls pollutant discharges to surface and groundwater by regulating storm water discharge, and protects water quality by appropriate design, sizing and construction of erosion and sediment controls.	In the case of the KRCD CPP, compliance will be implemented and enforced by the CVRWQCB Fresno Office. KRCD CPP will implement BMPs and appropriate mitigation measures to ensure that waste soils are not discharged during grading and construction activities and to protect surface watercourses. See Section 8.12.4.2.

8.12.4.1 Federal

<u>The Federal Water Pollution Control Act of 1972; Clean Water Act of 1977 (as amended 1987)</u>

The Federal Water Pollution Control Act, commonly referred to as the Clean Water Act (CWA), establishes requirements for discharges of storm water or wastewater from any point source that

would affect the beneficial uses of waters of the United States. The Regional Water Quality Control Board (RWQCB), by authority of the State Water Resources Control Board (SWRCB) administers compliance with the CWA. In the case of the KRCDPP, compliance will be implemented and enforced by the Central Valley RWQCB (CVRWQCB) Fresno Office.

There are two permitting options for storm water discharges, the individual permit and the General Permit. The General Permit for Discharges of Storm Water Runoff Associated with Construction Activity (Permit No. CAS000002), also known as the General Construction Permit, is required for all construction activities that involve more than five acres of land disturbance. Modifications to the General Permit, which were adopted in late 2002, expanded the National Pollutant Discharge Elimination System (NPDES) program by lowering the threshold acreage of soil disturbance requiring permit coverage from five acres to one acre. The program modification became effective in March 2003. The KRCD CPP will be subject to the requirements of the General Construction Permit.

The General Permit for the KRCD CPP will address the quality of surface water leaving the site, and soil erosion and sedimentation associated with the construction activities on the project site and along the associated linear facilities. To be covered under the General Permit, a Notice of Intent (NOI) must be completed and a SWPPP must be prepared. A draft Construction SWPPP, which includes the NOI, is included as Appendix 8.5-3, in Section 8.5, Water Resources.

United States Department of Agriculture Engineering Standards

The USDA, NRCS's National Engineering Handbook provides standards for soil conservation during planning, design and construction activities. The proposed KRCD CPP will conform to applicable standards in the National Engineering Handbook, including Section 3 (Sedimentation) to ensure that the project will not cause soil loss through accelerated erosion. The proposed mitigation measures described below and in the draft SWPPP (see Appendix 8.5-3, in Section 8.5, Water Resources) identify steps to be taken during grading and construction to limit soil erosion caused be soil disturbance.

8.12.4.2 State

Porter-Cologne Water Quality Control Act of 1972. California Water Code. California Code of Regulations (CCR), Title 23, Sections 13000 et seq.

The California Water Code controls pollutant discharges to surface and groundwater by regulating storm water discharge, and protects water quality by appropriate design, sizing and construction of erosion and sediment controls. The discharge of soils into surface waters resulting from land disturbance may require the filing of a report of waste discharge (Water Code Section 13260a). As with the CWA, the SWRCB has the ultimate authority over state water rights and water quality policy, however, the RWQCB has been delegated to oversee water

quality on a day-to-day basis at the local/regional level. In the case of the KRCD CPP, compliance will be implemented and enforced by the CVRWQCB Fresno Office.

The KRCD CPP will implement BMPs and appropriate mitigation measures to ensure that waste soils are not discharged during grading and construction activities and to protect surface watercourses. The BMPs and mitigation measures are previously discussed and are also discussed in the draft SWPPP, which is included as Appendix 8.5-3, in Section 8.5, Water Resources.

8.12.5 Involved Agencies and Contacts

Agencies with jurisdiction and corresponding points of contact to issue applicable permits related to soils resources and impacts are listed in Table 8.12-5.

Table 8.12-5
Soil Agency Contacts
KRCD CPP

Agency	Contact Person, Title and email	Phone Number
CVRWQCB 1685 E Street Fresno, CA 93706 (559) 445-5116	Douglas Patteson, P.E. Senior Water Resource Control Engineer dpatteson@waterboards.ca.gov	(559) 445-5156

8.12.6 Permits

Table 8.12-6 identifies the required permits and permit schedule for the KRCD CPP.

Table 8.12-6
Required Permits and Schedules
KRCD CPP

Permit or Approval	Permit Applicability	Schedule
Storm Water Permit for Construction Activities (General Construction Permit)	Required to regulate the discharge of storm water during construction. Will be obtained prior to construction. The SWPPP will be included as part of the permit.	Permit will be obtained prior to construction. A draft outline of the Construction SWPPP is included in Section 8.5, Water Resources.
Storm Water Permit for Industrial Activity	Required to regulate surface runoff during project operations. Will be obtained prior to KRCD CPP operations.	Will be obtained prior to KRCD CPP operations.
Grading Permits	Required for site preparation and construction activities; require compliance with Uniform Building Code.	The excavation contractor will be responsible for securing this permit prior to construction.

Each permit listed in Table 8.12-6 is expected to take approximately 60 to 90 days to obtain.

8.12.7 REFERENCES

Environmental Data Resources Inc. 2007. EDR DataMap Corridor Study – KRCD CPP, Fresno, CA 93631, January 11, 2007.

Twining Laboratories Inc., 2006. Phase I Environmental Site Assessment – 31.25 Acre Property – 9664 South Bethel Avenue, Fresno County, California (pp. 9, 13, 15, 19, 20).

Twining Laboratories Inc., 2007a. Limited Phase II Environmental Site Assessment; Results of Limited Soil Investigation; January 25, 2007 Letter Report and appendices.

Twining Laboratories Inc., 2007b. Preliminary Geotechnical Engineering Investigation and Geologic Hazard Evaluation – Kings River Conservation District Proposed Power Plant North of the Intersection of East Dinuba Avenue and South Bethel Avenue, Fresno County, California (pp 26-32). Twining Project Number F08306.02-01

USDA NRCS. List of Soil Surveys by State; California. Website at: http://soils.usda.gov/survey/printed_surveys/state.asp?state=California&abbr=CA

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USDA NRCS, Soil Survey Division. 2007. Soil Survey of Tulare County, CA-Western Part. Table 4 - Acreage and Proportionate Extent of the Soils Website at: http://www.ca.nrcs.usda.gov/mlra02/wtulare/

USDA NRCS, Soil Survey Division. 2007. Soil Survey of Tulare County, CA-Western Part. Table 9 – Storie Index Rating. Website at: http://www.ca.nrcs.usda.gov/mlra02/wtulare/

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USDA NRCS, Soil Survey Division. 2007. Soil Survey of Tulare County, CA-Western Part. Table 20 – Physical Properties of the Soils Website at: http://www.ca.nrcs.usda.gov/mlra02/wtulare/

USDA NRCS, Soil Survey Division. 2007. Soil Survey of Tulare County, CA-Western Part. Table 21 – Chemical Properties of the Soils
Website at: http://www.ca.nrcs.usda.gov/mlra02/wtulare/

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USDA, SCS - In Cooperation with the California Agricultural Experiment Station. 1971. Soil Survey – Eastern Fresno Area, California. Storie Index Rating (p. 171).

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