5.6 AGRICULTURE AND SOILS

SECTION 5.6 AGRICULTURE AND SOILS
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5.6 AGRICULTURE AND SOILS

This section presents the environmental effects of construction and operation of the proposed Tesla Power Project (TPP) on agriculture and soils.

5.6.1 Affected Environment

The proposed power plant site is located in northeastern Alameda County and the electrical transmission line, Ravenswood line relocation, and water supply pipeline and pump station are also in Alameda County. From the power plant site, the first one mile of the natural gas pipeline is in Alameda County and the remaining 1.8 miles are in San Joaquin County (Figure 5.6-1).

Alameda County has a land area of approximately 738 square miles of which approximately 49 percent is devoted to agriculture (CDC, 1999a). Other important land uses include urban residential and commercial, government, recreation, and transportation.

San Joaquin County has a land area of approximately 1,409 square miles of which 86 percent is devoted to agriculture (CDC, 1999b).

5.6.1.1 Agricultural Resources

Existing land use, including agricultural use for the proposed project site, natural gas pipeline, electrical transmission line, Ravenswood line relocation, and water pump station and pipeline, is provided in Section 5.7, Land Use. The following section describes agricultural use for each project component.

Project Site and Surrounding Area

The 60 acre site where the power plant will be located is presently used for pasture. The power plant, switchyard, and detention basin will occupy approximately 25 acres of this land (see Table 3.7-3). Properties immediately surrounding the project site including the adjacent construction laydown area are also used mainly for pasture.

Proposed Natural Gas Pipeline

Land use along the proposed 2.8-mile route for the natural gas pipeline is primarily agricultural. Agricultural uses include pasture and cropland (see Figure 5.7-3).

Proposed Electrical Transmission Line

The 0.8-mile (4,000 ft.) electrical transmission line connects the project site to the PG&E Tesla Substation and crosses agricultural lands presently used for pasture.

Proposed Ravenswood Line Relocation

The 0.3-mile (1800 ft.) Ravenswood line relocation crosses agricultural lands presently used for pasture.

Proposed Water Pump Station and Pipeline

The proposed 0.5-acre water pump station that will be located adjacent to the California Aqueduct and may lie on potential pasture land. The 1.7-mile water supply pipeline, which will connect the pumping station with the power plant site is within disturbed road right-of-way and only a small portion may cross agricultural lands.

5.6.1.2 Prime Farmland

The proposed TPP site and all of its related facilities consist, at least partly, of soils that qualify as Farmland of Statewide Importance (USDA, SCS 1966). A small portion of the proposed electrical transmission line, the Ravenswood alternative transmission line route, and portions of the natural gas pipeline consist of soils that qualify as Prime Farmland (USDA, SCS 1966 and 1992). However, the proposed site, the adjacent construction laydown area, the Alameda County portion of the natural gas pipeline route, both transmission line routes, water pump station, and water supply pipeline route are classified as Grazing Land according to the 1998 Alameda County Important Farmland Map (CDC 1999a). Since these areas are not classified as Prime Farmland, Unique Farmland, or Farmland of Statewide Importance on the Important Farmland Map, their use would not have a significant impact on agriculture as defined by CEQA Guidelines. The portions of the San Joaquin natural gas pipeline that qualify as Prime Farmland in the San Joaquin County soil survey (USDA, SCS 1992) also qualify as Prime Farmland according to the 1998 San Joaquin County Important Farmland Map (CDC 1999b). Although portions of the natural gas pipeline route consist of Prime Farmland, the soils will not be permanently impacted because following re-contouring to pre-construction conditions, agricultural use could resume immediately after construction is completed. The soils listed below are the soils along portions of the San Joaquin natural gas pipeline that qualify as Prime Farmland (also see Table 5.6-1 and Figure 5.6-1).

- 118 – Capay clay, 0 to 2 percent slopes
- 119 – Capay clay, 2 to 5 percent slopes
- 123 – Carbona clay loam, 2 to 8 percent slopes
- 252 – Stomar clay loam, 0 to 2 percent slopes

5.6.1.3 Soil Resources

Project Site

The Alameda County soil survey identifies the following soils on the project site and adjacent construction laydown area [U.S. Department of Agriculture, Soil Conservation Service (USDA, SCS), 1966] (Note: the SCS is now known as the Natural Resources Conservation Service):

- LaC – Linne clay loam, 3 to 15 percent slopes
- LaE2 – Linne clay loam, 30 to 45 percent slopes

Table 5.6-1. Soil Mapping Units Description and Properties

Map Symbol	Map Unit Name and Description	Slope %	Depth to Bedrock (inches)	Hazard of Erosion	Land Capability	Comments
	ALAMEDA COUNTY					
AmE2	Altamont clay. Moderately deep, well-drained soil formed in material that weathered from interbedded shale and fine-grained sandstone. Dark brown clay to about 28 inches, finely mottled dark brown and dark yellowish brown clay from 28 to 37 inches, yellowish brown silty clay from 37 to 50 inches, to depth over 50 inches is shattered shale and fine-grained sandstone.	30 to 45	18 to 36	severe	VIe-5	Permeability is slow and the shrink-swell potential is high.
ArD	Altamont rocky clay. Moderately deep, well-drained soil formed in material that weathered from interbedded shale and fine-grained sandstone. Dark brown clay to 28 inches, finely mottled dark brown and dark yellowish brown clay from 28 to 37 inches, yellowish brown silty clay from 37 to 50 inches, to depth over 50 inches is shatted shale and fine-grained sandstone.	7 to 30	18 to 36	moderate	VIe-5	Permeability is slow and the shrink-swell potential is high.
CdB	Clear Lake clay. Very deep, moderately well-drained soil formed in fine-textured alluvium from sedimentary rock. Dark gray clay to about 48 inches, and substratum is dark grayish brown and light olive brown calcareous silty clay.	3 to 7	>65	slight	IIIw-5	Permeability is slow and the shrink-swell potential is high.
DbC	Diablo clay. Deep, well-drained soil formed in material that weathered from soft, calcareous, interbedded shale and fine-grained sandstone. Surface soil is dark gray clay, grades to gray or olive gray silty clay subsoil, and substratum is mottled olive gray to light olive gray silty clay loam.	7 to 15	36 to 60	slight to moderate	IIIe-5	Permeability is slow and the shrink-swell potential is high.
DbD	Diablo clay. Deep to moderately deep, well-drained soil formed in material that weathered from soft, calcareous, interbedded shale and fine-grained sandstone. Surface soil is dark gray clay, grades to gray or olive gray silty clay subsoil, and substratum is mottled olive gray to light olive gray silty clay loam.	15 to 30	36 to 60	moderate	IVe-5	Permeability is slow and the shrink-swell potential is high.

Table 5.6-1 Soil Mapping Units Description and Properties (Continued)

Map Symbol	Map Unit Name and Description	Slope %	Depth to Bedrock (inches)	Hazard of Erosion	Land Capability	Comments
DbE2	Diablo clay. Deep to moderately deep, well-drained soil formed in material that weathered from soft, calcareous, interbedded shale and fine-grained sandstone. Surface soil is dark gray clay, grades to gray or olive gray silty clay subsoil, and substratum is mottled olive gray to light olive gray silty clay loam.	30 to 45	36 to 60	severe	VIe-5	Permeability is slow and the shrink-swell potential is high.
LaC	Linne clay loam. Moderately deep, well-drained soil formed on hills from soft, calcareous, interbedded shale and fine-grained sandstone. Surface soil is dark gray, strongly calcerous clay loam, grades to similar subsoil that contains filaments and nodules of lime.	3 to 15	12 to 50	slight to moderate	IIIe-5	Permeability is moderately slow and the shrink-swell potential is low.
LaD	Linne clay loam. Moderately deep, well-drained soil formed on hills from soft, calcareous, interbedded shale and fine-grained sandstone. Surface soil is dark gray, strongly calcerous clay loam, grades to similar subsoil that contains filaments and nodules of lime.	15 to 30	12 to 50	moderate	IVe-5	Permeability is moderately slow and the shrink-swell potential is low.
LaE2	Linne clay loam. Moderately deep, well-drained soil formed on hills from soft, calcareous, interbedded shale and fine-grained sandstone. Surface soil is dark gray, strongly calcerous clay loam, grades to similar subsoil that contains filaments and nodulules of lime.	30 to 45	10 to 50	severe	VIe-5	Permeability is moderately slow and the shrink-swell potential is low.
Pd	Pescadero clay. Moderately deep, poorly drained soil formed in basins from alluvium derived from sedimentary rocks. Surface soil is brown and dark grayish brown coarse sandy loam, grades to brown very gravelly coarse sandy loam	0 to 2	>60	slight	VIw-2	Permeability is very slow and the shrink-swell potential is high.
RdA	Rincon clay loam. Very deep, well-drained soil formed in alluvium from sandstone and shale. Surface soil is grayish brown clay loam, upper subsoil is brown clay, and the lower subsoil is yellowish brown clay loam.	0 to 3	>60	slight	IIs-3	Permeability is slow and the shrink-swell potential is moderate.

Table 5.6-1 Soil Mapping Units Description and Properties (Continued)

Map Symbol	Map Unit Name and Description	Slope %	Depth to Bedrock (inches)	Hazard of Erosion	Land Capability	Comments
So	Sycamore silt loam. Very deep, moderately well-drained soil formed in alluvium from sedimentary rock. Light brownish gray silt loam to about 18 inches, to depth of 60 inches is light olive gray silt loam.	(nearly level valley floors)	>60	slight	I-1	Permeability is moderate and the shrink-swell potential is low.
	SAN JOAQUIN COUNTY					
114	Calla-Carbona complex. This unit is 45 percent Calla clay loam and 40 percent Carbona clay loam. Very deep, well-drained soil formed in alluvium derived from mixed rock sources. Calla soil is light brownish gray clay loam about 18 inches thick, to a depth of 60 inches is light yellowish brown and pale brown clay loam. Carbona soil is dark gray clay loam to about 6 inches, the lower 19 inches of the surface layer is dark grayish brown clay, the upper 11 inches of the subsoil is pale brown clay loam, to a depth of 62 inches is light yellowish brown clay loam.	8 to 30	>60	severe	IVe-1 (Nonirrigated)	Permeability is moderately slow to slow and the shrink-swell potential is high.
115	Calla-Carbona complex. This unit is 50 percent Calla clay loam and 35 percent Carbona clay loam. Very deep, well-drained soil formed in alluvium derived from mixed rock sources. Calla soil is light brownish gray clay loam about 18 inches thick, to depth of 60 inches is light yellowish brown and pale brown clay loam. Carbona soil is dark gray clay loam to about 6 inches, the lower 19 inches of the surface layer is dark grayish brown clay, the upper 11 inches of the subsoil is pale brown clay loam, to a depth of 62 inches is light yellowish brown clay loam.	30 to 50	>60	severe	VIe (Nonirrigated)	Permeability is moderately slow to slow and the shrink-swell potential is high.

Table 5.6-1 Soil Mapping Units Description and Properties (Continued)

Map Symbol	Map Unit Name and Description	Slope %	Depth to Bedrock (inches)	Hazard of Erosion	Land Capability	Comments
116	Calla-Pleito complex. This unit is 60 percent Calla clay loam and 25 percent Pleito clay loam. Very deep, well-drained soil formed in alluvium derived from mixed rock sources. Calla soil is light brownish gray clay loam about 11 inches thick, the next 18 inches is light gray, grayish brown, and light brownish gray clay loam, to a depth of 60 inches is white and light gray clay loam. Pleito soil is grayish brown and dark grayish brown clay loam about 16 inches thick, to a depth of 60 inches is grayish brown and brown clay loam.	8 to 30	>60	moderate to severe	IVe-1 (Nonirrigated)	Permeability is moderately slow and the shrink-swell potential is moderate.
118	Capay clay. Very deep, moderately well-drained soil formed in alluvium derived from mixed rock sources. Grayish brown and dark grayish brown clay about 20 inches thick, to a depth of 60 inches is grayish brown, dark grayish brown, dark brown, and pale brown clay.	0 to 2	>60	slight	IIs-5 (Irrigated), IVe-5 (Nonirrigated)	Permeability is slow and the shrink-swell potential is high.
119	Capay clay. Very deep, moderately well-drained soil formed in alluvium derived from mixed rock sources. Grayish brown and dark grayish brown clay about 20 inches thick, to a depth of 60 inches is grayish brown, dark grayish brown, dark brown, and pale brown clay.	2 to 5	>60	slight	IIe-5 (Irrigated), IVe-5 (Nonirrigated)	Permeability is slow and the shrink-swell potential is high.
123	Carbona clay loam. Very deep, well-drained soil formed in alluvium derived from mixed rock sources. Dark gray clay to about 6 inches thick, 19 inches is dark grayish brown, 11 inches is pale brown clay loam, to depth of 62 inches is light yellowish brown clay loam.	2 to 8	>60	slight	IIe-5 (Irrigated), IVe-5 (Nonirrigated)	Permeability is slow and the shrink-swell potential is high.
252	Stomar clay loam. Very deep, well-drained soil formed in alluvium derived from sedimentary rock sources. Grayish brown clay loam about 17 inches thick, the next 30 inches is brown clay loam and clay, to a depth of 60 inches is yellowish brown clay loam.	0 to 2	>60	Slight	IIs-3 (Irrigated), IVs-3 (Nonirrigated)	Permeability is slow and the shrink-swell potential is high.

Linne clay loam is a moderately deep to very deep, well-drained soil that is formed from soft, calcareous, inter-bedded shale and fine-grained sandstone. Linne clay loam consists of calcareous clay loam to a depth of about 3 feet underlined by calcareous sandstone. Depth to bedrock is approximately 10 to 50 inches (USDA, SCS 1966).

The shrink-swell potential for Linne clay loam is low, runoff is medium to very rapid, and erosion hazard is slight to moderate when at 3 to 15 percent slopes and severe when at 30 to 45 percent slopes. Proper surface drainage is important to reduce the hazard of erosion. Preserving the existing vegetation cover, where possible, and revegetating disturbed areas around construction sites, helps to control erosion.

Proposed Natural Gas Pipeline

Soil types along the natural gas pipeline are identified in Figure 5.6-1 (Soil Mapping Units) and described in Table 5.6-1 (Soil Mapping Units Description). For the soil along the proposed route in Alameda County, the hazard of erosion is slight to moderate for most, and severe for Linne clay loam at 30 to 45 percent slopes (USDA, SCS 1966). For soils along the proposed route in San Joaquin County, the hazard of erosion is slight for most soils and severe for Calla-Carbona complex at 8 to 30 and 30 to 50 percent slopes (USDA, SCS 1992). There are approximately 1.3 miles of pipeline length with severe erosion potential.

Proposed Electrical Transmission Line

Soil types along the electrical transmission line are identified in Figure 5.6-1 (Soil Mapping Units) and described in Table 5.6-1 (Soil Mapping Units Description). For the soils along the proposed route, the hazard of erosion is slight with the exception of Linne clay loam at 3 to 15 percent slopes and Diablo clay at 15 to 30 percent slopes, which has a slight to moderate hazard of erosion (USDA, SCS 1966).

Proposed Ravenswood Line Relocation

The soil types along the proposed Ravenswood line relocation are identified in Figure 5.6-1 (Soil Mapping Units) and described in Table 5.6-1 (Soil Mapping Units Description). For soils along the proposed relocation route, the hazard of erosion is slight with the exception of Linne clay loam, which has a slight to moderate hazard of erosion when at 3 to 15 percent slopes (USDA, SCS 1966).

Proposed Water Pump Station and Pipeline

The soil types along the proposed water pump station and pipeline are identified in Figure 5.6-1 (Soil Mapping Units) and described in Table 5.6-1 (Soil Mapping Units Description). For the soil at the proposed water pump station site, the hazard of erosion is slight to moderate. For the soils along the proposed water supply pipeline route, Linne clay loam, LaC and LaE2, the hazard of erosion is slight to moderate at 3 to 15 percent slopes and severe at 30 to 45 percent slopes (USDA, SCS 1966). Less than 0.1 mile of the proposed route has a severe hazard of erosion.

5.6.2 Environmental Impacts

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

5.6.2.1 Agricultural Resources

For evaluation of potential impacts to agricultural resources, an impact would be significant if the project would:

- Cause substantial displacement or curtailment of agricultural land uses.
- Cause substantial degradation of agricultural land productivity.
- Cause the conversion of Prime Farmland, agricultural areas of statewide importance, or unique farmland to non-agricultural use.
- Conflict with existing zoning for agricultural use.

Impacts could be significant if the project were to alter land with special designations (e.g., Prime Farmland) to the point that the disturbed area would no longer exhibit the inherent characteristics of the special designation.

Construction Impacts to Agricultural Resources

Construction of the project site and related linear facilities would temporarily impact approximately 89 acres of agricultural land. With the exception of the project site, the temporary disturbance to agricultural production would not last longer than one crop season. Overall, the construction impacts to agriculture will be temporary and will not cause a substantial curtailment of agricultural production activity in Alameda or San Joaquin counties.

Project Site. At the project site and adjacent construction laydown area, approximately 65 acres of agricultural land, currently used for pasture, will be temporarily disturbed during a construction period lasting approximately 23 months. The project site will permanently impact approximately 25 of these acres, and the remaining 40 acres could be returned to pasture land immediately after construction has been completed.

Natural Gas Pipeline. The approximately 2.8-mile long natural gas pipeline will be located mostly on agricultural lands mainly used for pasture and cropland. Construction disturbances are expected to be approximately 100 feet wide, for a total of approximately 36.2 acres (see Table 3.7-3). The pipeline construction would probably not require more than two to three months of construction at any location and, following re-contouring to pre-construction conditions, agricultural use could resume immediately after construction is completed.

Electrical Transmission Line. The approximately 0.8 mile long electrical transmission line, which will be suspended by approximately 20 pole structures. Most of the structures will be located on the temporarily disturbed area of the power generation facility and adjacent construction laydown area and the remaining will be along the proposed transmission line route. The structures will be located mostly on agricultural lands currently used for pasture.

Temporary construction disturbances are expected to be approximately 0.9 acre, and permanent disturbances are expected to be 0.1 acre (see Table 3.7-3). The transmission line construction would probably not require more than two to three months of construction at any location and, following re-contouring to pre-construction conditions, agricultural use could resume immediately after construction is completed.

Ravenswood Line Relocation. The approximately 0.3 mile long Ravenswood line relocation, which will be suspended by approximately 3 pole structures, will be located mostly on lands currently used for pasture. Temporary construction disturbances are expected to be approximately 1.6 acres, and permanent disturbances are expected to be 0.1 acres (see Table 3.7-3). The relocation line construction would probably not require more than two to three months of construction at any location and, following re-contouring to pre-construction conditions, agricultural use could resume immediately after construction is completed.

Water Pump Station and Pipeline. Temporary construction disturbances for the water pump station, which may be located mostly on potential pasture land (see Table 3.7-3), is expected to be approximately 1.0 acre. Immediately after construction is completed, 0.5 acres of that 1.0 acre could be placed in agricultural use, following re-contouring to pre-construction conditions. The water supply pipeline will be located within disturbed road right-of-way and will not impact agricultural lands.

Operational Impacts to Agricultural Resources

Once the plant site, natural gas pipeline, electrical transmission line, Ravenswood line relocation, water pump station and water supply pipeline are constructed, there will be minimal impacts to agricultural resources. The power plant and related facilities will occupy approximately 25 acres of the 60-acre site, and most of the unoccupied land on the project site as well as the adjacent construction laydown area will continue to be used as pasture. The water pump station may permanently impact 0.5 acres of agricultural land adjacent to the California Aqueduct. Loss of this small amount of pastureland is not considered significant. When considering all project components, the project will permanently impact less than 26 acres of agricultural land.

Alameda County has a total of approximately 258,871 acres of agricultural land and San Joaquin County has 912,600 acres of agricultural land (CDC, 1993a and b). The project will not cause a substantial curtailment of agricultural production in either county. Following decommissioning, the land occupied by the project could be returned to agricultural production.

On agricultural areas crossed by the natural gas pipeline and the water supply pipeline, the pipelines will be buried at a depth that will allow continued use for agriculture. For a portion of the natural gas pipeline in San Joaquin County, some of the land is designated Prime Farmland, however the project will not change or limit their agricultural use. No significant impacts to agricultural use are anticipated.

5.6.2.2 Soils Resources

Potential impacts to soil resources include increased soil erosion, soil compaction, loss of soil productivity and disturbance of saturated soils. Soil erosion results in the loss of topsoil and increases sedimentation of surface waters downstream of the construction site. The magnitude, extent, and duration of this construction-related impact would depend on several factors, including the proximity of the construction to water, the soils affected, and the method, duration, and time of year of construction. The soil type present at the site of the proposed power plant is Linne clay loam (LaC and LaE2). This soil is slightly to moderately susceptible to erosion at 3 to 15 percent slopes and is severely susceptible to erosion at 30 to 45 percent slopes (USDA, SCS 1966).

Soil compaction results from vehicle traffic along access roads and in equipment staging areas. Compaction damages soil structure and reduces pore space, which impedes the movement of air and water. The degree of compaction depends on the moisture content and texture of the soil. Construction during late winter and early spring could result in compaction of saturated soils.

Without proper erosion control measures, construction activities could also lower soil productivity by removing topsoil and altering the subsoil and drainage properties of the soil. Loss of soil productivity would hamper mitigation and revegetation efforts.

For evaluation of potential impacts to soil resources, an impact would be significant if the project would:

- Result in substantial soil erosion or loss of topsoil.
- Result in substantial sedimentation in stream channels and stream crossings.

Impacts to soil resources could be significant if construction activities were to occur in areas of high erosion susceptibility and the disturbed areas were left exposed and not properly stabilized.

Construction Impacts to Soil Resources

Effects that construction can have on soil resources include increased soil erosion, soil compaction, loss of soil productivity, and disturbance of saturated soils. Soil erosion results in the loss of topsoil and increases sedimentation of surface waters downstream of the construction site. The magnitude, extent, and duration of this construction-related impact would depend on several factors, including the proximity of the construction to water, the soils affected, the method, duration, and time of year of construction.

Project Site. Construction of the power plant will require some grading and earthwork. The existing site topography will be cut and filled to provide a level area for the power plant site at an elevation of about 380 feet above mean sea level. Site drainage within the curbed areas of the plant site will be routed to an oil water separator for pre-treatment before disposal. Storm

water from the site will flow to a detention basin before release to the existing natural offsite drainage.

Graded areas will be smooth, compacted, free from irregular surface changes, and sloped to drain towards the natural drainage system. Cut and fill slopes for permanent embankments will be designed to withstand horizontal ground accelerations for Seismic Zone 4. Slopes for embankments will be no steeper than 2:1 (horizontal:vertical).

Areas to be backfilled will be prepared by removing unsuitable material and rocks. The bottom of an excavation will be examined for loose or soft areas. Such areas will be excavated fully and backfilled with compacted fill. Backfilling will be done in layers of uniform specified thickness. Structural fill supporting foundations, roads, parking areas, etc., will be compacted in accordance with applicable standards. Final grading will include aggregate surfacing of the entire site to control erosion except for paved roadways and landscaped areas.

The cut-and-fill operations at the plant site will result in alteration of the existing soil profiles. Clearing of the protective vegetation cover and the subsequent soil disturbance will likely result in short-term increases in water and wind erosion rates. The proposed project design will include measures to stabilize fill areas and cut slopes and to control drainage and erosion. These design measures are expected to minimize erosion and sedimentation to acceptable levels.

Construction vehicle and equipment use on disturbed soils at the plant site will also likely temporarily increase wind erosion rates at the plant site and the adjacent construction laydown areas. Approximately 40 acres of land adjacent to the plant site and switchyard will be used for construction laydown, construction parking, offices, tool storage and sanitary facilities (see Table 3.7-3). Impacts to these areas include vegetation and soil disturbance and soil compaction. Wind and water erosion rates at the laydown areas are expected to temporarily increase due to surface disturbance and compaction.

Following construction, wind and water erosion on the plant site will be reduced, because the plant site will be leveled, compacted, covered with concrete and/or aggregate, and drainage will be controlled through a storm drain system. Calculation of soil loss from the power plant site was not considered appropriate because of the proposed surface design (see Figure 3.5-3) and implementation of the landscaping plan, which will effectively eliminate soil loss. Implementation of the mitigation measures discussed in Section 5.6.3 is expected to limit impacts to the soil resources at the power plant site to acceptable levels.

Natural Gas Pipeline. Activities during the construction phase of the approximately 2.8 mile long natural gas pipeline will potentially temporarily increase wind and water erosion along the route. Erosion and dust control techniques will be implemented as part of the Construction Storm Water Pollution Plan that will incorporate Best Management Practices (BMPs) during construction and impacts to soils along this pipeline are expected to be insignificant.

Electrical Transmission Line. Activities during the construction phase of the pole structures, that will suspend the 0.8 mile long electrical transmission line, will potentially temporarily increase wind and water erosion along the route. Erosion and dust control techniques will be implemented during construction. Impacts to soils along this transmission line are expected to be insignificant.

Ravenswood Line Relocation. Activities during the construction phase of the pole structures, that will suspend the 0.3 mile long Ravenswood line relocation, will potentially temporarily increase wind and water erosion along the route. Erosion and dust control techniques will be implemented during construction. Impacts to soils along this line relocation are suspected to be insignificant.

Water Pump Station and Pipeline. Activities during the construction phase of the 0.5 acre water pump station and 1.7 mile long water supply pipeline will potentially temporarily increase the hazard of wind and water erosion at the pump station site and along the pipeline route. Erosion and dust control techniques will be implemented during construction and impacts to the soils around the pump station site and along pipeline are expected to be insignificant.

Operational Impacts to Soil Resources

Operation of the project should not result in significant impacts to soil from either erosion or compaction. Routine vehicular access to the individual project components during operation of the project will be limited to existing roads, most of which are paved. Standard operational activities will not involve disruption of soil. Impacts to soil resources during project operations are expected to be insignificant.

5.6.3 Mitigation Measures

The TPP is not expected to result in significant impacts to soil resources and to agricultural operations. Nonetheless, the Applicant will employ mitigation measures as discussed in this section.

Construction and operation of this project will not result in loss of significant acreage, or a change in type or productivity of prime agricultural land and/or other designated farmlands. Therefore, the impact of this project on agricultural lands will not be significant.

Appropriate erosion control measures will be required to help maintain soil resources, water quality, protect property from erosion damage, and prevent accelerated soil loss, which destroys soil productivity and its capacity to support and maintain vegetation. Temporary erosion control measures will be installed before construction begins and will be removed from the site after completion of construction.

The following mitigation measures will be implemented to reduce potential impacts.

- Prepare an Erosion Control Plan prior to construction and implement the plan during and following construction.

- Stabilize disturbed areas that will not be covered with surface structures (e.g., buildings) or pavement following grading and/or cut-and-fill operations. In areas to be disturbed or excavated along pipeline routes and where vegetation is present prior to construction, topsoil will be selectively salvaged and replaced.
- Limit soil erosion/dust generation by wetting active construction areas with water (including roads) or by applying commercial dust palliatives (soil binders).
- Conduct visual post-construction monitoring of areas that were disturbed during the construction phase, particularly noting steep slope areas or other erosion prone areas; implement corrective measures in areas that do not respond adequately to initial stabilization techniques or in areas where accelerated erosion is occurring.
- In agricultural areas, construct pipelines at a depth that will minimize land use conflicts. Where practical, construction activities will be timed to avoid impacts to cultivated areas.

5.6.4 Significant Unavoidable Adverse Impacts

No significant unavoidable adverse impacts on agricultural or soil resources are anticipated as a result of the construction and operation of the TPP.

5.6.5 Cumulative Impacts

The TPP will not cause or contribute to a significant cumulative impact to erosion or sedimentation. Although it may result in an insignificant incremental increase in soil erosion and sedimentation, impact to soil resources will be minimized by implementation of mitigation measures during both construction and operation. Construction impacts will be short term. The power plant site will be graded and surfaced to prevent erosion and construction areas along project linear features will be allowed to naturally re-vegetate.

5.6.6 Laws, Ordinances, Regulations and Standards (LORS)

Design, construction and operation of the TPP including transmission lines, pipelines, and ancillary facilities will be conducted in accordance with all LORS pertinent to Agriculture and Soils. Project compliance with LORS applicable to agriculture and soils resources is summarized in Table 6.1-1.

The following LORS are applicable to protection of soil resource and protection of surface water quality from project induced erosion impacts.

5.6.6.1 Federal Authorities and Administering Agencies

Clean Water Act of 1977 (including its 1987 amendments) 33 USC § 1342; 40 CFR Parts 122-136. These authorities establish requirements for any facility or activity which has or which will discharge wastes (including sediment due to accelerated erosion) that may interfere with the beneficial uses of affected waters.

The administering agency for the above authority is the Regional Water Quality Control Board (RWQCB), Central Valley Region under the direction of the State Water Resources Control Board (SWRCB).

5.6.6.2 State Authorities and Administering Agencies

California Public Resources Code § 25523(a); CCR §§ 1752, 1752.5, 2300-2309, and Chapter 2, -Subchapter 5. Article 1. Appendix B. Part (i). This authority provides for protection of environmental quality. With respect to the TPP and agriculture and soils, it requires submission of information to the CEC concerning potential environmental impacts to agriculture and soils. In addition, the CEC's decision on the AFC must include consideration of these same issues.

The administering agency for the above authority is the CEC.

The California Porter-Cologne Water Quality Control Act of 1972, California Water Code § 13260 – 13269; 23 CCR Chapter 9. The code requires adequate protection of water quality by appropriate design, sizing and construction of erosion and sediment controls. Discharge of waste earthen material into surface waters resulting from land disturbance may require the filing of a report of waste discharge (Water Code § 13260(a)), and provides for the insurance of waste discharge requirements with respect to the discharge of any waste that can affect the quality of the waters of the state. Concerning potential surface water pollution from project area runoff, the waste discharge requirements may incorporate requirements based on the following sources of recommended methods and procedures:

- State water Resources Control Board. 1996. *Erosion and Sediment Control Field Manual.*
- US EPA. 1973. *Processes, Procedures and Methods to Control Pollution resulting From All Construction Activity.* Presents information on processes, procedures, and methods for controlling sediment, storm water, and pollutants form construction activities.
- California Department of Resources Conservation. 1978. *Erosion and Sediment Control Handbook.* Provides procedures by which physical and climatic data and erosion control practices can be considered in making an assessment of a site for determining the need for an erosion control plan and for preparing an erosion control plan.

The administering agencies for the above authority are the CEC, the RWQCB (Central Valley Region), and the State Water resources Control Board.

5.6.6.3 Local Authorities and Administering Agencies

Alameda County:

Alameda County General Plan – Conservation Element. This element sets forth policies addressing soils, water, mineral resources, and vegetation.

The administering agency for the above authority is Alameda County Planning Department.

Alameda County Hydrology Manual. Assists in designing drainage systems to meet all applicable criteria.

The administering agency for the above authority is Alameda County Department of Public Works.

Alameda County Code of Building Regulation Grading Ordinance. This outlines how project construction must comply with grading requirements. A grading permit and building permit are required.

The administering agency for the above authority is the Alameda County Department of Public Works.

San Joaquin County:

San Joaquin County General Plan – Conservation Element. This element sets forth policies addressing soils, water, mineral resources, and vegetation.

The administering agency for the above authority is San Joaquin County Planning and Community Development Department.

San Joaquin County Hydrology Manual. Assists in designing drainage systems to meet all applicable criteria.

The administering agency for the above authority is San Joaquin County Department of Public Works.

San Joaquin County Code of Building Regulation Grading Ordinance. This outlines how project construction must comply with grading requirements. A grading permit and building permit are required.

The administering agency for the above authority is the San Joaquin County Department of Public Works.

5.6.6.4 Industry Codes and Standards

U.S. Department of Agriculture, SCS, National Engineering handbook (1983). Sections 2 and 3. The U.S. Department of Agriculture prescribes standards of technical excellence for the SCS, now called the NRCS for the planning, design, and construction of soil conservation practices.

The administering agency for the above authority is the NRCS.

5.6.6.5 Tesla Power Project Compliance with Agricultural and Soils LORS

The TPP will obtain a general stormwater permit and will grade and excavate in accordance with approved grading plans to reduce soil erosion from development of the project. Project compliance with LORS applicable to agriculture and soils resources is summarized in Table 6.1-1.

5.6.7 Involved Agencies and Agency Contacts

Agencies and agency contacts relative to agricultural and soil resources for the TPP are provided in Table 5.6-2.

Table 5.6-2. Involved Agencies and Agency Contacts

Agency/Address	Contact/Telephone	Permits/Reason for Involvement
Alameda County Grading Department 399 Elmhurst Street Hayward, CA 94544	Gary Moore Grading Supervisor (510) 670-5402	Grading and trenching
San Joaquin County Community Development 1810 E. Hazelton Avenue Stockton, CA 95205-6298	Rick Coates Deputy Director (209) 468-2097	Grading permit
California Department of Conservation (CDC) 801 K Street, MS.13-71 Sacramento, CA 95814	David Patch Associate Environmental Planner (916) 324-0860	Prime farmland mapping
Central Valley Regional Water Quality Control Board (CVRWQCB) 3443 Routier Road, Suite A Sacramento, CA 95827-3003	Leo Sarmiento Water Quality Engineer (916) 255-3049	General Permit for Storm Water Discharges

5.6.8 Permits Required and Permit Schedule

The Alameda Grading Department and the San Joaquin Department of Engineering will require a grading and erosion control permit prior to the start of construction. The State Water Resources Control Board will require a NPDES General Permit for Storm Water Discharges prior to the start of construction. The schedule for acquiring these permits is summarized in Table 5.6-3.

Table 5.6-3. Permits Required and Permit Schedule

Permit/Approval Required	Schedule
Grading/Erosion Control Permit	30 days prior to start of construction.
NPDES General Permit for Storm Water Discharges Associated with Construction Activities	30 days prior to start of construction.

5.6.9 References

California Department of Conservation. 1993a. Soil Candidate Listing for Prime Farmland and Farmland of Statewide Importance, Alameda County.

California Department of Conservation. 1993b. Soil Candidate Listing for Prime Farmland and Farmland of Statewide Importance, San Joaquin County.

California Department of Conservation. 1999a. Alameda County Important Farmland Map. 1:100,000 scale map.

California Department of Conservation. 1999b. San Joaquin County Important Farmland Map. 1:100,000 scale map.

National Resource Conservation Service (NRCS). 2001. Official Series Descriptions. www.statlab.iastate.edu.

US Department of Agriculture, Soil Conservation Service. 1966. Soil Survey of Alameda Area, California.

US Department of Agriculture, Soil Conservation Service. 1992. Soil Survey of San Joaquin County, California.