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APPENDIX

7.9 SOILS

This section describes the environmental effects of the construction and operation of the project on soils in accordance with California Energy Commission (CEC) requirements. Impacts are assessed for the site of the proposed new generation project and offsite water supply and discharge pipeline alignment. Impacts to agricultural systems are discussed in Section 7.4, Land Use and Agriculture.

Section 7.9.1 provides a description of the existing environment that may be affected. Section 7.9.2 identifies environmental impacts from development of the proposed project, and Section 7.9.3 presents possible mitigation measures. Section 7.9.4 presents the laws, ordinances, regulations and standards (LORS) applicable to soils. Section 7.9.5 describes the agencies involved and provides agency contacts, and Section 7.9.6 describes required permits.

7.9.1 Affected Environment

The Willow Pass Generating Station (WPGS) site is located in northern California, approximately 33 miles east of San Francisco. The WPGS site is located in the City of Pittsburg, approximately 2 miles west of the city center. The WPGS site encompasses approximately 26 acres on the northeastern portion of the approximately 1,000-acre Pittsburg Power Plant (PPP) site (also referred to as the existing plant).

As shown on Figure 2.2-2, all construction and operation activities will take place within the PPP site and the Pacific Gas and Electric Company (PG&E) switchyard adjacent to the PPP site, except for those associated with the installation of new water supply and discharge pipelines. The pipelines will be approximately 5 miles long from the WPGS to the Delta Diablo Sanitation District Wastewater Treatment Plant (DDSD WTP). Construction parking, laydown areas, and office areas totaling approximately 21.5 acres will all be located on the PPP site and the adjacent PG&E switchyard. The project will also include the construction of a series of screening walls, located on the eastern portion of the PPP site within the eastern-most construction laydown and parking area for the WPGS. These walls will be constructed between existing Tanks 1 through 6, as shown on Figure 2.1-2. All construction parking and laydown areas are void of vegetation, previously disturbed and graded, compacted, or paved for existing industrial uses.

The PPP commenced power plant operations in 1954 and is surrounded by residential, industrial, and commercial uses, except for undeveloped land to the west of the site (see Section 7.4, Land Use and Agriculture, for a more detailed discussion of land uses in the vicinity of the project).

Soil types at the WPGS site and in the project vicinity are shown in Figure 7.9-1 and described below and in Table 7.9-1. The soil properties and locations described below are based on information gathered from the USDA Natural Resources Conservation Service (NRCS) online mapping service, Web Soil Survey 2.0 (USDA NRCS, 2007).

7.9.1.1 Soil Types Affected

WPGS Site

The Clear Lake Clay soil component covers the WPGS site.

Map Unit Cc – Clear Lake Clay. The Clear Lake Clay soil component is found on basin floors with slopes of 0 to 2 percent. The parent material consists of alluvium. Roots can penetrate this soil component to depths of more than 60 inches. The natural drainage class is poorly drained, and water movement in the most restrictive layer is moderately low. Water is highly available to a depth of 60 inches. Clear Lake Clay is occasionally flooded but is not ponded, and there is no zone of water saturation within a depth of 72 inches. Its shrink-swell potential is high. Organic matter content in the surface horizon is about 2 percent. Clear Lake Clay soil meets the USDA NRCS criteria for hydric soils.

Construction Laydown/Parking

The proposed construction laydown and parking areas are covered by Clear Lake Clay (described above) and Omni Salty Clay soil components.

Map Unit Ob – Omni Salty Clay. The Omni Salty Clay component is found on flood plains with slopes of 0 to 2 percent. The parent material consists of alluvium derived from sedimentary rock. Roots can penetrate to depths of more than 60 inches. The natural drainage class is poorly drained, and water movement in the most restrictive layer is moderately low. Water is moderately available to a depth of 60 inches. Omni Salty Clay is occasionally ponded; however, it is rarely flooded. Its shrink-swell potential is high. A seasonal zone of water saturation is at 39 inches. Organic matter content in the surface horizon is about 2 percent. Clear Lake Clay meets hydric criteria.

Water Pipeline Alignment

Soil components found along the water pipeline alignment from the WPGS site to the DDSD WTP include Clear Lake and Omni Salty Clay (both described above), Capay Clay, Rincon Clay Loam, and Brentwood Clay Loam.

Map Unit CaA and CaC – Capay Clay. Two components of Capay Clay are found along the water pipeline alignment. Map Unit CaA is found on benches and basin floors with slopes of 0 to 2 percent. Map Unit CaC is found on benches with slopes of 2 to 9 percent. The parent material of both map units consists of alluvium derived from sedimentary rock. Roots can penetrate to depths of more than 60 inches. The natural drainage class is moderately well drained, and water movement in the most restrictive layer is moderately low. Water is highly available to a depth of 60 inches. Capay Clay is not flooded and is not ponded, and its shrink-swell potential is high. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. Capay Clay does not meet hydric criteria.

Map Unit RbC and RbD – Rincon Clay Loam. Two components of Rincon Clay Loam are found along the water pipeline alignment. Map Unit RbC is found on benches with slopes of 2 to 9 percent. Map Unit RbD is found on benches with slopes of 9 to 15 percent. The parent material of both map units consists of alluvium derived from sedimentary rock. Roots can penetrate to depths of more than 60 inches. The natural drainage class is well drained, and water movement in the most restrictive layer is moderately low. Water is highly available to a depth of 60 inches. Rincon Clay Loam is not flooded and is not ponded, and its shrink-swell potential is moderate. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. Rincon Clay Loam does not meet hydric criteria.

Map Unit Bb – Brentwood Clay Loam. The Brentwood Clay Loam component is found on valley floors with slopes of 0 to 2 percent. The parent material consists of alluvium derived from sedimentary rock. Roots can penetrate to depths of more than 60 inches. The natural drainage class is well drained, and water movement in the most restrictive layer is moderately high. Water is highly available to a depth of 60 inches. Brentwood Clay Loam is not flooded and is not ponded. Its shrink-swell potential is high. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 1 percent. This soil does not meet hydric criteria.

Surrounding Area

The surrounding area within a mile radius of the WPGS site and one-quarter mile of the water pipeline alignment consists of a variety of soil types, mostly characteristic of alluvial deposits. In addition to Brentwood Clay Loam, Capay Clay, Clear Lake Clay, Omni Salty Clay, and Rincon Clay Loam (all described above), the following soil types are found within the project vicinity.

Contra Costa County

Map Unit AdA and AdC – Antioch Loam. Two components of Antioch Loam are found in the area surrounding the WPGS site. Map Unit AdA is found on terraces with slopes of 0 to 2 percent, and Map Unit AdC is found on terraces with slopes of 2 to 9 percent. The parent material of both components consists of alluvium derived from igneous and sedimentary rock. Roots can penetrate to depths of more than 60 inches. The natural drainage class is moderately well drained, and water movement in the most restrictive layer is low. The availability of water to a depth of 60 inches is low. Antioch Loam's shrink-swell potential is moderate and it is not flooded or ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. This soil does not meet hydric criteria.

Map Unit Ja – Joice Muck. Joice Muck is found in salt marshes with slopes of 0 to 1 percent. The parent material consists of organic material. Roots can penetrate to depths of more than 60 inches. The natural drainage class is very poorly drained, and water movement in the most restrictive layer is high. Water is moderately available to a depth of 60 inches. Joice Muck is occasionally flooded and is frequently ponded. Its shrink-swell potential is low. A zone of water saturation is at 24 inches year round. Organic matter content in the surface horizon is about 45 percent. This soil meets hydric criteria.

Map Unit Pe – Piper Loamy Sand. Piper Loamy Sand is found on deltas with slopes of 0 to 2 percent. The parent material consists of eolian deposits. Roots can penetrate to depths of more than 60 inches. The natural drainage class is poorly drained, and water movement in the most restrictive layer is high. The availability of water to a depth of 60 inches is low, and its shrink-swell potential is low. Piper Loamy Sand is not flooded, although it is frequently ponded. A zone of water saturation is at 45 inches year round. Organic matter content in the surface horizon is about 1 percent. Piper Loamy Sand meets hydric criteria.

Map Unit RbA – Rincon Clay Loam. Rincon Clay Loam is found on benches with slopes of 0 to 2 percent. The parent material consists of alluvium derived from sedimentary rock. Roots can penetrate this soil to depths of more than 60 inches. The natural drainage class is well drained, and water movement in the most restrictive layer is moderately low. Water is highly available to a depth of 60 inches. Shrink-swell potential is moderate. Rincon Clay Loam is does not flooded or pond. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is approximately 2 percent. Rincon Clay Loam does not meet hydric criteria.

Map Unit So – Sycamore Silty Clay Loam. Sycamore Silty Clay Loam is found on flood plains with slopes of 0 to 2 percent. The parent material consists of alluvium derived from sedimentary rock. Roots can penetrate to depths of more than 60 inches. The natural drainage class is poorly drained, and water movement in the most restrictive layer is moderately high. Water is highly available to a depth of 60 inches. Sycamore Silty Clay Loam's shrink-swell potential is moderate, and it is not flooded or ponded. A zone of water saturation is at 50 inches year round. Organic matter content in the surface horizon is about 2 percent. Sycamore Silty Clay Loam meets hydric criteria.

Map Unit W – Water. Water is mapped as a miscellaneous area that has little or no soil material and supports little or no vegetation.

Solano County

Soils in Solano County consist of Joice Muck (described above), Suisun Peaty Muck, Tidal Marsh, and Water (described above).

Map Unit Sp – Suisun Peaty Muck. Suisun Peaty Muck is found on tidal flats with slopes of 0 to 2 percent. The parent material consists of organic material and mixed alluvium. Roots can penetrate to depths of more than 60 inches. The natural drainage class is very poorly drained, and water movement in the most restrictive layer is high. Water is moderately available to a depth of 60 inches. Suisun Peaty Muck is frequently flooded and is frequently ponded, and its shrink-swell potential is low. A zone of water saturation is at 15 inches year round. Organic matter content in the surface horizon is about 50 percent. This soil meets hydric criteria.

Map Unit Td – Tidal Marsh. Tidal marsh is mapped as a miscellaneous area. These soils can be found on tidal flats with slopes of 0 to 2 percent. The parent material consists of grassy organic material. The natural drainage class is very poorly drained. Tidal Marsh is frequently flooded and is frequently ponded.

7.9.1.2 Soil Contamination

As discussed further in Section 7.13, Waste Management, and Appendix R, Phase I Environmental Site Assessment (ESA), there are areas of potential soil contamination on the WPGS site. Soils could be contaminated around power-generating Units 1 through 4, fuel storage Tank 7, pipelines near the tank farm, the former portable turbine generator that was reportedly located between the PG&E switchyard and Tanks 6 and 7, and the former paint department waste storage area located within the building just west of Tank 7. Potentially contaminated areas of the WPGS site are shown on Figure 3 of Appendix R. The Phase I ESA recommends additional soil sampling and groundwater investigations, and remediation of contaminated soil, if applicable.

During equipment dismantling and removal, all machinery, tanks, pipelines, and appurtenances will be inspected for possible points of release. If release points are identified, further investigation will be performed to determine whether a release has occurred. If it is determined that a release did occur, the impacted area will be investigated and notifications will be made to appropriate parties. Where necessary, materials that have been impacted by the release will be collected and analyzed to determine further action. All impacted materials will be removed and disposed of in licensed landfills.

In addition to those areas of potential soil contamination identified in the Phase I ESA for the WPGS site, there is also an approximately 5-mile-long water pipeline alignment that would be excavated for the installation of new water supply and discharge lines. Three miles of the five-mile-long route currently contains an unused fuel oil pipeline owned by Mirant Delta, which historically was used to convey oil between the Contra Costa Power Plant and the PPP. The unused fuel oil pipeline will be removed and replaced with the new water pipelines. It is anticipated that soil excavated to remove the existing pipeline will be reused to backfill the excavation after installation of the new water pipelines. In the event that contaminated soil is encountered, the impacted area will be investigated and notifications will be made to appropriate parties.

7.9.2 Environmental Consequences

Significance criteria have been selected based on California Environmental Quality Act (CEQA) Guidelines as well as performance standards adopted by responsible agencies. An impact may be considered significant from a soil standpoint if the project results in substantial soil erosion or loss of topsoil. Impacts to soil-vegetation systems and agriculture are discussed in Section 7.4, Land Use.

7.9.2.1 Construction Impacts

It is expected that approximately 23.5 acres of the 26-acre WPGS site will be disturbed by construction activities associated with the project. The northern 2.5 acres of the WPGS site (closest to Suisun Bay) are not expected to be disturbed. The project area is currently used as an industrial facility (the PPP), and the soil in the vicinity is compacted. Existing structures (such as Tank 7, Units 1 through 4, the administration building, and hazardous materials storage and waste buildings) at the PPP would be demolished during construction. The WPGS site will then be graded to provide a level surface for the construction of the new generating units. In addition, a 3.5-acre area of the PPP just north of Units 1 through 4 that contains an unused surface impoundment (adjacent to the north of the WPGS site) would be used for construction laydown, parking, and offices. The impoundment would be demolished and the area regraded for use during construction. The area proposed for construction of screening walls will be in an area previously disturbed and compacted. Tanks 1 through 6 and the containment structures surrounding the tanks will remain intact. Water supply and discharge pipelines would be constructed underground using open trench and jack-and-bore methods (depending on the location) from the WPGS to the DDSD WTP. Each of these construction activities has the potential to affect soil resources and is discussed further below. Best management practices (BMPs) will be implemented as required by the state and local construction permits (see Section 7.9.6 below) to reduce construction impacts. Therefore, impacts to soil resources from construction would be less than significant.

As described above, the areas designated for construction laydown, parking, and offices are void of vegetation, previously disturbed and graded, compacted, or paved for existing industrial uses. Construction of the WPGS would involve laying 4 inches of crushed stone and would not result in impacts to soil resources through erosion.

The Revised Universal Soil Loss Equation is typically used to quantify water-induced soil loss in agricultural areas. The Revised Universal Soil Loss Equation was used to estimate the potential amount of soil erosion from the WPGS site for construction conditions. The existing plant site is characterized as heavy industrial land. Based on an approximately 3-year construction period (34 months), the estimated soil loss for the 23.5-acre portion of the WPGS site and the 3.5-acre construction laydown and parking area is approximately 80 tons. The Revised Universal Soil Loss Equation uses the worst-case factors. During construction, the WPGS site and the 3.5-acre construction laydown area would be disturbed. At that time, the area would be void of vegetation/impervious cover and have the highest potential for erosion. Soil erosion would be reduced through BMPs, which include watering to suppress fugitive dust, providing straw bales and silt fences, and limiting exposed areas.

Construction of the project could result in soil compaction due to the erection of foundations and paving. Soil compaction could also result from vehicle traffic along temporary access roads and in the equipment staging area. Compaction densifies the soil, thereby reducing pore space and impeding water and gas movement through this medium, which can result in increased runoff, erosion, and sedimentation. The project area is currently used as an industrial facility, and the soil is compacted. The incorporation of BMPs during project construction will result in less-than-significant impacts from soil compaction.

Grading associated with the plant construction would primarily involve removing the berm that surrounds Tank 7 and regrading the areas demolished to create a relatively level surface for construction of the new units, as shown in the Site Grading Plan and Drainage Plan (see Figure 2.6-2). As currently estimated, these activities would involve approximately 8,305 cubic yards of cut and 83,828 cubic yards of fill. Brentwood Decorative Rock, located at 6745 Brentwood Blvd, Brentwood, CA, 94513 is the expected source of the estimated 75,523 cubic yards of imported soil that would be required.

Water supply and discharge pipelines would be constructed underground using open trench and jack-and-bore installation methods (depending on location) from the WPGS to the DDSD WTP. Approximately

3 miles of the 5-mile-long water pipeline alignment runs along the route of the PPP's existing unused 10.75-inch pipeline historically used for conveying oil. This unused pipeline would be removed, and the two new water pipelines would be installed along the alignment. The new pipelines would be 10 inches in diameter, and the trench is expected to be no greater than 15 feet wide along the entire 5-mile-long alignment. The depth of the trench is not expected to be greater than 5 feet deep along most of the alignment, except in locations where the existing unused oil pipeline is located at further depths (e.g., at railroad, road, or creek crossings). Soil would be removed from the trench and used as backfill. Disposal is expected to be minimal. Construction of the pipelines is considered in the overall construction schedule presented in Figure 2.7-1.

Soil would be inspected during removal of the existing, unused oil pipeline. If release points are identified, further investigation would be performed to determine whether a release has occurred. If contaminated soil is encountered, it will be managed and disposed of in accordance with applicable local, state, and federal requirements.

Prior to construction, a grading plan would be incorporated into the building permit application to the City of Pittsburg for construction of the proposed facilities. The grading plan would show existing and proposed features of the site (slopes, elevation, locations of cut and fill) as well as erosion and sediment control measures to be incorporated during construction.

During construction of all project components, the potential for erosion would be greater than for existing conditions but will be managed to minimize impacts; therefore, impacts from soil erosion are expected to be less than significant.

As discussed in Section 7.14, Water Resources, the project will comply with the National Pollutant Discharge Elimination System (NPDES) General Permit for Stormwater Discharges Associated with Construction Activity and a stormwater pollution prevention plan (SWPPP) will be prepared prior to construction. The Erosion and Sediment Control Plan identifies erosion control measures that could be implemented during construction of the project.

7.9.2.2 Operations Impacts

Plant operations would not result in impacts to the soil from erosion or compaction. When construction is complete, the WPGS site would either be covered with structures or paved; therefore, there would be no potential for soil erosion. The water supply and discharge pipelines would be underground and therefore would not pose soil erosion risks. Routine vehicle traffic during WPGS operation would be limited to paved roads, and standard operational activities would not disrupt the soil.

7.9.2.3 Cumulative Impacts

Past and current development in the project vicinity has not resulted in a cumulatively significant impact to soils. Relevant future projects identified in Section 7.4.3 would also not be expected to result in a cumulatively significant impact to soils. By definition, the project would not therefore contribute to a cumulatively significant impact, and cumulative impacts of the project would be less than significant.

7.9.3 Mitigation Measures

This section discusses mitigation measures proposed by the applicant that will be implemented to reduce project-related impacts to soil resources. To minimize soil erosion and sedimentation, BMPs will be used during construction activities. Temporary erosion control measures will be required during the construction period to help maintain water quality, protect the site and surrounding property from erosion damage, and prevent accelerated soil erosion or dust generation. These measures will be in place before construction begins and will be removed after completion.

SOIL-1 Temporary Erosion Control Measures

Typically, temporary erosion control measures include revegetation, slope stabilizers, dust suppression, construction of berms and ditches, and sediment barriers. Vegetation is the most efficient form of erosion control because it stabilizes the soil and maintains the landscape; however, it would not be used due to the industrial environment.

During construction of the project, dust erosion control measures will be used to minimize the windblown erosion of soil from the WPGS site. Clean water will be sprayed on the soil in construction areas to suppress dust.

Sediment barriers, such as straw bales or silt fences, slow runoff and trap sediment. They are usually placed below the disturbed area. Sediment barriers are often placed around sensitive areas, such as wetlands or creeks, to prevent contamination by sediment-laden water. Barriers will be placed around the site boundary to prevent sediment from leaving the site. Because the WPGS site is relatively level, standard surface erosion control techniques should be effective. Soil stockpiles generated during construction will be covered and protected from rainfall if left on site for long periods.

7.9.4 Laws, Ordinances, Regulations, and Standards

The project would be constructed and operated in accordance with all LORS applicable to soil resources. Federal, state, and local LORS applicable to soils are discussed below and summarized in Table 7.9-2.

7.9.4.1 Federal

The Clean Water Act (CWA) empowers the U.S. EPA with regulation of wastewater and stormwater discharges into surface waters by using NPDES permits and pretreatment standards. At the state level, these permits are issued by the Regional Water Quality Control Board (RWQCB), but the U.S. EPA might retain jurisdiction at its discretion. The CWA's primary effect on the WPGS site is with respect to the control of soil erosion during construction.

7.9.4.2 State

The Porter-Cologne Water Quality Control Act of 1972 is the state equivalent of the federal CWA, and its effect on the WPGS site would be similar. The San Francisco Bay RWQCB has jurisdiction of the project area. The CEQA requires an evaluation of impacts by the project if construction would cause substantial flooding, soil erosion, or sedimentation. Several plans, which include an SWPPP, a soil erosion control plan, and a construction grading plan, will be prepared in accordance with local and regional guidelines.

7.9.4.3 Local

The City of Pittsburg Municipal Code contains requirements for filling, excavation, and grading associated with new development projects. Permits are issued prior to land-disturbing or land-filling activities.

7.9.5 Involved Agencies and Agency Contacts

Several agencies will be monitoring the project and are likely to be involved. Table 7.9-3 outlines the agencies that will be concerned with soil resource issues.

7.9.6 Permits Required and Permit Schedule

Permits to protect soil resources are summarized in Table 7.9-4.

7.9.7 References

USDA NRCS (Natural Resources Conservation Service), 2007. Web Soil Survey 2.0, Natural Cooperative Soil Survey. Accessed online at: http://websoilsurvey.nrcs.usda.gov/app/. Accessed January 10, 2008, and May 16, 2008.

Table 7.9-1
Soil Mapping Units Surrounding WPGS Site – Description and Properties

Map Symbol	Texture	Slope (%)	Unit Thickness (inches)	Drainage	USCS Classification[a]	Permeability (inches/hour)	Wind Erodibility (tons/acre/year)[b]	Hydrologic Soil Group	Storie Index (approx.)[c]	Land Capability[d]	pH	Salinity (Mmhos per cm at 25°C)[e]	Parent Material
AdA	Loam	0-2	0-60	Moderate	ML	0.52406	48	D	Grade 2- Good	4s/4s	5.1-6.0	0.0-2.0	Alluvium derived from sedimentary rock
AdC	Loam	2-9	0-60	Moderate	ML	0.52406	48	D	Grade 2 - Good	4e/4e	5.1-6.0	0.0-2.0	Alluvium derived from sedimentary rock
Bb	Clay loam	0-2	0-60	Well drained	CL	0.38268	48	B	Grade 1 - Excellent	4c/1	6.6-8.4	0.0-2.0	Alluvium derived from sedimentary rock
CaA	Clay	0-2	0-72	Moderate	CL	0.12898	0	D	Grade 3 - Fair	4s/2s	6.6-8.4	0.0-2.0	Alluvium derived from sedimentary rock
CaC	Clay	2-9	0-72	Moderate	CL	0.12898	38	D	Grade 3 - Fair	4e/2e	6.6-8.4	0.0-2.0	Alluvium derived from sedimentary rock
Cc	Clay	0-2	0-60	Poor	CH, CL	0.12898	38	D	Grade 4 - Poor	4w/2w	6.1-8.4	2.0-4.0	Alluvium
Ja	Muck	0-1	0-60	Very poor	PT	13.03937	134	D	-	7w/7w	4.5-5.5	16.0-48.0	Organic material
Ob	Silty clay	0-2	0-60	Poor	CH, CL	0.12898	0	D	Grade 5 – Very Poor	4w/3w	7.9-8.4	2.0-8.0	Alluvium derived from sedimentary rock
Pe	Loamy sand	0-2	0-60	Poor	SM	13.03937	134	C	Grade 4 - Poor	4w/4w	7.4-8.4	0.0-4.0	Eolian deposits
RbA	Clay loam	0-2	0-60	Well drained	CL	0.30923	48	C	Grade 1 - Excellent	4s/2s	6.1-7.8	0.0-2.0	Alluvium derived from sedimentary rock
RbC	Clay loam	2-9	0-60	Well drained	CL	0.30923	48	C	Grade 1 - Excellent	4e/2e	6.1-7.8	0.0-2.0	Alluvium derived from sedimentary rock
RbD	Clay loam	9-15	0-60	Well drained	CL	0.30923	48	C	Grade 2 - Good	4e/3e	6.1-7.8	0.0-2.0	Alluvium derived from sedimentary rock
So	Silty clay loam	0-2	0-60	Poor	CL	0.56479	0	C	Grade 3 - Fair	4c/1	6.6-7.3	0-2.0	Alluvium derived from sedimentary rock
Sp	Silty clay loam	0-2	0-60	Very poor	CL	13.03937	134	C	-	6w/6w	0	0.0-2.0	Organic material and mixed alluvium
Td	Variable	0-2	0-60	Very poor	-	-	-	D	-	8w/8w		8.0-16.0	Grassy organic material

Source: USDA, Natural Resources Conservation Service, 2008.

Notes:

a USCS = Unified Soil Classification System

b The wind erodibility index is a numerical value indicating the susceptibility of soil to wind erosion, or the tons per acre per year that can be expected to be lost to wind erosion. There is a close correlation between wind erosion and the texture of the surface layer, the size and durability of surface clods, rock fragments, organic matter, and a calcareous reaction. Soil moisture and frozen soil layers also influence wind erosion.

c The Storie Index is a soil rating based on soil properties that govern a soil's potential for cultivated agriculture in California. For simplification, Storie Index ratings have been combined into six grades follows: Grade 1 (excellent), 100 to 80; grade 2 (good), 79 to 60; grade 3 (fair), 59 to 40; grade 4 (poor), 39 to 20; grade 5 (very poor), 19 to 10; and grade 6 (nonagricultural), less than 10.

d Land Capability – An indication of the suitability of soils for most kinds of field crops. Capability classes are 1 through 8. Subclasses are letters e, w, s, or c. First index refers to nonirrigated land and second index number refers to irrigated land. Capability classes, the broadest groups, are designated by the numbers 1 through 8. The numbers indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

- Class 1 soils have slight limitations that restrict their use.
- Class 2 soils have moderate limitations that restrict the choice of plants or that require moderate conservation practices.
- Class 3 soils have severe limitations that restrict the choice of plants or that require special conservation practices, or both.
- Class 4 soils have very severe limitations that restrict the choice of plants or that require very careful management, or both.
- Class 5 soils are subject to little or no erosion but have other limitations, impractical to remove, that restrict their use mainly to pasture, rangeland, forestland, or wildlife habitat.
- Class 6 soils have severe limitations that make them generally unsuitable for cultivation and that restrict their use mainly to pasture, rangeland, forestland, or wildlife habitat.
- Class 7 soils have very severe limitations that make them unsuitable for cultivation and that restrict their use mainly to grazing, forestland, or wildlife habitat.
- Class 8 soils and miscellaneous areas have limitations that preclude commercial plant production and that restrict their use to recreational purposes, wildlife habitat, watershed, or aesthetic purposes.

Capability subclasses are soil groups within one class. They are designated by adding a small letter, e, w, s, or c, to the class numeral, for example, 2e. The letter e shows that the main hazard is the risk of erosion unless close-growing plant cover is maintained; w shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); s shows that the soil is limited mainly because it is shallow, droughty, or stony; and c, used in only some parts of the United States, shows that the chief limitation is climate that is very cold or very dry.

e Salinity is a measure of soluble salts in the soil at saturation. It is expressed as the electrical conductivity of the saturation extract, in millimhos per centimeter at 25 degrees Centigrade. Estimates are based on field and laboratory measurements at representative sites of nonirrigated soils.

Table 7.9-2
Applicable Soils Laws, Ordinances, Regulations, and Standards

Laws, Ordinances, Regulations, and Standards	Applicability	Administering Agency	AFC Section
Federal			
Clean Water Act	Federal regulation of wastewater and stormwater. Controls erosion of soil and disruption or displacement of surface soil.	U.S. EPA, RWQCB	7.9.5, 7.14.5
State			
Porter-Cologne Water Quality Act	State regulation of soil erosion during construction	RWQCB	7.9.5, 7.14.5
California Environ-mental Quality Act	Requires evaluation of impacts of project on soils.	CEC	7.9.5
Local			
City of Pittsburg Municipal Code	Approval required for filling, excavation, and grading	City of Pittsburg, Engineering Department	7.9.5

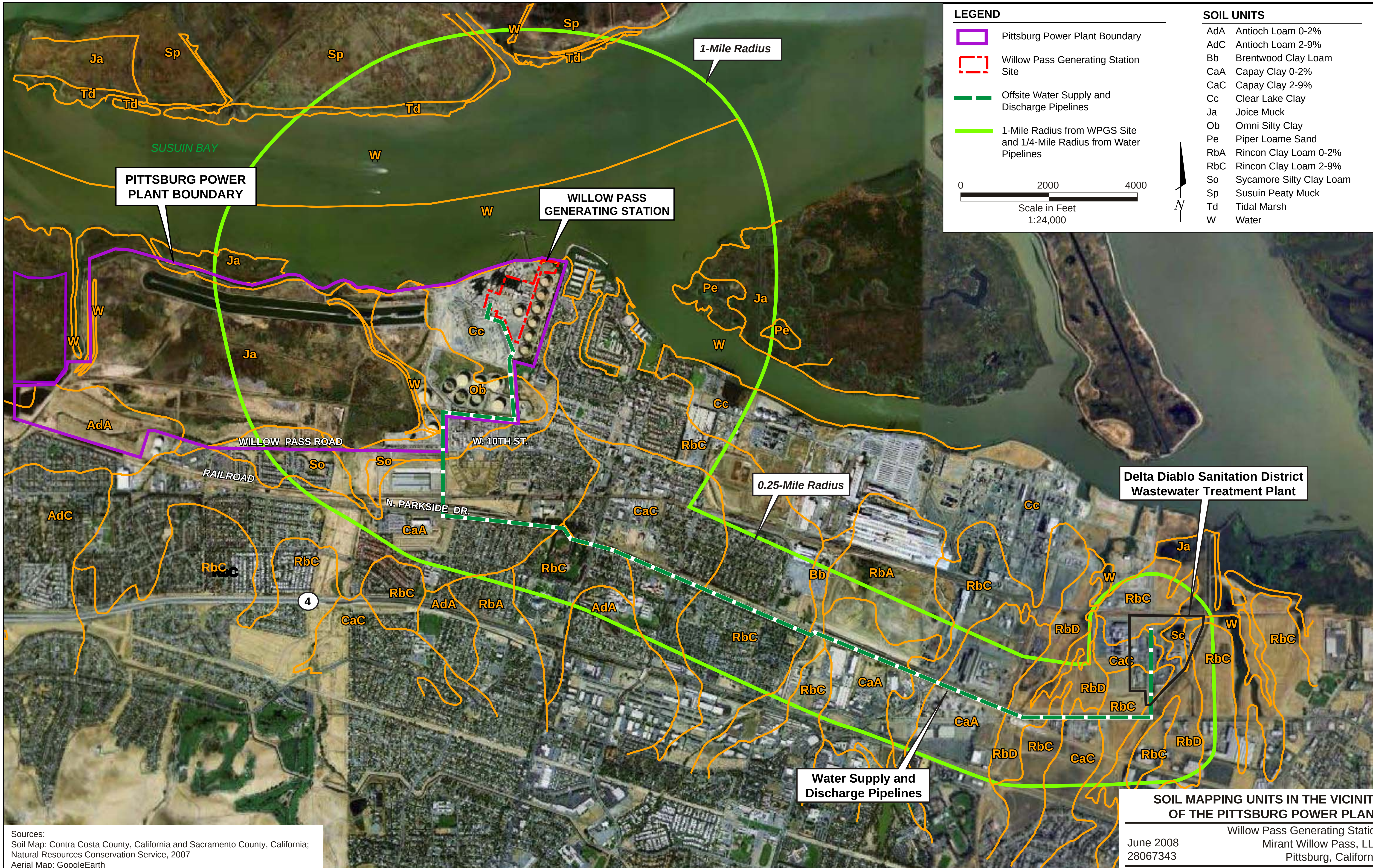
Notes:
CBC = California Buildings Standards Code
CEC = California Energy Commission
RWQCB = Regional Water Quality Control Board
U.S. EPA = U.S. Environmental Protection Agency

Table 7.9-3
Involved Agencies and Agency Contacts

Issue	Agency/Address	Contact/Title	Telephone
Soil erosion	San Francisco Bay Regional Water Quality Control Board, 1515 Clay Street, Suite 1400, Oakland, CA 94612	Michelle Rembaum-Fox	(510) 622-2387
Stormwater runoff and erosion control	Contra Costa County Clean Water Program, 255 Glacier Drive, Martinez, CA 94553	Donald Freitas, Building Official, Building Inspection Department	(925) 313-2360
Grading, erosion and sediment control	City of Pittsburg, Engineering and Development Services Division, 65 Civic Avenue, Pittsburg, CA 94565	Joe Sbranti, City Engineer, Engineering Department	(925) 252-4930

Table 7.9-4
Permits Required

Responsible Agency	Permit/Approval	Schedule
San Francisco Bay Regional Water Quality Control Board (SFBRWQCB)	General Construction Activity Storm Water Permit	At least 30 days prior to construction, applicant must submit Notice of Intent (NOI) to SFBRWQCB.
Contra Costa County – Building Inspection Department	Building Permit including drainage plan	Applicant must obtain a Building Permit, which includes a drainage plan. Review time typically takes 2 to 4 weeks.
City of Pittsburg – Engineering and Development Services Division – Processes Building Permits	Building and Grading Permits	Applicant must obtain Building and Grading Permits. Initial review of the applications typically takes 2 to 4 weeks; final permitting can take up to 4 months,



SOIL MAPPING UNITS IN THE VICINITY OF THE PITTSBURG POWER PLANT

Willow Pass Generating Station
Mirant Willow Pass, LLC
Pittsburg, California

June 2008
28067343

URS

FIGURE 7.9-1

Sources:
Soil Map: Contra Costa County, California and Sacramento County, California; Natural Resources Conservation Service, 2007
Aerial Map: GoogleEarth

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