

10.0 HYDROLOGY AND WATER QUALITY

10.1 INTRODUCTION

This chapter describes the existing hydrology and water quality within Pacific Gas and Electric Company's Windsor Substation Project area and evaluates the potential hydrology and water quality impacts associated with project construction and operation. PG&E's best management practices (BMPs) include avoidance and protection measures (APMs) described in Section 10.5 Avoidance and Protection Measures that will ensure that any potential impacts to hydrology and water quality will be less than significant.

10.2 METHODOLOGY

The hydrologic setting was evaluated by field inspecting nearby waterbodies and drainages in January and July 2009, reviewing the Stantec 2008 *Phase I Environmental Site Assessment Report, Lot-1 Evans/Drew Industrial Subdivision*, and reviewing stream and watershed information prepared by federal, state, and local agencies. The *Phase I Environmental Site Assessment Report, Lot-1 Evans/Drew Industrial Subdivision* will be provided separately to California Public Utility Commission (CPUC) staff.

10.2.1 Regulatory Background

10.2.1.1 Federal and State (National Pollutant Discharge Elimination System)

Surface and groundwater quality in the proposed substation site project area is under the jurisdiction of the North Coast Regional Water Quality Control Board (RWQCB). The RWQCB manages the beneficial uses of water, and, with the California Environmental Protection Agency Department of Toxic Substance Control, oversees the remediation of hazardous material releases to soil and water. The RWQCB issues National Pollution Discharge Elimination System (NPDES) non-point source permits for discharges to water bodies for municipalities and major industries.

Projects disturbing more than one acre of land during construction are required to file a Notice of Intent to be covered under the state NPDES General Construction Permit for construction-related discharges of stormwater. A Stormwater Pollution Prevention Plan (SWPPP) must be developed and implemented for each project covered by the general permit. The SWPPP must include BMPs that are designed to reduce potential impacts to surface water quality during project construction and operation.

10.3 EXISTING CONDITIONS

10.3.1 Surface Water Hydrology

The project is located within the Mark West Creek Hydrologic Sub Area No. 114.23, Russian River Hydrologic Unit No. 114.00. The property proposed for the substation was used as a horse boarding and training facility from approximately 1952 until 2005. In 2006, the buildings associated with the horse boarding and training facility were removed, and the proposed

substation site was graded so that the general topographic gradient slopes gently to the south. A gravel road was constructed along the west and south borders of the proposed substation site, under which subsurface sanitary and stormwater lines were installed. A storm drain drop inlet was installed on the southeast corner of the proposed substation site (see Figure 10-1). Water from the proposed substation site drains south and east into this storm drain drop inlet and then into an underground stormwater pipe flowing east. Stormwater empties from the underground stormwater pipe into an intermittent stream running westerly through the wetland mitigation area to the south of the proposed substation site. This intermittent stream crosses under the railroad tracks and enters the Town of Windsor's (Town) underground stormwater collection system.

Hydrologic connectivity between the proposed substation site and adjacent lands is limited by topography and other features. Gutters along the south edge of Mitchell Lane carry offsite runoff flowing towards the property into the Town's stormwater system. To the northwest of the property, the existing mitigation bank/preserve lies at a lower elevation than the proposed substation site and the southeast slope of the land directs water from the site away from the mitigation preserve/wetland. A gravel road located along the west end of the property further impedes water flow from the proposed substation site to the wetland. On the south side of the property, a vegetated swale detains and directs runoff eastward into the stormwater drop inlet. A gravel access road lies south of the vegetated swale on the proposed substation site's southern boundary. The property is hydrologically separated from the adjacent property to the east by a drainage ditch created to carry runoff from either property south to the stormwater drop inlet.

The power line poles supporting the existing Fulton No. 1 60 kV line are located along Eagle Drive within either sidewalks or planting strips. Water from the planting strips runs into street gutters, which connect to the Town's stormwater system.

10.3.2 Precipitation

The Town has an annual mean precipitation rate of 30 to 40 inches of rain. The summers are dry, with less than half an inch of rain falling per month. The rainy season begins in October, with a monthly mean precipitation rate of 2 to 3 inches. Rains increase in November to a mean precipitation rate of 5 to 10 inches per month and maintain a similar range through March. In April, precipitation begins to slow again to 2 to 3 inches per month. The dry summer season begins in May. The mean maximum daily precipitation in Windsor is 3.5 to 4.0 inches, and can occur in any of the winter months.

10.3.3 Channels, Creeks, and Streams

The proposed substation site is located approximately 0.25 mile north of Pool Creek, a tributary of Windsor Creek. The existing 12 kV distribution line spans Pool Creek on Hembree Lane between Northampton Drive and Victory Lane. Pool Creek drains into the Russian River first via Windsor Creek and then Mark West Creek.

Figure 10-1: Hydrology Figure

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Pool Creek at Hembree Lane was dry during field visits in July 2009. Its channel at the location of the bridge crossing is fairly incised, with a sand/gravel substrate and steep banks stabilized by gravity retaining walls. The vegetation along the banks is a combination of native and nonnative shrubs and annual grasses.

Pool Creek is located within the Pool Creek Planning Watershed, as delineated by the California Department of Forestry and Fire Protection (CDF), CDF Watershed ID Number 1114.230201. The Planning Watershed covers approximately 35 square miles and includes most of the extent of the Town, representing approximately 40% of the total area of the Mark West Hydrologic Sub Area (HSA).

A section of the 12kV distribution line alignment along Mitchell Lane is located less than 5 feet from an intermittent stream that flows south under Mitchell Lane where the line spans it.

10.3.4 Wetlands

No wetlands are located within the proposed substation site. Northwest of the proposed substation site, a 0.27-acre mitigation bank/preserve area allows for potential seasonal ponding. South of the proposed substation site is a 3.9 acre wetland mitigation preserve, which contains nine man-made wetlands, created through grading activities in the fall of 2004. The pools vary in size from approximately 100 square meters to 0.03 acre.

No wetlands lie within the existing 12 kV distribution line alignment; however, the section of the alignment heading north along Conde Lane is located less than 100 feet away from an existing culvert and associated wetland feature on the east side of Conde Lane.

10.3.5 Flood Potential

The proposed substation site has been determined to be outside the 500 year floodplain. The nearest 100-year flood zone, along Pool Creek, is about one quarter mile south-east of the proposed substation site. The existing 12 kV distribution line crosses the 100-year flood zone at Pool Creek.

The Town is within the dam failure inundation hazard area of the Warm Springs Dam, which is located 17 miles to the northwest of the Town. In the event that the Warm Springs Dam breaks, flood waters would reach the Town within two hours and all areas below 100 feet in elevation would be inundated. The lowest elevation of the overall proposed substation site is 105 feet; therefore, the site will not be inundated in the event that the Warm Springs Dam breaks.

10.3.6 Surface Water Supply and Quality

There are no waterbodies on the proposed substation site. The closest stream, Pool Creek, is located approximately one-third mile to the south of the proposed substation site, and is crossed by the existing 12 kV distribution line along Hembree Lane between Northampton Drive and Victory Lane.

Pool Creek was dry during field visits in July, 2009. The creek is part of the Mark West HSA. The beneficial uses of any specifically identified water body generally apply to all its tributaries; those of the Mark West HSA are listed in Table 1.

Table 10-1: Beneficial Uses of the Mark West Hydrological Subunit (HSA 114.23)

Beneficial Use	Existing (E) or Potential (P) Use
Municipal and Domestic Supply	E
Agricultural Supply	E
Industrial Service Supply	E
Industrial Process Supply	P
Groundwater Recharge	E
Freshwater Replenishment	E
Navigation	E
Hydropower Generation	P
Water Contact Recreation	E
Non-Contact Water Recreation	E
Commercial and Sport Fishing	E
Warm Freshwater Habitat	E
Cold Freshwater Habitat	E
Wildlife Habitat	E
Rare, Threatened, or Endangered Species	E
Migration of Aquatic Organisms	E
Spawning, Reproduction, and/or Early Development	E
Shellfish Harvesting	P
Aquaculture	P

Surface water quality is not monitored at Pool Creek by any group or agency. The nearest surface water quality data is collected on Windsor Creek into which Pool Creek drains. Data collected by the Community Clean Water Institute in October 2006 indicated that Windsor Creek failed to meet conductance and total dissolved oxygen objectives for the Russian River Hydrologic Unit upstream of its confluence with Laguna de Santa Rosa. Subsequent sampling in December 2006 indicated that Windsor Creek met all water quality objectives. It is likely that surface water quality in Pool Creek also varies throughout the year.

10.3.7 Groundwater Supply and Quality

The project is within the Santa Rosa Plain Groundwater Subbasin. The proposed substation site is located upon the Glen Ellen Formation of the subbasin, which consists of partially cemented beds and lenses of poorly sorted gravel, sand, silt, and clay that vary widely in thickness and extent. Groundwater recharge occurs fairly quickly in most areas and in general, the overall quality of groundwater within the subbasin is good.

Although there are no designated groundwater recharge areas in the project vicinity, the Town's groundwater system is recharged through the pervious surfaces throughout the Town, including those on the proposed substation site. The local groundwater system provides much of the supply of domestic and irrigation water for municipal, agricultural, and industrial use as well as other beneficial uses associated with a network of healthy riparian corridors, such as providing wildlife habitat, recreation opportunities, and fish migration corridors.

10.4 IMPACTS

10.4.1 Significance Criteria

Standards of significance were derived from Appendix G of the California Environmental Quality Act (CEQA) Guidelines. Impacts to hydrology and water quality may be considered significant if they were to:

- violates any water quality standards or waste discharge requirements;
- substantially depletes groundwater supplies or interferes substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level;
- substantially alters the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation on- or off-site;
- substantially alters the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increases the rate or amount of surface runoff in a manner that would result in flooding on or off site;
- creates or contributes runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provides substantial additional sources of polluted runoff;
- otherwise substantially degrades water quality;
- places housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map;
- places within a 100-year flood hazard area structures that would impede or redirect flood flows;
- exposes people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam; and/or
- causes inundation by seiche, tsunami, or mudflow.

10.4.2 Construction

This section separately addresses temporary and permanent impacts associated with project construction. The project will not violate any water quality standards or waste discharge requirements, or otherwise substantially degrade water quality.

10.4.2.1 Temporary Impacts

10.4.2.1.1 Groundwater

Because much of the supply of the Town of Windsor's domestic water is provided by the local groundwater system, construction activities will require some use of groundwater. However, only a minimal amount of water will be used during construction, and therefore, the impact to groundwater supply levels will be less than significant.

10.4.2.1.2 Runoff (Alteration of Stormwater Patterns, Increased Runoff and Accelerated Soil Erosion)

Construction activities that expose and relocate soil have the potential to increase sediment and pollutants in stormwater runoff and increase erosion along exposed slopes and open ground. However, with use of the standard construction stormwater APMs and BMPs indicated in Section 10.5, impacts resulting from increased runoff and accelerated soil erosion will be less than significant during construction.

10.4.2.1.3 Wetlands

No wetlands are located on the proposed substation site. Though the site is adjacent to wetland mitigation banks/preserves/areas, any effects to these sites will be avoided through the use of APMs indicated in Section 10.5. The project will cause no impacts to wetlands.

10.4.2.1.4 Flooding and Inundation

No houses or structures will be constructed within the 100-year floodplain. The project is within a dam inundation hazard zone, but above the inundation level. The project is not near any large waterbodies or steep terrain and will not cause any coastal hazards, such as tsunamis, high tides, or future sea-level rise. As a result, there will be no flood-related impacts.

10.4.2.1.5 Hazardous Material Spills

Based on the collective experience of PG&E and their consultants, the type of equipment used onsite along with the development and implementation of BMPs and the SWPPP will ensure that impacts to water quality will be less than significant.

10.4.2.2 Permanent Impacts

10.4.2.2.1 Runoff (Alteration of Stormwater Patterns, Increased Runoff and Accelerated Soil Erosion)

The northern portion of the substation site will be graded during construction, altering existing onsite drainage patterns, so that runoff from the northern portion of the proposed substation pad will flow into the SPCC retention basin and then to the existing stormwater system in the southeastern corner of the property. However, the majority of the substation pad will be covered with pervious gravel and as such the runoff will be minimal due to infiltration. The existing vegetated swale and stormwater drain will be integrated in the project layout to minimize the potential for erosion or enhanced sedimentation. Vegetated buffer strips will be maintained around the perimeter of the proposed substation site, which will additionally slow runoff velocities and allow sediment and other pollutants to settle and provide further infiltration into underlying soils.

As a result of these design elements which utilize the existing storm drain patterns and facilities, there will be no permanent construction impacts to existing stormwater patterns, runoff, and erosion from construction of the proposed substation.

Interconnecting the Fulton No. 1 60 kV line into the proposed substation and reconductoring of the existing 12 kV distribution line will have no affect on stormwater patterns. There will be minimal soil disturbance for the interconnecting and reconductoring work. The appropriate APMs in Section 10.5 will be used as necessary to prevent soil erosion. Impacts resulting from soil erosion will be less than significant for the interconnecting and reconductoring of the lines.

10.4.3 Operations and Maintenance

10.4.3.1 Hazardous Materials Spills

The SPCC plan prepared in conjunction with detailed site planning will include engineered methods for containing and controlling a release from oil-filled electric equipment present at the proposed substation site, including a water-collection system and retention basin equipped with an oil/water separator. If oil is present in the basin, a vacuum truck will be used to remove the oil for offsite disposal at a permitted facility. This collection and retention system will also regulate the release of stormwater runoff from the northern portion of the proposed substation site (containing the transformers) and serve as a settling basin to reduce turbidity and sedimentation. Releases from this basin into the existing storm drain system will only be made when it is apparent no oil or sedimentation will be released with the discharge.

For the proposed substation area outside the perimeter fence/wall, vegetation management can increase the amount of dissolved and particulate pollutants from fertilizer and pesticides in runoff. However, the landscaping will be designed to minimize the use of fertilizers and pesticides by selecting native plant materials appropriate to the site, soil, and climate.

During operations and maintenance activities, there is potential for hazardous materials to be released from vehicles or work equipment, such as gasoline or diesel fuel, and from solvent containers, such as cleaning chemicals. PG&E has Standard Operating Procedures that 1) require

maintenance vehicles to carry emergency spill kits to contain and control minor spills, and 2) outline reporting procedures in case of accidental spill. The existing 12 kV distribution line will not be operated or maintained any differently than it is currently being operated or maintained. PG&E will remain in compliance with state and federal laws and will implement appropriate APMs as stated in Section 10.5. The release of hazardous materials due to operation and maintenance activities will result in a less-than-significant impact.

10.4.3.2 Groundwater

The Town's groundwater basin is recharged through pervious surfaces throughout the Town, including those of the proposed substation site. Because of the necessity to support substation infrastructure, some increase in impervious surfaces on the site is unavoidable. However, the majority of the proposed substation pad will be covered with pervious gravel and the net decrease in the amount of groundwater recharged to the basin will be negligible. Therefore, impacts to the groundwater supply levels as a result of an increase in impervious surfaces will be less than significant.

Landscaping surrounding the proposed substation site will be irrigated using recycled water supplies provided by the Town from its existing system specifically for that purpose. The meter and valve set for this system is currently located along the Mitchell Lane property frontage. There will be no impacts to groundwater supply levels as result of the landscaping.

The interconnecting of the Fulton No. 1 60 kV line into the proposed substation and reconductoring of the existing 12 kV distribution line will have no affect on groundwater.

10.4.3.3 Flooding

The project will not expose structures or land to inundation by a wave that oscillates in lakes, bays, or estuaries (seiche); tsunami; or mudflow. Likewise, no houses will be constructed within a 100-year floodplain. Therefore, there will be no impacts.

10.5 AVOIDANCE AND PROTECTION MEASURES

The project will not result in any impacts requiring mitigation other than those addressed by existing regulatory programs or PG&E standard BMPs. Nevertheless, PG&E will implement the following BMPS and avoidance and protection measures during construction and operation of the project.

10.5.1 Construction

PG&E will file a Notice of Intent for coverage at the Risk Level 1 under the NPDES Construction Storm Water program administered by the Regional Water Quality Control Board. The following measures are generally drawn from that program and PG&E standard practices, and will be included in the Storm Water Pollution Prevention Plan prepared for the construction of the project.

- All BMPs will be on-site and ready for installation before the start of construction activities.
- PG&E will develop a SWPPP (as outlined in General Permit 2009-0009-DWQ) that will describe BMPs to prevent the acceleration of natural erosion and sedimentation rates. The SWPPP will include a written site-specific Construction Site Monitoring Program (CSMP). A monitoring program will be established to ensure that the prescribed APMs are followed throughout project construction. BMPs will include:
 - silt fences or other sediment containment methods placed around and/or down slope of disturbed areas prior to construction;
 - protection of drain inlets from receiving polluted stormwater through the use of filters, such as fabrics, gravel bags, or straw wattles;
 - installation of additional silt fencing prior to construction along the northwest and south edges of the proposed substation site to address unforeseen runoff from the property into the nearby existing mitigation bank/preserve and mitigation area;
 - use of brooms and shovels when possible to maintain a clean site as opposed to water;
 - construction of a stabilized construction entrance/exit to prevent tracking onto roadway;
 - establishment of a vehicle storage, maintenance, and refueling area, if needed, to minimize the spread of oil, gas, and engine fluids. Use of oil pans under stationary vehicles is strongly recommended; and
 - no overnight parking of mobile equipment within 100 feet of wetlands, culverts, or creeks. Stationary equipment (e.g., pumps, generators) used or stored within 100 feet of wetlands, culverts, or creeks will be positioned over secondary containment.
- A worker-education program will be established for all field personnel prior to initiating fieldwork, to provide training in the appropriate application and construction of erosion and sediment control measures. This education program will also discuss appropriate hazardous materials management and spill response.
- All BMPs will be inspected on a weekly basis, and at least once every 24-hour period during extended storm events. BMPs will be inspected as described in the SWPPP, maintained on a regular basis, and replaced as necessary through the course of construction. For each inspection required, an inspection checklist will be completed using a form as described in Attachment C of General Permit 2009-0009-DWQ. This checklist will remain onsite with the SWPPP.

- A Qualified SWPPP Practitioner will supervise placement of silt fencing at the boundary between the work area and wetland mitigation site to limit the area of disturbance during construction of the proposed substation. The silt fence will be monitored regularly to ensure effectiveness.

10.5.2 Operation and Maintenance

- Standard Urban Stormwater Mitigation Plan (SUSMP) features, e.g. vegetated bioswales and vegetated buffer strips, will be maintained around the perimeter of the proposed substation pad.
- The SPCC plan and design that will be developed and implemented during the construction phase will also cover substation operations and maintenance activities as described above.

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