

## **2.0 SITE 8 PROJECT DESCRIPTION**

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### **2.1 SITE ALTERNATIVE OVERVIEW**

A substation at Site 8 would require the same substation equipment and layout as detailed in the PEA; however, the associated power line and distribution work would be more substantial and would include:

- replacing an existing wood pole on the Fulton No. 1 60 kV (eventually 115 kV) Power Line with a new, tubular-steel pole (TSP) located across the railroad tracks west (along the back side) of Site 8. From the new pole, an approximate 270-foot, 60 kV power line loop would be built between the new substation and the Fulton No. 1 Power Line;
- installing approximately 700 feet (0.10 mile) of underground distribution line, of which 350 feet would extend west from the substation to the Fulton No. 1 60 kV Power Line and 350 feet would extend east from the substation to Old Redwood Highway;
- rebuilding approximately 7,900 feet (1.50 miles) of the existing Fulton No. 1 60 kV Power Line between Site 8 and Windsor River Road to hold a new, double-circuit 12 kV distribution line underneath the higher-voltage wires. This new distribution “underbuild” would require replacing 34 existing wood poles with new, taller wood poles to accommodate the required minimum spacing between the co-located distribution and transmission conductors; and
- replacing conductors (reconductoring) on approximately 9,420 feet (1.80 miles) of existing overhead and underground single-circuit distribution line with 12 kV double-circuit conductor along Old Redwood Highway between Site 8 and Windsor River Road (involves replacing 43 existing wood poles with new, taller wood poles and adding one riser pole where the existing distribution line is currently underground).

Operations and maintenance of the facilities at Site 8 would be the same as for the proposed project (see Section 1.8 of the PEA).

### **2.2 SITE LOCATION**

Site 8 is in the Town of Windsor, west of Highway 101 at the intersection of Herb Road (which is a single-lane gravel private road at this location) and Old Redwood Highway, at 10789 Old Redwood Highway (see Figure 2.2-1). The site is bounded by Herb Road on the northwest side, Old Redwood Highway on the northeast side, rural residential on the north, a school bus yard on the southeast side, and the Northwestern Pacific Railroad (NWPRR) and more rural residential to the west. For ease of reference, descriptions in the remainder of this document are based on Herb Road being defined as north of the site, Old Redwood Highway as east of the site, and the school bus yard as south of the site; representations of Site 8 in the figures are not altered and remain depicted using true north. The 4.11-acre, privately-owned parcel, of which 3.83 acres is currently fenced, is flat land and contains some large concrete foundations (remnants from previous buildings), gravel, annual grasses, and weeds. The site is zoned Service Commercial. The school

bus yard to the south is zoned Public Institutional, lands to the west are zoned Estate Residential, and lands to the east on the far side of Old Redwood Highway are zoned Gateway Commercial and contain one residence. Lands to the north and west of Herb Road are outside of the Town of Windsor jurisdiction, in unincorporated Sonoma County; the adjacent parcels to the north and west are residential, each containing two single-family dwelling units. Figure 2.2-1 depicts current land uses and the boundaries of the 4.4-acre parcel.

## **2.2.1 Substation**

A proposed substation at Site 8 would contain the same major equipment as described in Section 1.5.1 of the PEA. Site 8 is approximately 4.4 acres in size; however, like the proposed project, the permanent footprint of the substation (walled and fenced areas) would measure approximately 268 feet by 220 feet, as described in Section 1.5.1 of the PEA.

The following differences apply to the substation facilities at Site 8:

- An 8-foot-tall wall would border the eastern side of the substation along Old Redwood Highway and the northern side facing Herb Road. The remaining sides would be enclosed by a chain-linked mesh fabric fence for security. Double swing entry and exit gates on the east side of the substation would be designed to blend with the bordering wall. As is proposed in the Section 1.5.1 of the PEA, an earth-tone colored, prefabricated wall design and landscaping plan would be prepared in coordination with the Town of Windsor.
- Construction power to Site 8 would be provided from an existing adjacent distribution line on Old Redwood Highway. A temporary overhead construction service tap and meter set would be installed just inside the substation property.
- Construction of a substation at Site 8 would likely necessitate parcel frontage improvements along Old Redwood Highway, including gutter, curb, and sidewalk in a road-widening dedication.
- The site contains the remnant walls of a concrete block building and extensive concrete pads from previous business operations. All of these materials would need to be removed from the site. While most of the material can be recycled, material that cannot be would be disposed of as construction waste at a permitted landfill.

## **2.2.2 Power Line Interconnection and Distribution Lines**

### ***2.2.2.1 Power Lines***

The project at Site 8 would include looping the existing Fulton No. 1 60 kV circuit into and out of the back side of the substation. PG&E would replace an existing wood pole located on the Fulton No. 1 60 kV Power Line, across the railroad tracks approximately 270 feet west of the substation property, with a new 75-foot-tall TSP to support a short power line loop extending to the dead-end structures in the substation.



**Figure 2.2-1**  
**Site 8**  
*Windsor Substation Project*



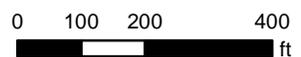
-  Proposed 115 kV Loop  
(Initially 60 kV Loop)
-  Site 8
-  Fulton No. 1 60 kV

Preliminary and subject to change based on California Public Utilities Commission requirements, final engineering, and other factors.

photo: April 2009

1:3,600

1 inch = 300 feet



**BACK OF FIGURE 2.2-1**

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### **2.2.2.2 Distribution Lines**

Table 2.1-1 summarizes the length of the initial two 12 kV distribution circuits (i.e., Circuits 1 and 2) and the future distribution circuits associated with Site 8. Circuit 1 would extend underground west from the substation across the substation parcel, cross under the railroad tracks using the jack-and-bore construction technique, and rise up on a newly-replaced overhead power line pole located on the Fulton No. 1 60 kV Power Line on the west side of the railroad tracks. Circuit 1 would continue south on approximately 34 replaced poles on the Fulton No. 1 60 kV Power Line and then tie into the existing distribution line along Windsor River Road. Circuit 2 would extend underground east from the substation, continue across the substation parcel, and rise up on an overhead pole along Old Redwood Highway. The overhead line would continue south along replaced poles on the west side of Old Redwood Highway, crossing to the east side of Old Redwood Highway just north of Starr Road and back to the west side of Old Redwood Highway just south of Arata Lane. Intermittently, Circuit 2 would be undergrounded along Old Redwood Highway where the existing undergrounding already takes place at the following locations: approximately 320 feet at Rio Ruso, 270 feet at Dawn Way, and approximately 480 feet at Godfrey Drive. Circuit 2 would continue overhead along replaced poles until it reached a new riser pole to be installed near the intersection of Joe Redota Drive and Old Redwood Highway. Circuit 2 would then continue 1,500 feet underground and tie into the existing main feeder line at Windsor River Road. A total of approximately 43 existing distribution poles would be replaced with taller poles along the route.

At the present rate of growth in electric demand, the remaining 10 distribution circuits would be installed roughly two circuits every other year. However, to minimize future disruption to the mature substation landscaping, partial extension of all 10 future distribution-circuit conduits would be installed as part of the initial development. Five future circuit conduits would extend west from within the substation footprint, parallel to the initial Circuit 1 (two conduits within the same trench and three conduits within a separate trench, offset approximately 6 feet), to the Fulton No. 1 60 kV Power Line, where they would be stubbed and capped within PG&E's existing easement. Five future circuit conduits would extend east, parallel to the initial Circuit 2 (two future circuits within the same trench as Circuit 2, and three future circuits within a separate trench, offset approximately 6 feet). Circuits heading east would be stubbed and capped in a vault located within the newly dedicated PUE. See Table 2.2-1 for the length of the distribution circuits.

Depending on the direction of future load growth, future Circuits 3 through 12 would be installed and directed along other streets as needed, and may require additional splice boxes for cable pulling and connections at street crossings. Once the two-circuit maximum on pole lines has been met, remaining circuits would likely be installed underground by open trench construction alongside existing overhead lines, as necessary.

**Table 2.2-1: Distribution Circuits at Site 8**

Circuit	Approximate Lengths and Locations of Circuit Installation		
	Underground	Overhead	Total Length
1 and Future 3 and 4	350 feet - Circuit 1 and conduits for future Circuits 3 and 4 would extend west across the substation parcel and under the railroad tracks to the Fulton No. 1 60 kV Power Line. Conduits for future Circuits 3 and 4 would be stubbed and capped at the Fulton No. 1 60 kV Power Line easement for future use.	7,900 feet - Circuit 1 would extend south along existing Fulton No. 1 60 kV Power Line until reaching Windsor River Road.	8,520 feet
2 and Future 8 and 9	2,920 feet - Circuit 2 and conduits for future Circuits 8 and 9 would extend 350 feet east across the substation parcel to Old Redwood Highway; Circuit 2 would also require three bores [approximately 320 feet, 270 feet, and 480 feet] along Old Redwood Highway at Rio Ruso Drive, Dawn Way, and Godfrey Street. Circuit 2 would also be undergrounded 1,500 feet from Joe Redota Drive until Windsor River Road, where existing conductor is currently underground. Conduits for future Circuits 8 and 9 would be stubbed and capped at Old Redwood Highway.	6,850 feet - Circuit 2 would extend south on portions of the west and east side of Old Redwood Highway until reaching Windsor River Road.	9,770 feet
Future 5, 6, and 7	350 feet - Conduits would extend west across the substation parcel, and under the railroad tracks and would be stubbed and capped at the Fulton No. 1 60 kV Power Line easement for future use.	0	350 feet
Future 10, 11, and 12	350 feet - Conduits would extend east across the substation parcel and would be stubbed and capped at Old Redwood Highway for future use.	0	350 feet

### 2.2.3 Access and Laydown Areas

During construction, access to the substation site and the power and distribution lines would be via Highway 101, Old Redwood Highway, Starr Road, Gumview Road, Herb Road (public section), and other minor side streets for short-term access to individual pole locations. Access to the substation site parcel would be directly off Old Redwood Highway, via a new curb cut and driveway installed as part of the road frontage improvements. The entire 4.4-acre site would be used during construction for parking and lay down, and staging for construction materials and equipment; no additional lay down areas would be required. Access to conduct construction activities at individual pole locations along the Fulton No. 1 60 kV Power Line may require the installation of a new temporary access road through site alternative 6 from Herb Road and parallel to the existing transmission pole line route.

## 2.3 GENERAL CONSTRUCTION METHODS AT SITE 8

### 2.3.1 Typical Construction Equipment

Typical equipment and machinery that would be used during construction of the substation, access road, power line loop, and distribution lines at Site 8 would be the same as discussed in Section 1.6.1 of the PEA, with the exception of some additional equipment needed for demolition of the existing building foundations at Site 8. Also, equipment associated with distribution line installation (overhead and underground) would be used for a greater length of time due to the additional length of distribution work.

Table 2.3-1 illustrates the breakdown of typical duration of use during construction activities, including days per week of operation, hours per day of operation, and the total duration of use (in weeks)<sup>3</sup>.

**Table 2.3-1: Site 8 - Typical Construction Equipment**

Equipment	Use	Number of Vehicles	Days per Week of Operation	Hours per Day of Operation	Duration of Use (weeks)
<b><i>Substation Construction (additional equipment)</i></b>					
Excavator with breaker	Demolition of existing structure and foundations	1	5	10	4
Sheep's foot roller	Demolition of existing structure and foundations	1	5	10	4
Crew truck-cab truck (3/4	Transport construction	1	5	10	4

<sup>3</sup> Typical durations of usage are conservative estimates and have been overstated to account for worse-case-scenarios when included as part of air emissions estimates. Actual equipment usage may be less than the durations specified in Table 2.3-1.

<b>Equipment</b>	<b>Use</b>	<b>Number of Vehicles</b>	<b>Days per Week of Operation</b>	<b>Hours per Day of Operation</b>	<b>Duration of Use (weeks)</b>
to one ton)	personnel				
Dump truck	Removal of existing structure and foundations	1	5	10	4
Loader	Demolition of existing structure and foundations	1	5	10	4
<b><i>Distribution Line Installation (Overhead)</i></b>					
3/4-ton pickup trucks	Transport construction personnel	3	5	8	22
Crew-cab trucks (3/4 to 1 ton)	Transport construction personnel	3	5	8	22
Line truck	Drill hole and install poles	3	5	8	22
Puller rig	Pull conductor wire	1	5	8	13
Bucket truck	String conductor wire	5	5	8	13
Splicing van	Make splices in conductor	5	5	8	17
Crane truck	Pole and Conductor Delivery	6	5	8	14
Water truck	Water Site	1	5	8	22
<b><i>Distribution Line Installation (Underground)</i></b>					
3/4-ton pickup trucks	Transport construction personnel	1	4	3	20
Crawler backhoe	Excavate trench	1	4	8	20
Dump trucks	Haul trench spoils from site and deliver clean backfill	1	4	5	20
HDD rig	Directional drilling	1	4	8	17
Bore rig	For jack and bore under railroad tracks	1	4	8	17
Excavator	For large-volume excavations	1	4	8	17
Crew truck	Tools and equipment	1	4	2	20
Water truck	Water site	1	4	8	20

### **2.3.2 General Construction Sequence**

Construction activities would generally occur in the same order as discussed in Section 1.6.2 of the PEA and there would be no difference with respect to cleanup activities (Section 1.6.7 of the PEA).

### **2.3.3 Substation Construction**

Substation construction would be similar to what is described in Section 1.6.3 of the PEA. The following differences apply to substation construction at Site 8:

- Site 8 preparation would begin with removal of existing concrete foundations, remnants from previous buildings, and gravel; clearing of vegetation (re-established plants and grasses); and grading of the substation pad.
- Site 8 is located outside the Town of Windsor's recycled water service area; therefore, potable water supplied by the Town of Windsor from an existing potable water valve box located along Old Redwood Highway at the eastern front of the substation would be used for landscape irrigation. Water used for construction purposes, such as dust control, would come from the same water valve box.

### **2.3.4 Power Line Interconnection Construction**

Construction techniques associated with power line interconnection at Site 8, including pole installation and replacement, would be similar to what is described in Section 1.6.4 of the PEA. The wood pole that would be replaced on the Fulton No. 1 60 kV Power Line is located on the opposite side of the railroad tracks, west of the substation site. To interconnect the substation at Site 8, the existing pole would be removed and replaced with a TSP with a diameter of approximately 30 inches at ground level that tapers slightly toward the top, on a concrete foundation with a diameter of approximately 5.5 feet at ground level. The TSP would be a maximum of approximately 75 feet high and would have two cross arms on each side that extend 4-feet (laterally) on each side of the pole. The foundation hole would be approximately 20 feet deep, depending on soil characteristics.

### **2.3.5 Distribution Line Installation**

Increased capacity provided by the substation at Site 8 would require:

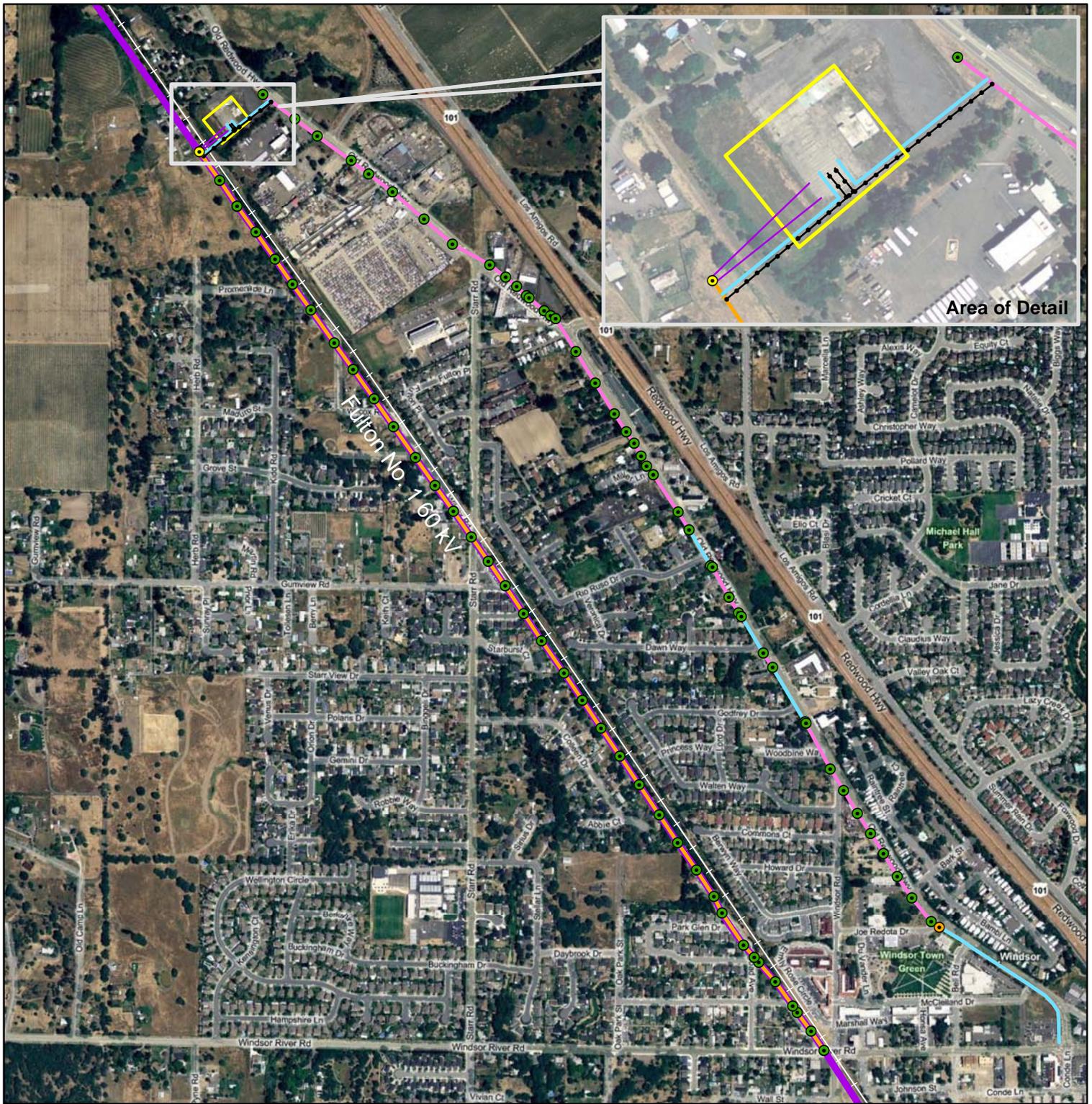
- replacing approximately 43 distribution poles and approximately 9,600 feet (1.82 miles) of conductor along Old Redwood Highway, of which approximately 1,070 feet (0.20 mile) would be bored underground and approximately 8,530 feet (1.62 miles) would be overhead, and installing new riser poles as needed where the existing distribution line is underground;
- rebuilding the existing Fulton No. 1 60 kV Power Line to support approximately 8,600 feet (1.63 miles) of new, double-circuit 12 kV distribution conductor on taller wood poles; and

- installing approximately 700 feet (0.13 mile) of underground 12 kV double-circuit distribution conductor (350 feet west from the substation to the Fulton No. 1 60 kV Power Line and 350 feet east from the substation site to Old Redwood Highway) (see Figure 2.3-1).

### ***2.3.5.1 Reconductoring of Distribution Line and Power Line Underbuild***

Reconductoring and the associated pole replacement and installation would be similar to what is described in Sections 1.6.5.1 and 1.6.5.2 of the PEA. The following differences apply to distribution and power line work associated with a substation at Site 8:

- Installing new distribution lines along the Fulton No. 1 60 kV Power Line and Old Redwood Highway would require replacing existing wood poles with new wood poles that are approximately 20 feet taller.
- Overhead distribution line reconductoring along Old Redwood Highway would require replacing the existing conductor with a heavier-duty 1,100 thousand circular mils (KCmil) aluminum conductor that would increase the capacity of the line (aluminum conductor steel-reinforced line would be replaced with all aluminum).
- Replacement wood poles along the Fulton No 1 60 kV Power Line and Old Redwood Highway would have two cross arms on each side that extend 4 feet (laterally) on either side of the pole, each containing three insulators and conductors; cross arms would be separated by a minimum of 10 feet (vertically).
- Pole replacement would require an approximately 75-foot radius of temporary impact around the TSP, 50-foot radius of temporary impact around wood poles, and 10-foot-wide corridor between poles.
- Distances between wood poles (spans) along the Fulton No 1 60 kV Power Line and Old Redwood Highway would be similar to the existing lengths, approximately 200 to 300 feet.
- The existing wood poles along Old Redwood Highway support AT&T™ telephone lines and CATV. Co-located utility lines would be detached from the existing wood poles and re-attached to the new replacement poles.
- Several pull and tension locations along Old Redwood Highway and the Fulton No. 1 60 kV Power Line would be necessary for the reconductoring operation; pull and tension sites would be located at dead-end or angle-pole locations within the street whenever possible, and would be approximately 50 feet long by 100 feet wide.



**FIGURE 2.3-1**  
 Associated Reconductoring - Site 8  
*Windsor Substation Project*

1:12,000  
 1 inch = 1,000 feet  
 0 250 500 1,000  
 ft



Preliminary and subject to change based on California Public Utilities Commission requirements, final engineering, and other factors.

- Wood-to-Wood Pole Replacement
- Wood-to-Steel Pole Replacement
- New Riser Pole
- Future Underground Distribution Line Conduits
- Overhead Double Circuit 12 kV Distribution Line Underbuild of Existing Fulton No. 160 kV Power Line
- Overhead Double Circuit Reconductoring of Existing 12 kV Distribution Line
- Underground Double Circuit Reconductoring of Existing 12 kV Distribution Line
- Proposed 115 kV Loop (Initially 60 kV Loop)
- Fulton No. 160 kV
- Site 8

**BACK OF FIGURE 2.3-1**

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### **2.3.5.2 Underground Installation**

Underground Installation would be similar to what is described in Section 1.6.5.3 of the PEA. The following differences apply to underground installation at Site 8:

- The 1,500-foot underground segment to be reconductored along Old Redwood Highway from Joe Redota Road to Windsor River Road would be replaced in an existing 6-inch duct located within a PUE.
- PG&E would coordinate with the Town of Windsor regarding construction techniques via the encroachment permit process; however, PG&E anticipates the following methods would be used for the underground installation:
  - The 700-foot segment (350 feet heading west, and 350 feet heading east) of undergrounded conductor extending across the substation parcel between the Fulton No. 1 60 kV Power Line and Old Redwood Highway would be completed using open trenching. Jack-and-bore techniques would be employed for crossing under the NWPRR tracks.
  - The 350-foot segment of the new underground distribution line extending west from the substation (Circuit 1, future Circuit 3 and 4) and the parallel 350-foot segment also extending west (future Circuit 5, 6, and 7) would be completed using open trenching within the substation parcel, resulting in excavation of approximately 84 cubic yards per segment. The 350-foot underground segment (Circuit 2 and future Circuits 8 and 9), and 350-foot segment (future Circuits 10, 11, and 12) would extend east across the substation parcel and would be installed using open trenching, resulting in the excavation of approximately 84 cubic yards per segment.
  - Three underground segments that would extend south on Old Redwood Highway at Rio Ruso Drive, Dawn Way, and Godfrey Drive would be installed using horizontal directional bores measuring 320 feet, 270 feet, and 480 feet, respectively. Approximately 77 cubic yards, 65 cubic yards, and 115 cubic yards of material would be generated from the bores, respectively.
- Underground vaults, approximately 4.5 feet long by 8.5 feet wide by 6 feet deep, would be installed at each of the bore locations along Old Redwood Highway, unless existing vaults could be used. Each vault installation would require the excavation of approximately 9 cubic yards of soil.

### **2.3.6 Vegetation Clearance**

Vegetation clearance would be similar to what is described in Section 1.6.6 of the PEA. The following difference applies to vegetation clearance at Site 8:

- While tree trimming would be avoided when feasible within the substation property and along the existing transmission and distribution alignments, approximately one tree must be removed within the substation boundary, and approximately two or three trees located outside of the substation boundary may need trimming depending on the heights of the

interconnection line coming into the substation. Although PG&E's project is not subject to local tree ordinance requirements, PG&E would nevertheless coordinate with the Town of Windsor regarding any protected trees that must be removed and replace such trees consistent with the Town of Windsor Ordinance for Tree Mitigation as discussed in Section 1.6.6 of the PEA.

### **2.3.7 Construction Workforce**

The size and composition of the workforce would be similar to what is described in Section 1.6.8 of the PEA, with the exception of the distribution line work, which would require a maximum workforce of approximately 16 workers over approximately four to five months.

## **2.4 CONSTRUCTION SCHEDULE**

Due to the Town's request to explore other site options, the project schedule has been delayed by several months. Construction is now targeted to begin in September 2012 to meet an in-service date of May 2013.

## **2.5 RIGHT-OF-WAY ACQUISITION**

PG&E would purchase the proposed substation site from its current landowner and acquire a new easement at the west side of the substation site for the power line interconnection across the railroad property to connect with PG&E's existing easement on the Fulton No. 1 60 kV Power Line. Construction work along Old Redwood Highway would take place in the street and public utility easement. PG&E would obtain ministerial encroachment permits to conduct work in public rights-of-way in accordance with the Town of Windsor requirements.

Land entitlement issues are not part of this regulatory proceeding, in which the California Public Utilities Commission is considering whether to grant or deny PG&E's application for a Permit to Construct. Rather, any land rights issues would be resolved in subsequent negotiations and/or condemnation proceedings in the proper jurisdiction, following the decision by the Commission on PG&E's application (for example, see Jefferson-Martin 230 kV Transmission Project, A.02-04-043, D.04-08-046, p. 85).

## **2.6 AVOIDANCE AND PROTECTION MEASURES**

The project would incorporate Avoidance and Protection Measures (APMs) discussed in Section 1.10 of the PEA to ensure there are no significant impacts associated with the project (see Attachment A, Table A-1). In addition, the measures included in Attachment A, Table A-2 would be integrated.