

## DOCKETED

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<b>Project Title:</b>	Sutter Power Plant Application for Certification
<b>TN #:</b>	200833
<b>Document Title:</b>	SEC Response to Formal DR 1-6
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<b>Organization:</b>	CH2M HILL
<b>Submitter Role:</b>	Applicant Consultant
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October 11, 2013

Ms. Beverly Bastian  
California Energy Commission  
1516 Ninth Street  
Sacramento, CA 95814

**Subject: Sutter Energy Center (97-AFC-2C), Data Requests 1 through 6**

Dear Ms. Bastian:

Attached please find Calpine Construction Finance Company, L.P. (Calpine) Responses to CEC Staff Data Requests 1 through 6 in the areas of Transmission and Air Quality for the Sutter Energy Center (97-AFC-2C).

Please do not hesitate to contact Doug Davy at (916) 286-0278 or me at (916)286-0249 if you have any questions regarding the information we have submitted.

Sincerely,

CH2M HILL

A handwritten signature in blue ink, appearing to read "Doug Davy".

Douglas M. Davy, Ph.D.  
Program Manager

Attachment

cc: M. Weinberg, Calpine  
B. McBride, Calpine

# Sutter Energy Center

## Petition to Amend #6

### Response to Formal Data Requests 1–6

Submitted to  
California Energy Commission

Submitted by  
Calpine Construction Finance Company, L.P.

Prepared by:

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2485 Natomas Park Drive  
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October 2013

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# Introduction

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Attached are Calpine Construction Finance Company, L.P. (CCFC or the Applicant) responses to the California Energy Commission (CEC) Data Requests 1 through 6 regarding the Sutter Energy Center (SEC) (97-AFC-2C) Petition to Amend (PTA) #6. The Applicant received the data requests via email on July 24, 2013. The responses are grouped by individual discipline or topic area. Within each discipline area, the responses are presented in the same order as the CEC presented them and are keyed to the Data Request numbers (1 through 6).

New or revised graphics or tables are numbered in reference to the Formal Data Request number. For example, the first table used in response to Data Request 2 would be numbered Table DR2-1. The first figure used in response to Data Request 42 would be Figure DR42-1, and so on. Figures or tables from the SEC PTA that have been revised have "R1" following the original number, indicating revision 1.

Additional tables, figures, or documents submitted in response to a data request (for example, supporting data, stand-alone documents such as plans, folding graphics, etc.) are found at the end of each discipline-specific section and are not sequentially page-numbered consistently with the remainder of the document, though they may have their own internal page numbering system.

# Transmission System Engineering (1–5)

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## Background

On March 22, 2013, Calpine Construction Finance Company, L.P. (CCFC), filed with the Energy Commission this document: “Petition to Amend the License for the Sutter Energy Center, Yuba City, California” (Petition to Amend), requesting to change the Point of Interconnection (POI) of the Sutter Energy Center (SEC) from the existing Western Area Power Association grid to the California ISO grid at the PG&E Table Mountain-Tesla 500-kV line through a new PG&E 500/230-kV substation.

Staff has reviewed the SEC owner’s petition, but did not find a complete description of the transmission interconnection facilities, including the project switchyard, the generation tie line, and the interconnection to the existing transmission grid. Staff needs a complete description of these proposed facilities to analyze how the proposed modifications would affect the SEC’s continuing compliance with applicable laws, ordinances, regulations, and standards (LORS).

To obtain the information needed to complete its analysis of the changes proposed for the SEC by the CCFC, staff submits the following Data Requests regarding the new interconnection facilities.

1. *Please provide a one-line electrical diagram of the proposed 500/230-kV substation to be constructed by PG&E adjacent to the existing PG&E Table Mountain-Tesla 500-kV overhead (OH) to connect to the new 500/230-kV transformer bank to be constructed by the applicant. The one-line diagram should show transmission outlets for connections to the 500-kV line and to the new 230-kV underground (UG) cable generator (gen-tie) line, along with the configuration of high- and low-side buses, breakers, and disconnect switches, and their respective sizes and/or ratings. Provide also the ratings of the 500/230-kV transformer bank in the diagram.*

**Response:** As design has not yet begun by PG&E on the substation, a conceptual one-line diagram for a sample 500 kV switching station has been provided as Figure DR1-1.

2. *Please provide a physical layout drawing of the proposed PG&E 500/230-kV substation showing the fence lines, all major equipment, and the transmission outlets to the PG&E Table Mountain-Tesla 500-kV OH line, along with their respective routes and lengths and the locations of the additional structures between the substation and the Table Mountain-Tesla 500-kV line. Should the proposed 230-kV UG cable gen-tie line be terminated on a steel pole/structure at the 500/230-kV substation, please also submit the design drawing of the cable termination pole/structure.*

**Response:** As design has not yet begun by PG&E on the substation, a conceptual physical layout drawing of the substation is not yet available. Figure DR2-1 illustrates the 230-kV underground cable gen-tie line termination pole/structures that the project owner will construct adjacent to the 500 kV substation. Figure DR2-2 shows the cable termination structures on the SEC switchyard end.

3. *Please provide a discussion and drawing of the physical layout showing distinctly (in a larger scale) the preferred and alternate routes (along any road or land) of the proposed approximately 1.71-mile-long, 230-kV UG cable gen-tie line, including Right of Way (ROW) width(s) between the existing SEC 230-kV switchyard and the new PG&E 500 kV/230-kV substation. Describe whether the ROW would go through any private or public lands.*

**Response:** Figures DR3-1a-d identify the preferred route of the proposed 1.71 mile-long 230 kV underground cable gen-tie line, including right-of-way widths between the existing SEC 230 kV switchyard and the new PG&E 500 kV substation. No alternate routes are anticipated at this time. Land to the north and south of the underground gen-tie line is privately owned. There are public lands belonging to the US Fish and Wildlife Service to the east of the new PG&E 500/230 kV substation, but the underground gen-tie line would not cross them.

4. *Please provide the conductor size and type of the 230-kV cable gen-tie line. Also provide a design drawing of the 230-kV UG cable Duct Bank construction, showing the depth and width below the ground surface, the layout plan of concrete-embedded PVC conduits, and their spacing for drawing power, communication, and grounding cables. Also submit the drawing for the cable termination pole/structure at the SEC 230-kV switching station.*

**Response:** The 230 kV cable gen tie line is anticipated to use 2000 KCMIL XLPE conductors. Figure DR4-1 provides the anticipated duct bank construction parameters. Figure DR2-2 shows the 230 kV underground cable gen-tie line termination pole/structures.

5. *Please submit a post-project, one-line electrical diagram of the SEC 230-kV switchyard (for net 600-MW maximum generation output to the ISO grid), showing the generator step-up transformers and the configuration of switchyard 230-kV buses, breakers, and disconnect switches on the 230-kV side, with their respective sizes and/or ratings, and the proposed UG gen-tie line transmission outlet. Also provide a post-project physical layout diagram of the SEC 230-kV switchyard, showing the fence line, all major equipment, and the proposed UG gen-tie line outlet*

**Response:** Equipment within the existing SEC 230 kV switchyard will not change due to the proposed changes, with the exception that the switchyard will tie into the new 230 kV underground gen-tie line instead of the current aboveground line. Both the underground gen-tie line and the aboveground line exit the plant on the southwest corner. A one-line diagram identifying this change is provided as Figure DR5-1. Figure DR5-2 provides an aerial view of the existing switchyard, fenceline of the switchyard and the location of the proposed underground gen-tie line outlet.





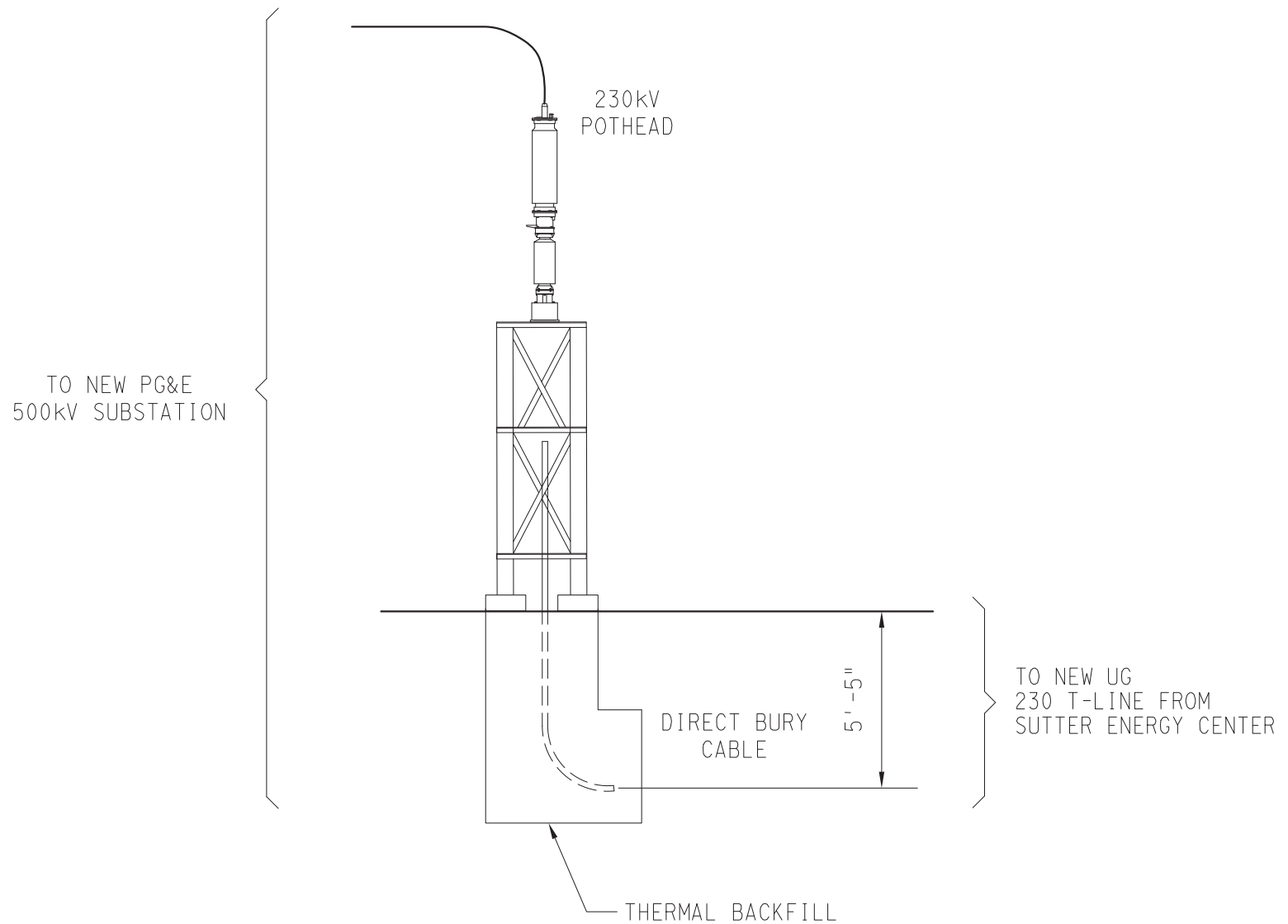
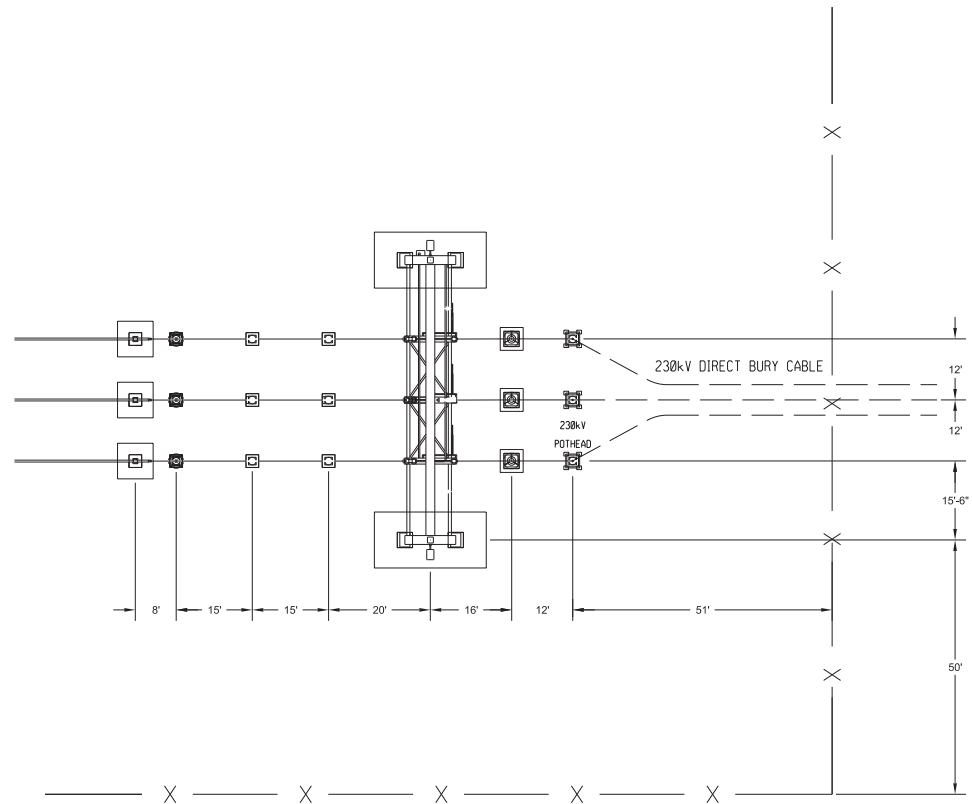


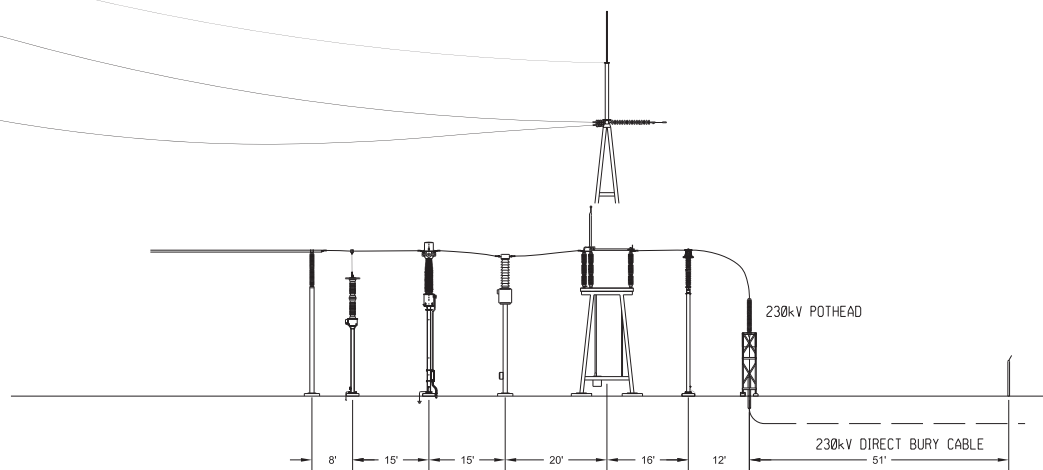
FIGURE DR2-1  
**500 kV Substation End of Proposed  
 230 kV Underground Transmission Line**  
*Sutter Energy Center*

Source: WorleyParsons, 9/18/2013.



NOTE:

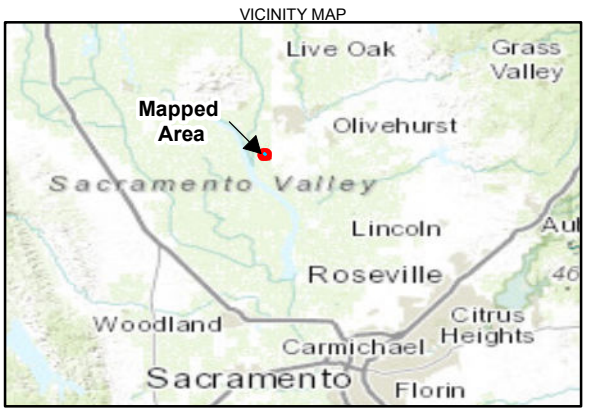
1. THIS DRAWING IS CONCEPTUAL AND IS NOT INTENDED FOR DETAIL DESIGN.



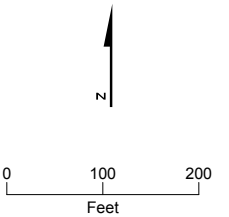
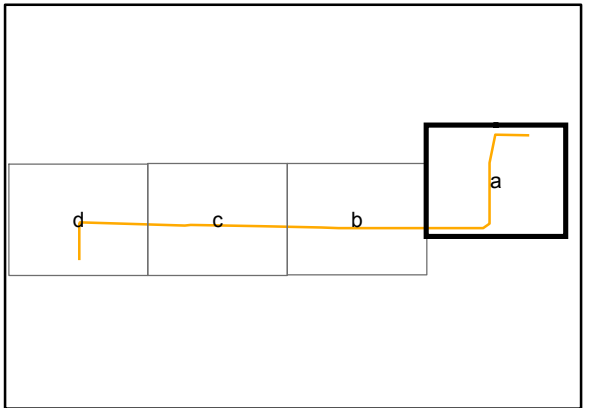
**FIGURE DR2-2**  
**230-kV Underground Cable Gen-tie Line**  
**Termination Pole/Structures**  
*Sutter Energy Center*

Source: WorleyParsons, 8/22/2013.



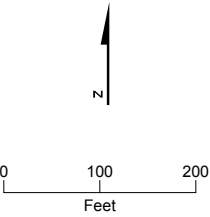
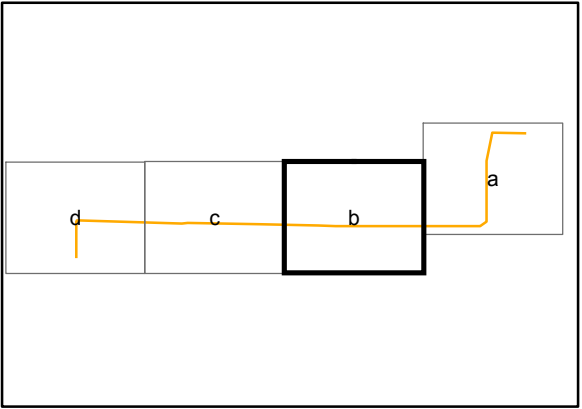
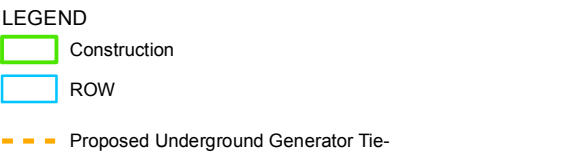
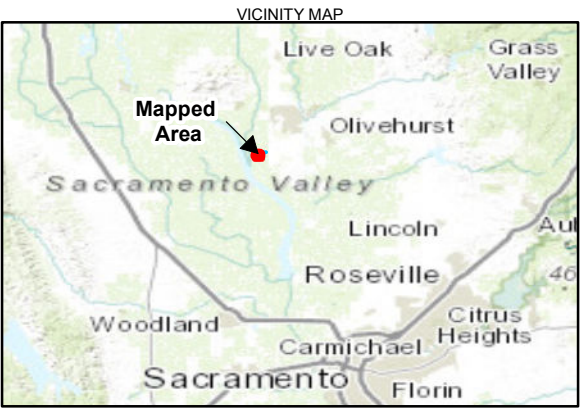


- LEGEND**
- Approximate Underground Gen-Tie Line Outlet
  - Sutter Energy Center Boundary
  - SEC Perimeter Road and Fenceline
  - Construction
  - ROW
  - Proposed Underground Generator Tie-Line



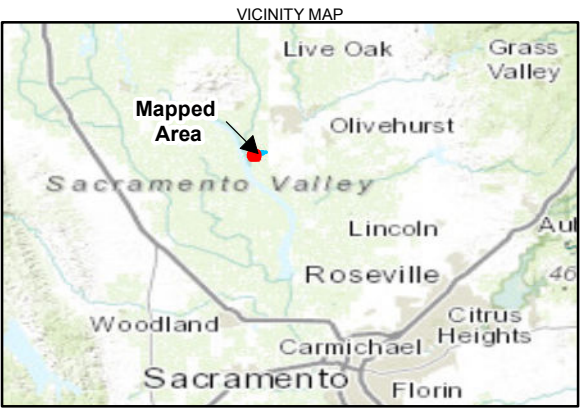
**FIGURE DR3-1a**  
**Underground 230-kV Gen-Tie Route**  
*Sutter Energy Center*



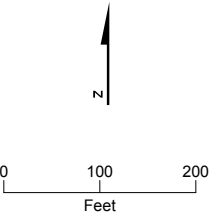
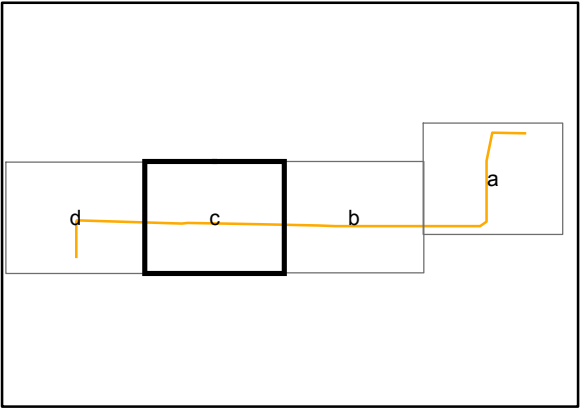


**FIGURE DR3-1b**  
**Underground 230-kV Gen-Tie Route**  
*Sutter Energy Center*



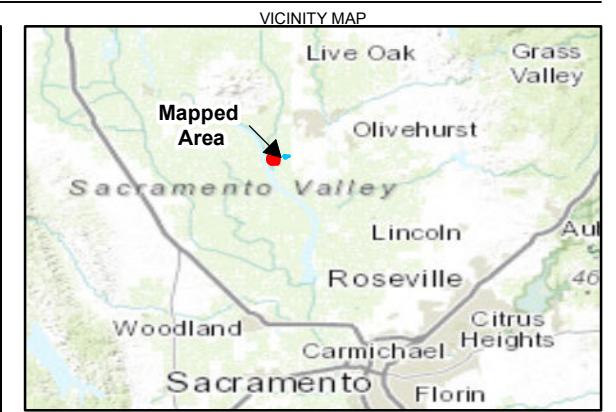


- LEGEND
- Construction
  - ROW
  - Proposed Underground Generator Tie-

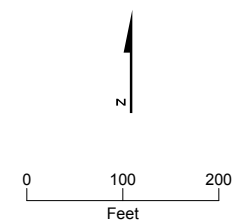
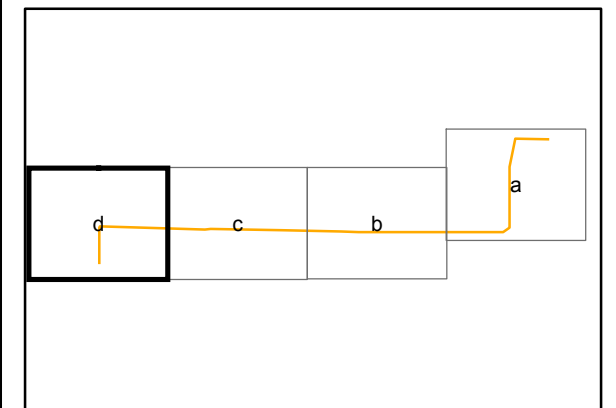


**FIGURE DR3-1c**  
**Underground 230-kV Gen-Tie Route**  
*Sutter Energy Center*





- LEGEND
- Construction
  - ROW
  - Proposed Substation
  - Proposed Underground Generator Tie-



**FIGURE DR3-1d**  
**Underground 230-kV Gen-Tie Route**  
*Sutter Energy Center*



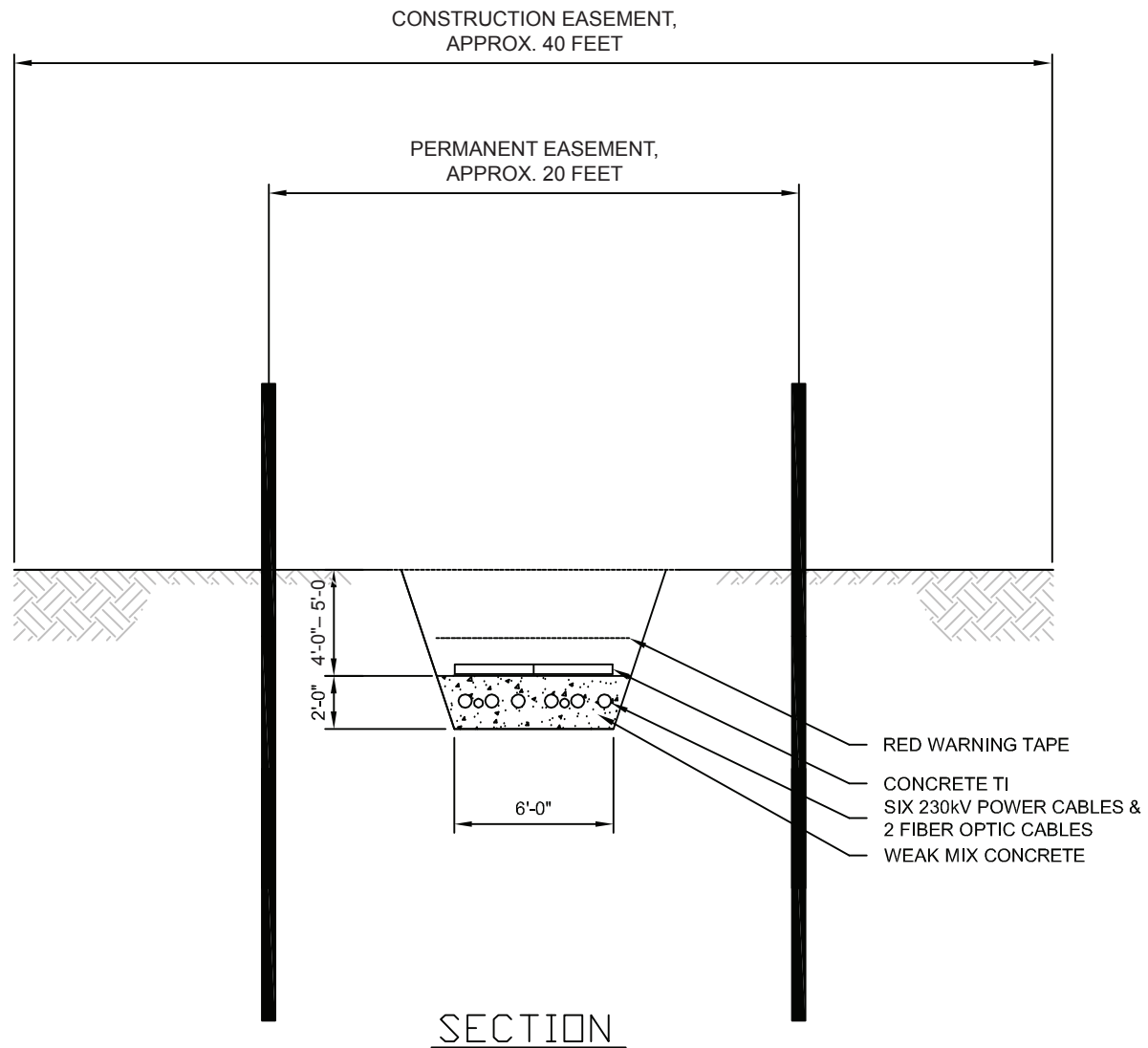
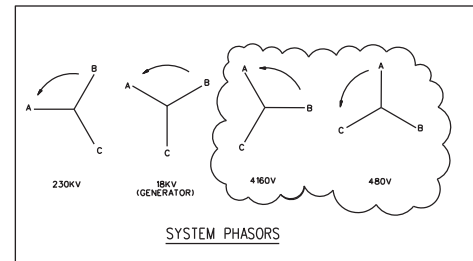


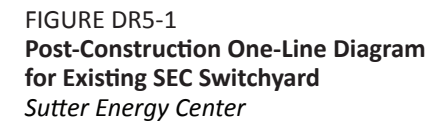
FIGURE DR4-1  
Anticipated Cross Section of  
Underground Gen-Tie Line  
*Sutter Energy Center*



CLF	-	CURRENT LIMITING FUSE
DS	-	DISCONNECT SWITCH
EXC	-	EXCITATION, GENERATOR
GND	-	GROUND
MTR	-	MOTOR
N.C.	-	NORMALLY CLOSED
N.O.	-	NORMALLY OPEN
PT	-	VOLTAGE TRANSFORMER
RM	-	REVENUE METER (BY WESTERN AREA POWER ADMINISTRATION)
SA	-	SURGE ARRESTOR
S-W	-	SIEMENS - WESTINGHOUSE

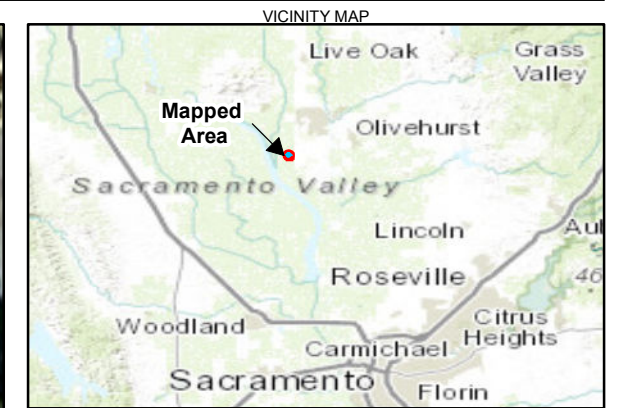
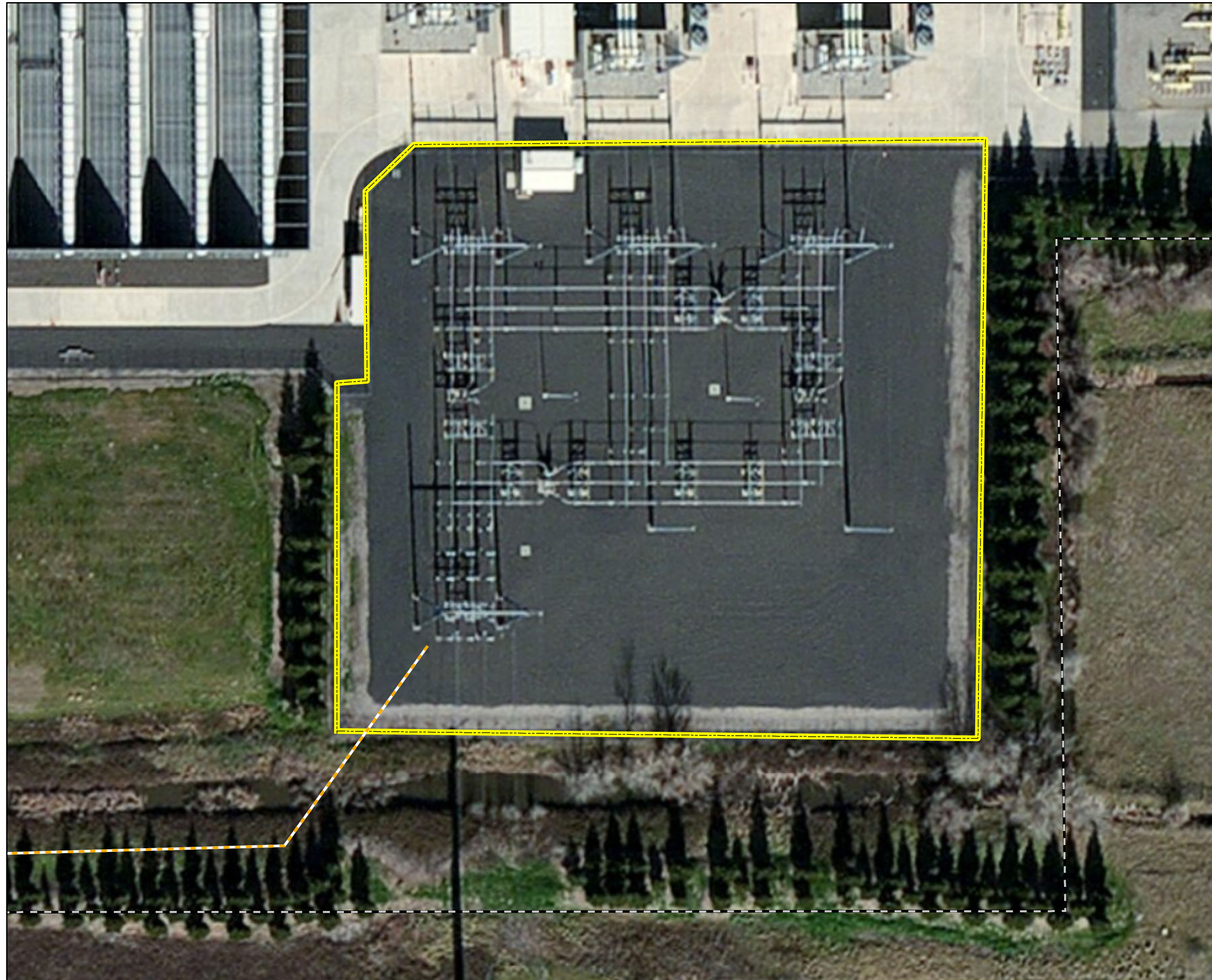
1. SURGE ARRESTORS FURNISHED WITH TRANSFORMER.
2. CT AND ST GENERATORS ARE RATED 250MVA.  
AT 67°F, AND APPROXIMATELY 215MVA AT 115°F.
3. FEEDWATER PUMPS ARE 2-100% PER HRSG; CONDENSATE PUMPS ARE 3-50%.
4. ALL EQUIPMENT IS LOCATED OUTDOORS, UNLESS NOTED OTHERWISE. ALL MOTOR CONTROL CENTERS (MCCS) ARE LOCATED INDOORS.
5. PARTIAL CAPACITY OFFSITE SOURCE FEED TO THE CTG AUXILIARY LOADS FOR PLANT SHUTDOWN INTERLOCKED MECHANICALLY WITH THE NORMAL SOURCE FEED.
6. ALL BREAKERS ARE NORMALLY CLOSED UNLESS NOTED OTHERWISE.
7. 480V SYSTEM IS HIGH RESISTANCE GROUNDED TO LIMIT GROUND FAULT CURRENT TO LESS THAN 10 AMPS. A GROUND FAULT LOCATION SYSTEM PROVIDED.




1. CTG GENERATOR/ 4160VAC SINGLE LINE, SIEMENS - WESTINGHOUSE  
DRAWING 8119D18 (BECHTEL NO. V01-MU02-00033).
2. STG GENERATOR/ 4160VAC SINGLE LINE, SIEMENS - WESTINGHOUSE  
DRAWING 8119D18 (BECHTEL NO. V01-MU03-00017).
3. SWITCHYARD SINGLE LINE METER & RELAY DIAGRAM  
0-E1-ZB-00002.

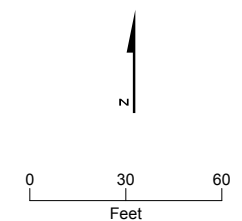


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- LEGEND**
-  Sutter Energy Center Boundary
  -  Proposed Underground Generator Tie-Line
  -  Switchyard Fenceline



**FIGURE DR5-2**  
**Aerial view of the SEC Switchyard**  
*Sutter Energy Center*



# Air Quality (6)

## Background

The applicant's cumulative impact analysis in the Sutter Energy Center amendment does not include information on any extant projects within a 6-mile radius of the site, nor does it include a request to the Feather River Air Quality Management District (FRAQMD) for a list of projects for which the district is currently processing an application. This information would be required in an application for a new project, in order for the application to be data adequate, so staff expected it would be provided in the SEC petition. Staff needs this information to evaluate any other large stationary sources that have recently been permitted, or are currently in the permitting process within a 6-mile radius of the SEC site.

6. *Please provide a list from the FRAQMD of large stationary source projects with permitted emissions greater than 5 tons of any single criteria pollutant. Include projects located within six miles of the project site that have been recently permitted, but have not yet started operation, and any projects that are in the process of being permitted.*

**Response:** The FRAQMD was contacted in order to provide a list of sources located within a 6-mile radius of the project site. The source list was specific to projects that the district is currently or has recently (within the last 18 months) permitted within this radius.

On July 29<sup>th</sup>, Timothy Mitro of the FRAQMD responded with a list of existing sources within the 6-mile project radius, which is listed in the Table DR6-1. He further stated that no new permits have been applied for within this area, nor have the sources in the table been proposed for modification. Thus, no cumulative air quality modeling analysis is needed.

TABLE DR6-1  
Existing Sources Within 6 miles of Sutter Energy Center

			Over 5 tons?				
Permit #	Source Type	Status	VOC	NOx	SOx	PM10	CO
2118	Natural Gas Compressor	Permitted	X				X
2110	Natural Gas Compressor	Permitted					X
2123	Natural Gas Compressor	Permitted					X
2115	Natural Gas Compressor	Permitted					X
2031	Natural Gas Compressor	Permitted					X
2243	Natural Gas Compressor	Permitted					X
2057	Natural Gas Compressor	Permitted					X
13003	Electrical Generation	Permitted	X	X	X	X	X
13007	Electrical Generation	Permitted	X	X		X	X
23072	Electrical Generation	Permitted					X
16019	Boilers	Permitted		X			X
10001	WWTP	Permitted		X			X
34015	Boilers/Prune Drying	Permitted		X			X
16000	Boilers/Prune Drying	Permitted					X