REQUEST WINDOW SUBMISSION FORM

Please complete this submission form and the Attachment A (technical data) and send the documentation to the ISO contact listed in section 2. Please note that this form should be used for the purpose of submitting information that applies to the scope of Request Window that is a part of the ISO Transmission Planning Process only. For more information on the Request Window, please refer to the Business Practice Manual (BPM) for the Transmission Planning Process which is available at: http://www.caiso.com/planning/Pages/TransmissionPlanning/Default.aspx.

The undersigned ISO Stakeholder Customer submits this request to be considered in the CAISO Transmission Plan. This submission is for (check one)[1]:

- ☒ Reliability Transmission Project (refer to section 1 of Attachment A)
  - ☒ Submission is requested by a PTO with a PTO service territory
  - ☐ Submission is requested by a non-PTO, a PTO without a PTO service territory or a PTO outside its PTO service territory.
- ☐ Merchant Transmission Facility (refer to section 1 of Attachment A)
- ☐ Location Constrained Resource Interconnection Facility (LCRIF) (refer to sections 1 & 2 of Attachment A)
- ☐ Project to preserve Long-term Congestion Revenue Rights (CRR) (refer to section 1 of Attachment A)
- ☐ Demand Response Alternatives (refer to section 3 of Attachment A)
- ☐ Generation Alternatives (refer to section 4 of Attachment A)

1. Please provide the following basic information of the submission:
   a. Please provide the project name and the date you are submitting the project proposal to the ISO. It is preferred that the name of the project reflects the scope and location of the project:

      Project Name: **Placer 115/60 kV Transformer Replacement and SPS**

      Submission Date: **September 14, 2012**

   b. Project location and interconnection point(s): Redacted

   c. Description of the project. Please provide the overview of the proposed project (e.g. overall scope, project objectives, estimated costs, etc.): **This project proposes to replace the Placer 115/60 kV Transformer with a new 200 MVA transformer and install a Special Protection Scheme (SPS) at Placer that would mitigate the effects of a DCTL outage.**

   d. Proposed In-Service Date, Trial Operation Date and Commercial Operation Date by month, day, and year and Term of Service.

[1] Please contact the ISO staff at requestwindow@caiso.com for any questions regarding the definitions of these submission categories in this form.

Proposed In-Service date: **05 / 31 / 2016**

Proposed Trial Operation date (if applicable): / /

Proposed Commercial Operation date (if applicable): / /

Proposed Term of Service (if applicable):

e. Contact Information for the Project Sponsor:

Name: Redacted

Title: **Manager**

Company Name: **Pacific Gas and Electric Company**

Street Address: Redacted

City, State:

Zip Code:

Phone Number:

Fax Number:

Email Address: Redacted

2. This Request Window Submission Form shall be submitted to the following ISO representative:

Name: Dana Young

Email Address: requestwindow@caiso.com

3. This Request Window Submission Form is submitted by:

Check here if the information is the same as the Project Sponsor information in 1 (f) of this submission: ☒

Name:

Title:

Company Name:

Street Address:

City, State:

Zip Code:

Phone Number:

Fax Number:

Email Address:

Placer 115/60 kV Transformer Replacement and SPS

IN-SERVICE DATE

May 2016

PURPOSE AND BENEFIT

Reliability – NERC compliance.

PROJECT CLASSIFICATION

This is a new project submitted for CAISO approval by March 2013.

DESCRIPTION AND SCOPE OF PROJECT

The project scope is to:

- Replace the existing Redacted 115/60 kV Transformer with a new 200 MVA transformer
- Investigate installing a SPS to drop load in the Redacted area following a Gold Hill-Placer 115 kV Lines Double Circuit Tower Line (DCTL) outage.

This project protects against NERC category A, B, and C5 contingencies.

The project is expected to cost between $15M and $20M

BACKGROUND

The Drum 115 and 60 kV systems are located in Redacte County. Together, they serve over 200 MW of electric demand or approximately 76,000 customers. Approximately 200 MW of local hydro generation serves as the main source to these systems. The 115 and 60 kV systems each have their own separate issues but affect to each other. The Placer system is located within the Drum Area.

Placer 115/60 kV System

The Placer system receives power primarily from three 115 kV lines including the Bell-Placer 115 kV Line and Gold Hill-Placer Nos. 1 & 2 115 kV Lines.

During the summer, Weimar CB 72, located between Redacted substations, operates normally open to reduce/limit the loading on the Drum 60 kV system. Therefore, the Placer 115/60 kV Transformer becomes the only source to the Placer 60 kV system.

The Redacte 115/60 kV Transformer radially feeds Redacted Redacted distribution substations through the Redacted and Redacted 60 kV Lines. This includes approximately 17,900 electric customers, or 75 MW, served by this transformer. The Placer 115/60 kV Transformer loads up to 4% above its normal rating under base conditions in 2022 and 1% above its normal rating following the loss of Halsey PH in 2015.

Additionally, a Double Circuit Tower Line outage of both the Redacted 115 kV Lines forces the Redacted 115 kV Path to feed the Redacte system. This overloads the Redacted 115 kV Line and causes extremely low voltages in the Placer Area, risking cascading low voltages.

This project proposal addresses these Placer system issues. Other issues identified in this local area are outlined below as well as how PG&E proposes to meet the system performance requirements.

60 kV System

The Redact 60 kV system is fed from both Redac and Redacte with Redacted open to separate the two sources. Drum directly feeds Redacted Redacted and Redacted distribution substations through the Redacted Redacted 60 kV Line. Following an outage of the Redacted 60 kV Line, this line also serves Redacted 60 kV substation as part of a flip-flop arrangement. This equates to approximately 13,900 electric customers, or 40 MW, served by this line.

Loading on the 60 kV transmission facilities are driven by load demand. The Redacted 60 kV Line is approximately 31 miles in length and comprised of 4/0 ACSR, 397 ACSR, 2/0 Cu, 4/0 Cu, and 397 Al conductors. The section from Redacted s 15.5 miles.

Planning analysis concludes that during 2013 summer peak conditions, a combined outage of the Redacted Valley 60 kV Line & Rollins PH overloads the Redacted 60 kV Line up to 8% above its emergency rating when the additional load is picked up. This outage also creates voltage issues in the area. A SEL49 thermal relay a Redacted protects this line by tripping the Redacted 60 kV Line for a thermal overload. This relay, however, is not always reliable because the temperature down the line at Redacted can be significantly higher than the temperature at Redact located in the mountains. To protect against this situation,

PG&E plans to reinforce the distribution system in order to be able to feed Redacted Redacte Substation from Redacted and Redacted only during emergency conditions.

115 kV System

Drum area generation provides power from the Redacte area and Redacted generation to both the Redacted and Redacte areas through three 115 kV lines. Load and generation levels determine whether the power flows primarily go toward Redacted through the Redacted Nos. 1 & 2–115 kV Lines or toward Redacted through the Redacted 115 kV path. This path consists of the Redacte Redacted feeds Redacted substation while the Redacted path feeds Redacted and Redacted substations. This equates to approximately 22,000 electric customers, or 100 MW, served directly from these lines. Additionally, the Redacted Nos. 1 & 2 – 115 kV Lines, fed by the two Redacted 230/115 kV Transformers, provide additional support to the Redacte area.

Planning analysis concludes that during 2017 summer peak conditions, an outage of Chicago Park PH loads the Redacted 115 kV Line up to 1% above its summer normal rating. The Redacted No. 2 - 115 kV Line loads up to 1% above its emergency rating following an outage of the Redacted 115 kV Line. Assuming that generation levels remain the same, more power flows toward Redacted as load increases, reducing the power flow toward the Drum – Rio Redac 115 kV Lines. As a current solution to this issue, generation in the area is operated according to CAISO Procedure Nos. 7240 and 7240A to prevent overloads on these lines.

Following a combined N-1-1 outage of two of these three lines, the remaining line loads up to 89% above its summer emergency rating. To guard against these conditions, generation in the area may need to be reduced further.

BASE CASE AND STUDY ASSUMPTIONS

PG&E used base cases and assumptions approved in the CAISO Unified Planning Assumptions and Study Plan for the 2012/2013 Transmission Planning Process cycle.

STUDY CRITERIA

NERC Transmission Planning Reliability Standards
WECC Transmission Planning System Performance Criterion
California ISO Planning Standards

OTHER ALTERNATIVES CONSIDERED

Alternative 1: Status Quo

This alternative is not recommended because it does not mitigate the expected capacity constraints without having to rely on operator switching actions.

Alternative 2: Atlantic-Placer Voltage Conversion Project

This alternative involves converting the 60 kV lines between Redacted and Redacted to 115 kV. This is a viable alternative to solve the Redacte Transformer Category A overload and low voltages due to the Gold Hill-Placer 115 kV Lines DCTL outage. However, it was not chosen due to the high cost without addressing the Drum 115 and 60 kV Lines issues.

This project is expected to cost between $90M and $100M.

PROJECT SCHEDULE

- Environmental and Permitting Processes – TBD
- Design – TBD
- Major Equipment – transformers, breakers
- Construction – TBD

KEY ISSUES

- Land-Use Restrictions – TBD
- Environmental Concerns – TBD
- Special Metering or Protection - TBD
- Common Mode Exposure Items – Placer-Gold Hill Nos. 1 & 2 115 kV Lines
- Interaction with other Projects or Studies – Rio Oso Voltage Support Project, New Rio Oso-Atlantic 230 kV Line Project, Rio Oso Transformers Replacement Project, Vaca Dixon-Davis Conversion Project, Gold Hill-Horseshoe 115 kV Reinforcement, Shady Glen Reliability Project

GEPSLF MODELING INFORMATION

```
##############################
#Placer 115/60 KV Transformer Replacement
#EDRO: May 2016
#Patrick Tan
#Created: 9-10-2012
#Replace existing Placer 115/60 KV Transformer
##############################
#
```

OLD_TRAN 32394, 32228, CKT=1, ZR=0.0021, ZX=0.0369, BMAG=-0.0007, MVA1=200, MVA2=220, MVA3=200, MVA4=220,+
VNOMF=60, VNOMT=115, MVABASE=100, STAT=1, TYPE=2, REG=32394, VMAX=1.05, VMIN=1.03,+
STEPP=0.01, TMAX=1.1, TMIN=0.9, TAPFP=1.0, TAPFS=1.0, GMAG=0, AREA=5, ZONE=305, OWN=390

MISCELLANEOUS DATA

- PG&E will construct, own, and finance the project
- PG&E will be the planned operator of the project

ATTACHMENTS

1. Single Line Diagrams
2. Demand Forecast
3. Drum Generation
4. Power Flow Summary
5. Pre and Post Project Power Flow Plots

Attachment 1: Scope Diagram

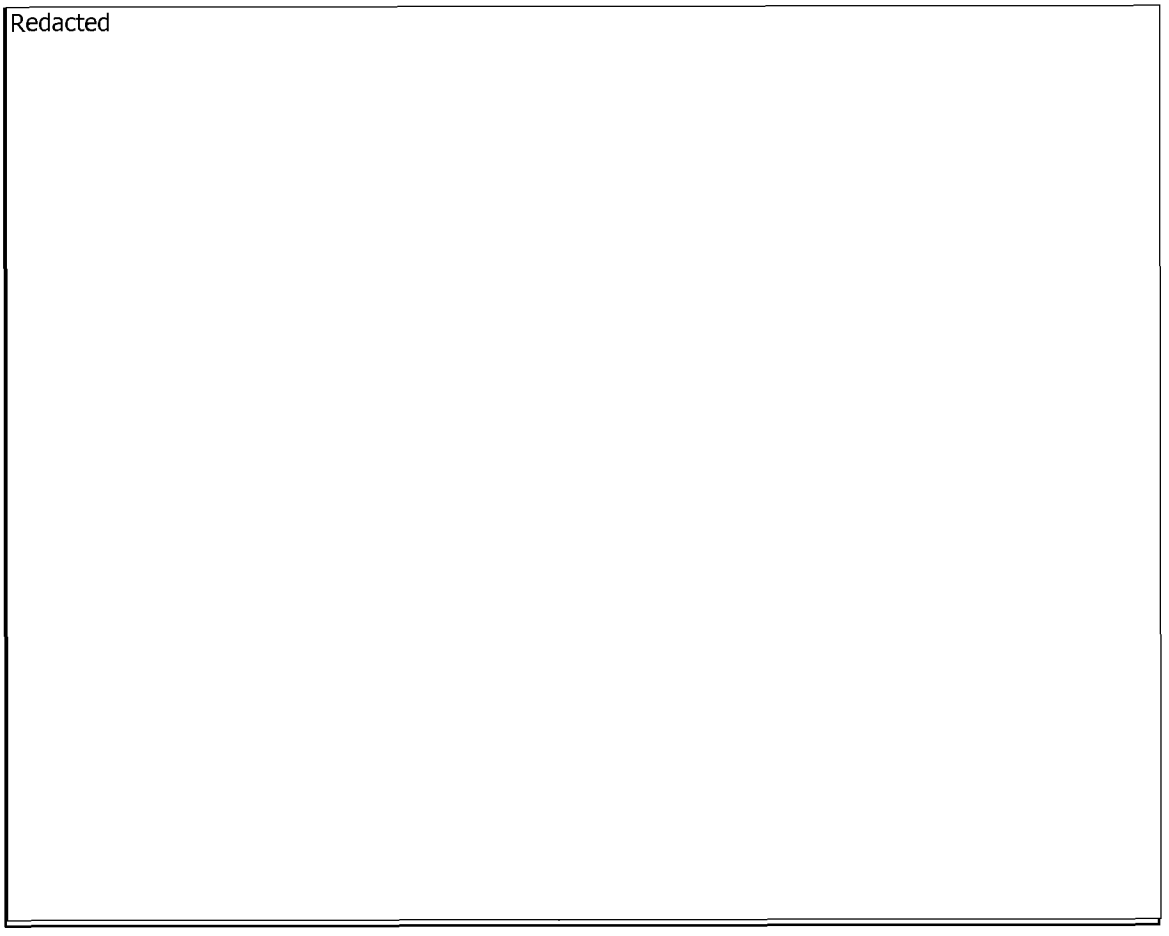

Figure 1: Existing Single Line Diagram

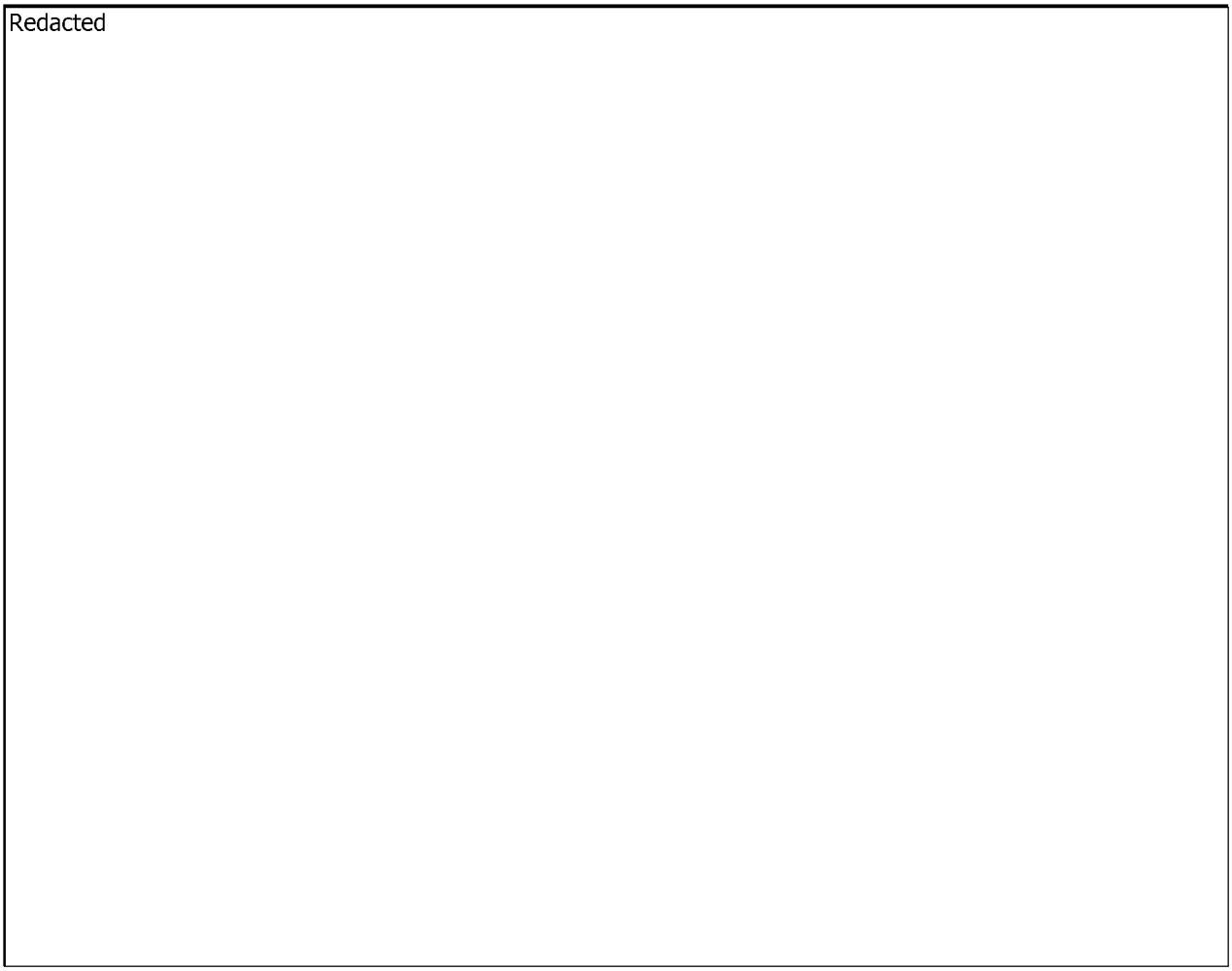

Figure 2: Proposed Single Line Diagram

Attachment 2: Demand Forecast

Table 1: Demand Forecast in the Drum-Placer Area

Substation/Bank	2013 (MW)	2014 (MW)	2015 (MW)	2016 (MW)	2017 (MW)	Growth Rate (MW/yr)
Redacted	12.2	12.6	12.8	13.0	13.3	0.3
	1.5	1.5	1.6	1.6	1.6	0.0
	7.4	7.5	7.6	7.8	7.9	0.1
	2.5	2.5	2.5	2.5	2.5	0.0
	7.5	7.6	7.8	7.9	8.1	0.2
	8.1	8.2	8.4	8.5	8.7	0.2
	17.8	18.1	18.4	18.8	19.1	0.3
	13.4	13.6	13.9	14.1	14.4	0.3
	6.2	6.3	6.5	6.6	6.7	0.1
	7.1	7.3	7.5	7.8	8.0	0.2
	27.4	27.8	28.2	28.6	29.0	0.4
	16.8	17.3	17.7	18.0	18.3	0.4
	5.7	5.9	6.0	6.1	6.2	0.1
	13.5	13.9	14.2	14.4	14.7	0.3
	23.9	24.4	24.8	25.3	25.7	0.5
	17.7	18.0	18.3	18.7	19.0	0.3
	23.8	24.2	24.7	25.1	25.6	0.5
	12.5	12.7	12.9	13.2	13.4	0.2
	24.5	25.3	25.7	26.2	26.7	0.6
	30.5	29.8	30.3	30.9	31.6	0.3
	12.2	12.6	12.3	13.0	13.3	0.3
Total Area Load	**292.2**	**297.1**	**302.1**	**308.1**	**313.8**	**5.4**

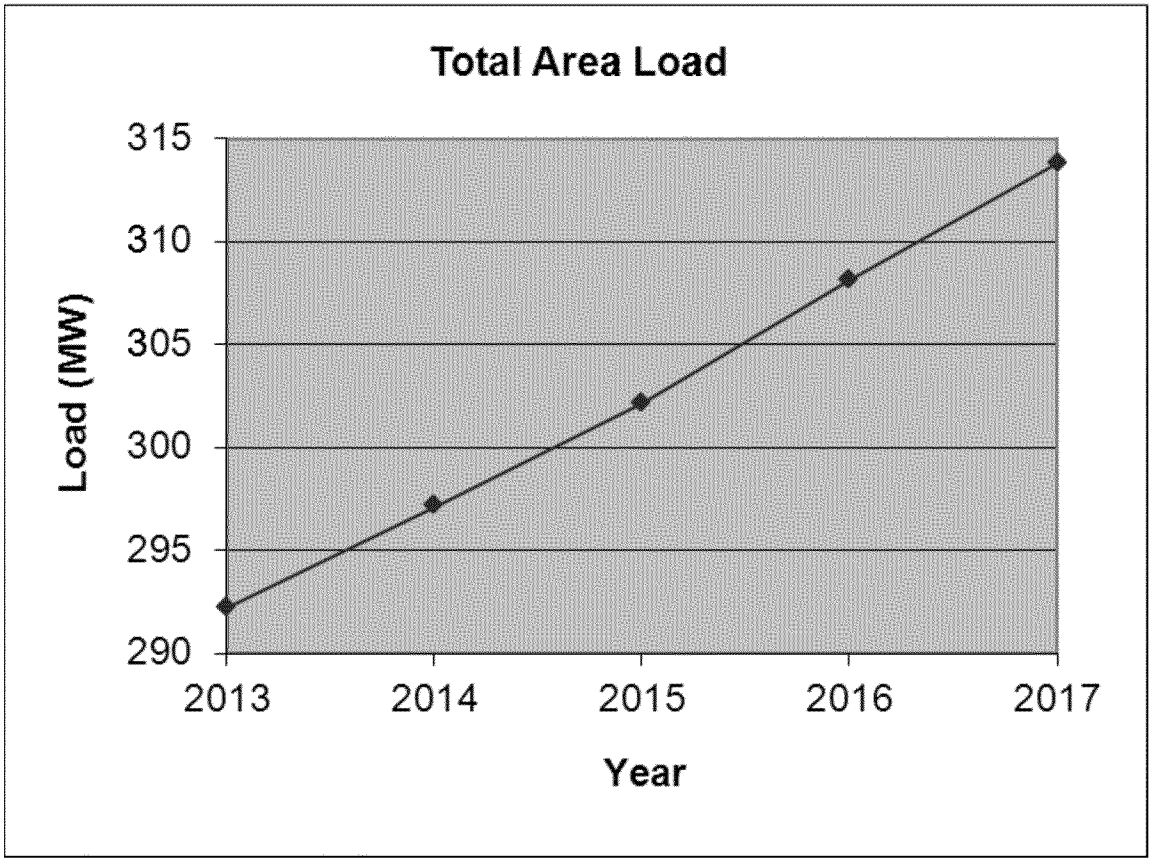

Figure 3: Demand Forecast Graph

Attachment 3: Area Generation

Table 2: Drum-Placer Area Generation

Drum Area Generation	
Generators	**2013 MW**
Redacted	54
	46
	22
	2
	3
	4
	22
	16
	38
	6
	11
	8
Total	**232**

Attachment 4: Power Flow Summary

Table 3: Power Flow Results

			Pre-Project						Post Project	
No.	Facility	Facility Rating	2013	2014	2015	2016	2017	2022	2022	Contingency
Category A										
1	Redac 115/60 kV Transformer No. 1	SN Rating 77 MVA	88%	90%	91%	93%	95%	104%	40%	Red system (n-0)
	Redac 115/60 kV Transformer No. 1	SN Rating 77 MVA	97%	99%	101%	103%	105%	114%	43%	Redac PH (G-1)
Category C										
2	Redac Area Voltages	115 kV 60 kV	diverge	diverge	diverge	diverge	diverge	diverge	Area Dropped	Redact 230 kV Bus 1 & 2 - CB 202 Failure (C2)
			diverge	diverge	diverge	diverge	diverge	diverge	Area Dropped	Redacte 115 kV Bus 1 & 2 - CB 102 Failure (C2)
			diverge	diverge	diverge	diverge	diverge	diverge	Area Dropped	Red 230/115 kV Transformer Nos. 1 & 2 (C3)
			diverge	diverge	diverge	diverge	diverge	diverge	Area Dropped	Redacted 115 kV Line No. 1 & Placer-Gold Hill 115 kV Line No. 2 (C5)

Attachment 5: Pre and Post Power Flow Plots Summary

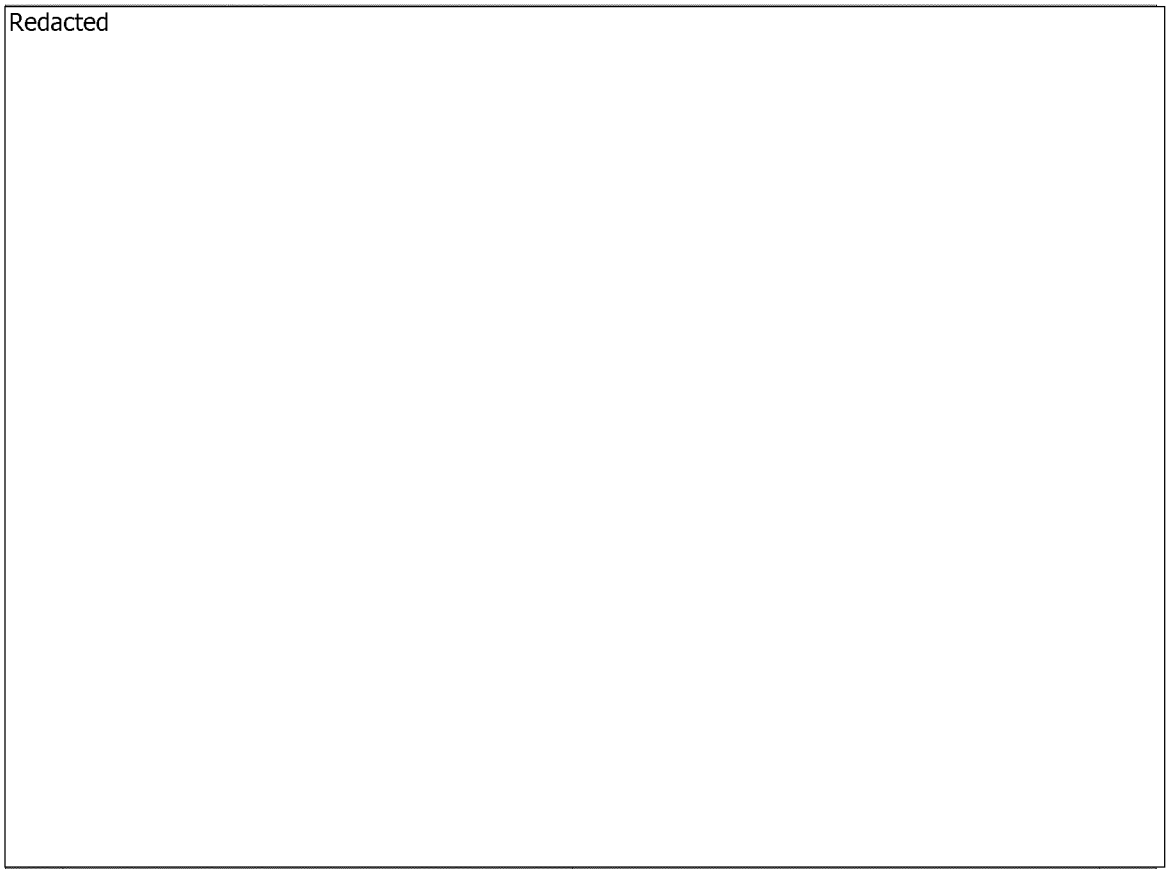

Figure 4: 2022 Pre Project – Normal Conditions

Redacted

Figure 5: 2022 Pre Project – Halsey PH Outage (G-1)

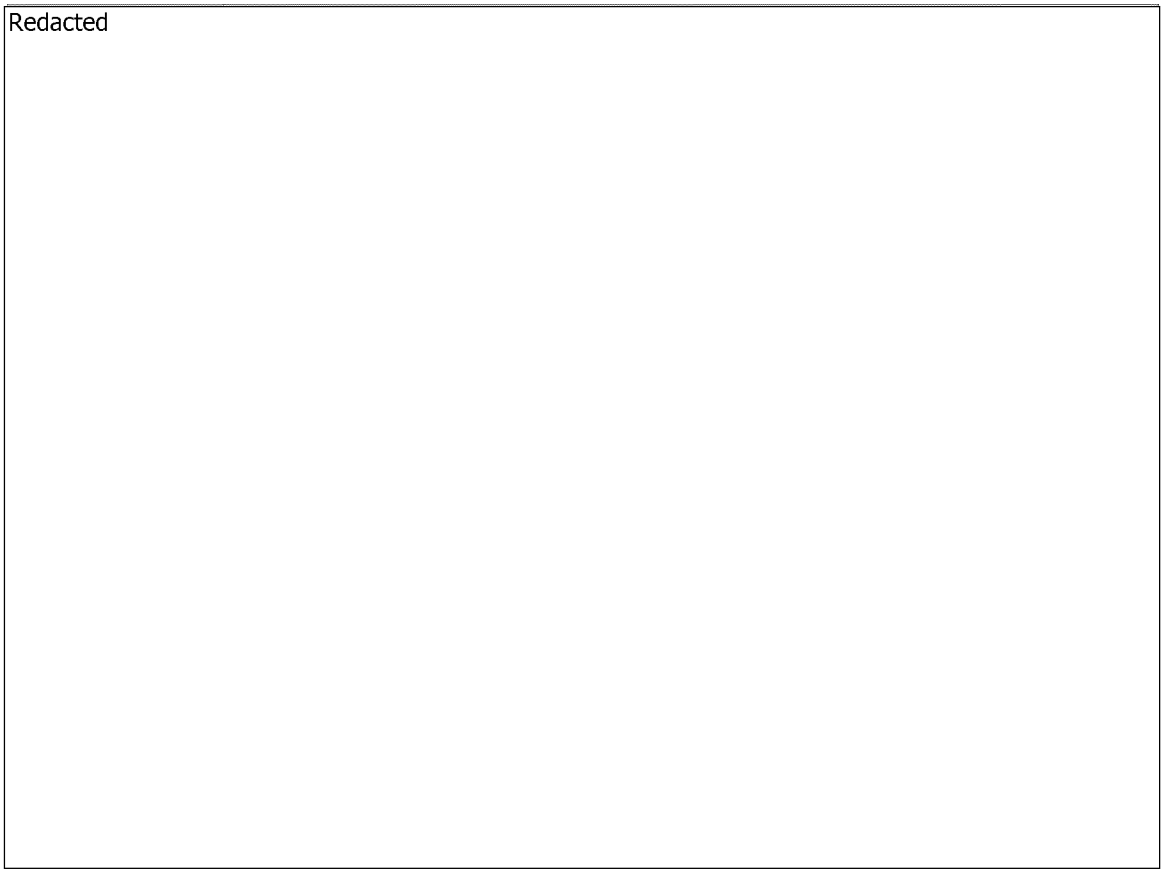

Figure 6: 2016 Pre Project – Placer-Gold Hill 115 kV Line Nos. 1 & 2 (DCTL)

Figure 7: 2022 Post Project – Normal Conditions

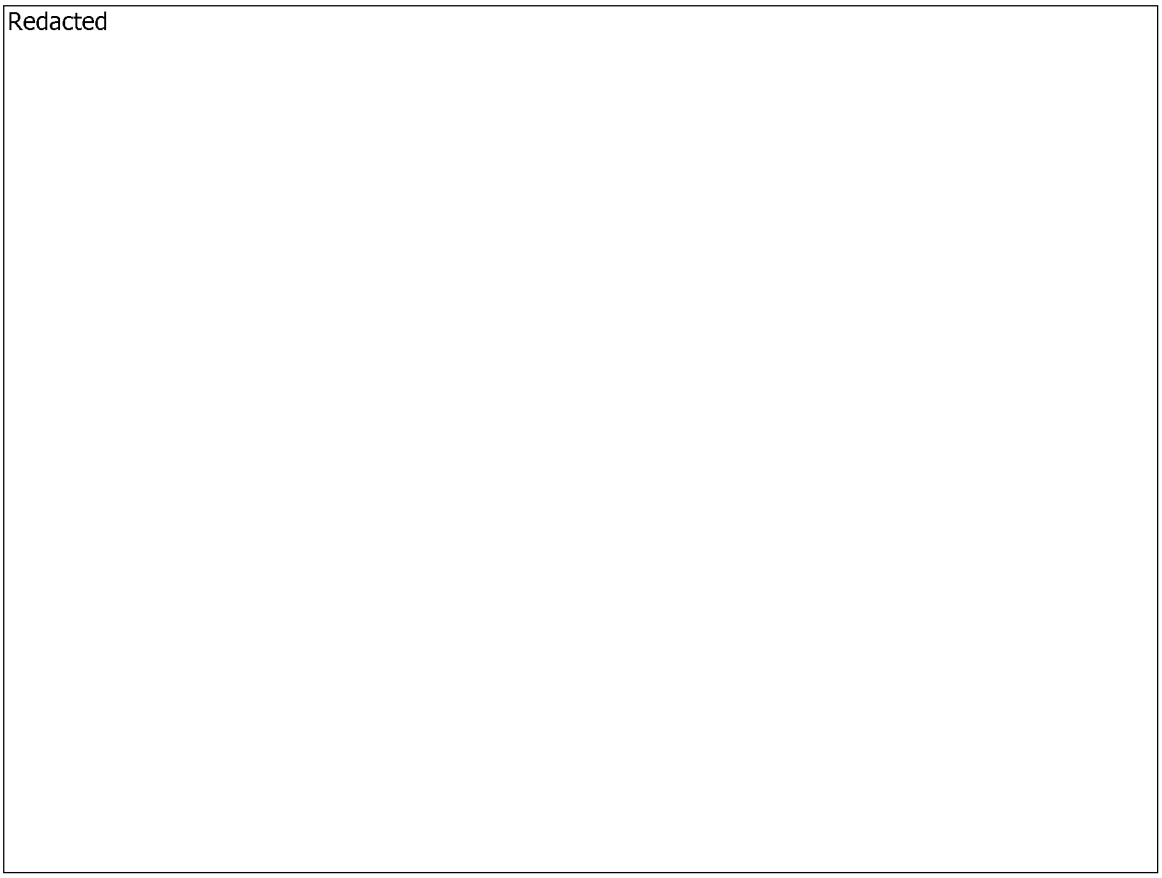

Figure 8: 2022 Post Project – Halsey PH Outage (G-1)

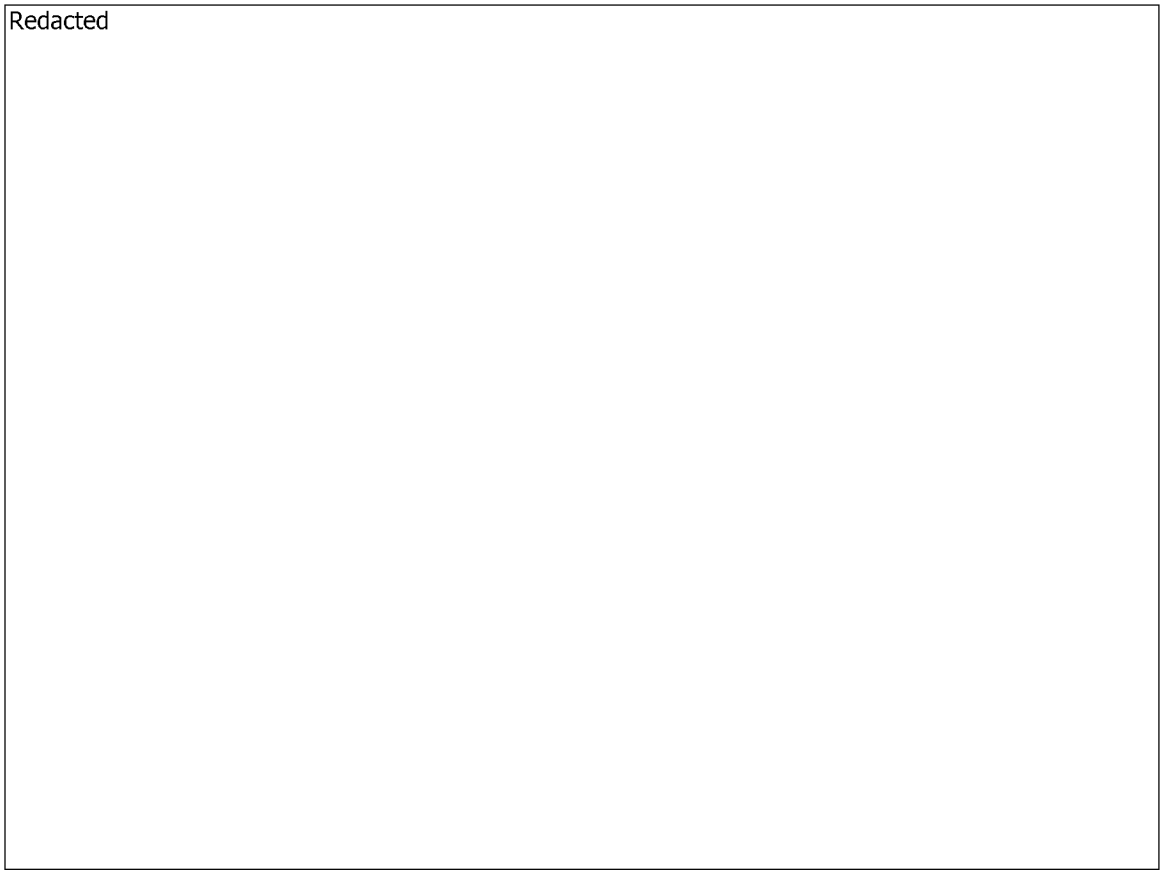

Figure 9: 2022 Post Project – Placer-Gold Hill 115 kV Line Nos. 1 & 2 (DCTL)